

K.L.N. COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)

(Accredited by NAAC for 5 Years W.e.f November 2018)

(An ISO 9001:2015 Certified Institution)



Pottapalayam -630612, Sivagangai District, Tamilnadu
(11km From Madurai City)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Permanently Affiliated to Anna University, Chennai)

(Research Centre of Anna University, Chennai)

(Accredited by NBA up to 30.06.2022)

FOR I YEAR

ELECTRICAL AND ELECTRONICS ENGINEERING

STUDENTS HAND BOOK

Anna University, Chennai

Regulation - 2017

(Academic Year 2019-2020)

K.L.N. COLLEGE OF ENGINEERING
Department of Electrical and Electronics Engineering
STUDENTS HAND BOOK
B.E. – EEE – First – Semester – Odd Semester of 2019 – 2020

This book contains the following:

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VISION AND MISSION OF THE COLLEGE

VISION

To become a Premier Institute of National Repute by Providing Quality Education, Successful Graduation, Potential Employability and Advanced Research & Development through Academic Excellence.

MISSION

To Develop and Make Students Competent Professional in the Dynamic Environment in the field of Engineering, Technology and Management by emphasizing Research, Social Concern and Ethical Values through Quality Education System.

VISION AND MISSION OF THE EEE DEPARTMENT

VISION

To become a high standard of excellence in Education, Training and Research in the field of Electrical & Electronics Engineering and allied applications.

MISSION

To produce excellent, innovative and Nationalistic Engineers with Ethical Values and to advance in the field of Electrical & Electronics Engineering and allied areas.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Educational Objectives of the Electrical and Electronics Engineering (EEE) Program represent major accomplishments that we expect our graduates to achieve after three to five years of graduation. More specifically our graduates are expected:

PEO1: to excel in industrial or graduate work in Electrical and Electronics Engineering and allied fields

PEO2: to practice their Professions conforming to Ethical Values and Environmentally friendly policies

PEO3: to work in international and multi-disciplinary Environments

PEO4: to successfully adapt to evolving Technologies and stay current with their Professions

PROGRAM SPECIFIC OUTCOMES (PSOs)

Electrical and Electronics Engineering Graduates will be able to:

PSO1: Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits, analog and digital electronic circuits, electrical machines and power systems.

PSO2: Apply appropriate techniques and modern Engineering hardware and software tools in power systems to engage in life- long learning and to successfully adapt in multi disciplinary environments.

PROGRAM OUTCOMES (POs)

Electrical and Electronics Engineering Graduates will be able to:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

OUTCOME BASED EDUCATION (OBE)

In a traditional education system, students are given grades and rankings compared to each other. Content and performance expectations are based primarily on what was taught in the past to students of a given age. The goal of traditional education was to present the knowledge and skills of an older generation to the new generation of students, and to provide students with an environment in which to learn. The process paid little attention (beyond the classroom teacher) to whether or not students learn any of the material.

An outcome is a culminating demonstration of learning; it is what the student should be able to do, at the end of a course/program, in-terms of the knowledge, skill and behavior.

Outcome-based education is an approach to education in which decisions about the curriculum are driven by the exit learning outcomes that the students should display at the end of the course. In outcome-based education, product defines process. Outcome-based education can be summed up as results-oriented thinking and is the opposite of input-based education where the emphasis is on the educational process. Outcome-based education promotes fitness for practice and education for capability.

BENEFITS AND SIGNIFICANCE OF ACCREDITATION

The process of accreditation helps in realizing a number of benefits, such as:

- Helps the Institution to know its strengths, weaknesses and opportunities
- Initiates Institutions into innovative and modern methods of pedagogy
- Gives Institutions a new sense of direction and identity
- Provides society with reliable information on quality of education offered
- Promotes intra and inter-Institutional interactions

Accreditation signifies different things to different stakeholders. These are:

Benefits to Institutions

Accreditation is market-driven and has an international focus. It assesses the characteristics of an Institution and its programme against a set of criteria established by National Board of Accreditation. NBA's key objective is to contribute to the significant improvement of the Institutions involved in the accreditation process. Accreditation process quantifies the strengths, weaknesses in the processes adopted by the Institution and provides directions and opportunities for future growth. NBA provides a quality seal or label that differentiates the Institutions from its peers at the national level. This leads to a widespread recognition and greater appreciation of the brand name of Institutions and motivates the Institutions to strive for more.

Benefits to Students

Students studying in NBA accredited Institutions can be assured that they will receive education which is a balance between high academic quality and professional relevance and that the needs of the corporate world are well integrated into programs, activities and processes. It signifies that he has entered the portals of an Institution, which has the essential and desirable features of quality professional education.

Benefits to Employers

Accreditation assures prospective employers that students come from a programme where the content and quality have been evaluated, satisfying established standards. It also signifies that the students passing out have acquired competence based on well established technical inputs.

Benefits to the Public

Accredited status represents the commitment of the programme and the Institution to quality and continuous improvement.

Catalyst for International Accreditations

Due to accreditation from NBA, the Institution's systems and procedures get aligned with the Institution's Mission and Vision. All essential prerequisites for international accreditation are included in the accreditation process of NBA. Therefore, NBA acts as a catalyst for the Institutions planning to acquire International Accreditation.

Benefits to Industry and Infrastructure Providers

It signifies identification of quality of Institutional capabilities, skills and knowledge.

Benefits to Parents

It signifies that their ward goes through a teaching-learning environment as per accepted good practices.

Benefits to Alumni

It reassures alumni that alumni are products of an institute with a higher standing in terms of learning.

Benefits to Country

Accreditation helps in gaining confidence of stakeholders and in giving a strong message that as a country, our technical manpower is of international standards and can be very useful in enhancing the global mobility for our technical manpower.

ENGINEERING ETHICS

Engineering Ethics is the set of rules and guidelines that engineers adhere to as a moral obligation to their profession and to the world. Engineering is a professional career that impact lives. When ethics is not followed, disaster often occurs; these disasters not only include huge monetary costs and environmental impacts, but also often result in the loss of human life. Engineering Ethics applies to every engineer and is very important.

The National Society of Professional Engineers (NSPE) decides the overall standards and codes of ethics for all the engineering professions. The Preamble of the NSPE *Code of Conduct for Engineers* (2007) states: “*Engineers shall at all times recognize that their primary obligation is to protect the safety, health, property, and welfare of the public. If their professional judgment is overruled under circumstances where the safety, health, property, or welfare of the public are endangered, they shall notify their employer or client and such other authority as may be appropriate.*”

Electrical Engineering Ethics

Electrical Engineering is a type of engineering profession that deals with the creation of better electronics. Since our society is heading towards an era of technology, where all members of society will be affected, it is especially important for electrical engineers to follow a code of engineering ethics. For electrical engineers, an important set of guidelines is the [*Electrical Engineering Code of Ethics*](#), published by IEEE.

IEEE code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology; its appropriate application, and potential consequences;

6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

Engineering Ethics in College/Education

The main engineering ethics problem that college students are face with is academic integrity. Academic integrity can show itself in the form of cheating by copying someone's work, intentional cheating, plagiarism, and/or self-plagiarism.

However, professional ethics is something that can be learned even when it conflicts with personal ethics, as for example, a situation where you are personally okay with building a product that can harm the environment, yet save lives. You can learn professional ethics and realize that something that is harmful to the environment is not okay. Ethics codes can even help you see the bigger picture. For example, in the previous scenario, these codes can help you re-evaluate your ethics and realize that something that is harmful to the environment will eventually be harmful to the people around you and yourself.

Engineering Ethics in the Professional World

In the professional world, ethical engineering problems come up in many cases. One of these includes the case of a professional using someone else's work that is published in the widespread market of publication. Another is the case of a professional using someone else's work that is not published yet and stealing their idea. Engineers who have good engineering ethics often have a good sense of the value of life. They don't hesitate to admit that they made a mistake because they know that the cost of not owning up to your mistakes can have disastrous consequences. It might even cost a human life.

Engineering Ethics in Companies

Not only do individual engineers have to be conscious of engineering ethics, but also companies. Companies have to be aware of their Corporate Social Responsibility and Environmental Responsibility. Corporate Social Responsibility is a company's responsibility to give back to the community that they profit from and to behave ethically so that both they and their community can benefit. Environmental Responsibility is a business's initiative to leave the environment (where it is taking its resources from) the same, if not better, that it is found it.

BLOOM'S TAXONOMY

Definitions of the different levels of thinking skills in Bloom's taxonomy

1. **Remember** – recalling relevant terminology, specific facts, or different procedures related to information and/or course topics. At this level, a student can remember something, but may not really understand it.
2. **Understand** – the ability to grasp the meaning of information (facts, definitions, concepts, etc.) that has been presented.
3. **Apply** – being able to use previously learned information in different situations or in problem solving.
4. **Analyze** – the ability to break information down into its component parts. Analysis also refers to the process of examining information in order to make conclusions regarding cause and effect, interpreting motives, making inferences, or finding evidence to support statements/arguments.
5. **Evaluate** – being able to judge the value of information and/or sources of information based on personal values or opinions.
6. **Create** – the ability to creatively or uniquely apply prior knowledge and/or skills to produce new and original thoughts, ideas, processes, etc. At this level, students are involved in creating their own thoughts and ideas.

List of Action Words Related to Critical Thinking Skills

REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Count	Associate	Add	Analyze	Appraise	Categorize
Define	Compute	Apply	Arrange	Assess	Combine
Describe	Convert	Calculate	Breakdown	Compare	Compile
Draw	Defend	Change	Combine	Conclude	Compose
Identify	Discuss	Classify	Design	Contrast	Create
Label	Distinguish	Complete	Detect	Criticize	Drive
List	Estimate	Compute	Develop	Critique	Design
Match	Explain	Demonstrate	Diagram	Determine	Devise
Name	Extend	Discover	Differentiate	Grade	Explain
Outline	Extrapolate	Divide	Discriminate	Interpret	Generate
Point	Generalize	Examine	Illustrate	Judge	Group
Quote	Give	Graph	Infer	Justify	Integrate
Read	examples	Interpolate	Outline	Measure	Modify
Recall	Infer	Manipulate	Point out	Rank	Order
Recite	Paraphrase	Modify	Relate	Rate	Organize
Recognize	Predict	Operate	Select	Support	Plan
Record	Rewrite	Prepare	Separate	Test	Prescribe
Repeat	Summarize	Produce	Subdivide		Propose
Reproduce		Show	Utilize		Rearrange
Select		Solve			Reconstruct
State Write		Subtract			Related
		Translate			Reorganize
		Use			Revise
					Rewrite
					Summarize
					Transform
					Specify

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM - 630 612
ACADEMIC CALENDAR - ODD Semester of 2019 – 2020
First Semester - B.E./B.Tech Courses

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM, SIVANGANGAI DISTRICT – 630 612											
Ref: KLNCE / 1 yr B.E./B.Tech / Academic Calendar / 1 Sem / 2019 - 2020 / Revised / <u>448</u>											
ACADEMIC CALENDAR – 2019-2020 - First Semester - B.E./B.Tech Courses											
Date: 06.08.2019											
August – 2019				September – 2019				October – 2019			
Day	Dt		wd	Dt		wd	Dt		wd	Dt	
Thu	1	Induction Programme									
Fri	2	Induction Programme									
Sat	3										
Sun	4										
Mon	5	1 Yr. B.E./B.Tech - Orientation Programme & Commencement of regular classes	1	2	Vinayagar Chathurthi - Holiday						
Tue	6	Dept. Faculty Meeting I (06 to 10)	2	3	Class Committee Meeting II (03 to 09)	20	1				41
Wed	7	Class Committee Meeting I (07 to 10)	3	4	Dept. Faculty Meeting II (04 to 06)	21	2	Gandhi Jayanthi - Holiday			
Thu	8		4	5		22	3				42
Fri	9		5	6		23	4				43
Sat	10	Working day - Monday order	6	7			5	Teachers' Day			
Sun	11			8			6				
Mon	12	Bakrid - Holiday		9			7	Ayudha pooja - Holiday			
Tue	13		7	10	Moharam - Holiday		8	Vijayadhasami - Holiday			
Wed	14		8	11		25	9	Class Committee Meeting III (09 to 19)			44
Thu	15	Independence Day - Holiday		12	End of Unit - II	26	10				45
Fri	16		9	13		27	11				46
Sat	17			14	Working day - Friday order CIT - I (14 to 20)	28	12	Working day - Tuesday order Parents Teachers Meeting			47
Sun	18			15			13				
Mon	19		10	16		29	14	Dept. Faculty Meeting III (14 to 18)			48
Tue	20		11	17		30	15	Engineers' Day			49
Wed	21		12	18		31	16				50
Thu	22	End of Unit - I	13	19		32	17				51
Fri	23	Krishna Jayanthi - Holiday		20		33	18	End of Unit - IV - CIT - II (18 to 25)			52
Sat	24	Working day - Thursday order	14	21			19				
Sun	25			22			20				
Mon	26	Class Test I (26.8.19 to 3.9.19)	15	23	Attendance Review	34	21				53
Tue	27		16	24		35	22				54
Wed	28		17	25		36	23				55
Thu	29		18	26		37	24				56
Fri	30		19	27		38	25				57
Sat	31			28	Working day - Monday order End of Unit - III	39	26	Working day - Wednesday order			58
Sun				29			27	Deepavalli - Holiday			
Mon				30	CIT - I Result Analysis & Class Test II (30.9.19 to 10.10.19)	40	28				59
Tue							29				60
Wed							30				61
Thu							31				62

[PTO]

November – 2019				December – 2019			
Day	Dt		wd	Dt			wd
Mon							
Tue							
Wed							
Thu							
Fri	1	CIT - II Result Analysis	63				
Sat	2	-----					
Sun	3	-----		1			
Mon	4	Class Committee Meeting IV (04 to 09)	64	2			
Tue	5	End of Unit - V	65	3			
Wed	6	CIT - III (06 to 09)	66	4	Commencement of AU End Semester Examinations		
Thu	7	Dept. Faculty Meeting III (07 to 11)	67	5			
Fri	8		68	6			
Sat	9	Working day - Monday order	69	7			
Sun	10	Miladi Nabi - Holiday		8			
Mon	11		70	9			
Tue	12	Model Exam (12 to 19)	71	10			
Wed	13		72	11			
Thu	14		73	12			
Fri	15		74	13			
Sat	16	-----		14			
Sun	17	-----		15			
Mon	18	CIT - III Result Analysis	75	16			
Tue	19		76	17			
Wed	20	Last Working Day	77	18			
Thu	21			19			
Fri	22	Commencement of AU Practical Examination		20			
Sat	23			21			
Sun	24			22			
Mon	25			23			
Tue	26			24			
Wed	27			25			
Thu	28			26			
Fri	29			27			
Sat	30			28			

Commencement of II Semester classes: 06.01.2020 (Monday)
Cc to All HODs, Directors, E.O (S & PR), E.O (Admin & HR)
Cc to Librarian (UG/PG), ISSG, TPO, PD, SM, Student section

[Signature]
6/8/19

[Signature]
PRINCIPAL

K.L.N.COLLEGE OF ENGINEERING, POTTAPALAYAM-630612.

Department of Electrical and Electronics Engineering

CLASS WISE TIME TABLE -2019-2020 (ODD SEMESTER)

Batch : 2019-2023

Year/Sem/Sec : I / I / A

With effect from 31.07.2019

[Class Room:EE02]

Faculty In-charge : V.Sindhu

Staff Code : 10235060

TIME→ DAY↓	09.00 – 09.50	09.50 – 10.40	10.55- 11.45	11.45- 12.35	L	01.10- 01.55	01.55- 02.40	02.50- 03.35	03.35- 04.20
PERIOD→	I	II	III	IV		V	VI	VII	VIII
MON	PSPP	MATHS	ENG	PHY	U	PHY LAB / CHE LAB			
TUE	CHE	PSPP	MATHS	ENG		PSPP LAB			
WED	PHY	ENG	PHY/CHE	PSPP	C	EG			
THU	MATHS	PHY	PSPP	CHE		H	PSPP	CHE	PD
FRI	EG				PHY		MATHS	ENG	CHE

STAFF CODE	STAFF NAME	SUB CODE	SUBJECT NAME	ABBREVIATION	TOTAL PERIODS
18435046	K. Sarangan	HS 8151	Communicative English	ENG	4
18135035	G.Pushparajan	MA 8151	Engineering Mathematics-I	MATHS	5
18235018	Ramasubramanian V	PH 8151	Engineering Physics	PHY	4.5
18335009	E. Rajalakshmi	CY 8151	Engineering Chemistry	CHE	4.5
10235060	V.Sindhu	GE 8151	Problem Solving and Python Programming	PSPP	5
10135033	M. Satheshkumar	GE 8152	Engineering Graphics	EG	8
10235060	V.Sindhu	GE 8161	Problem Solving and Python Programming Laboratory	PSPP LAB	4
18235018	Ramasubramanian V	BS 8161	Physics and	PHY LAB	4
18335009	E. Rajalakshmi		Chemistry Laboratory	CHE LAB	
-	-	-	PD	-	1

FACULTY INCHARGE

HOD/EEE

1/8/2019

**ANNA UNIVERSITY, CHENNAI
AFFILIATED INSTITUTIONS
REGULATIONS – 2017**

CHOICE BASED CREDIT SYSTEM

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

CURRICULUM AND SYLLABUS - FIRST SEMESTER

SEMESTER I

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	HS8151	Communicative English	HS	4	4	0	0	4
2.	MA8151	Engineering Mathematics - I	BS	4	4	0	0	4
3.	PH8151	Engineering Physics	BS	3	3	0	0	3
4.	CY8151	Engineering Chemistry	BS	3	3	0	0	3
5.	GE8151	Problem Solving and Python Programming	ES	3	3	0	0	3
6.	GE8152	Engineering Graphics	ES	6	2	0	4	4
PRACTICALS								
7.	GE8161	Problem Solving and Python Programming Laboratory	ES	4	0	0	4	2
8.	BS8161	Physics and Chemistry Laboratory	BS	4	0	0	4	2
TOTAL				31	19	0	12	25

SEMESTER II

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	HS8251	Technical English	HS	4	4	0	0	4
2.	MA8251	Engineering Mathematics - II	BS	4	4	0	0	4
3.	PH8253	Physics for Electronics Engineering	BS	3	3	0	0	3
4.	BE8252	Basic Civil and Mechanical Engineering	ES	4	4	0	0	4
5.	EE8251	Circuit Theory	PC	4	2	2	0	3
6.	GE8291	Environmental Science and Engineering	HS	3	3	0	0	3
PRACTICALS								
7.	GE8261	Engineering Practices Laboratory	ES	4	0	0	4	2
8.	EE8261	Electric Circuits Laboratory	PC	4	0	0	4	2
TOTAL				30	20	2	8	25

OBJECTIVES:

- To develop the basic reading and writing skills of first year engineering and technology students.
- To help learners develop their listening skills, which will, enable them listen to lectures and comprehend them by asking questions; seeking clarifications.
- To help learners develop their speaking skills and speak fluently in real contexts.
- To help learners develop vocabulary of a general kind by developing their reading skills

UNIT I SHARING INFORMATION RELATED TO ONESELF/FAMILY& FRIENDS 12

Reading- short comprehension passages, practice in skimming-scanning and predicting- **Writing-** completing sentences- - developing hints. **Listening-** short texts- short formal and informal conversations. **Speaking-** introducing oneself - exchanging personal information- **Language development-** Wh- Questions- asking and answering-yes or no questions- parts of speech. **Vocabulary development--** prefixes- suffixes- articles.- count/ uncount nouns.

UNIT II GENERAL READING AND FREE WRITING 12

Reading - comprehension-pre-reading-post reading- comprehension questions (multiple choice questions and /or short questions/ open-ended questions)-inductive reading- short narratives and descriptions from newspapers including dialogues and conversations (also used as short Listening texts)- register- **Writing** – paragraph writing- topic sentence- main ideas- free writing, short narrative descriptions using some suggested vocabulary and structures –**Listening-** telephonic conversations. **Speaking** – sharing information of a personal kind—greeting – taking leave- **Language development–** prepositions, conjunctions **Vocabulary development-** guessing meanings of words in context.

UNIT III GRAMMAR AND LANGUAGE DEVELOPMENT 12

Reading- short texts and longer passages (close reading) **Writing-** understanding text structure- use of reference words and discourse markers-coherence-jumbled sentences **Listening** – listening to longer texts and filling up the table- product description- narratives from different sources. **Speaking-** asking about routine actions and expressing opinions. **Language development-** degrees of comparison- pronouns- direct vs indirect questions- **Vocabulary development** – single word substitutes- adverbs.

UNIT IV READING AND LANGUAGE DEVELOPMENT 12

Reading- comprehension-reading longer texts- reading different types of texts- magazines **Writing-** letter writing, informal or personal letters-e-mails-conventions of personal email- **Listening-** listening to dialogues or conversations and completing exercises based on them. **Speaking-** speaking about oneself- speaking about one's friend- **Language development-** Tenses- simple present-simple past- present continuous and past continuous- **Vocabulary development-** synonyms-antonyms- phrasal verbs

UNIT V EXTENDED WRITING 12

Reading- longer texts- close reading –**Writing-** brainstorming -writing short essays – developing an outline- identifying main and subordinate ideas- dialogue writing-**Listening** – listening to talks- conversations- **Speaking** – participating in conversations- short group conversations-**Language development-** modal verbs- present/ past perfect tense - **Vocabulary development-** collocations- fixed and semi-fixed expressions

TOTAL: 60 PERIODS

OUTCOMES: At the end of the course, learners will be able to:

- Read articles of a general kind in magazines and newspapers.
- Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
- Comprehend conversations and short talks delivered in English
- Write short essays of a general kind and personal letters and emails in English.

TEXT BOOKS:

1. Board of Editors. **Using English** A Coursebook for Undergraduate Engineers and Technologists. Orient BlackSwan Limited, Hyderabad: 2015
2. Richards, C. Jack. **Interchange Students' Book-2** New Delhi: CUP, 2015.

REFERENCES

- 1 Bailey, Stephen. **Academic Writing: A practical guide for students**. New York: Rutledge, 2011.
- 2 Comfort, Jeremy, et al. **Speaking Effectively : Developing Speaking Skills for Business English**. Cambridge University Press, Cambridge: Reprint 2011
- 3 Dutt P. Kiranmai and Rajeevan Geeta. **Basic Communication Skills**, Foundation Books: 2013
- 4 Means, L. Thomas and Elaine Langlois. **English & Communication For Colleges**. Cengage Learning, USA: 2007
- 5 Redston, Chris & Gillies Cunningham **Face2Face** (Pre-intermediate Student's Book & Workbook) Cambridge University Press, New Delhi: 2005

OBJECTIVES :

- The goal of this course is to achieve conceptual understanding and to retain the best traditions of traditional calculus. The syllabus is designed to provide the basic tools of calculus mainly for the purpose of modelling the engineering problems mathematically and obtaining solutions. This is a foundation course which mainly deals with topics such as single variable and multivariable calculus and plays an important role in the understanding of science, engineering, economics and computer science, among other disciplines.

UNIT I DIFFERENTIAL CALCULUS**12**

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules - Maxima and Minima of functions of one variable.

UNIT II FUNCTIONS OF SEVERAL VARIABLES**12**

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT III INTEGRAL CALCULUS**12**

Definite and Indefinite integrals - Substitution rule - Techniques of Integration - Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals.

UNIT IV MULTIPLE INTEGRALS**12**

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals.

UNIT V DIFFERENTIAL EQUATIONS**12**

Higher order linear differential equations with constant coefficients - Method of variation of parameters – Homogenous equation of Euler's and Legendre's type – System of simultaneous linear differential equations with constant coefficients - Method of undetermined coefficients.

TOTAL : 60 PERIODS**OUTCOMES :**

After completing this course, students should demonstrate competency in the following skills:

- Use both the limit definition and rules of differentiation to differentiate functions.
- Apply differentiation to solve maxima and minima problems.
- Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
- Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
- Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.

- Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
- Apply various techniques in solving differential equations.

TEXT BOOKS :

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.
2. James Stewart, "Calculus: Early Transcendentals", Cengage Learning, 7th Edition, New Delhi, 2015. [For Units I & III - Sections 1.1, 2.2, 2.3, 2.5, 2.7(Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1(Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8].

REFERENCES :

1. Anton, H, Bivens, I and Davis, S, "Calculus", Wiley, 10th Edition, 2016.
2. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 3rd Edition, 2007.
3. Narayanan, S. and Manicavachagom Pillai, T. K., "Calculus" Volume I and II, S. Viswanathan Publishers Pvt. Ltd., Chennai, 2007.
4. Srimantha Pal and Bhunia, S.C, "Engineering Mathematics" Oxford University Press, 2015.
5. Weir, M.D and Joel Hass, "Thomas Calculus", 12th Edition, Pearson India, 2016.

PH8151

ENGINEERING PHYSICS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology.

UNIT I PROPERTIES OF MATTER

9

Elasticity – Stress-strain diagram and its uses - factors affecting elastic modulus and tensile strength – torsional stress and deformations – twisting couple - torsion pendulum: theory and experiment - bending of beams - bending moment – cantilever: theory and experiment – uniform and non-uniform bending: theory and experiment - I-shaped girders - stress due to bending in beams.

UNIT II WAVES AND FIBER OPTICS

9

Oscillatory motion – forced and damped oscillations: differential equation and its solution – plane progressive waves – wave equation. Lasers : population of energy levels, Einstein's A and B coefficients derivation – resonant cavity, optical amplification (qualitative) – Semiconductor lasers: homojunction and heterojunction – Fiber optics: principle, numerical aperture and acceptance angle - types of optical fibres (material, refractive index, mode) – losses associated with optical fibers - fibre optic sensors: pressure and displacement.

UNIT III THERMAL PHYSICS

9

Transfer of heat energy – thermal expansion of solids and liquids – expansion joints - bimetallic strips - thermal conduction, convection and radiation – heat conduction in solids – thermal conductivity - Forbe's and Lee's disc method: theory and experiment - conduction through compound media (series and parallel) – thermal insulation – applications: heat exchangers, refrigerators, ovens and solar water heaters.

UNIT IV QUANTUM PHYSICS**9**

Black body radiation – Planck's theory (derivation) – Compton effect: theory and experimental verification – wave particle duality – electron diffraction – concept of wave function and its physical significance – Schrödinger's wave equation – time independent and time dependent equations – particle in a one-dimensional rigid box – tunnelling (qualitative) - scanning tunnelling microscope.

UNIT V CRYSTAL PHYSICS**9**

Single crystalline, polycrystalline and amorphous materials – single crystals: unit cell, crystal systems, Bravais lattices, directions and planes in a crystal, Miller indices – inter-planar distances - coordination number and packing factor for SC, BCC, FCC, HCP and diamond structures - crystal imperfections: point defects, line defects – Burger vectors, stacking faults – role of imperfections in plastic deformation - growth of single crystals: solution and melt growth techniques.

TOTAL : 45 PERIODS**OUTCOMES:**

Upon completion of this course,

- the students will gain knowledge on the basics of properties of matter and its applications,
- the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
- the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
- the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and
- the students will understand the basics of crystals, their structures and different crystal growth techniques.

TEXT BOOKS:

1. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015.
2. Gaur, R.K. & Gupta, S.L. "Engineering Physics". Dhanpat Rai Publishers, 2012.
3. Pandey, B.K. & Chaturvedi, S. "Engineering Physics". Cengage Learning India, 2012.

REFERENCES:

1. Halliday, D., Resnick, R. & Walker, J. "Principles of Physics". Wiley, 2015.
2. Serway, R.A. & Jewett, J.W. "Physics for Scientists and Engineers". Cengage Learning, 2010.
3. Tipler, P.A. & Mosca, G. "Physics for Scientists and Engineers with Modern Physics". W.H. Freeman, 2007.

OBJECTIVES:

- To make the students conversant with boiler feed water requirements, related problems and water treatment techniques.
- To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.
- Preparation, properties and applications of engineering materials.
- Types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.
- Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.

UNIT I WATER AND ITS TREATMENT

9

Hardness of water – types – expression of hardness – units – estimation of hardness of water by EDTA – numerical problems – boiler troubles (scale and sludge) – treatment of boiler feed water – Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) external treatment

– Ion exchange process, zeolite process – desalination of brackish water - Reverse Osmosis.

UNIT II SURFACE CHEMISTRY AND CATALYSIS

9

Adsorption: Types of adsorption – adsorption of gases on solids – adsorption of solute from solutions – adsorption isotherms – Freundlich's adsorption isotherm – Langmuir's adsorption isotherm – contact theory – kinetics of surface reactions, unimolecular reactions, Langmuir - applications of adsorption on pollution abatement.

Catalysis: Catalyst – types of catalysis – criteria – autocatalysis – catalytic poisoning and catalytic promoters - acid base catalysis – applications (catalytic convertor) – enzyme catalysis– Michaelis – Menten equation.

UNIT III ALLOYS AND PHASE RULE

9

Alloys: Introduction- Definition- properties of alloys - significance of alloying, functions and effect of alloying elements- Nichrome and stainless steel (18/8) – heat treatment of steel. Phase rule: Introduction, definition of terms with examples, one component system -water system - reduced phase rule - thermal analysis and cooling curves - two component systems - lead-silver system - Pattinson process.

UNIT IV FUELS AND COMBUSTION

9

Fuels: Introduction - classification of fuels - coal - analysis of coal (proximate and ultimate) - carbonization - manufacture of metallurgical coke (Otto Hoffmann method) - petroleum - manufacture of synthetic petrol (Bergius process) - knocking - octane number - diesel oil - cetane number - natural gas - compressed natural gas (CNG) - liquefied petroleum gases (LPG) - power alcohol and biodiesel. Combustion of fuels: Introduction - calorific value - higher and lower calorific values- theoretical calculation of calorific value - ignition temperature - spontaneous ignition temperature - explosive range - flue gas analysis (ORSAT Method).

UNIT V ENERGY SOURCES AND STORAGE DEVICES

9

Nuclear fission - controlled nuclear fission - nuclear fusion - differences between nuclear fission and fusion - nuclear chain reactions - nuclear energy - light water nuclear power plant - breeder reactor - solar energy conversion - solar cells - wind energy. Batteries, fuel cells and supercapacitors: Types of batteries – primary battery (dry cell) secondary battery (lead acid battery, lithium-ion-battery) fuel cells

– H₂-O₂ fuel cell.

TOTAL: 45 PERIODS

OUTCOMES:

- The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.

TEXT BOOKS:

1. S. S. Dara and S. S. Umare, "A Textbook of Engineering Chemistry", S. Chand & Company LTD, New Delhi, 2015
2. P. C. Jain and Monika Jain, "Engineering Chemistry" Dhanpat Rai Publishing Company (P) LTD, New Delhi, 2015
3. S. Vairam, P. Kalyani and Suba Ramesh, "Engineering Chemistry", WileyIndia PVT, LTD, New Delhi, 2013.

REFERENCES:

1. Friedrich Emich, "Engineering Chemistry", Scientific International PVT, LTD, New Delhi, 2014.
2. Prasanta Rath, "Engineering Chemistry", Cengage Learning India PVT, LTD, Delhi, 2015.
3. Shikha Agarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, 2015.

GE8151**PROBLEM SOLVING AND PYTHON PROGRAMMING****L T P C****3 0 0 3****COURSE OBJECTIVES:**

- To know the basics of algorithmic problem solving
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures — lists, tuples, dictionaries.
- To do input/output with files in Python.

UNIT I ALGORITHMIC PROBLEM SOLVING**9**

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II DATA, EXPRESSIONS, STATEMENTS**9**

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III CONTROL FLOW, FUNCTIONS**9**

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV LISTS, TUPLES, DICTIONARIES**9**

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters;

Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing - list comprehension; Illustrative programs: selection sort, insertion sort, mergesort, histogram.

UNIT V FILES, MODULES, PACKAGES

9

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

COURSE OUTCOMES:

Upon completion of the course, students will be able to

- Develop algorithmic solutions to simple computational problems
- Read, write, execute by hand simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python Programs.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
(<http://greenteapress.com/wp/think-python/>)
2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

REFERENCES:

1. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus, Wiley India Edition, 2013.
2. John V Guttag, "Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press , 2013
3. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
4. Paul Gries, Jennifer Campbell and Jason Montojo, "Practical Programming: An Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC, 2013.
5. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
6. Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd., 2015.

OBJECTIVES:

- To develop in students, graphic skills for communication of concepts, ideas and design of Engineering products.
- To expose them to existing national standards related to technical drawings.

CONCEPTS AND CONVENTIONS (Not for Examination)

1

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREEHAND SKETCHING

7+12

Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

Visualization concepts and Free Hand sketching: Visualization principles –Representation of Three Dimensional objects – Layout of views- Freehand sketching of multiple views from pictorial views of objects

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE

6+12

Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS

5+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method.

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES

5+12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS

6+12

Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method .

TOTAL: 90 PERIODS**OUTCOMES:**

On successful completion of this course, the student will be able to

- familiarize with the fundamentals and standards of Engineering graphics
- perform freehand sketching of basic geometrical constructions and multiple views of objects.
- project orthographic projections of lines and plane surfaces.
- draw projections and solids and development of surfaces.
- visualize and to project isometric and perspective sections of simple solids.

TEXT BOOK:

1. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.
2. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.

REFERENCES:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
2. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.
3. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
4. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
5. N S Parthasarathy And Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
6. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson, 2nd Edition, 2009.

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only.
The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day

GE8161**PROBLEM SOLVING AND PYTHON PROGRAMMING
LABORATORY****LT P C
0 0 4 2****COURSE OBJECTIVES:**

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python.

LIST OF PROGRAMS

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton's method)
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Linear search and Binary search
6. Selection sort, Insertion sort
7. Merge sort
8. First n prime numbers
9. Multiply matrices
10. Programs that take command line arguments (word count)
11. Find the most frequent words in a text read from a file
12. Simulate elliptical orbits in Pygame
13. Simulate bouncing ball using Pygame

PLATFORM NEEDED

Python 3 interpreter for Windows/Linux

COURSE OUTCOMES:

Upon completion of the course, students will be able to

- Write, test, and debug simple Python programs.
- Implement Python programs with conditionals and loops.
- Develop Python programs step-wise by defining functions and calling them.
- Use Python lists, tuples, dictionaries for representing compound data.
- Read and write data from/to files in Python.

TOTAL :60 PERIODS

BS8161

PHYSICS AND CHEMISTRY LABORATORY

L T P C

(Common to all branches of B.E. / B.Tech Programmes)

0 0 4 2

OBJECTIVES:

- To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics, properties of matter and liquids.

LIST OF EXPERIMENTS: PHYSICS LABORATORY (Any 5 Experiments)

1. Determination of rigidity modulus – Torsion pendulum
2. Determination of Young's modulus by non-uniform bending method
3. (a) Determination of wavelength, and particle size using Laser
(b) Determination of acceptance angle in an optical fiber.
4. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
5. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer
6. Determination of wavelength of mercury spectrum – spectrometer grating
7. Determination of band gap of a semiconductor
8. Determination of thickness of a thin wire – Air wedge method

TOTAL: 30 PERIODS

OUTCOMES:

Upon completion of the course, the students will be able to

- apply principles of elasticity, optics and thermal properties for engineering applications.

CHEMISTRY LABORATORY: (Any seven experiments to be

conducted) OBJECTIVES:

- To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
 - To acquaint the students with the determination of molecular weight of a polymer by viscometry.
1. Estimation of HCl using Na_2CO_3 as primary standard and Determination of alkalinity in water sample.
 2. Determination of total, temporary & permanent hardness of water by EDTA method.
 3. Determination of DO content of water sample by Winkler's method.
 4. Determination of chloride content of water sample by argentometric method.
 5. Estimation of copper content of the given solution by Iodometry.
 6. Determination of strength of given hydrochloric acid using pH meter.
 7. Determination of strength of acids in a mixture of acids using conductivity meter.
 8. Estimation of iron content of the given solution using potentiometer.
 9. Estimation of iron content of the water sample using spectrophotometer (1, 10-Phenanthroline / thiocyanate method).
 10. Estimation of sodium and potassium present in water using flame photometer.
 11. Determination of molecular weight of polyvinyl alcohol using Ostwald viscometer.
 12. Pseudo first order kinetics-ester hydrolysis.
 13. Corrosion experiment-weight loss method.
 14. Determination of CMC.
 15. Phase change in a solid.
 16. Conductometric titration of strong acid vs strong base.

OUTCOMES:

- The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.

TOTAL: 30 PERIODS

TEXTBOOKS:

1. Vogel's Textbook of Quantitative Chemical Analysis (8TH edition, 2014)

OBJECTIVES: The Course prepares second semester engineering and Technology students to:

- Develop strategies and skills to enhance their ability to read and comprehend engineering and technology texts.
- Foster their ability to write convincing job applications and effective reports.
- Develop their speaking skills to make technical presentations , participate in group discussions.
- Strengthen their listening skill which will help them comprehend lectures and talks in their areas of specialisation.

UNIT I INTRODUCTION TECHNICAL ENGLISH 12

Listening- Listening to talks mostly of a scientific/technical nature and completing information-gap exercises- **Speaking** –Asking for and giving directions- **Reading** – reading short technical texts from journals- newspapers- **Writing-** purpose statements – extended definitions – issue- writing instructions – checklists-recommendations-**Vocabulary Development-** technical vocabulary **Language Development** –subject verb agreement - compound words.

UNIT II READING AND STUDY SKILLS 12

Listening- Listening to longer technical talks and completing exercises based on them-**Speaking** – describing a process-**Reading** – reading longer technical texts- identifying the various transitions in a text- paragraphing- **Writing** - interpreting charts, graphs- **Vocabulary Development-**vocabulary used in formal letters/emails and reports **Language Development-** impersonal passive voice, numerical adjectives.

UNIT III TECHNICAL WRITING AND GRAMMAR 12

Listening- Listening to classroom lectures/ talks on engineering/technology -**Speaking** – introduction to technical presentations- **Reading** – longer texts both general and technical, practice in speed reading; **Writing-**Describing a process, use of sequence words- **Vocabulary Development-**sequence words- Misspelled words. **Language Development-** embedded sentences

Listening- Listening to documentaries and making notes. **Speaking** – mechanics of presentations- **Reading** – reading for detailed comprehension- **Writing-** email etiquette- job application – cover letter –Résumé preparation(via email and hard copy)- analytical essays and issue based essays--**Vocabulary Development-** finding suitable synonyms-paraphrasing-. **Language Development-** clauses- if conditionals.

UNIT V GROUP DISCUSSION AND JOB APPLICATIONS 12 **UNIT IV WRITING 12** **REPORT 12**

Listening- TED/Ink talks; **Speaking** –participating in a group discussion -**Reading**– reading and understanding technical articles **Writing**– Writing reports- minutes of a meeting- accident and survey- **Vocabulary Development-** verbal analogies **Language Development-** reported speech

TOTAL : 60 PERIODS

OUTCOMES: At the end of the course learners will be able to:

- Read technical texts and write area- specific texts effortlessly.
- Listen and comprehend lectures and talks in their area of specialisation successfully.
- Speak appropriately and effectively in varied formal and informal contexts.
- Write reports and winning job applications.

TEXT BOOKS:

1. Board of editors. **Fluency in English A Course book for Engineering and Technology.** Orient Blackswan, Hyderabad: 2016
2. Sudharshana.N.P and Saveetha. C. **English for Technical Communication.** Cambridge University Press: New Delhi, 2016.

REFERENCES

1. Booth-L. Diana, **Project Work**, Oxford University Press, Oxford: 2014.
2. Grussendorf, Marion, **English for Presentations**, Oxford University Press, Oxford: 2007
3. Kumar, Suresh. E. **Engineering English.** Orient Blackswan: Hyderabad,2015
4. Means, L. Thomas and Elaine Langlois, **English & Communication For Colleges.** Cengage Learning, USA: 2007
5. Raman, Meenakshi and Sharma, Sangeetha- **Technical Communication Principles and Practice.**Oxford University Press: New Delhi,2014.

Students can be asked to read Tagore, Chetan Bhagat and for supplementary reading.

MA8251**ENGINEERING MATHEMATICS – II**

L	T	P	C
4	0	0	4

OBJECTIVES :

- This course is designed to cover topics such as Matrix Algebra, Vector Calculus, Complex Analysis and Laplace Transform. Matrix Algebra is one of the powerful tools to handle practical problems arising in the field of engineering. Vector calculus can be widely used for modelling the various laws of physics. The various methods of complex analysis and Laplace transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines.

UNIT I MATRICES**12**

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley-Hamilton theorem – Diagonalization of matrices – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms.

UNIT II VECTOR CALCULUS**12**

Gradient and directional derivative – Divergence and curl - Vector identities – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface integral - Area of a curved

surface - Volume integral - Green's, Gauss divergence and Stoke's theorems – Verification and application in evaluating line, surface and volume integrals.

UNIT III ANALYTIC FUNCTIONS

12

Analytic functions – Necessary and sufficient conditions for analyticity in Cartesian and polar coordinates - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions $w = z + c$, cz , $\frac{1}{z}$, z^2 - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION

12

Line integral - Cauchy's integral theorem – Cauchy's integral formula – Taylor's and Laurent's series – Singularities – Residues – Residue theorem – Application of residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour.

UNIT V LAPLACE TRANSFORMS

12

Existence conditions – Transforms of elementary functions – Transform of unit step function and unit impulse function – Basic properties – Shifting theorems -Transforms of derivatives and integrals – Initial and final value theorems – Inverse transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear second order ordinary differential equations with constant coefficients.

TOTAL: 60 PERIODS

OUTCOMES :

After successfully completing the course, the student will have a good understanding of the following topics and their applications:

- Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
- Gradient, divergence and curl of a vector point function and related identities.
- Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
- Analytic functions, conformal mapping and complex integration.
- Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

TEXT BOOKS :

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.
2. Kreyszig Erwin, "Advanced Engineering Mathematics ", John Wiley and Sons, 10th Edition, New Delhi, 2016.

REFERENCES :

1. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.), New Delhi, 7th Edition, 2009.
2. Jain R.K. and Iyengar S.R.K., " Advanced Engineering Mathematics ", Narosa Publications, New Delhi , 3rd Edition, 2007.
3. O'Neil, P.V. "Advanced Engineering Mathematics", Cengage Learning India Pvt., Ltd, New Delhi, 2007.

4. Sastry, S.S, "Engineering Mathematics", Vol. I & II, PHI Learning Pvt. Ltd, 4th Edition, New Delhi, 2014.
5. Wylie, R.C. and Barrett, L.C., "Advanced Engineering Mathematics "Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012.

PH8253	PHYSICS FOR ELECTRONICS ENGINEERING	L	T	P	C
	(Common to BME, ME, CC, ECE, EEE, E&I, ICE)	3	0	0	3

OBJECTIVES:

- To understand the essential principles of Physics of semiconductor device and Electron transport properties. Become proficient in magnetic, dielectric and optical properties of materials and nano devices.

UNIT I ELECTRICAL PROPERTIES OF MATERIALS 9

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Wiedemann-Franz law – Success and failures - electrons in metals – Particle in a three dimensional box – degenerate states – Fermi- Dirac statistics – Density of energy states – Electron in periodic potential: Bloch theorem – metals and insulators - Energy bands in solids– tight binding approximation - Electron effective mass – concept of hole.

UNIT II SEMICONDUCTOR PHYSICS 9

Intrinsic Semiconductors – Energy band diagram – direct and indirect semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Carrier transport: Velocity-electric field relations – drift and diffusion transport - Einstein's relation – Hall effect and devices – Zener and avalanche breakdown in p-n junctions - Ohmic contacts – tunnel diode - Schottky diode – MOS capacitor - power transistor.

UNIT III MAGNETIC AND DIELECTRIC PROPERTIES OF MATERIALS 9

Magnetism in materials – magnetic field and induction – magnetization - magnetic permeability and susceptibility–types of magnetic materials – microscopic classification of magnetic materials - Ferromagnetism: origin and exchange interaction- saturation magnetization and Curie temperature – Domain Theory. Dielectric materials: Polarization processes – dielectric loss – internal field – Clausius-Mosotti relation- dielectric breakdown – high-k dielectrics.

UNIT IV OPTICAL PROPERTIES OF MATERIALS 9

Classification of optical materials – carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and Semiconductors (concepts only) - photo current in a P- N diode – solar cell –photo detectors - LED – Organic LED – Laser diodes – excitons - quantum confined Stark effect – quantum dot laser.

UNIT V NANO-ELECTRONIC DEVICES 9

Introduction - electron density in bulk material – Size dependence of Fermi energy– quantum confinement – quantum structures - Density of states in quantum well, quantum wire and quantum dot structures –Zener-Bloch oscillations – resonant tunneling – quantum interference effects – mesoscopic structures: conductance fluctuations and coherent transport – Coulomb blockade effects - Single electron phenomena and Single electron Transistor – magnetic semiconductors– spintronics - Carbon nanotubes: Properties and applications.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the students will able to

- gain knowledge on classical and quantum electron theories, and energy band structures,
- acquire knowledge on basics of semiconductor physics and its applications in various devices,
- get knowledge on magnetic and dielectric properties of materials,

- have the necessary understanding on the functioning of optical materials for optoelectronics,
- understand the basics of quantum structures and their applications in spintronics and carbon electronics.

TEXT BOOKS:

1. Kasap, S.O. "Principles of Electronic Materials and Devices", McGraw-Hill Education, 2007.
2. Umesh K Mishra & Jasprit Singh, "Semiconductor Device Physics and Design", Springer, 2008.
3. Wahab, M.A. "Solid State Physics: Structure and Properties of Materials". Narosa Publishing House, 2009.

REFERENCES

1. Garcia, N. & Damask, A. "Physics for Computer Science Students". Springer-Verlag, 2012.
2. Hanson, G.W. "Fundamentals of Nanoelectronics". Pearson Education, 2009
3. Rogers, B., Adams, J. & Pennathur, S. "Nanotechnology: Understanding Small Systems". CRC Press, 2014

BE8252

BASIC CIVIL AND MECHANICAL ENGINEERING

L T P C

4 0 0 4

OBJECTIVES:

- To impart basic knowledge on Civil and Mechanical Engineering.
- To familiarize the materials and measurements used in Civil Engineering.
- To provide the exposure on the fundamental elements of civil engineering structures.
- To enable the students to distinguish the components and working principle of power plant units, IC engines, and R & AC system.

A – OVER VIEW

UNIT I SCOPE OF CIVIL AND MECHANICAL ENGINEERING 10

Overview of Civil Engineering - Civil Engineering contributions to the welfare of Society – Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation and Water Resources Engineering

Overview of Mechanical Engineering - Mechanical Engineering contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering - Production, Automobile, Energy Engineering - Interdisciplinary concepts in Civil and Mechanical Engineering.

B – CIVIL ENGINEERING

UNIT II SURVEYING AND CIVIL ENGINEERING MATERIALS 10

Surveying: Objects – classification – principles – measurements of distances – angles – leveling – determination of areas– contours - examples.

Civil Engineering Materials:Bricks – stones – sand – cement – concrete – steel - timber - modern materials

UNIT III BUILDING COMPONENTS AND STRUCTURES 15

Foundations: Types of foundations - Bearing capacity and settlement – Requirement of good foundations. 31

Civil Engineering Structures: Brickmasonry – stonemasonry – beams – columns – lintels – roofing – flooring – plastering – floor area, carpet area and floor space index - Types of Bridges and Dams – water supply - sources and quality of water - Rain water harvesting - introduction to high way and rail way.

C – MECHANICAL ENGINEERING

UNIT IV INTERNAL COMBUSTION ENGINES AND POWER PLANTS 15
 Classification of Power Plants - Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Working principle of steam, Gas, Diesel, Hydro - electric and Nuclear Power plants — working principle of Boilers, Turbines, Reciprocating Pumps (single acting and double acting) and Centrifugal Pumps

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM 10
 Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system—Layout of typical domestic refrigerator—Window and Split type room Air conditioner.

OUTCOMES:

On successful completion of this course, the student will be able to

- appreciate the Civil and Mechanical Engineering components of Projects.
- explain the usage of construction material and proper selection of construction materials.
- measure distances and area by surveying
- identify the components used in power plant cycle.
- demonstrate working principles of petrol and diesel engine.
- elaborate the components of refrigeration and Air conditioning cycle.

TOTAL: 60 PERIODS

TEXTBOOKS:

1. Shanmugam Gand Palanichamy MS, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, 1996.

REFERENCES:

1. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010.
2. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai Publishing Co.(P) Ltd. 1999.
3. Seetharaman S., “Basic Civil Engineering”, Anuradha Agencies, 2005.
4. ShanthaKumar SRJ., “Basic Mechanical Engineering”, Hi-tech Publications, Mayiladuthurai, 2000.
5. Venugopal K. and Prahu Raja V., “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, 2000.

EE8251	CIRCUIT THEORY	L T P C
		2 2 0 3

OBJECTIVES:

- To introduce electric circuits and its analysis
- To impart knowledge on solving circuit equations using network theorems
- To introduce the phenomenon of resonance in coupled circuits.
- To educate on obtaining the transient response of circuits.
- To introduce Phasor diagrams and analysis of three phase circuits

UNIT I BASIC CIRCUITS ANALYSIS 6+6

Resistive elements - Ohm's Law Resistors in series and parallel circuits – Kirchoffs laws – Mesh current and node voltage - methods of analysis.

UNIT II NETWORK REDUCTION AND THEOREMS FOR DC AND AC IRCUITS 6+6

Network reduction: voltage and current division, source transformation – star delta conversion. Thevenins and Norton Theorems – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem.

32

UNIT III TRANSIENT RESPONSE ANALYSIS 6+6

L and C elements -Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. sinusoidal input.

UNIT IV THREE PHASE CIRCUITS 6+6

A.C. circuits – Average and RMS value - Phasor Diagram – Power, Power Factor and Energy.- Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & unbalanced – phasor diagram of voltages and currents – power measurement in three phase circuits.

UNIT V RESONANCE AND COUPLED CIRCUITS

6+6

Series and parallel resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

TOTAL : 60 PERIODS

OUTCOMES:

- Ability to analyse electrical circuits
- Ability to apply circuit theorems
- Ability to analyse transients

TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, edition, New Delhi, 2013.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2013.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, 1999.
2. Jegatheesan, R., "Analysis of Electric Circuits," McGraw Hill, 2015.
3. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, McGraw-Hill, New Delhi, 2010.
4. M E Van Valkenburg, "Network Analysis", Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
5. Mahadevan, K., Chitra, C., "Electric Circuits Analysis," Prentice-Hall of India Pvt Ltd., New Delhi, 2015.
6. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley & Sons, Inc. 2015.
7. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", McGraw Hill, 2015.

GE8291

ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P C

3 0 0 3

OBJECTIVES:

- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth's interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

33

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological

pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION

8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES

10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over- utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

7

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT

6

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

OUTCOMES:

- Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
- Public awareness of environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions
- Development and improvement in std. of living has lead to serious environmental disasters₄

TEXTBOOKS:

1. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2006.

2. Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.

REFERENCES :

1. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
2. Erach Bharucha, "Textbook of Environmental Studies", Universities Press(I) PVT, LTD, Hyderabad, 2015.
3. G. Tyler Miller and Scott E. Spoolman, "Environmental Science", Cengage Learning India PVT, LTD, Delhi, 2014.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.

GE8261

ENGINEERING PRACTICES LABORATORY

L T P C

0 0 4 2

OBJECTIVES:

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

13

Buildings:

- (a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:

- (a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
- (b) Study of pipe connections requirements for pumps and turbines.
- (c) Preparation of plumbing line sketches for water supply and sewage works.
- (d) Hands-on-exercise:

Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.

- (e) Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

- (a) Study of the joints in roofs, doors, windows and furniture.
- (b) Hands-on-exercise:
Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

18

Welding:

- (a) Preparation of butt joints, lap joints and T- joints by Shielded metal arc welding.
- (b) Gas welding practice

Basic Machining:

- (a) Simple Turning and Taper turning
- (b) Drilling Practice

Sheet Metal Work:

- (a) Forming & Bending:
- (b) Model making – Trays and funnels.
- (c) Different type of joints.

Machine assembly practice:

- (a) Study of centrifugal pump
- (b) Study of air conditioner

Demonstration on:

- (a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
- (b) Foundry operations like mould preparation for gear and step cone pulley.
- (c) Fitting – Exercises – Preparation of square fitting and V – fitting models.

GROUP B (ELECTRICAL & ELECTRONICS)

- | | | |
|------------|--|-----------|
| III | ELECTRICAL ENGINEERING PRACTICE | 13 |
| | <ul style="list-style-type: none"> 1. Residential house wiring using switches, fuse, indicator, lamp and energy meter. 2. Fluorescent lamp wiring. 3. Stair case wiring 4. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit. 5. Measurement of energy using single phase energy meter. 6. Measurement of resistance to earth of an electrical equipment. | |
| IV | ELECTRONICS ENGINEERING PRACTICE | 16 |
| | <ul style="list-style-type: none"> 1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR. 2. Study of logic gates AND, OR, EX-OR and NOT. 3. Generation of Clock Signal. 4. Soldering practice – Components Devices and Circuits – Using general purpose PCB. 5. Measurement of ripple factor of HWR and FWR. | |

TOTAL: 60 PERIODS

OUTCOMES:

On successful completion of this course, the student will be able to

- fabricate carpentry components and pipe connections including plumbing works.
- use welding equipments to join the structures.
- Carry out the basic machining operations
- Make the models using sheet metal works
- Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
- Carry out basic home electrical works and appliances
- Measure the electrical quantities
- Elaborate on the components, gates, soldering practices.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

CIVIL

- | | |
|---|----------|
| 1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. | 15 Sets. |
| 2. Carpentry vice (fitted to work bench) | 15 Nos. |
| 3. Standard woodworking tools | 15 Sets. |
| 4. Models of industrial trusses, door joints, furniture joints | 5 each |
| 5. Power Tools: (a) Rotary Hammer | 2 Nos |
| (b) Demolition Hammer | 2 Nos |
| (c) Circular Saw | 2 Nos |
| (d) Planer | 2 Nos |
| (e) Hand Drilling Machine | 2 Nos |
| (f) Jigsaw | 2 Nos |

MECHANICAL

- | | |
|---|-----------|
| 1. Arc welding transformer with cables and holders | 5 Nos. |
| 2. Welding booth with exhaust facility | 5 Nos. |
| 3. Welding accessories like welding shield, chipping hammer, wire brush, etc. | 5 Sets. |
| 4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. | 2 Nos. |
| 5. Centre lathe | 2 Nos. |
| 6. Hearth furnace, anvil and smithy tools | 2 Sets. |
| 7. Moulding table, foundry tools | 2 Sets. |
| 8. Power Tool: Angle Grinder | 2 Nos |
| 9. Study-purpose items: centrifugal pump, air-conditioner | One each. |

ELECTRICAL

- | | |
|---|---------|
| 1. Assorted electrical components for house wiring | 15 Sets |
| 2. Electrical measuring instruments | 10 Sets |
| 3. Study purpose items: Iron box, fan and regulator, emergency lamp | 1 each |
| 4. Megger (250V/500V) | 1 No. |
| 5. Power Tools: (a) Range Finder | 2 Nos |
| (b) Digital Live-wire detector | 2 Nos |

ELECTRONICS

- | | |
|---|---------|
| 1. Soldering guns | 10 Nos. |
| 2. Assorted electronic components for making circuits | 50 Nos. |
| 3. Small PCBs | 10 Nos. |
| 4. Multimeters | 10 Nos. |
| 5. Study purpose items: Telephone, FM radio, low-voltage power supply | |

OBJECTIVES:

- To simulate various electric circuits using Pspice/ Matlab/e-Sim / Scilab
- To gain practical experience on electric circuits and verification of theorems.

LIST OF EXPERIMENTS

1. Simulation and experimental verification of electrical circuit problems using Kirchhoff's voltage and current laws.
2. Simulation and experimental verification of electrical circuit problems using Thevenin's theorem.
3. Simulation and experimental verification of electrical circuit problems using Norton's theorem.
4. Simulation and experimental verification of electrical circuit problems using Superposition theorem.
5. Simulation and experimental verification of Maximum Power transfer Theorem.
6. Study of Analog and digital oscilloscopes and measurement of sinusoidal voltage, frequency and power factor.
7. Simulation and Experimental validation of R-C electric circuit transients.
8. Simulation and Experimental validation of frequency response of RLC electric circuit.
9. Design and Simulation of series resonance circuit.
10. Design and Simulation of parallel resonant circuits.
11. Simulation of three phase balanced and unbalanced star, delta networks circuits.

TOTAL: 60 PERIODS**OUTCOMES:**

- Understand and apply circuit theorems and concepts in engineering applications.
- Simulate electric circuits.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

- 1 Regulated Power Supply: 0 – 15 V D.C - 10 Nos / Distributed Power Source.
- 2 Function Generator (1 MHz) - 10 Nos.
- 3 Single Phase Energy Meter - 1 No.
- 4 Oscilloscope (20 MHz) - 10 Nos.
- 5 Digital Storage Oscilloscope (20 MHz) – 1 No.
- 6 10 Nos. of PC with Circuit Simulation Software (min 10 Users) (e-Sim / Scilab/ Pspice / MATLAB /other Equivalent software Package) and Printer (1 No.)
- 7 AC/DC - Voltmeters (10 Nos.), Ammeters (10 Nos.) and Multi-meters (10 Nos.)
- 8 Single Phase Wattmeter – 3 Nos.
- 9 Decade Resistance Box, Decade Inductance Box, Decade Capacitance Box - 6 Nos each.
- 10 Circuit Connection Boards - 10 Nos.

Necessary Quantities of Resistors, Inductors, Capacitors of various capacities (Quarter Watt to 10 Watt)



ANNA UNIVERSITY, CHENNAI -25.
OFFICE OF THE CONTROLLER OF EXAMINATIONS

RULES OF THE EXAMINATIONS

A candidate is permitted to use geometric tools, non-programmable calculators and approved tables and data books only during the theory and the practical examinations. No other material/gadget (including cell phone) should be brought inside the examination hall.

A candidate should neither possess/refer any forbidden material in any form nor should seek/obtain assistance in any form from any person/source towards answering the questions during the examinations. He/she should not assist other candidates in any form towards answering the questions during the examinations. The candidate should not reveal his/her identity in any form in the answer scripts. The candidate should not indulge in canvassing either directly or indirectly to award more than deserving marks in the examinations. The candidate should maintain discipline and decorum during the examinations.

Violation of the above rules in any form during the examinations will attract punishment ranging from levying fine to permanently debarring the candidate from continuing his/her studies as given below.

Sl.No.	Nature of Malpractice	Maximum Punishment
1	Appeal by the candidate in the answer script to show mercy by way of awarding more than deserving marks.	Fine of Rs. 1000/- per subject.
2	The candidate writing his/her name in the answer script.	
3	The candidate writing his/her registration number/college name in places other than specified in the answer script	
4	Any special marking in the answer script by the candidate.	
5	The candidate communicating with neighbouring candidate orally or non-verbally; the candidate causing suspicious movement of his/her body.	
6	Irrelevant writing by the candidate in the answer script.	
7	The candidate marking on the question paper or writing answer on his/her question paper or making use of his/her question paper for rough work	
8	The candidate possessing cell phones/programmable calculator(s)/any other electronic storage device(s) gadgets	Invalidating the examination of the particular subject written by the candidate
9	The Candidate facilitating the other candidate(s) to copy from his /her answer script	

10	The candidate possessing any incriminating material(s) (whether used or not). For example:- Written or printed materials, bits of papers containing written information, writings on scale, calculator, handkerchief, dress, part of the body, Hall Ticket, etc.	<p>Invalidating the examinations of the subject concerned and all the theory and the practical subjects of the current semester registered by the candidate.</p> <p>Further the candidate is not considered for revaluation of answer scripts of the arrears-subjects.</p> <p>If the candidate has registered for arrears – subjects only, invalidating the examinations of all the arrears – subjects registered by the candidate.</p>
11	The candidate possessing cell phone(s)/programmable calculator(s)/any other electronic storage device(s) gadgets and containing incriminating materials (whether used or not).	
12	The Candidate possessing the question paper of another candidate with additional writing on it.	
13	The candidate passing his/her question paper to another candidate with additional writing on it	
14	The candidate passing incriminating materials brought into the examination hall in any medium (hard/soft) to other candidate(s).	
15	The candidate copying from neighbouring candidate.	
16	The candidate taking out of the examination hall answer booklet(s), used or unused	
17	Appeal by the candidate in the answer script coupled with a promise of any form of consideration.	<p>Invalidating the examinations of the subject concerned and all the theory and the practical subjects of the current semester registered by the candidate.</p> <p>Further the candidate is not considered for revaluation of answer scripts of the arrears-subjects.</p> <p>If the candidate has registered for arrears – subjects only, invalidating the examinations of all the arrears – subjects registered by the candidate.</p> <p>Additional Punishment:</p> <p>1. if the candidate has not completed the programme, he/she is debarred from continuing his/her studies for one year i.e., for two subsequent semesters. However the student is permitted to appear for the examination in all the arrears-subjects up to the last semester during the debarred period.</p> <p>2. if the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears-subjects for two subsequent semesters.</p>
18	Candidate destroying evidence relating to an alleged irregularity.	
19	Vulgar/offensive writings by the candidate in the answer script.	
20	The candidate possessing the answering script of another candidate	
21	The candidate passing his /her answer script to another candidate	Invalidating the examinations of all the theory and practical subjects of the current semester and all the arrears –subjects registered by the candidate.

22	Involved in any one or more of the malpractices of serial no. 8 to 21 for the second or subsequent times.	Invalidating the examinations of all the theory and practical subjects of the current semester and all the arrears –subjects registered by the candidate.
23	The candidate substituting an answer book let prepared outside the examination hall for the one already distributed to the candidate	Additional Punishment: (i) If the candidate has not completed the programme, he/she is debarred from continuing his/her studies for one year i.e., for two subsequent semesters. However the student is permitted to appear for the examination in all the arrears-subjects up to the last semester during the debarred period. (ii) If the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears-subjects for two subsequent semesters.
24	The candidate indulge in any disruptive conduct including, but not limited to, shouting, assault of invigilator, officials or students using abusive and /or threatening language, destruction of property.	Invalidating the examinations of all the theory and practical subjects of the current semester and all the arrears –subjects registered by the candidate.
25	The candidate harass or engage others to harass on his/her behalf an invigilator, official, witnesses or any other person in relation to an irregularity by making telephone calls, visits, mails or by any other means.	Additional Punishment: (i) if the candidate has not completed the programme, he/she is debarred from continuing his/her studies for two years i.e., for four subsequent semesters. However the student is permitted to appear for the examination in all the arrears-subjects up to the last semester during the debarred period. (ii) if the candidate has completed the programme, he/she is prevented from writing the examinations of the arrears-subjects for four subsequent semesters.
26	Candidate possessing any firearm/weapon inside the examination hall.	
27	Cases of Impersonation	(i) Handing over the impersonator to the police with a complaint to take appropriate action against the person involved in the impersonation by the Chief Supt. (ii) If a student of this University is found to impersonate a 'bonafide student', the impersonating student is debarred from continuing his/her studies and writing the examinations permanently . He/she is not eligible for any further admission to any programme of the University. (iii) Debarring the 'bonafide student' for whom the impersonation was done from continuing his/her studies and writing the examinations permanently . He/she is not eligible for any further admission to any programme of the University.

CONTROLLER OF EXAMINATIONS

**K.L.N. COLLEGE OF ENGINEERING, Pottapalayam 630612
(11 km from Madurai City)**

STUDENTS LEAVE APPLICATION FORM

Department of Electrical and Electronics Engineering

Date:

Name of the Student:

Roll No. :

Sem / Sec. :

Details of leave availing / applied: Date & Day:

No. of. Days (a):

Reason for Leave :

No. of days, leave & OD, already availed (b):

Total. No. of. Days (a+b):

% of Attendance as on : _____ is _____

Signature of the Student

Name, Mobile No. & Signature of Parent / Guardian

Recommended / Not Recommended

Class Coordinator

HOD/EEE

**K.L.N. COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**NORMS FOR ATTENDING WORKSHOP / SEMINAR/ TECHNICAL SYMPOSIUM/
CONFERENCE / TECHNICAL CONTEST etc.**

Students are regularly encouraged to attend skill development programme such as workshop / seminar / Technical Symposium / Conference / Technical Contest etc., outside the college. This is to facilitate to improve their technical skills and competency. However, frequently attending such events will reduce their academic performance, as they are not consistent in attending regular Theory / Practical classes. Also, it was reported that, few students were absent for class tests /CIT's and regular practical classes, in order to attend such skill development programme. Hence, the following norms are framed, in order to balance the academic performance and facilitate the students to attend skill development programme.

1. A student will be permitted, to attend skill development programme, not **more than three events per semester (6 days – OD- maximum)**.
2. Academic performance of the students will be considered, before permitting a student to attend skill development programme (**Upto 3 arrears, passed 4 subjects in Class test / CIT's – only will be permitted**).
3. Attendance of the student should **not be less than 90% as on date**.
4. No history of disciplinary action taken on the students.
5. Students will not be permitted during Class test / Centralized Internal Test to attend Skill development programme. However students with high academic performance will be permitted, considering the nature of the event during class tests.
6. Students will be permitted to attend such events, only in the higher learning Institutions. (IITs, IISC, NITs, Anna University, MIT, NAAC accredited (A grade), Deemed Universities, NBA accredited, Government & Government Aided Institutions and Self financing Engineering Colleges).
7. Students are instructed to refer the academic calendar of the College, regularly so as to know the Internal test schedule and other events.
8. Students registering any events, without following above norms and not obtaining prior permission, **will not be granted ON DUTY and no RETEST** will be conducted. Necessary action will be taken against defaulters.
9. ON DUTY form is revised, accordingly, in order to incorporate all the above details.
10. Class Co-ordinators / Academic Co-ordinators are instructed to recommend for OD, as per the above norms.

HOD/EEE

**K.L.N.COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL & ELECTRONICS
ENGINEERING**

Format No.: F127

**ON DUTY REQUISITION FORM
STUDENTS – TO ATTEND SKILL DEVELOPMENT PROGRAMMES
(Workshop / Seminar / Symposium etc.)**

Date: _____

To,
The
Principal,
KLNCE,
Pottapalayam.

Respected Sir,

Sub.: Request for OD to attend _____ (Workshop /

As, I am going to attend _____ conducted by
_____ (Venue &
Place) from _____ to _____. Please permit me to attend the programme and also grant
me

O.D. for these days.

S.No	Roll No.	Name & (Degree, Semester / Section)	No. of Programmes already attended & Days OD availed	No. of Arrears in AU Exam	No. of subjects failed in Class Test	No. of Subjects failed in CIT's	ATT % As on	Sign

Discipline / misbehavior, reported if

any : Clash with Internal test if any :

Recommended by		
Class Co-ordinator	HOD	
	OD Permitted	OD Approved

BONA FIDE CERTIFICATE

To
The Principal,
KLNCE,
Pottapalayam.

Sub: Requisition for Bonafide Certificate

Respected Sir,

Kindly issue Bonafide Certificate to me

Purpose :

Venue :

Name :

Father's Name :

Roll No. :

Department :

Year & Sem :

Thanking You,

Yours Sincerely,

Date :

Station :

Recommended by :

Received :

Lecture Schedule

Course/Branch : **B.E / EEE**
2019 Subject Code

Subject: **Problem Solving & Python Programming**
: **GE8151**

Regulation: **2017 (AUC) Staff Handling**

Duration: **Aug-Nov**
Semester: **I**
: **V.SINDHU**

AIM

To expose the students to the concept of algorithmic problem solving & to develop programs logically using Python.

PRE-REQUISITE : Basic Knowledge of Computer

OBJECTIVES

- To know the basics of algorithmic problem solving
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures – lists, tuples, dictionaries.
- To do input/output with files in Python.

COURSE OUTCOMES: After the course, the student should be able to:

Course	Course Outcome	POs	PSOs
C105.1	Develop algorithmic solutions to simple computational problems.	1,2,3,6,12	1
C105.2	Demonstrate programs using simple Python statements and expressions.	1,2,3,5,6,12	1,2
C105.3	Explain control flow and functions concept in Python for solving problems.	1,2,3,5,6,12	1,2
C105.4	Use Python data structures – lists, tuples & dictionaries for representing compound data.	1,2,3,5,6,12	1,2
C105.5	Explain files, exception, modules and packages in Python for solving problems.	1,2,3,4,5,6,12	1,2

S. No.	Date	Period Number	Topics to be Covered	Book No [Page No]
UNIT I - ALGORITHMIC PROBLEM SOLVING				Target periods : 11
1.			Introduction - Problem Solving Process	R4 [77-78]
2.			Problem Solving Methodology – Problem Analysis, Program Design, Implementation & Testing	R1 [17-22]
3.			Algorithms – Definition, Characteristics, Qualities of a good algorithm	R5 [1.17-1.18]
4.			Building blocks of algorithms - Statements, Sequential Control, Conditional Control	R5 [1.19-1.21]
5.			Building blocks of algorithms - Control flow & Functions	R5 [1.21-1.24]
6.			Notations - Pseudo code – Guidelines, Benefits & Limitations	R4 [83-84]
7.			Flow chart – Symbols, Guidelines, Benefits & Limitations	R4 [79-83]
8.			Programming languages	R4 [92-98]
9.			Algorithmic problem solving - Simple strategies for developing algorithms (iteration, recursion)	R4 [85-87]
10.			Illustrative problems: Find minimum in a list, insert a card in a list of sorted cards	R5 [1.77-1.79]
11.			Illustrative problems: Guess an integer number in a range, Towers of Hanoi.	R5[1.84-1.87]
ASSIGNMENT – I				
UNIT II - DATA, EXPRESSIONS, STATEMENTS				Target periods : 13 + 1

12.			Introduction – History & Features of Python	R3 [83-87]
13.			Python interpreter and interactive mode – IDLE	R1 [22-26]
14.			Variables & Identifiers ; Reserved words Values and types: int, float, boolean, string and list	R1 [50-54] R3 [94-97, 109]
15.			Expressions & Statements Comments	T1 [11-12] T1 [15-16]
16.			Tuples – Introduction & assignment : Sequence & Multiple Assignment	R2 [65-67]
17.			Operators – Types: Arithmetic, Comparison, Assignment, Unary	R3 [99-102]
18.			Types of Operators: Bitwise, Shift, Logical, Membership & Identity	R3 [102-105]
19.			Operators Precedence & Associativity	R1 [61-63]
20.			Modules – Introduction Functions – Introduction & Need for functions	R2 [59-61] R3 [185-186]
21.			Function Definition & Function Call	R3 [187-190]
22.			Function parameters & arguments; Flow of Execution	T1 [25-27]
23.			Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.	T1 [62-64]
24.				R5 [2.100]
25.			Technical Quiz - I	
CENTRALIZED INTERNAL TEST – I				
UNIT III - CONTROL FLOW, FUNCTIONS				Target Periods: 13
26.			Boolean Values & Operators: Relational operators, Membership operators, Boolean (logical) operators	R1 [81-85]
27.			Decision Control Statements: Conditional (if), Alternative (if-else), Chained Conditional (if-elif-else), Nested Conditional	T1 [49-51]
28.			Iterative Statements: while, for, break, continue, pass	T1 [77-79] R3 [147-171]
29.			Fruitful functions: return values	T1 [61]
30.			Function composition	T1 [23]
31.			Variable Scope & Life time: Local & Global Variables	R1 [183-186]
32.			Recursive Functions	T1 [51-54]
33.			Strings- Introduction – Concatenating, Appending & Multiplying strings	T1 [85-88] R3 [242-245]
34.			Strings – Immutability – String Slices	T1 [87-89]
35.			String functions and methods	R1 [296-300]
36.			String module Lists as arrays	R3 [265-267] R3 [322-323]
37.			Illustrative programs: square root, GCD, exponentiation, sum an array of numbers.	T1 [79-80] R6 [387-389]
38.			Illustrative programs: linear search, binary search	R2 [152-157]
ASSIGNMENT – II				
UNIT IV - LISTS, TUPLES, DICTIONARIES				Target Periods: 13
39.			List – Introduction – Creating, Accessing & Updating values in lists	R3 [322-325]
40.			Basic List Operations : retrieve, replace, insert, remove, append	R1 [127-128]
41.			List Methods	T1 [327-332]

42.			List loop: for loop & while loop	R1 [137-141]
43.			List slices & List Parameters	T1 [110]
44.			Mutability ,Aliasing,Cloning lists	T1 [108-109] T1 [115-116] R2 [73-75]
45.			Tuples: Tuple assignment & tuple as return value	T1 [141-142]
46.			Dictionaries: Introduction - creating, accessing, adding & modifying an entry	R3 [366-373]
47.			Dictionaries: operations and methods	R3 [374-376]
48.				
49.			Advanced list processing - list comprehension	R3 [332-334]
50.			Illustrative programs: Selection sort & Insertion sort	R5 [4.32-4.38]
51.			Illustrative programs: Merge sort, Histogram	R2 [159-162] T1 [127-128]
ASSIGNMENT – III				
CENTRALIZED INTERNAL TEST – II				
UNIT V - FILES, MODULES, PACKAGES				Target Periods: 10 + 2
52.			Files – Introduction, File path & types of files	R3 [289-292]
53.			Opening & Closing files	R1 [291-293]
54.			Reading and Writing files	R1 [293-295]
55.			Format operator	T1 [166, 167]
56.			Command Line Arguments	R5 [5.38-5.40]
57.			Introduction to Errors and Exceptions – Types of Errors	R3 [480-482]
58.			Catching and Handling Exceptions	R1 [303-309]
59.			Modules: Modules & Namespaces, Importing Modules	R1 [255-262]
60.				
61.			Packages	R3 [225-226]
62.			Illustrative programs: word count, copy file.	T1 [172-173] R6 [360-366]
63.			<u>Content Beyond Syllabus:</u> Simple Graphics using Turtle	
64.			Technical Seminar - I	
CENTRALIZED INTERNAL TEST – III				
MODEL EXAM				

Books: Text/Reference

Book No	Title of the Book	Author	Publisher	Year
T1	Think Python: How to Think Like a Computer Scientist	Allen B. Downey	Shroff/O'Reilly Publishers	2016
T2	An Introduction to Python	Guido van Rossum and Fred L. Drake Jr	Network Theory Ltd	2011
R1	Introduction to Computer Science using Python: A Computational Problem-	Charles Dierbach	Wiley India Edition	2013

	Solving Focus			
R2	Introduction to Computation and Programming using Python	John V Guttag	MIT Press	2013
R3	Python Programming using Problem Solving Approach	Reema Thareja	Oxford University Press	2017
R4	Computer Programming	Ashok N. Kamthane	ITL Education Solutions Limited	2013
R5	Problem Solving & Python Programming	Dr. V. Ramesh Babu M. Muni Rathnam	VRB Publishers Pvt. Ltd.	2017
R6	Problem Solving & Python Programming	S. A. Kulkarni	Yes Dee Publishing Pvt. Ltd.	2017

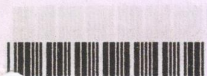
4. IMPORTANT QUESTIONS			
S. No.	Questions	COs	POs
UNIT I - ALGORITHMIC PROBLEM SOLVING			
Q.1.1	Explain in detail about the various building blocks of algorithm.	C105.1	1
Q.1.2	Explain in detail about program control structures with an example.	C105.1	1
Q.1.3	(a) Define an algorithm. List the characteristics of a good algorithm. (b) Write an algorithm to determine greatest of three numbers.	C105.1	1,2
Q.1.4	(a) Draw a flowchart to check whether the given number is zero, positive or negative. (b) Draw a flowchart to solve the quadratic equation.	C105.1	1,2,3
Q.1.5	(a) Define pseudo code. Explain its guidelines and benefits. (b) Develop a pseudo code to guess an integer number in a range.	C105.1	1,2,3
Q.1.6	(a) Draw a flow chart to find factorial of a number. (b) Draw a flow chart to find sum of first 100 natural numbers.	C105.1	1,2,3
Q.1.7	(a) Develop an algorithm to determine minimum in a list. (b) Develop an algorithm to insert a card in a list of sorted cards.	C105.1	1,2,3
Q.1.8	(a) Define a flowchart. Explain in detail about the guidelines to be followed while drawing a flowchart. (b) List the merits and demerits of flowcharting.	C105.1	1
Q.1.9	Develop an algorithm to solve Towers of Hanoi problem using recursion.	C105.1	1,2,3
Q.1.10	Explain in detail about different types of programming languages.	C105.1	1,2,3
UNIT II - DATA, EXPRESSIONS, STATEMENTS			
Q.2.1	List the various operators available in Python. Discuss each one of them with suitable examples.	C105.2	1
Q.2.2	Discuss in detail about functions in Python.	C105.2	1
Q.2.3	Explain function with and without arguments with examples for each.	C105.2	1
Q.2.4	(a) Write a Python program to find the smallest and largest number from the given 10 numbers using functions. (b) Write a Python program to determine the distance between two points using functions.	C105.2	1,2,3,5
Q.2.5	(a) Write a Python program to exchange the values of two variables with & without using third variable. (b) Write a Python program to circulate the values of n variables.	C105.2	1,2,3,5
Q.2.6	Write a Python program to compute Simple Interest and Compound Interest for a given amount.	C105.2	1,2,3,5

Q.2.7	Explain the concept of mutability and immutability in Python.	C105.2	1
Q.2.8	Discuss briefly about the order of precedence with a suitable example.	C105.2	1
Q.2.9	Discuss the basic data types in Python.	C105.2	1
Q.2.10	Explain in detail about function parameters & arguments and flow of execution.	C105.2	1
UNIT III - CONTROL FLOW, FUNCTIONS			
Q.3.1	Explain in detail about various decision making structures available in Python with illustrative examples.	C105.3	1
Q.3.2	Describe the various looping statements used in Python with suitable examples.	C105.3	1
Q.3.3	Describe in detail about Boolean values & different types of Boolean Operators.	C105.3	1
Q.3.4	Define recursion? Explain a recursive function with suitable example. Write a recursive function to find the factorial of a number.	C105.3	1,2,3,5
Q.3.5	(a) Write a Python program to reverse a string. (b) Write a Python program to print the Fibonacci series of a given number.	C105.3	1,2,3,5
Q.3.6	(a) Explain in detail about fruitful functions with an example. (b) Develop a program to search an element using search techniques available in Python.	C105.3	1,2,3,5
Q.3.7	(a) Write a Python program for the following series: $1 + 2 + 3 + \dots + n$. (b) Write a Python program to find sum of digits of an integer.	C105.3	1,2,3,5
Q.3.8	(a) Write a Python program to print first ten prime numbers. (b) Write a Python program to find the given number is Armstrong or not.	C105.3	1,2,3,5
Q.3.9	Explain in detail about various String functions and methods.	C105.3	1
Q.3.10	Explain about the concept of immutability of strings and also explain the operation of string slices.	C105.3	1
UNIT IV - LISTS, TUPLES, DICTIONARIES			
Q.4.1	Explain in detail about lists and basic list operations.	C105.4	1
Q.4.2	Explain about aliasing and cloning in list.	C105.4	1
Q.4.3	(a) Write a Python code to add two matrices using list. (b) Write a program to determine maximum & minimum element in a list.	C105.4	1,2,3,5
Q.4.4	A book shop details contains the Title of book and Number of copies of each title. As books are added to shop, the number of copies in each should	C105.4	1,2,3,5
	increase and as books are sold the number of copies in each should decrease. Implement this scenario using Dictionary in Python.		
Q.4.5	Develop a program to sort a list of elements using Selection sort.	C105.4	1,2,3,5
Q.4.6	Explain about tuples and how tuple is assigned.	C105.4	1
Q.4.7	(a) Explain the concept of iterating over lists with examples. (b) List the advantages of Tuples over Lists.	C105.4	1
Q.4.8	Explain about Dictionaries in Python and discuss about its operations and methods.	C105.4	1
Q.4.9	Develop a program to sort a list of elements using Insertion sort.	C105.4	1,2,3,5
Q.4.10	(a) Explain in detail about list comprehension. (b) Develop a program to sort a list of elements using Merge sort.	C105.4	1,2,3,5
UNIT V – FILES, MODULES, PACKAGES			
Q.5.1	Discuss about how to open, read and write a file in python.	C105.5	1
Q.5.2	Write a program to count each letter in a file with exception handling.	C105.5	1,2,3,5

Q.5.3	Write a python code to read a text file, copy the contents to another file after removing the blank lines.	C105.5	1,2,3,5
Q.5.4	Describe the use of try-except method in Python with suitable illustration.	C105.5	1
Q.5.5	Explain in detail about catching and handling exceptions in Python.	C105.5	1
Q.5.6	Explain in detail about modules and packages in Python.	C105.5	1
Q.5.7	Develop a program to find the most frequent words in a text read from a file.	C105.5	1,2,3,5
Q.5.8	Develop a program to count the number of lines, words, characters in a text file.	C105.5	1,2,3,5
Q.5.9	Develop a program that generates a Quiz and uses two files – Questions.txt and Answers.txt. The program opens Questions.txt and reads a question and displays the question with options on the screen. The program then opens the Answers.txt file and displays the correct answers.	C105.5	1,2,3,4,5
Q.5.10	Develop a program to calculate the area of circle with exception handling.	C105.5	1,2,3,5
<u>5. ASSIGNMENT QUESTIONS</u>			
UNIT I - ALGORITHMIC PROBLEM SOLVING			
A.1.1	Develop an algorithm to access an ATM.	C105.1	1,2,3
A.1.2	Write algorithmic steps to create an Email account.	C105.1	1,2,3
A.1.3	Develop Pseudo code and flowchart to determine the sum of all odd integers between 1 and n.	C105.1	1,2,3
UNIT III - CONTROL FLOW, FUNCTIONS			
A.3.1	Develop a Python program to print Pascal triangle using “for loop”.	C105.3	1,2,3,5
A.3.2	Develop a Python program to solve “Towers of Hanoi” problem using Recursion.	C105.3	1,2,3,5
A.3.3	Develop a Python program to convert a given Binary number into its equivalent Decimal number.	C105.3	1,2,3,5
UNIT IV - LISTS, TUPLES, DICTIONARIES			
A.4.1	Develop a Python program using Dictionary to generate a small dictionary of synonyms. The program should then accept a word and generate synonyms.	C105.4	1,2,3,5
A.4.2	Develop a Python program using Tuples to input student details. The program should accept a given student’s roll number and display his specific records.	C105.4	1,2,3,5
A.4.3	Develop a Python program to reverse the elements of a given list.	C105.4	1,2,3,5

SEMINAR TOPICS

1. Applications of Python for Web & Internet development
2. Language Translators
3. Internet
4. Operating Systems
5. Goodies
6. Booting
7. Pygame
8. Moodle
9. Modules
10. Packag



Reg. No. :

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Question Paper Code : 40066

B.E. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Bio Medical Engineering

PH 8253 – PHYSICS FOR ELECTRONICS ENGINEERING

(Common to : Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering/Medical Electronics Engineering)
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Distinguish between Mean free path and Collision time.
2. Define density of energy states.
3. What are n-type and p-type semiconductors ? Give examples.
4. Distinguish between Ohmic and Schottky contacts.
5. Define the terms intensity of magnetization and flux density.
6. Mention the energies involved in origin of domains in ferromagnetic material.
7. What is recombination process in semiconductors ?
8. List out any four advantages of LED in electronic display.
9. Define the term quantum well and quantum wire.
10. What is spintronics ?

40066



PART – B

(5×16=80 Marks)

11. a) Deduce mathematical expressions for electrical conductivity and thermal conductivity of a conducting material and hence obtain Wiedemann-Franz law.
(OR)
b) Explain the band theory of solids in detail and classify solids into conductors, semiconductors and insulators with neat diagram.
12. a) Write a note on carrier transport in n-type and p-type semiconductors.
(OR)
b) Explain with necessary theory the Hall Effect and the experimental method to determine the electrical conductivity of a semiconductor. Explain any four applications.
13. a) What are ferrites? Describe the different types of ferrites structure with suitable diagrams and mention its applications.
(OR)
b) Describe the working of magnetic hard disc based on GMR sensor. Mention its advantages and disadvantages.
14. a) Explain absorption and emission of light in metals, insulators and semiconductors.
(OR)
b) Describe in detail, the principle construction and the working of OLED with a neat diagram.
15. a) Discuss in detail quantum confinement and quantum structures in nano materials.
(OR)
b) Explain the synthesis mechanism and physical properties of CNTs with a neat sketch and mention its application.



Reg. No. :

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Question Paper Code : 40057

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Aeronautical Engineering

MA 8251 – ENGINEERING MATHEMATICS – II

(Common to all branches, except Marine Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. If 3 and 5 are two eigenvalues of the matrix.

$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

then find its third eigenvalue and hence $|A|$.

2. Show that the eigenvalues of a null matrix are zero.

3. If $\vec{F} = x^3 \vec{i} + y^3 \vec{j} + z^3 \vec{k}$, then find $\text{div curl } \vec{F}$.

4. Find the values of a, b, c such that the following vector is irrotational.

$$\vec{F} = (x + 2y + az) \vec{i} + (bx - 3y - z) \vec{j} + (4x + cy + 2z) \vec{k}$$

5. If $f(z) = r^2 (\cos 2\theta + i \sin 2\theta)$ is analytic, then find the value of 'p'.

6. Examine whether the function $u = xy^2$ can be a real part of an analytic function.

7. If 'C' is the circle $|z| = 3$ and if $g(z_0) = \int_C \frac{2z^2 - z - 2}{z - z_0} dz$ then find $g(2)$.

8. Find the value of $\int_C \frac{3z^2 + 7z + 1}{z + 1} dz$ if C is $|z| = \frac{1}{2}$.

40057

-2-



9. If $L[f(t)] = F(s)$ then prove that $L[f(at)] = \frac{1}{a} F\left(\frac{s}{a}\right)$.

10. Find the Laplace transform of $\left[\frac{t}{e^t}\right]$.

PART - B

(5×16 = 80 Marks)

11. a) i) Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} 11 & -4 & -7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{bmatrix}$ (8)

ii) Using Cayley-Hamilton theorem find the inverse of the given matrix

$$A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 2 & 1 \\ 1 & 1 & 3 \end{bmatrix} \quad (8)$$

(OR)

b) Reduce the quadratic form $2x^2 + 5y^2 + 3z^2 + 4xy$ to a canonical form through an orthogonal transformation. Find also its nature. (16)

12. a) Verify the Gauss divergence theorem for $\vec{F} = x^3 \vec{i} + y^3 \vec{j} + z^3 \vec{k}$ taken over the cube bounded by $x = 0, x = a, y = 0, y = a, z = 0$ and $z = a$. (16)

(OR)

b) Verify Stoke's theorem for $\vec{F} = (y - z + 2) \vec{i} + (yz + 4) \vec{j} - (xz) \vec{k}$ where S is the open surface of the cube $x = 0, x = 2, y = 0, y = 2, z = 0$ and $z = 2$ above the xy -plane. (16)

13. a) i) Find the analytic function $f(z) = u + iv$ if $u - v = e^x [\cos y - \sin y]$. (8)

ii) Find the bilinear transformation which maps the points $z = -1, 0, 1$ on to the points $w = -1, -i, 1$. Show that under this transformation the upper half of the z -plane maps on to the interior of the unit circle $|w| = 1$. (8)

(OR)

b) i) If $f(z) = u + iv$ is an analytic function then prove that

$$\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \right) (u^p) = p(p-1)(u^{p-2}) |f'(z)|^2. \quad (8)$$

ii) Find the image of the circle $|z - 2i| = 2$ in the complex plane under the transformation $w = \frac{1}{z}$. (8)



14. a) i) Evaluate $\int_C \frac{z^2}{(z^2 + 1)^2} dz$ where C is the circle $|z - i| = 1$ by using Cauchy's integral formula. (8)

- ii) Expand $f(z) = \frac{6z + 5}{(z + 1)z(z - 2)}$ in Laurent's series valid for $1 < |z + 1| < 3$. (8)
- (OR)

- b) Evaluate $\int_0^{2\pi} \frac{\cos 2\theta}{5 + 4 \cos \theta} d\theta$ using contour integration. (16)

15. a) i) Using convolution theorem find the inverse Laplace transform of $\left[\frac{s^2}{(s^2 + a^2)(s^2 + b^2)} \right]$. (8)

- ii) Find the Laplace transform of $[t \cos t \sin h 2t]$. (8)

(OR)

- b) i) Find $L[f(t)]$ if $f(t) = \begin{cases} 1, & 0 < t < 1 \\ 0, & 1 < t < 2 \end{cases}$ given $f(t + 2) = f(t)$. (8)

- ii) Solve $y'' - 3y' + 2y = 1$ given that $y(0) = 0$, $y'(0) = 1$ by using Laplace transform method. (8)
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Reg. No. :

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Question Paper Code : 40050

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Aeronautical Engineering

HS 8251 – TECHNICAL ENGLISH

(Common to all branches, except Marine Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

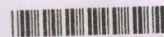
PART – A

(10×2=20 Marks)

1. Define **any two** of the following terms : (2×1=2)
a) Satellite b) Modem c) Capacitor d) Library
2. Fill in the blanks with appropriate forms of verbs : (4×1/2=2)
a) One of my friends _____ (has/have) gone to Spain.
b) Jeffries, along with Maria, _____ (hope/hopes) to avoid indigestion after eating these weird biscuits.
c) Oil and water _____ (do/does) not mix.
d) Either Ram or Naveen _____ (are/is) responsible for this.
3. Change the following sentences into their passive forms. (2×1=2)
i) I would have kept your car here if you had left it with me.
ii) They called off the meeting.
4. Complete the following conditional sentences : (2×1=2)
a) If only he had attended the interview,

b) _____, you will get good marks in your examination.

40050



5. Rewrite the following as numerical adjectives :

($4 \times \frac{1}{2} = 2$)

- Three barrels which can hold five litres each
- Storage space of 32 giga bytes
- An electric cable which is of ten metres length
- Project lasting for two years

6. Match the words in column A with their synonyms in column B.

($4 \times \frac{1}{2} = 2$)

Column A

Column B

juvenile

strict

austere

convincing

ponderous

immature

cogent

unwiedly

7. Fill in the blanks with the suitable words given below :

($4 \times \frac{1}{2} = 2$)

Therefore, Because, For example, However, Such as, Although, On the contrary in earlier days, weather forecasters described hurricanes or typhoons by their positions in degrees of latitude or longitude. _____ (1) _____, a storm used to be called "22.20 north, 132, 54 west". _____ (2) _____ this method was confusing because storms don't stay in the same place ; _____ (3) _____, people developed other ways to identify them. In the 60s, a weather forecaster in Australia used to name typhoons after politicians he disliked. _____ (4) _____ this caused criticism among public, this trend continued to exist for quite a long time.

8. Change the following dialogue into reported speech :

($2 \times 1 = 2$)

Gokul : Do you know that Arun had met with an accident and is in hospital ?

Ram : Oh ! I don't. Is he badly hurt ? Which hospital is he in ?

9. Choose the appropriate word from the given options and make a compound word for the following words :

($4 \times \frac{1}{2} = 2$)

i) home

a) wash

b) line

c) made

d) way

ii) life

a) long

b) hood

c) loss

d) hand

iii) key

a) cluster

b) made

c) knife

d) hole

iv) under

a) lie

b) level

c) ground

d) stuff



-3-

40050

10. Choose the appropriate words and complete the following sentences : (4×1½=2)

- a) The movie _____ (when/which) we saw last week has won three national awards.
- b) I want to borrow the book _____ (when/that) you bought last month.
- c) I visited my uncle _____ (who/that) lives in Delhi.
- d) Most of the people _____ (whose/whom) she met were from Jalandhar.

PART – B

(5×16=80 Marks)

Question No. 11 is Compulsory :

11. Read the following passage and answer the questions given below :

Farmers have progressed in many other parts of the world yet they are **languishing** in this country. Despite decades of industrial development, about 600 million Indians, or roughly half the population, depend on growing crops or rearing animals to earn a living. The country still relies on imports of essential items, such as pulses and cooking oil. Almost half of the average Indian household's expenditure is on food, an important factor behind inflation. Food security at the micro level remains elusive. The global development experience, especially of the BRICS countries, reveals that one percentage point growth in agriculture is at least two to three times more effective in reducing poverty than the same degree of growth emanating from the non-agriculture sector.

Of late, the woes of the farmer have exacerbated. Untimely rain damaged winter crops in northern India. The heat wave killed more than 2000 people – mostly working in the fields. Suicides by farmers, owing to the low price of their produce, are almost a recurrent tragedy. There is general concern over the monsoon ; patchy or inadequate rainfall can spell disaster. Low productivity is a chronic problem because of the shrinking size of the cultivated plots. Two-grain harvests a year are fairly routine. But the yields are low by global standards. The policy message for reforming agriculture is very clear. The areas which merit urgent and concerted attention to streamlining agriculture revolve around investment, incentive and institutions. We need to rationalise and prune input subsidies. The savings, thus generated, should be invested in agriculture – Research and development at rural roads, rural education, irrigation and water works.

Higher levels of investment in agriculture both by the public and private sector can yield much better results. Policy makers must be bold to **bite the bullet** and drastically cut subsidies which will open the avenue for increasing the size of the public investment. One way to contain the subsidy bill is to provide subsidies directly to farmers. Private investment is the engine of agricultural growth. Again, it responds to incentives. Much of the adverse impact on incentives comes from **strangulating the domestic market** under the Essential



Commodities Act (ECA) 1955. This law allows the state to restrict movement of agro-products across state boundaries. Furthermore, the law bans the storage of large quantities of any of the 90 commodities, including onions and wheat. The intention is to deter 'hoarding', but it has adversely affected investment in cold storages and warehouses. Therefore, a substantial quantity of crops rots before they reach the dining table.

A) Choose the right answer for the given questions : (7×1=7)

1) Which of the following sectors is sluggish in our country compared to the others ?

- a) Industrial sector
- b) Agricultural sector
- c) Private sector
- d) Technological sector

2) According to the passage which of the following is an important factor behind inflation ?

- a) Progress of middle class
- b) Expenditure on food by household
- c) Low agricultural productivity
- d) Irrational fertilizer subsidy

3) How is Essential Commodities Act (ECA) 1955 counterproductive for the farmers ?

- A) This demotivates investments in the cold storages and warehouses
- B) Free movement of goods in the entire country is regulated
- C) This encourages hoarding of non-essential commodities

- a) Only (A) b) Only (B)
- c) Only (A) and (B) d) All (A), (B) and (C)

4) Which of the following is a cause of low production in India ?

- a) Lack of agricultural land
- b) Lesser technological expertise
- c) Lack of HYV seeds
- d) Lack of irrigation facility

5) What has been suggested by the author for reforming agriculture ?

- a) Rationalizing subsidies
- b) Providing subsidies directly to the farmer's bank accounts
- c) Scrapping ECA 1955
- d) All of the above



-5-

40050

- 6) What areas do not merit concentrated attention in regulating agriculture ?
- a) Institution
 - b) Investment
 - c) Incentive
 - d) Subsidies

- 7) Which of the following is a matter of annoyance for farmers in northern India ?

- a) Loss of fertility
- b) Much damage caused due to unseasonal rainfall
- c) Soil erosion
- d) Drastic cut in subsidies

- B) Choose the right meaning for the given word/phrase :

(5×1=5)

- 1) The line 'Of late, the woes of the farmer have exacerbated' means ?

- a) The misery of farmers have intensified in recent times
- b) The worry of farmers have been in standstill in recent times
- c) The problems of farmers have improved in present times
- d) The issues of farmers have sorted in these days

- 2) What does the phrase 'bite the bullet' in the passage mean ?

- a) Accept criticism
- b) Force yourself to do something difficult
- c) Confront someone who oppose you
- d) Volunteer to help others

- 3) When someone is 'hoarding something', it means

- a) Signpost
- b) Billboard
- c) Accumulate food or other items
- d) Grab food or other items

- 4) The word 'languishing' in the first paragraph means

- a) Suffering
- b) Working
- c) Flourishing
- d) Farming

- 5) When you 'strangulate the domestic market', it means you

- a) Help the domestic market grow
- b) Tax the domestic market
- c) Obstruct the domestic market
- d) Transport the domestic market to other states

40050

-6-



C) Say True or False :

(4×1=4)

- 1) Farmers in India are doing well in their profession.
- 2) The highest expense spent by a common man in India is for his food.
- 3) Essential commodities Act has helped a lot to address the problems faced by farmers.
- 4) Private investment would help in the growth of agricultural growth.

12. a) Microtek Industries is looking for interns for their engineering departments for their Bangalore and Pune offices. Fresh graduates from Electronics/Computers/Civil streams can apply for internship with their CVs to M/s Microtek Industries, 219, Pritvi Avenue, Bangalore 21.

(16)

(OR)

- b) Write a job application along with your CV for the following advertisement. (16)

CAREER OPPORTUNITIES

ADVT CODE : JP18-02

A Delhi based Public Sector Scientific and Technical Organization seeks to fill the under mentioned posts with highly motivated and result-oriented individuals in following disciplines :

Position Code	Position & Scale	Qualification & Experience required
1	Assistant Engineer Electronics (SPS-5)	B.E./B.Tech. First class in ECE/EEE Preference given to individuals having sound Knowledge of Quality Management System (QMS)
2	Assistant Engineer Networking (SPS-8)	B.E./B.Tech. First class in CSE ; Preference given to individuals having sound knowledge of Java Script, Microsoft SQL Server, Oracle
3	Assistant Engineer Civil (SPS-11)	B.E./B.Tech First class in Civil ; Preference given to individuals having knowledge of Autocad, Staad pro.

The duly filled in applications should be sent to Director General, HRD, P. O. Box 454, Delhi-6

13. a) Write a set of eight instructions to be followed by people to manage the heat during the summer.

(16)

(OR)

- b) Write a set of eight recommendations to parents to protect their children online.

(16)



-7-

40050

14. Write an essay of not more than 350 words on **any one** of the topic given below :

(16)

a) Colleges and universities should require their students to spend at least one semester studying in a foreign country.

(OR)

b) How can social media bullying be prevented ?

(16)

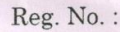
15. a) You are working as the Technical Manager in a Software company, Hidalco Inc. There was a fire accident in your warehouse which resulted in the damage of goods stored there. Your MD asks you to investigate the cause of the accident and send a report.

(16)

(OR)

b) Your college administration wants to find what students feel about your college's environment and facilities. As student advisor you have been asked to conduct a survey among students about college infrastructure and environment. Conduct a survey on these topics and submit a report to your Dean.

(16)

[illegible]

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Electrical and Electronics Engineering

BE 8252 – BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to : Electronics and Instrumentation Engineering/Environmental Engineering/Instrumentation and Control Engineering/Material Science and Engineering/B.Tech. Bio Technology/Food Technology/Pharmaceutical Technology)

(Regulations 2017)

Maximum : 100 Marks

PART - A

(10×2=20 Marks)

1. State the required properties of good quality sand.
2. Define Hooke's law.
3. List out the various types of surveying.
4. What are the qualities of good brick ?
5. Mention the objectives of plastering.
6. State the purpose of a dam.
7. Differentiate between boiler mountings and boiler accessories.
8. What is the use of surge tank in hydropower plants ?
9. Define the term refrigeration effect.
10. What is the function of thermostat ?

(5×13=65 Marks)

11. a) What are the different types of cement ? Explain in detail.

(OR)

- b) Describe the various forms and sources of energy.

40017



12. a) Explain the different properties of good building brick.

(OR)

b) What are the different types of instruments used in chain surveying? Explain in detail.

13. a) Elaborately discuss the points to be considered while selecting a site for construction of Dam.

(OR)

b) Discuss the advantages and disadvantages of brick masonry over stone masonry.

14. a) Describe the working principle of nuclear power plant with neat sketch.

(OR)

b) Explain the following components :

a) Connecting rod

b) Crank shaft

c) Camshaft, with reference to function and material.

15. a) Discuss in detail the working of window type air conditioner with a neat sketch.

(OR)

b) i) Distinguish between vapour compression and vapor absorption refrigeration system.

(10)

ii) List out the applications of refrigeration system.

(3)

PART - C

(1×15=15 Marks)

16. a) i) Differentiate between four-stroke and two-stroke cycle engines.

(10)

ii) Mention any five desirable properties of good refrigerant.

(5)

(OR)

b) i) With an illustration explain the working of a hydroelectric power plant.

(10)

ii) Draw a layout of a typical split air conditioner.

(5)



Reg. No. :

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Question Paper Code : 40036

B.E. DEGREE EXAMINATION, APRIL/MAY 2018

Second Semester

Electrical and Electronics Engineering

EE 8251 – CIRCUIT THEORY

(Common to Electronics and Instrumentation Engineering and Instrumentation
and Control Engineering
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. State Kirchoff's current law.
2. Estimate the resultant resistance produced by the parallel connection of two resistors of 10Ω and 30Ω .
3. Draw the circuit of a practical voltage source and its equivalent current source.
4. Let a network has Thevenin's equivalent circuit with source of $5V_{rms}$ and impedance of $50-j30\Omega$. Find optimum value of load to derive maximum power from the network.
5. Define time constant and write the time constant of a series RC circuit.
6. Let a RL circuit has 50Ω and 1 mH elements and free of source but, the inductor has initial current of 1 mA at time $t=0^-$ s. Find the voltage across the resistor at time $t = \infty$.
7. Draw the phasor diagram of voltages derived from a 3-phase source.
8. In a reactive circuit, the current leads the voltage by angle 45° . Find whether the resultant reactive is either inductive or capacitive and power factor.
9. Comment on the impedance and phase angle between voltage and current at resonance.
10. If circuit resonates at 1 MHz and produces -3dB bandwidth of 100 kHz then, find the quality factor of the circuit.



PART – B

(5×13=65 Marks)

11. a) Apply mesh analysis to the circuit shown in Fig. Q. 11. a) and find voltage across the dependent source.

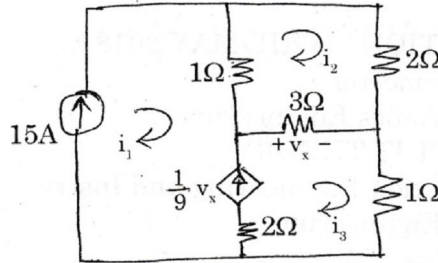


Fig. Q. 11. a)

(OR)

- b) Apply nodal analysis to the circuit shown in Fig. Q. 11. b) i) and find :

i) The voltage at each node of the circuit. (8)

ii) State and explain Kirchhoff's laws. (8)

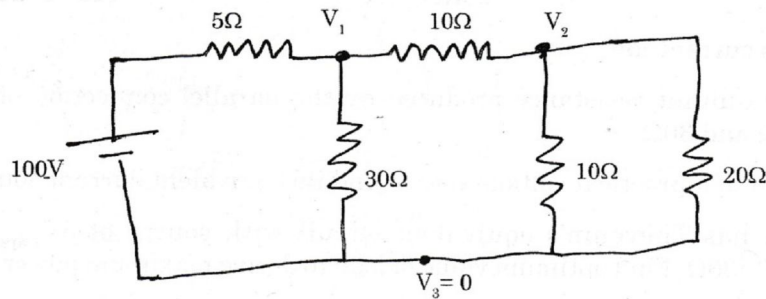


Fig. Q. 11. b) i)

12. a) State superposition theorem and apply to the circuit shown in Fig. 12. a) to find the voltage across $-j20\Omega$ capacitor.

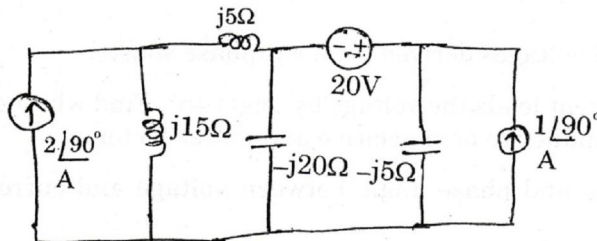


Fig. 12. a)

(OR)



- b) Determine Thevenin's and Norton's equivalent circuit of the network shown in Fig. Q. 12. b).

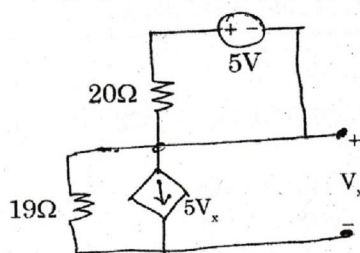


Fig. Q. 12. b).

13. a) Consider a source free parallel RLC circuit and evaluate the voltage response of the circuit on different damping conditions.
(OR)
b) Consider a series RC circuit has been energized by a DC source of V_0 Volts over infinite duration. Suddenly at time $t=0s$, the DC source potential increased to V_1 Volts. If so, find the voltage across the capacitor for all values of time t .
14. a) Discuss the method of measuring power in a three-phase system with balanced and unbalanced load conditions.
(OR)
b) Consider a series RLC circuit is energized by a sinusoidal signal source (assume amplitude of A_m and frequency of ω).
i) What would be the instantaneous and average power delivered by source. (7)
ii) What would be the instantaneous and average power dissipated by elements R, L and C. (6)
15. a) Consider the circuit shown in Fig. 15. a). Find the voltage across 1Ω resistor at resonance.

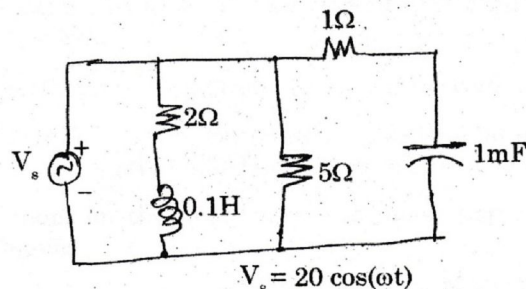


Fig. 15. a)
(OR)



- b) Consider the circuit shown in Fig. 15. b). Find the voltage across 3Ω resistor.

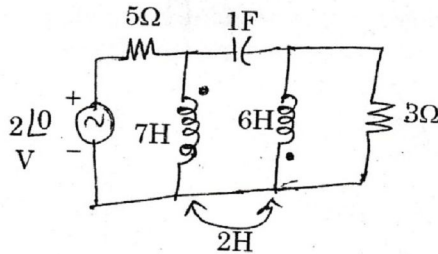


Fig. 15. b)

PART - C

(1×15=15 Marks)

16. a) Determine Thevenin's and Norton's equivalent circuits for the circuit shown in Fig. 16. a) Also, find the optimum value of Z_L to derive maximum power from the network and the resultant power derived by Z_L .

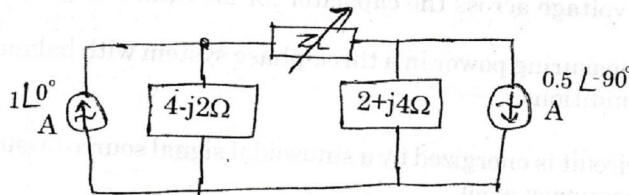


Fig. 16. a)

(OR)

- b) For the circuit shown in Fig. 16. b), determine expressions for i_1 and i_2 for $t > 0$, given the initial conditions, $i_1(0) = i_2(0) = 11$ A.

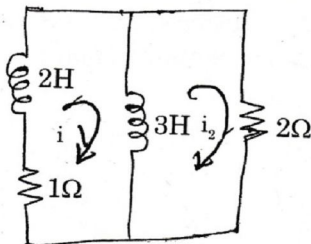


Fig. 16. b)

Reg. No. :

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Question Paper Code : 80209

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Civil Engineering

MA 8251 — ENGINEERING MATHEMATICS – II

(Common to All branches (Except Marine Engineering))

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. If λ is the eigenvalue of the matrix A , then prove that λ^2 is the eigenvalue of A^2 .
2. If the eigenvalues of the matrix A of order 3×3 are 2, 3 and 1, then find the determinant of A .
3. Find the unit normal vector to the surface $x^2 + y^2 = z$ at $(1, -2, 5)$.
4. State Stoke's theorem.
5. Is the function $f(z) = e^z$ analytic.
6. Find the fixed point of the bilinear transformation $w = \frac{1}{z}$.
7. Evaluate $\int_C \sin z \, dz$, where C is the entire complex plane.
8. Define singularity of a function $f(z)$.
9. Find $L[e^{-t} \sin t]$.
10. State sufficient conditions for the existence of Laplace transform.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Find the eigenvalues and the eigenvectors of the matrix
- $$\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}. \quad (8)$$

- (ii) Using Cayley-Hamilton theorem find A^{-1} , if $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$. (8)

Or

- (b) Reduce the quadratic form $2xy - 2yz + 2xz$ into a canonical form by an orthogonal reduction. (16)
12. (a) (i) Verify Gauss divergence theorem for the vector function $\vec{F} = x^2\vec{i} + y^2\vec{j} + z^2\vec{k}$ taken over the cuboids bounded by the planes $x=0, y=0, z=0, x=1, y=1$, and $z=1$. (10)
- (ii) Find the value of n so that the vector $r^n\vec{r}$ is irrotational and solenoidal. (6)

Or

- (b) (i) Apply Green's theorem to evaluate $\int_C [(2x^2 - y^2)dx + (x^2 + y^2)dy]$, where C is the boundary of the area by the x -axis and the upper half of the circle $x^2 + y^2 = a^2$. (8)
- (ii) Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} + 2xy\vec{j}$, taken around the rectangle bounded by the lines $x=0, y=0, x=1$ and $y=1$. (8)
13. (a) (i) Determine the analytic function $f(z) = u + iv$, if $u = \frac{\sin 2x}{\cosh 2y - \cos 2x}$. (8)
- (ii) Find the bilinear transformation which maps the points $z=1, i, -1$ onto $w=i, 0, -i$. (8)

Or

- (b) (i) Show that the real and imaginary parts of an analytic functions are harmonic. (8)
- (ii) Find the image of $|z - 2i| = 2$ under the transformation $w = \frac{1}{z}$. (8)

14. (a) (i) If $F(a) = \oint_C \frac{(3z^2 + 7z + 1)}{z - a} dz$, where C is $|z| = 2$, then find $F(1-i)$ and $F'(1-i)$. (8)

(ii) Using contour integration, evaluate $\int_0^\infty \frac{dx}{(x^2 + 1)^2}$. (8)

Or

(b) (i) Obtain the Laurent's series expansion of $f(z) = \frac{z^2 - 1}{(z + 2)(z + 3)}$ if $2 < |z| < 3$. (8)

(ii) Evaluate by using contour integration $\int_0^{2\pi} \frac{d\theta}{13 + 5 \sin \theta}$. (8)

15. (a) (i) Find the Laplace transform of $f(t)$ with period $2a$, where $f(t) = \begin{cases} t, & \text{for } 0 < t < a \\ 2a - t, & \text{for } a < t < 2a \end{cases}$. (8)

(ii) Using convolution theorem, find $L^{-1} \left[\frac{s^2}{(s^2 + a^2)(s^2 + b^2)} \right]$. (8)

Or

(b) (i) Find $L \left[\frac{\cos 2t - \cos 3t}{t} \right]$. (8)

(ii) Solve $\frac{d^2 y}{dt^2} - 3 \frac{dy}{dt} + 2y = e^{3t}$; given that $y(0) = 0, \frac{dy}{dt}(0) = 0$. (8)

[illegible]

Question Paper Code : 80038

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Electrical and Electronics Engineering

BE 8252 — BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to Electronics and Instrumentation Engineering/Environmental Engineering/Instrumentation and Control Engineering/Material Science and Engineering/Bio Technology/B.Tech. Food Technology/Pharmaceutical Technology)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the steps involved in the preparation of brick earth.
2. List the advantages of reinforced cement concrete.
3. State the reasons for foundation failure.
4. What are the reasons for carrying foundation below the ground level?
5. State the working principle of hydroelectric (hydel) power plant.
6. Differentiate centrifugal pump and reciprocating pump.
7. What is meant by scaling in the boiler? What is its effect?
8. Write short notes on crank case compression.
9. Define the following.
 - (a) Dry bulb temperature
 - (b) Wet bulb temperature.
10. What is meant by dry ice refrigeration?

PART B — ($5 \times 13 = 65$ marks)

11. (a) Explain briefly how bricks are manufactured.

Or

- (b) What are the types of rocks? Explain briefly about (i) dressing of stones and (ii) quarrying of stones.

12. (a) What are the different types of beams? Explain them with neat diagram.

Or

- (b) How the land is prepared before flooring? Explain any four types of flooring with neat examples.

13. (a) With a neat sketch explain the construction and working principle of Nuclear power plant. State its advantages and disadvantages.

Or

- (b) With a neat sketch, explain the construction and working principle of a double acting reciprocating pump.

14. (a) List out the various boiler mountings. Explain with sketches.

Or

- (b) Explain with a neat sketches the air cooling and water cooling system in IC engines.

15. (a) Differentiate vapour compression refrigeration system and vapour absorption refrigeration system.

Or

- (b) Draw the neat sketch, briefly explain the function of indoor unit and outdoor unit of a split type air conditioner.

PART C — ($1 \times 15 = 15$ marks)

16. (a) With a neat layout of thermal (steam) power plant, explain its construction and working principle. What are the major circuits in a thermal power plant? Explain briefly about them. List the advantages and disadvantages.

Or

- (b) Define surveying. Explain the various measurements in surveying.

Reg. No. :

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Question Paper Code : 80177

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second/Third/Fourth Semester

Civil Engineering

GE 8291 — ENVIRONMENTAL SCIENCE AND ENGINEERING

(Common to Agriculture Engineering /Materials Science and Engineering/
Medical Electronics/Chemical Engineering/Food Technology/Information
Technology/Aeronautical Engineering/Automobile Engineering/Computer Science
and Engineering/Computer and Communication Engineering/Electrical and
Electronics Engineering/Electronics and Communication Engineering/
Electronics and Instrumentation Engineering/Electronics and Telecommunication
Engineering/Environmental Engineering/Geoinformatics/
Industrial Engineering/Industrial Engineering and Management/ Instrumentation
and Control Engineering/Manufacturing Engineering/Marine Engineering/
Mechanical Engineering/Mechanical Engineering (Sandwich)/Mechanical and
Automation Engineering/Mechatronics Engineering/Production Engineering/
Robotics and Automation Engineering/Bio Technology/
Chemical and Electrochemical Engineering/Pharmaceutical Technology/Plastic
Technology/Polymer Technology)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is an ecosystem?
2. What is biodiversity?
3. What is air pollution?
4. What is thermal pollution?
5. Outline the fertiliser — pesticide problems.
6. Distinguish between renewable and non – renewable energy sources.
7. What is ozone layer depletion?

8. What is holocaust?
9. What is value education?
10. Outline the effects of population explosion.

PART B — ($5 \times 13 = 65$ marks)

11. (a) Give an account on the structure and function of the grassland ecosystem.

Or

- (b) Explain the causes and effects of soil pollution.

12. (a) What are the causes and effects of water pollution?

Or

- (b) Give an account on the environmental effects of extracting and using mineral resources.

13. (a) Enumerate on the use and over utilization of surface and ground water resources.

Or

- (b) Write a detailed account on water conservation, rain water harvesting and water shed management.

14. (a) Explain the present studies on climate change and global warming.

Or

- (b) Enumerate on the role of information technology in environment and human health.

15. (a) Give an account on the family welfare, women and child welfare programmes.

Or

- (b) Explain land degradation, soil erosion and desertification.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Give an account on the causes and effects of marine pollution. Add a note on the control measures.

Or

- (b) Explain the characteristic features, types, structure and function of the aquatic ecosystems.

Reg. No. :

Question Paper Code : 80124

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Electrical and Electronics Engineering

EE 8251 — CIRCUIT THEORY

(common to Electronics and Instrumentation Engineering/B.E. Instrumentation and Control Engineering)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchoff's Current law.
2. Find the equivalent resistance of circuit with three resistors connected in series each having a resistance value of 3 Ohms.
3. What is the condition for maximum power transfer in DC circuits?
4. State Thevenin's theorem.
5. Write down the time constant of R-L and R-C circuit.
6. How does an inductor act at $t=0^+$ and $t=\infty$?
7. Define Quality factor.
8. Find the current through the circuit with 5 Ohms resistor across a voltage source of $10\cos(50t - 50^\circ)$ Volts.
9. Mention the expression for resonant frequency in series resonance.
10. Define coefficient of coupling.

PART B — ($5 \times 13 = 65$ marks)

11. (a) Use resistance and source combinations to determine the current i in the Fig 1. And the power delivered by the 80-V source.

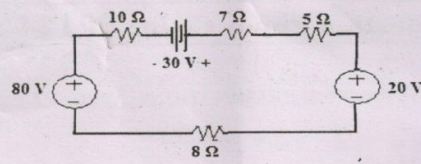


Fig. 1

Or

- (b) (i) Find the magnitude of total current (I_T) and also find out current and voltage drop across the resistors as shown in the Fig. 2. Assume $R_1 = 100\Omega$, $R_2 = 20\Omega$ and $V = 50V$.

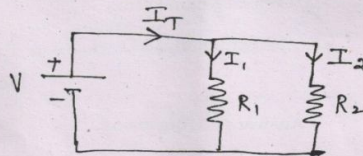


Fig. 2

- (ii) Find the voltage across the three resistances shown in the Fig. 3.

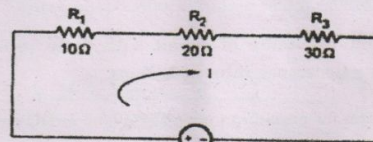


Fig. 3

12. (a) (i) Specify the procedure to solve any given circuit using thevenin theorem.
(ii) Find the Thevenin's Equivalent circuit for the network faced by the $1\text{ K}\Omega$ resistor in Fig 4.

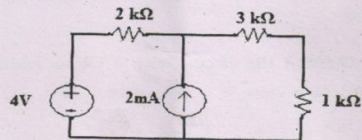


Fig. 4

Or

- (b) (i) Specify the procedure to solve any given circuit using Norton theorem.
- (ii) Find the Norton Equivalent circuit for the network faced by the $1\text{ k}\Omega$ resistor in Fig 5.

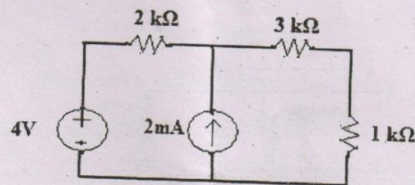


Fig. 5

13. (a) Derive the expressions for a current in a source free RC circuit.

Or

- (b) Derive the expressions for a current in a source free RL circuit.

14. (a) (i) Derive the expressions of the phasor relationship for Inductor.

- (ii) Find the current flowing through a circuit with a voltage of $8\cos(100t - 50^\circ)$ at a frequency $\omega = 100\text{ rad/s}$ across a 4 H inductor.

Or

- (b) Explicate in detail about the three phase balanced circuits.

15. (a) Derive the expression to obtain the frequency of parallel resonance.

Or

- (b) Elucidate the dot convention procedure to obtain the mutual inductance with relevant circuit diagrams.

PART C — ($1 \times 15 = 15$ marks)

(Application/Design/Analysis/Evaluation/Creativity/Case study questions)

16. (a) Calculate the readings of the two wattmeters (W_1 and W_2) connected to measure the total power for a balanced star-connected load shown in Fig. 6, fed from a three-phase, 400 V balanced supply with phase sequence as R-Y-B. The load impedance per phase is $20+j15$. Also find the line and phase currents, power factor, total power, total reactive VA and total VA.

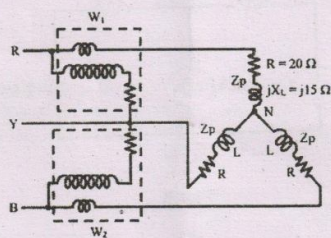


Fig. 6

Or

- (b) Calculate the readings of the wattmeter (W) connected as shown in Fig 7. The load is the balanced star-connected one, with impedance of per phase fed from a three-phase, 400 V, balanced supply, with the phase sequence as R-Y-B.

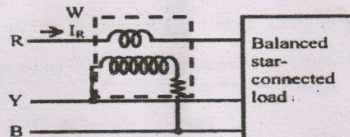


Fig. 7

Reg. No. :

Question Paper Code : 80195

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

HS 8251 – TECHNICAL ENGLISH

(Common to All Branches (Except Marine Engineering))

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Match the words in column A with the meanings in column B : $(4 \times \frac{1}{2} = 2)$

A

B

- | | |
|-----------------|-----------------------------|
| (a) incorporate | (i) introducing new |
| (b) innovative | (ii) abundantly filled with |
| (c) teeming | (iii) illegally enter |
| (d) trespass | (iv) include |

2. Define any TWO of the following terms : (2 × 1 = 2)

- (a) a crane
(b) firewall
(c) accelerator
(d) mercury

3. Expand the Compound Nouns : (4 × ½ = 2)

- (a) solar radiation
- (b) rural project
- (c) metal detector
- (d) community garden

4. Choose the verb that agrees with the subject of the sentence : $(4 \times \frac{1}{2} = 2)$
- Hundred dollars _____ (is / are) a big amount of money.
 - The President, along with his assistants _____ (are / is) attending the programme.
 - One of the satellites _____ (have / has) stopped sending signals.
 - Our AC as well as our refrigerator _____ (has / have) developed problems in summer.
5. Change the sentences into the passive form (Impersonal) : $(2 \times 1 = 2)$
- They have deployed several policemen in the train station for security reasons.
 - We planted many trees in our city after the cyclone.
6. Convert the following into numerical adjectives : $(4 \times \frac{1}{2} = 2)$
- a building that is hundred years old
 - a pole that is ten metres long
 - a bottle with the capacity of 500 millilitres
 - a retreat that would last for ten days
7. Complete the sentences with the correct 'If Clauses' : $(2 \times 1 = 2)$
- If more satellites are sent into the space, it _____ (lead) to huge space junk.
 - If the driver had been careful, he _____ (avoid) the collision.
8. Change the following into the reported speech : $(2 \times 1 = 2)$
- Teacher : Tharun, Have you designed the new machine?
 Tharun : Yes, sir. I shall show you tomorrow.
9. Write a check list of four items that a building authority Should take care to avoid fire accidents : $(4 \times \frac{1}{2} = 2)$
10. Embed a suitable clause in the blank given and complete the sentences : $(4 \times \frac{1}{2} = 2)$
- The boy, _____ is my brother.
 - The machine, _____ is from Germany.
 - The airplane, _____ is from Malaysia.
 - The ship, _____ is a cargo ship.

PART B — (5 × 16 = 80 marks)

11. Read the following passage and answer the questions given below :

We all know that technological progress is not an actual magic show. Still, it almost seems like magic the way the transistor, the main component in all modern electronics, has diminished in size since being invented in 1947.

The first transistor, made of gold, plastic, and germanium (a metallic Crystal), was about the size of an adult's fingernail. Today's transistors, etched on silicon wafers, can't be seen with the naked eye. The minimum size of a transistor is now 45 nanometers. A nanometer is one-billionth of a meter—roughly the width of three or four atoms.

Computer engineers are trying to make transistors even smaller. How tiny can they go? Every transistor has the same basic properties: It can both Conduct and stop the flow of electricity. The word transistor is a combination of two words: transfer and resistor. All transistors are made from materials called semiconductors. A semiconductor is a cross between a good conductor (such as copper) and a good insulator (such as rubber). It can be made to accept or reject the flow of electrons in a circuit. Germanium, used in the first transistors, is a semiconductor. So is silicon, widely used today.

A transistor's ability to control the flow of electricity has made possible our entire computerized world. All computers depend on the binary system to convert electric signals into useful information. The binary system has only two numbers : 1 and 0. When a transistor allows electricity to flow through, it registers a 1. When the transistor stops the flow of electrons, it registers a 0. Millions or billions of those 1s and 0s, flashing off and on hundreds of millions of times a second in programmed patterns, enable your computer to do everything it does—A transistor that is only a few atoms wide is incredibly small. But researchers want to make transistors even smaller and cheaper to produce. Chip-making technology has run into a big problem, however. Transistors smaller than 45 nanometers and etched on silicon chips don't work very well. They tend to leak electrons, making them less efficient.

To get around that problem, scientists are using nanotechnology to look at new materials and new methods to produce transistors. Nanotechnology is the engineering of materials on the atomic level, building new materials from the bottom up by manipulating atoms and molecules.

One Promising area of nanotechnology is the use of graphene, a Carbon fabric that is only one carbon atom thick. Graphene is strong, stable, and can act as a semiconductor. If researchers can find a practical way to etch transistors onto graphene, smaller and immensely faster computer chips can be more cheaply made.

Another Promising area of nanotechnology research involves using strands of deoxyribonucleic acid (DNA) to build transistors. DNA is the genetic material that determines the makeup of all living cells. Researchers can now take strands of DNA from bacteria and manipulate them into almost any shape they want. California Institute of Technology researcher Paul Rothemund has helped pioneer that technique. Rothemund and others are looking to shape DNA strands into a kind of scaffolding that could be attached to silicon wafers to make transistors. Because DNA does not conduct electricity, scientists are experimenting with ways to combine DNA with atoms of conducting materials, such as gold, to build transistors. DNA replicates (copies) itself. So if researchers can produce a DNA transistor, all they have to do is add the right "soup" of chemicals, and the DNA would reproduce itself, making millions of new nano-sized transistors at little or no cost.

Making transistors much smaller and much more cheaply could transform our lives. Tiny, smart nanomachines could do any number of things quickly and invisibly. Their greatest use might be in medicine. Swallowed in a pill or injected, tiny, computerized "nanobots" might be able to repair damaged cells one at a time, restoring health invisibly and painlessly before destroying themselves.

The nanobots might repair pipes, bridges, airplane engines, and electrical equipment too. They might even help with housework. Kris Pister, a University of California physicist, envisions what he calls smart dust-nanobots that move around the house at night, eating dirt and generally cleaning up such things are possible in your lifetime—all because scientists are now "thinking small."

- (a) Choose the correct answer : (10 × 1 = 10)
- (i) When was the transistor invented?
- (1) 1947
 - (2) 1945
 - (3) 2007
 - (4) 2000
- (ii) How does the author describe the changes transistors have undergone over time?
- (1) Transistors are used for the same things they were used for when first invented
 - (2) Transistors haven't changed much since they were invented
 - (3) Transistors have shrunk in size and become less useful
 - (4) Transistors have shrunk in size but increased in usefulness
- (iii) How do you think the author feels about the future of transistors and nanotechnology?
- (1) hopeful and excited
 - (2) concerned and worried
 - (3) cautious and uncertain
 - (4) to little information to determine

(iv) Which of the following was not found in the first transistor?

- (1) Plastic
- (2) Gold
- (3) Silicon
- (4) Germanium

(v) The semiconductor used in modern transistor is

- (1) Silicon
- (2) Germanium
- (3) Plastic
- (4) Graphene

(vi) What is the advantage of using graphene in Transistor is _____.

- (1) It is a good chemical
- (2) It can act as semiconductor
- (3) It conducts electricity
- (4) It is shining

(vii) What will be the function of DNA strands?

- (1) They are strong
- (2) Help to conduct electricity
- (3) Act as a kind of scaffolding and be attached to silicon
- (4) They are very cheap

(viii) Read the following sentences and answer the question below :

"Ladies and gentlemen, boys and girls, consider the amazing shrinking transistor! Watch it contract a million times until it becomes a tiny dot visible only under a powerful microscope!" What does the word **contract** mean?

- (1) agreement or pact
- (2) form an agreement
- (3) shrink
- (4) to get or incur, as in a virus or disease

(ix) This passage is mostly about

- (1) technology
- (2) nanotechnology
- (3) transistors
- (4) science

(x) The question below is an incomplete sentence. Choose the word that best completes the sentence.

If scientists can figure out how to etch transistors onto graphene, _____ they will be able to create much smaller and much faster computer chips.

- (1) but
- (2) then
- (3) so
- (4) however

(b) Fill in the blanks with the correct words taken from the passage :

(6 × 1 = 6)

- (i) Electric signals are converted into useful information through _____
- (ii) Transistors smaller than 45 nanometers do not work very well because _____.
- (iii) Graphene is one of the forms of _____
- (iv) Tiny nanobots may be used to repair _____ in medicine.
- (v) Nanobots can be used in houses to _____
- (vi) The transistor from the size of a fingernail has become _____.

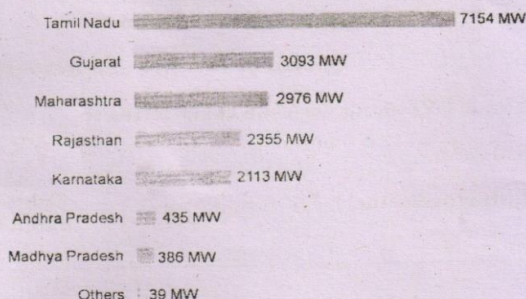
12. (a) Your friend is going to take part in an intercollegiate sports tournament. Write Eight instructions that has to be given to your friend before he/she leaves. (16)

Or

(b) Assume your sister is preparing for NEET exam. What recommendations would you offer with regard to preparation for the examination? Write Eight recommendations. (16)

13. (a) Read the following chart, and describe it. Interpret and analyse the data in two paragraphs. (16)

State wise wind energy capacity in India by Feb 2013 (In MW)



Or

- (b) Do you think the linking of rivers in India will help to solve water crisis in the country? Analyse the question and write an essay in two paragraphs, In around 200 words. (16)
14. (a) Read the following advertisement in the Hindu and apply to one of the posts. Write a Cover letter and a detailed CV. (16)

Software Engineers / Computer Technologists Required

We currently have vacancies for self-driven, passionate and results focused Senior Software Engineer and Technologists to be part of our specialist team that will be dedicated to designing, developing and implementing an exciting code generation project. You will have to work in an agile environment, collaborating with highly skilled people who are proactive, passionate about technology and results driven.

Coupled with your technical ability, you will possess strong communication skills both written and verbal, with the ability to engage with both internal and external stakeholders. Strong technical leadership and negotiation skills are essential.

Mail your CVs along with a cover letter to : hr@orbis.in

HR Manager

Orbis Systems

PO Box 4935

Chennai – 3

Or

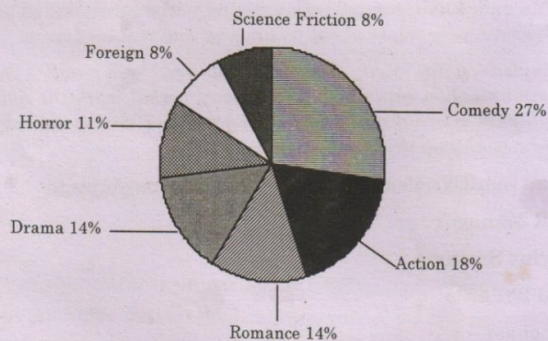
- (b) **Junior Engineers are wanted for the Metro Rail Project in Chennai**
Job Requirements : B.E/B.Tech in any Engineering
Good Communication and Interpersonal Skills
Able to work in team
Should be creative and Resourceful
Send your CVs along with the cover letter to
The Director
Recruitment Sector
Chennai - 6
(Advt : The Hindu dated 9th April 2018)

15. (a) You are working for a chemical industry. On a particular day, some acids stored in a container spilt down and some workers got burn injuries. They were rushed to the hospital and were given treatment. Two workers had major burns and were treated as inpatients whereas the others were discharged. Write a report to the Managing Director of the company about the cause of the accident, your findings and your recommendations to avoid such incidents in future. (16)

Or

- (b) After a survey conducted among the youth about their favourite movie genre, the following data is obtained. Write a report and interpret the data in 250 words : (16)

Percentage of youth who selected their favourite movie genre



[illegible]

Question Paper Code : 80286

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Second Semester

Medical Electronics

PH 8253 — PHYSICS FOR ELECTRONICS ENGINEERING

(Common to Bio Medical Engineering/Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by a free electron?
2. What are forbidden bands?
3. Define the term mobility of a semiconductor.
4. Mention the uses of Ohmic contact.
5. Define magnetic susceptibility and permeability.
6. The dielectric constant of a He gas at NTP is 1.0000684. Calculate the electronic polarizability of He atoms if the gas contains 2.7×10^{25} atoms/m³ and hence evaluate the radius of the He atoms. Given $\epsilon_0 = 8.85 \times 10^{-12}$ F/m.
7. Define carrier generation and recombination.
8. What are excitons? Give its types.
9. What is meant by tunnelling?
10. Define Coulomb blockade effect.

PART B — ($5 \times 16 = 80$ marks)

11. (a) Deduce mathematical expression for electrical conductivity and thermal conductivity of a conducting material and hence obtain Wiedemann-Franz law. (16)

Or

- (b) Obtain Eigen values and Eigen functions of an electron enclosed in a 3-D potential box. (16)
12. (a) Derive the intrinsic carrier concentration for intrinsic semiconductor. (16)

Or

- (b) Explain the fabrication of the power transistor with applications. (16)
13. (a) (i) Explain the different types of polarization mechanisms involved in a dielectric material. (10)
- (ii) Explain its frequency and temperature dependence. (6)

Or

- (b) What are the different types of dielectric break down in dielectric medium? Discuss in detail the various types of dielectric breakdown. (16)
14. (a) Explain the theory and working of LED. (16)

Or

- (b) Explain the construction and working of a semiconductor diode laser (laser diode) with diagram. (16)
15. (a) Discuss density of states in quantum well, quantum wire and quantum dot. (16)

Or

- (b) Describe the carbon nano tubes with their properties and applications. (16)

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E.B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.
First Semester
Civil Engineering
CY 8151 — ENGINEERING CHEMISTRY
(Common to all Braches (Except Marine Engineering))
(Regulation 2017)

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

1. What are the salts responsible for temporary hardness of water?
2. Mention the indicator used in EDTA titration. What is the end point?
3. Distinguish between physisorption and chemisorption.
4. Why is a reaction speeded up in the presence of a catalyst?
5. Write down any two applications of alloys.
6. What is triple point?
7. Classify fuels.
8. Define ignition temperature.
9. What is a nuclear chain reaction?
10. What is the voltage generated by $H_2 - O_2$ fuel cell?

PART B — (5 × 16 = 80 marks)

- 91

12. (a) (i) Discuss various factors which affect the adsorption of gas on a solid adsorbent. (8)
(ii) Deduce the expression for Langmuir adsorption isotherm. Mention its limitations. (8)

Or

- (b) (i) Explain
(1) Catalytic poisoning, (8)
(2) Catalytic promoters. (8)
(ii) Derive Michaelis-Menten equation. (8)
13. (a) (i) Write notes on any two types of heat treatment of steel. (8)
(ii) Mention the composition and uses of
(1) Nichrome, (8)
(2) Stainless steel. (8)

Or

- (b) (i) State phase rule and explain the terms involved in it. (8)
(ii) Draw and label the phase diagram of lead-silver system. Explain. (8)
14. (a) (i) How is proximate analysis of coal carried out? Mention its significance. (8)
(ii) Explain
(1) Octane number and
(2) Cetane number. (8)

How can they be improved?

Or

- (b) (i) How is the analysis of flue gas done? Explain with a neat diagram. (8)
(ii) What is calorific value? What are its types? Explain. (8)
15. (a) (i) Distinguish between nuclear fission and nuclear fusion. (8)
(ii) Explain the essential parts of a nuclear reactor with the help of a diagram. (8)

Or

- (b) (i) Describe the Ni-Cd cell with reactions. (8)
(ii) Construct a lead acid battery and explain. (8)

Reg. No. :

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Question Paper Code : 80193

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2019.

First Semester

Civil Engineering

HS 8151 — COMMUNICATIVE ENGLISH

(Common to all Branches (Except Marine Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Identify the countable and uncountable nouns in the following sentences.
(4 × $\frac{1}{2}$ = 2)
 - (a) Sugar and salt must be taken in moderation.
 - (b) The carpenter made tables.
2. Choose the most suitable option of the four given alternatives to fill in the blanks in the following sentences.
(2 × 1 = 2)
 - (a) The astronauts made extensive notes of their _____ on the planetary mission.
(i) Measures, (ii) measurements, (iii) metrics, (iv) metres
 - (b) Data collected by the equipment will be analyzed to determine any structural _____ in the tower.
(i) Errors, (ii) fallacies, (iii) mistakes, (iv) flaws
3. Frame 'WH' questions for the responses given.
(2 × 1 = 2)
 - (a) I prefer the model you showed me previously.
 - (b) The party begins at 7.00 pm.

4. Fill in the blanks with suitable prepositions.

($4 \times \frac{1}{2} = 2$)

Artificial Intelligence (AI) is the science _____ developing computers that can learn and follow instructions _____ great accuracy and speed. An example _____ AI is the use _____ expert systems.

5. Use appropriate conjunctions and combine the following sentences. ($4 \times \frac{1}{2} = 2$)

- (a) The parents could not afford to pay the fee. They decided to enrol their daughter anyway.
- (b) Can we eat sandwich? Can we have coffee?
- (c) Amit started to cry at the end of the movie. The dog has a tragic death.
- (d) Milo lives on Oak Street. His brother lives nearby.

6. Give single word substitutes for the following.

($4 \times \frac{1}{2} = 2$)

- (a) A company with branches in many countries.
- (b) One who looks at the brighter side of things.
- (c) A speech made without any preparation
- (d) Fit to be eaten

7. Complete the passage by filling the blanks with suitable tense forms.

($4 \times \frac{1}{2} = 2$)

Nanotechnology _____ (deal) with all the processes that tend to manipulate with matter on an atomic and molecular scale. They work on developing materials or devices that _____ (possess) at least one dimension within one hundred nanometer in size. Nanotechnology _____ (have) a great future. It can not only improve vast area of current applications but can also _____ (create) new materials and devices.

8. Fill in the blanks with suitable phrasal verbs from the options given below.

($2 \times 1 = 2$)

- (a) Tina finally _____ with her best friend Mira. They hadn't been talking for a few days.
 - (i) Put down
 - (ii) Made up
- (b) The relatives argued over the baby's nose-whether it had _____ the paternal or maternal grand mother.
 - (i) Taken after
 - (ii) Taken care of

9. Identify the following sentences as fixed and semi fixed expressions.

- (a) Pleased to meet you.
- (b) Would you like some more coffee?

10. Rewrite the following sentences with modal verbs given in brackets.

- (a) I left for Trichy on the sixth of December. (will)
- (b) She filled out an application. (can) correctly.

PART B – (5 × 16 = 80 marks)

11. Read the following passage and answer the questions that follow.

(8 × 2 = 16)

In the 16th century, an age of great marine and terrestrial exploration, Ferdinand Magellan led the first expedition to sail around the world. As a young Portuguese noble, he served the king of Portugal, but he became involved in the quagmire of political intrigue at court and lost the king's favor. After he was dismissed from service by the king of Portugal, he offered to serve the future Emperor Charles V of Spain.

A papal decree of 1493 had assigned all land in the New World west of 50 degrees W longitude to Spain and all the land east of that line to Portugal. Magellan offered to prove that the East Indies fell under Spanish authority. On September 20, 1519, Magellan set sail from Spain with five ships. More than a year later, one of these ships was exploring the topography of South America in search of a water route across the continent. This ship sank, but the remaining four ships searched along the southern peninsula of South America. Finally they found the passage they sought near 50 degrees S latitude. Magellan named this passage the Strait of All Saints, but today it is known as the Strait of Magellan.

One ship deserted while in this passage and returned to Spain, so fewer sailors were privileged to gaze at that first panorama of the Pacific Ocean. Those who remained crossed the meridian now known as the International Date Line in the early spring of 1521 after 98 days on the Pacific Ocean. During those long days at sea, many of Magellan's men died of starvation and disease.

Later, Magellan became involved in an insular conflict in the Philippines and was killed in a tribal battle. Only one ship and 17 sailors under the command of the Basque navigator Elcano survived to complete the westward journey to Spain and thus prove once and for all that the world is round, with no precipice at the edge.

Questions:

- (a) The 16th century was an age of great _____ exploration.
- (i) cosmic
 - (ii) land
 - (iii) mental
 - (iv) common man
 - (v) none of the above
- (b) Magellan lost the favor of the king of Portugal when he became involved in a political _____
- (i) entanglement
 - (ii) discussion
 - (iii) negotiation
 - (iv) problem
 - (v) none of the above
- (c) The Pope divided New World lands between Spain and Portugal according to their location on one side or the other of an imaginary geographical line 50 degrees west of Greenwich that extends in a _____ direction.
- (i) north and south
 - (ii) crosswise
 - (iii) easterly
 - (iv) south east
 - (v) north and west
- (d) One of Magellan's ships explored the _____ of South America for a passage across the continent.
- (i) coastline
 - (ii) mountain range
 - (iii) physical features
 - (iv) islands
 - (v) none of the above
- (e) Four of the ships sought a passage along a southern _____
- (i) coast
 - (ii) inland
 - (iii) body of land with water on three sides
 - (iv) border
 - (v) answer not available

- (f) The passage was found near 50 degrees S of
- (i) Greenwich
 - (ii) The equator
 - (iii) Spain
 - (iv) Portugal
 - (v) Madrid
- (g) In the spring of 1521, the ships crossed the _____ now called the International Date Line.
- (i) imaginary circle passing through the poles
 - (ii) imaginary line parallel to the equator
 - (iii) area
 - (iv) land mass
 - (v) answer not available
- (h) Give a suitable title for the passage.
12. (a) Describe any household appliance of your choice assuming that you are selling it to a customer. (Use appropriate vocabulary). (16)

Or

- (b) Describe the electronic gadget that you had bought recently. Assume you are describing it to your friend.
13. (a) Rearrange the following jumbled sentences in the correct order. (8 × 2 = 16)
- (i) The first settlements in North America took root and flourished in early Stuart times.
 - (ii) By the middle of the 1700s, these scattered colonies had begun to grow into a powerful and profitable empire.
 - (iii) By 1602, both England and the Netherlands had founded an 'East India Company' on the Indian coast to trade with the Far East.
 - (iv) In 1661, Britain gained her first African foothold, seizing James Island on the Gambia River.
 - (v) And gradually the empire grew to a great extent by 1821.
 - (vi) By the 1750s, the British Navy was the ruler of the seas.
 - (vii) Britain had started her collection of overseas colonies in the reign of Elizabeth I.
 - (viii) By 1763, Britain had won most of France's territory in North America.

Or

Reg. No. :

Question Paper Code : 80206

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Civil Engineering

MA 8151 — ENGINEERING MATHEMATICS – I

(Common to All Branches (Except Marine Engineering))

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Check whether $\lim_{x \rightarrow -3} \frac{3x+9}{|x+3|}$ exist.
2. Find the critical points of $y = 5x^3 - 6x$.
3. Find $\frac{du}{dt}$ in terms of t , if $u = x^3 + y^3$ where $x = at^2$, $y = 2at$.
4. If $x = u^2 - v^2$, $y = 2uv$ find the Jacobian of x, y with respect to u and v .
5. Evaluate $\int_0^{\frac{\pi}{2}} \frac{dx}{1 + \tan x}$.
6. Evaluate $\int_3^{\infty} \frac{dx}{(x-2)^{\frac{3}{2}}}$ and determine whether it is convergent or divergent.
7. Evaluate $\int_1^a \int_2^b \frac{dx dy}{xy}$.
8. Find the limits of integration $\iint_R f(x, y) dx dy$ where R is the triangle bounded by $x = 0$, $y = 0$, $x + y = 2$.

9. Find the particular integral of $(D - a)^2 y = e^{ax} \sin x$.

10. Solve the equation $x^2 y'' - xy' + y = 0$.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Find $\frac{dy}{dx}$ if $y = x^2 e^{2x} (x^2 + 1)^4$. (8)

(ii) For what value of the constant b , is the function f continuous on $(-\infty, \infty)$ if $f(x) = \begin{cases} bx^2 + 2x & \text{if } x < 2 \\ x^3 - bx & \text{if } x \geq 2. \end{cases}$ (8)

Or

(b) If $f(x) = 2x^3 + 3x^2 - 36x$, find the intervals on which it is increasing or decreasing, the local maximum and local minimum values of $f(x)$. (16)

12. (a) (i) If $u = f(2x - 3y, 3y - 4z, 4z - 2x)$, then find $\frac{1}{2} \frac{\partial u}{\partial x} + \frac{1}{3} \frac{\partial u}{\partial y} + \frac{1}{4} \frac{\partial u}{\partial z}$. (8)

(ii) Find the shortest and the longest distances from the point $(1, 2, -1)$ to the sphere $x^2 + y^2 + z^2 = 24$. (8)

Or

(b) (i) Expand $x^2 y^2 + 2x^2 y + 3xy^2$ in powers of $(x + 2)$ and $(y - 1)$ using Taylor's series upto third degree terms. (8)

(ii) Examine $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ for extreme values. (8)

13. (a) (i) Evaluate $\int_0^{\infty} e^{-ax} \sin bx \, dx$ ($a > 0$) using integration by parts. (8)

(ii) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x \cos x}{\cos^2 x + 3 \cos x + 2} \, dx$. (8)

Or

(b) (i) Evaluate $\int \frac{2x+5}{\sqrt{x^2-2x+10}} dx$. (8)

(ii) Evaluate $\int_0^{\frac{\pi}{4}} x \tan^2 x dx$. (8)

14. (a) (i) Change the order of integration in $\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y} dy dx$ and then evaluate it. (8)

(ii) Evaluate, by changing to polar coordinates $\int_0^a \int_y^a \frac{x^2 dx dy}{\sqrt{x^2+y^2}}$. (8)

Or

(b) (i) Evaluate $\iint xy dx dy$ over the region in the positive quadrant bounded by $\frac{x}{a} + \frac{y}{b} = 1$. (8)

(ii) Find the value of $\iiint xyz dz dy dx$ through the positive spherical octant for which $x^2 + y^2 + z^2 \leq a^2$. (8)

15. (a) (i) Solve by the method of variation of parameters :

$\frac{d^2 y}{dx^2} + a^2 y = \tan ax$. (8)

(ii) Solve $(D^2 + 2D + 1)y = e^x \sin 2x$ by using the method of undetermined coefficients. (8)

Or

(b) (i) Solve : $(x+2)^2 \frac{d^2 y}{dx^2} - (x+2) \frac{dy}{dx} + y = 3x + 4$. (8)

(ii) Solve : $\frac{dx}{dt} + \frac{dy}{dt} + 3x = \sin t, \frac{dx}{dt} + y - x = \cos t$. (8)

Reg. No. :

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Question Paper Code : 80277

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Civil Engineering

PH 8151 — ENGINEERING PHYSICS

(Common to all Branches)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any two factors affecting elastic modulus and tensile strength.
2. An artificial denture with ultimate strength of 10^7 Nm^{-2} breaks when the jaws exerted a normal force of just 2N while eating. Estimate the area in which the force acted on the denture.
3. Show that it is possible for stimulated emission to be predominant over spontaneous emission at microwave frequencies (~GHz) at room temperature 300K.
Given that $h = 6.626 \times 10^{-34} \text{ Js}$ $k = 1.38 \times 10^{-23} \text{ J/K}$
4. List the two major differences of homojunction and heterojunction lasers.
5. What are bimetallic strips? Give its application.
6. Give any two examples in daily life demonstrating thermal insulation is done through compound media.
7. Give the two important characteristics of black body radiation.
8. Define Compton effect.
9. Determine the lattice constant of a FCC crystal having atomic radius of 14.76 nm.
10. How does plastic deformation occur in solids?

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Derive an expression for couple per unit twist for a cylinder. (10)
(ii) Show that it is higher for a hollow cylinder than a solid cylinder made of the same material, mass and length. (6)

Or

- (b) Derive an expression for rigidity modulus and explain how rigidity modulus of a wire can be determined using a torsion pendulum. (16)
12. (a) (i) Derive Einstein's relations for spontaneous and stimulated emission of radiation. (12)
(ii) Obtain the ratio of Stimulated emission rate to stimulated absorption rate and discuss population inversion. (4)

Or

- (b) Derive Numerical Aperture and Acceptance Angle of a fiber. Discuss the various types of optical fiber. (8 + 8)
13. (a) Explain Forbe's method to determine the thermal conductivity of a good conductor. (16)

Or

- (b) Explain Lee's Disc method to determine the thermal conductivity of a poor conductor. (16)
14. (a) Derive an equation for Plank's quantum theory of radiation. (16)

Or

- (b) Solve time independent Schrödinger wave equation for a particle trapped in a potential well and obtain eigen functions and energy eigen values for the particle. Also show that the energy values are quantized. (16)
15. (a) Describe the two bulk crystal growth methods in detail using suitable schematic diagrams to fabricate semiconductor and dielectric materials. (16)

Or

- (b) (i) Derive the packing factor for HCP crystal structure. (10)
(ii) Write short notes on crystal imperfections and its advantages. (6)

Reg. No. :

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Question Paper Code : 80173

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Civil Engineering

GE 8151 — PROBLEM SOLVING AND PYTHON PROGRAMMING

(Common to all Branches)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the symbols used in drawing the flowchart.
2. Give the Python code to find the minimum among the list of 10 numbers.
3. Outline the logic to swap the contents of two identifiers without using third variable.
4. State about Logical operators available in python language with example.
5. Comment with an example on the use of local and global variable with the same identifier name.
6. Define recursive function.
7. How to create a list in python? Illustrate the use of negative indexing of list with example.
8. Demonstrate with simple code to draw the histogram in python.
9. Categorise the different types of errors arises during programming. Interpret the following python code

```
>>> import os
>>> cwd = os.getcwd()
>>> print cwd
/home/dinsdale
```
10. What is command line argument?

PART B — (5 × 16 = 80 marks)

11. (a) Mention the different types of iterative structure allowed in Python. Explain the use of continue and break statements with an example. (16)

Or

- (b) (i) What is an algorithm? Summarise the characteristics of a good algorithm. (8)
(ii) Outline the algorithm for displaying the first n odd numbers. (8)
12. (a) Describe about the concept of precedence and associativity of operators with example. (16)

Or

- (b) (i) Mention the list of keywords available in Python. Compare it with variable name. (8)
(ii) What are statements? How are they constructed from variable and expressions in Python? (8)
13. (a) (i) Analyse string slicing. Illustrate how it is done in Python with example. (8)
(ii) Write a Python code to search a string in the given list. (8)

Or

- (b) (i) Outline about function definition and call with example. (10)
(ii) Why are functions needed? (6)
14. (a) Demonstrate with code the various operations that can be performed on tuples. (16)

Or

- (b) Outline the algorithm and write a Python program to sort the numbers in ascending order using merge sort. (16)
15. (a) Explain about the file reading and writing operations using format operator with Python code. (16)

Or

- (b) (i) Explain about how exceptions are handled with example. (8)
(ii) Design a Python code to count the number of words in a Python file. (8)

Reg. No. :

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Question Paper Code : 80175

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

GE 8152 — ENGINEERING GRAPHICS

(Common to all branches)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

1. Diagrams should be neat and tidy
2. Lettering, Dimensioning and naming of diagrams carry marks
3. Correct usage of H, 2H, HB pencils should be followed while drawing
4. A3 size booklets consisting of 5 sheets would be given

Answer ALL questions.

(5 × 20 = 100)

1. (a) Draw free hand sketches of the front, top and right side views of block shown in Fig. 1.

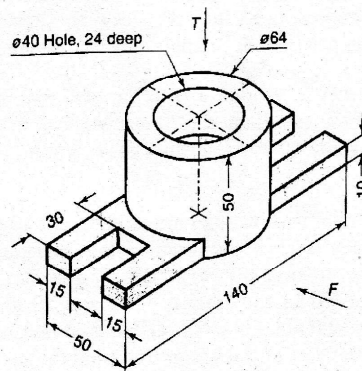
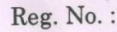


Fig. 1

Or

- (b) A point P moves in such a way that its distance from a fixed straight line is 9 units while its distance from a fixed point is always 7 units. Draw the curve by choosing at least 10 points. Assume that the distance between the fixed straight line is 30 mm from that the fixed point.
2. (a) The end P of a line PQ is 30 mm above HP and 35 mm in front of VP. The line is inclined at 35° to the HP. Its top view is 70 mm long and inclined at 40° to XY. Draw the projections of the straight line. Locate the traces. Find the true length and inclination of the line with the VP.
- Or
- (b) A hexagonal plate of side 20 mm rests on the HP on one of its sides inclined at 45° to the VP. The surface of the plate makes an angle of 30° with the HP. Draw the front and top views of the plate.
3. (a) A cylinder of diameter 30 mm and axis length 50 mm is resting on the HP on a point so that its axis is inclined at 45° to the HP and parallel to the VP. Draw its top and front views.
- Or
- (b) A square pyramid of base side 60 mm and altitude 100 mm lies on the HP on one of its triangular faces with its axis parallel to the VP. Draw its projections.
4. (a) A pentagonal pyramid of base side 20 mm and altitude 45 mm rests on its base on the HP with an edge of the base perpendicular to the VP. It is cut by a plane perpendicular to both the HP and VP. The cutting plane cuts the object at 8 mm from the axis in the top view. Draw the front, top and right end views of the pyramid.
- Or
- (b) A hexagonal prism of base edge 25 mm and height 60 mm rests on one of its ends on the HP with a vertical face parallel to the VP. A horizontal hole of diameter 36 mm is drilled centrally right through the prism with its axis perpendicular to the VP. Draw the development of the lateral surfaces of the prism with the hole.
5. (a) Draw the isometric view of a frustum of a cone of height 30 mm, base diameter 34 mm, top diameter 20 mm when it is centrally placed over a square slab of side 50 mm and thickness 10 mm.
- Or
- (b) A square prism of base 25×25 mm and height 40 mm rests on the GP on one of its ends with a rectangular face receding away from the PP towards right making 60° with PP. The corner nearest to the PP is 40 mm to the left of the station point and 20 mm behind the PP. The station point is 60 mm above the GP and 50 mm in front of the PP. Draw the perspective view of the prism by visual ray method. Use the top view and the front view.

[illegible]

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018
First Semester
Civil Engineering
GE 8151 – PROBLEM SOLVING AND PYTHON PROGRAMMING
(Common to All Branches)
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART - A

(10×2=20 Marks)

1. What is an algorithm ?
2. Write an algorithm to accept two numbers, compute the sum and print the result.
3. Name the four types of scalar objects Python has.
4. What is a tuple ? How literals of type tuple are written ? Give example.
5. Write a Python program to accept two numbers, multiply them and print the result.
6. Write a Python program to accept two numbers, find the greatest and print the result.
7. What is a list ? How lists differ from tuples ?
8. How to slice a list in Python ?
9. Write a Python script to display the current date and time.
10. Write a note on modular design.

PART - B

(5×16=80 Marks)

11. a) i) Draw a flow chart to accept three distinct numbers, find the greatest and print the result. (8)
ii) Draw a flow chart to find the sum of the series $1 + 2 + 3 + 4 + 5 + \dots + 100$. (8)
- (OR)

(OR)

- b) Outline the Towers of Hanoi problem. Suggest a solution to the Towers of Hanoi problem with relevant diagrams. (16)

54009



12. a) i) What is a numeric literal ? Give examples. (4)

ii) Appraise the arithmetic operators in Python with an example. (12)

(OR)

b) i) Outline the operator precedence of arithmetic operators in Python. (6)

ii) Write a Python program to exchange the value of two variables. (4)

iii) Write a Python program using function to find the sum of first 'n' even numbers and print the result. (6)

13. a) i) Appraise with an example nested if and elif header in Python. (6)

ii) Explain with an example while loop, break statement and continue statement in Python. (10)

(OR)

b) i) Write a Python program to find the factorial of a given number without recursion and with recursion. (8)

ii) Write a Python program to generate first 'N' Fibonacci numbers. (8)

Note : The Fibonacci numbers are 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, where each number is the sum of the preceding two.

14. a) i) What is a dictionary in Python ? Give example. (4)

ii) Appraise the operations for dynamically manipulating dictionaries. (12)

(OR)

b) i) Write a Python program to perform linear search on a list. (8)

ii) Write a Python program to store 'n' numbers in a list and sort the list using selection sort. (8)

15. a) Tabulate the different modes for opening a file and explain the same. (16)

(OR)

b) i) Appraise the use of try block and except block in Python with syntax. (6)

ii) Explain with an example exceptions with arguments in Python. (10)



Reg. No. :

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Question Paper Code : 54013

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018

First Semester

Civil Engineering

HS8151 : COMMUNICATIVE ENGLISH

(Common to : All Branches (Except Marine Engineering))

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Write Wh-questions for the following statements. (4×½=2)
 - a) I am planning to relocate to Canada in 2018.
 - b) Tanuj was late and so he could not attend the meeting.
 - c) The schools reopen on the 21st.
 - d) This is my friend's calculator.
2. Complete the word in the blank using the correct suffix. (4×½=2)
 - a) His exemplary service in the army proves his patriot ____ (–ness, –ism, –cy, –ward)
 - b) I found a new book ____ on dental health in the library. (–let, –ish, –worm, –ing)
 - c) Sugar crystal ____ very quickly. (–ism, –ing, –izes, –ed)
 - d) The stranger had a strange appear ____ (–ing, –ance, –less, –dis)
3. Fill in the blanks with suitable prepositions : (4×½=2)

Steve Jobs co-founded Apple Computer ____ Steve Wozniak ____ 1976. It soared ____ its start as a garage venture ____ a technology giant.
4. Guess the meaning of words in bold from the context. Choose the options from the answers given : (4×½=2)
 - i) The judgement of a good leader should not be coloured by **Prejudices**.
 - a) tolerance
 - b) bias
 - c) broadmindedness
 - d) dishonesty

54013

-2-



- ii) A balanced diet is **crucial** for maintaining one's health and fitness.
a) peripheral b) necessary c) optional d) unnecessary
- iii) She is very kind and **empathetic** to patients.
a) indifferent b) compassionate
c) rude d) careless
- iv) **Domestic** servants are well paid these days.
a) foreign b) intern c) household d) private
5. Use a single word that substitutes the following phrases : (4 × ½ = 2)
- i) A person who abstains from alcoholic drinks.
a) alcoholic b) drunkard c) teetotaler d) abstinence
- ii) A doctor who specialises in child health.
a) paediatrician b) physician c) psychologist d) anaesthetist
- iii) The first speech delivered by a person.
a) Oration b) Extempore
c) Speech d) Maiden speech
- iv) A lady who remains unmarried.
a) Bachelor b) Spinster c) Maid d) Feminist
6. Choose the correct adverbs and complete the sentences : (4 × ½ = 2)
- i) He writes _____ (mechanically/legibly).
- ii) She responded _____ when she was interviewed by her supervisor (confidently/noisily).
- iii) He has been reprimanded _____ (twice/recklessly).
- iv) Ram _____ writes to me these days (seldom/unofficial).
7. Choose the most suitable synonym for the word in bold : (4 × ½ = 2)
- i) His ancestral property was located at a **remote** place.
a) ancient b) rustic c) distant d) local
- ii) Many farmers are committing suicide on account of their inability to pay back their **debt**.
a) dues b) arrears c) salary d) finances
- iii) The behaviour of the criminal was rather **detestable**.
a) commendable b) despicable c) mysterious d) puzzling
- iv) The health care services in India are **understaffed**.
a) ample b) sufficient c) inadequate d) excess



8. Fill in the blanks with suitable tense forms from the options given : $(4 \times \frac{1}{2} = 2)$
- We _____ (have had/had) problems with our new printer recently.
 - All the children at the party hall were startled when the balloon _____ with a loud noise (burst/burst).
 - The artist _____ a beautiful portrait (drew/drawn).
 - I _____ (was reading/have read) a book when you called.
9. Choose the correct fixed expressions from the options given : $(4 \times \frac{1}{2} = 2)$
- Life is not _____ (a joyful trip/a bed of roses).
 - He always came up with _____ for coming late (a lame excuse/silly ideas).
 - It is difficult _____ such boring people (to put down with/to put up with).
 - The answer was on _____ (the tip of my mouth/the tip of my tongue).
10. Fill in the blanks with suitable modal verbs : $(4 \times \frac{1}{2} = 2)$
- Vijay _____ ride his two wheeler easily (can/would).
 - _____ we take a torch in case its dark in the alley ? (Should/Might).
 - _____ I borrow your dictionary ? (May/Might).
 - I _____ return the money by tomorrow. (shall/would).

PART - B

 $(5 \times 16 = 80 \text{ Marks})$

11. Read the following passage and answer the questions given below : (16)

The Coliseum is an ancient stadium in the center of Rome. It is the largest of its kind. It is very old. They started building it in the year 70. It took ten years to build. It is still around today. The Coliseum has been used in many ways. In ancient Rome, men fought each other in it. They fought against lions, tigers and bears. Oh my ! It was dreadful. But most of the people appreciated it. As many as 80,000 Romans would pack inside to watch the events with thrill. These gruesome events went on until 523. The Coliseum has been damaged many times over the years. It was struck by lightning in the year 217. This started a fire. Much of the Coliseum is made of stone. But the fire damaged the upper levels. They were made of wood. This damage took many years to repair. It was not finished until the year 240. The worst damage happened in 1349. A mighty earthquake shook Rome and the Coliseum. The south side of the building collapsed. Pieces of the arena were all over the ground. Many people took the fallen stones. Others took stones from the seating areas. They used them to repair houses and churches. The Romans of those days were not connected to the Coliseum. It had last been used as castle. Before that it was graveyard. It has been hundreds of years since the games. The damage to the Coliseum was never repaired. Its good thing the outer wall of it still stands



strong. Today the Coliseum is one of Rome's most popular attractions. People from all over the world come to Italy to see it. It has even appeared on the back of a coin. I guess that makes it a symbol that many people want too.

A) Choose the correct answer from the options given below : (10×1=10)

- 1) Which event happened first ?
 - a) An earthquake damaged the Coliseum
 - b) The Coliseum was struck by lightning
 - c) The Coliseum appeared on the back of a coin
 - d) The Coliseum was used as a castle
- 2) What does a 'Coliseum' mean ?
 - a) a symposium
 - b) a historical monument
 - c) a stadium or a large theatre
 - d) a dilapidated structure
- 3) What caused the fire that damaged the upper levels of the Coliseum ?
 - a) A bolt of lightning
 - b) Rowdy people who came to watch the events
 - c) An attacking army
 - d) An angry mob
- 4) For which purpose was the Coliseum not used ?
 - a) People fought other people in it
 - b) It was a private castle
 - c) People fought animals in it
 - d) It was a meeting place for the government
- 5) Which option caused the most damage to the Coliseum ?
 - a) Fires
 - b) Earthquakes
 - c) Wars
 - d) Hurricanes
- 6) What did the people do with the stones that they took from the Coliseum ?
 - a) They repaired buildings
 - b) They sold them
 - c) They used them as weapons
 - d) They used them as tombstones
- 7) Which option best defines the word gruesome as it is used in the second paragraph ?
 - a) Exciting
 - b) Funny
 - c) Horrifying
 - d) Boring



- 8) Which option best describes the main idea in the last paragraph ?
- a) This is about all the things the Coliseum has been used for throughout history
 - b) This is about how the Coliseum is a popular place to visit today
 - c) This is about how the Coliseum is a symbol that many people know
 - d) This is about how the Coliseum is used today

- 9) Which option is not a way in which the Coliseum was damaged over the years ?

- a) Earthquake
- b) Tornado
- c) Lightning
- d) Fire

- 10) Which statement would the author most likely agree with ?

- a) The Coliseum should be replaced with a building that is not damaged
- b) The Coliseum has its place in history but it is not useful today
- c) The Coliseum should be used for fighting once again
- d) The Coliseum is very old and has been used for many purposes

- B) Choose the option that is **opposite** in meaning to the underlined word in the following sentences : (6×1=6)

- a) The Coliseum is an ancient stadium in the center of Rome.

- i) Primeval
- ii) Early
- iii) Old
- iv) Contemporary

- b) It was dreadful.

- i) Awful
- ii) Lovely
- iii) Appalling
- iv) Frightful

- c) But most of the people appreciated it.

- i) Loved
- ii) Delighted
- iii) Commended
- iv) Criticised

- d) Today the Coliseum is one of Rome's popular attractions.

- i) Repulsion
- ii) Appeal
- iii) Fascination
- iv) Charm

- e) A mighty earthquake shook Rome and the Coliseum.

- i) Potent
- ii) Great
- iii) Large
- iv) Weak

- f) The south side of the building collapsed.

- i) broke down
- ii) rose up
- iii) caved in
- iv) flopped



12. Write two paragraphs of around **200** words on **one** of the topics. (16)

a) Conservation of natural resources in our State.

(OR)

b) The pleasures of reading.

13. a) Write a letter to the editor of a newspaper complaining about the inadequate water supply in your city. (16)

(OR)

b) Imagine you have organized a cultural event in your college. Write a letter to your friend sharing your experiences with him/her. (16)

14. Rearrange the jumbled sentences in a logical order. Attempt either of the two sets. (16)

SET - A

a) A) In 1904, he joined the Salem Government weaving school to master the art of weaving.

B) So, he left Salem after handing over his lucrative business to a partner and moved to Madras.

C) He had his school education in the town high school at Kumbakonam and moved to Salem in search of job opportunities.

D) C. Rajam was born on November 28, 1882 in the village of Swamimalai near Kumbakonam.

E) He manufactured dhoties, towels, shirt materials, etc., using fly shuttle looms.

F) Eventually, he started his own handloom factory in Salem with a capital of Rs. 1,000.

G) These materials were of high quality and found a ready market not only in Salem, but in all of Madras Presidency.

H) However, he was already looking out for newer pastures.

SET - B

b) A) Again, it is rarely sufficient for an advertiser simply to amuse the target audience in order to reap the sales benefit.

B) There are indications that in substituting the hard sell for a more entertaining approach, some agencies have rather thrown out the baby with the bath water.

C) Making people laugh is tricky.

D) Therefore, it requires a balance of humour and the ability to convince the audience that the product is good enough to be purchased.



- E) This is because the commercial can fall flat on many grounds.
- F) There are many advertisements which do amuse but do not even begin to set the cash tills ringing.
- G) Making people laugh while trying to sell them something is a tougher challenge particularly when the medium is through a commercial.
- H) At times, the intended humour may simply not come off.

15. Complete **any one** of the following dialogues :

(16)

a) Dialogue between Suresh and a travel agent.

Travel agent : Hello sir, How can I help you ?

Suresh : Our family is planning on a short trip to Kodaikanal ?

Travel agent :

Suresh :

(Add eight exchanges)

(OR)

b) Sheila is conversing over the phone with her friend Asha in an Arts and Science college.

Sheila : Hi, Asha How're you ?

Asha : Great, By the way how are you ?

Sheila :

Asha :

(Add eight exchanges)



Reg. No. :

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Question Paper Code : 54017

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018

First Semester

Civil Engineering

PH 8151 – ENGINEERING PHYSICS

(Common to : All Branches)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What are the effects of hammering and annealing on elasticity of a material ?
2. When a wire is bent back and forth, it becomes hot. Why ?
3. Define forced and damped oscillations.
4. How will you classify optical fibers based on the material ?
5. Distinguish between conduction and convection.
6. For a free particle moving within a one dimensional potential box, the ground state energy cannot be zero, why ?
7. State Wien's displacement law.
8. What is a bimetallic strip ? Give its applications.
9. For a cubic system, sketch the planes with miller Indices (110), (101), (011).
10. Determine the lattice constant for FCC lead crystal of radius 1.746 \AA .

54017

PART – B

(5×16=80 Marks)

11. a) What is Torsion pendulum ? Explain how it is used to determine the moment of inertia and rigidity modulus of the material of a thin wire. (16)

(OR)

- b) Derive an expression for the deflection produced at the free end of a rectangular cantilever subjected to point load at free end. What will be the deflection produced at the free end , with same load, if the cantilever is of circular cross section. (16)
12. a) Compare a homojunction semiconductor laser with a hetero junction semiconductor laser and detail their features. (16)

(OR)

- b) Derive an expression for Acceptance angle and Numerical aperture of an optical fiber. Bring out the differences between step index and graded index fiber. (12+4)
13. a) i) How will you determine the thermal conductivity of a poor conductor using Lee's disc method. Give the necessary theory.
- ii) A metal cube takes 5 minutes to cool from 60°C to 52°C . How much time will it take to cool to 44°C , if the temperature of the surroundings is 32°C ? (12+4)

(OR)

- b) How are heat exchangers helpful in refrigerators, ovens and solar water heater ? (16)
14. a) What is Compton effect ? Give the theory of Compton effect and show that the Compton shift. (16)

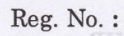
$$\lambda' - \lambda = \frac{h}{m_e c} (1 - \cos \theta)$$

(OR)

- b) What are the draw backs of classical free electron theory ? Derive Schroedinger time dependent and time independent wave equations. (2+7+7)
15. a) What is packing factor ? Obtain packing factors for SC, BCC, FCC and HCP structures. (2+3+3+3+5)

(OR)

- b) Write a note on point imperfections in crystals. Discuss in detail a suitable method to grow single crystal of semiconducting materials. (8+8)



B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018

First Semester

Civil Engineering

GE 8152 – ENGINEERING GRAPHICS

(Common to All Branches)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions. (5×20=100 Marks)

1. a) Construct a hyperbola when the distance between the focus and directrix is 40 mm, the eccentricity is $\frac{4}{3}$. Also draw tangent and normal to the curve from any point on it.

(OR)

- b) Draw the elevation, top and side view for the component given below.



54018



2. a) A hexagonal plate of side 20 mm rests on the HP on one of its sides inclined at 45° to VP. The surface of the plate makes an angle of 30° with the HP. Draw the front view and top view of the plate.

(OR)

- b) The point A of a line AB is in HP and 60 mm in front of VP. The point B is in VP and 40 mm above HP. The distance between projectors is 70 mm. Draw the projections of the line, find the true length, inclinations and locate its traces.

3. a) A cone of base diameter 50 mm and axis 60 mm has one of its generators in the VP. Draw its projections when the apex is 35 mm above the HP.

(OR)

- b) A cylinder of diameter 30 mm and axis length 50 mm is resting on the HP on a point so that its axis is inclined at 45° to the HP and parallel to VP. Draw its top and front views.

4. a) A pentagonal pyramid side of base 30 mm and axis 90 mm long is resting on its base with one of its base edges parallel, nearer and 15 mm away from the VP. It is cut by a plane perpendicular to HP, inclined at 40 degrees to VP and 10 mm away from the axis. Draw the views and also obtain the true shape of the section.

(OR)

- b) A conical shape vertical chimney of 60 m base diameter joins a roof sloping at an angle of 35° with the horizontal. The shortest portion over the roof is 25 m. Determine the shape of the sheet metal from which the chimney can be fabricated. Take appropriate scale.

5. a) Draw the perspective view of a square prism of base side 20 mm and height 35 mm resting on an end on the ground with a rectangular face parallel to the picture plane. The axis of the prism is 25 mm behind the picture plane and 25 mm to the right of the eye. The eye is 50 mm in front of the PP and 50 mm above the ground.

(OR)

- b) A pentagonal pyramid with edge of base 40 mm and axis 70 mm long, is resting on its base on H.P. One of the base edges of the pyramid is perpendicular to V.P. A section plane, perpendicular to V.P. and inclined to H.P. at 30° , passes through the axis, at a height of 30 mm from the base. Draw the isometric view of the truncated pyramid.



Reg. No. :

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Question Paper Code : 54008

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018

First Semester

Civil Engineering

CY 8151 – ENGINEERING CHEMISTRY

**(Common to : All Branches (Except Marine Engineering))
(Regulations 2017)**

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. Name any two salts that cause temporary hardness.
2. What is reverse osmosis ?
3. List any four characteristics of enzyme catalysis.
4. What are autocatalysts ? Give an example.
5. Define "component" and "Degree of freedom".
6. What are the uses of phase diagram ?
7. What is a calorie ? Give the different units of calorific value.
8. How coals are classified ?
9. Give an example each for nuclear fission and nuclear fusion reactions.
10. What are the advantages of lithium cell ?

54008



PART – B

(5×16=80 Marks)

11. a) i) What are the essential requirements of boiler feed water ? (6)
ii) What are the various boiler troubles and how they can be prevented ? (10)
(OR)
b) i) Write the differences between internal and external treatment of boilers. (6)
ii) Discuss the various methods available for internal conditioning. (10)
12. a) What is an adsorption isotherm ? Draw the five general types of adsorption isotherms. Derive Langmuir adsorption isotherm mathematically. (16)
(OR)
b) i) Give any four applications of adsorption. (4)
ii) Derive Michaelis-Menten equation for enzyme catalysis. (12)
13. a) Draw and explain the phase diagram of Pb-Ag eutectic system. (16)
(OR)
b) With two cooling curves for pure substance and mixture, discuss briefly about thermal analysis. (16)
14. a) With a neat diagram of Orsat's apparatus, explain the analysis of flue gas. (16)
(OR)
b) What is ultimate analysis of coal ? Give its significance. (16)
15. a) Explain the construction, charging and discharging of lead acid accumulator. (16)
(OR)
b) What are the components of a nuclear power reactor and explain the functioning of light water nuclear power reactor with a neat diagram ? (16)



Reg. No. :

Question Paper Code : 54016

B.E./B.Tech. DEGREE EXAMINATION, JANUARY 2018

First Semester

Civil Engineering

MA 8151 – ENGINEERING MATHEMATICS – I

Common to All Branches (Except Marine Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Mark

Answer ALL questions.

PART - A

(10×2=20 Marks)

- Sketch the graph of the function $f(x) = \begin{cases} 1+x; x < -1 \\ x^2; -1 \leq x \leq 1 \\ 2-x; x \geq 1 \end{cases}$ and use it to determine the value of "a" for which $\lim_{x \rightarrow a} f(x)$ exists?
- Does the curve $y = x^4 - 2x^2 + 2$ have any horizontal tangents? If so where?
- If $x = r \cos \theta$ and $y = r \sin \theta$ then find $\frac{\partial r}{\partial x}$.
- If $x = uv$ and $y = \frac{u}{v}$ then find $\frac{\partial(x, y)}{\partial(u, v)}$.
- What is wrong with the equation $\int_{-1}^2 \frac{4}{x^3} dx = \left[\frac{-2}{x^2} \right]_{-1}^2 = \frac{3}{2}$?
- Evaluate $\int_1^{\infty} \frac{1}{\sqrt{x}} dx$ and determine whether it is convergent or divergent.

54016

-2.



7. Find the value of $\int_0^{\infty} \int_0^y \left(\frac{e^{-y}}{y} \right) dx dy$.
8. Find the limits of integration in the double integral $\iint_R f(x, y) dx dy$ where R is in the first quadrant and bounded $x = 1, y = 0, y^2 = 4x$.
9. Convert $x^2 y'' - 2xy' + 2y = 0$ into a linear differential equation with constant coefficients.
10. Find the particular integral of $(D - 1)^2 y = e^x \sin x$.

PART - B

(5×16=80 Marks)

11. a) i) For what value of the constant "c" is the function "f" continuous on

$$(-\infty, \infty) f(x) = \begin{cases} cx^2 + 2x; & x < 2 \\ x^3 - cx; & x \geq 2 \end{cases} \quad (8)$$

- ii) Find the local maximum and minimum values of $f(x) = \sqrt{x} - \sqrt[4]{x}$ using both the first and second derivative tests. (8)

(OR)

- b) i) Find y'' if $x^4 + y^4 = 16$. (6)

- ii) Find the tangent line to the equation $x^3 + y^3 = 6xy$ at the point (3, 3) and at what point the tangent line horizontal in the first quadrant. (10)

12. a) i) If $u = (x^2 + y^2 + z^2)^{-1/2}$ then find the value of $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}$. (8)

- ii) Find the dimensions of the rectangular box without a top of maximum capacity, whose surface area is 108 sq.cm. (8)

(OR)

- b) i) Obtain the Taylor's series expansion of $x^3 + y^3 + xy^2$ in terms of powers of $(x-1)$ and $(y-2)$ up to third degree terms. (8)

- ii) Find the maximum or minimum values of $f(x, y) = 3x^2 - y^2 + x^3$. (8)



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54016

13. a) i) Evaluate $\int \frac{\tan x}{\sec x + \cos x} dx$. (8)

ii) Evaluate $\int e^{ax} \cos bx \, dx$ using integration by parts. (8)

(OR)

b) i) Evaluate $\int \frac{x}{\sqrt{x^2 + x + 1}} dx$. (8)

ii) Evaluate $\int_0^{\pi/2} \cos^5 x \, dx$. (8)

14. a) i) Change the order of integration for the given integral $\int_0^a \int_0^{2\sqrt{ax}} (x^2) dy \, dx$ and evaluate it. (8)

ii) Evaluate by changing to polar coordinates $\int_0^a \int_0^a \frac{x}{x^2 + y^2} dx \, dy$. (8)

(OR)

b) i) Evaluate $\iiint (x y z) dx \, dy \, dz$ over the first octant of $x^2 + y^2 + z^2 = a^2$. (8)

ii) Using double integral, find the area bounded by $y = x$ and $y = x^2$. (8)

15. a) i) Solve $\frac{d^2 y}{dx^2} + y = \cot x$ by using method of variation of parameters. (8)

ii) Solve $(D^2 - 2D)y = 5e^x \cos x$ by using method of undetermined coefficients. (8)

(OR)

b) i) Solve $[(x+1)^2 D^2 + (x+1)D + 1]y = 4 \cos \log(x+1)$. (8)

ii) Solve $Dx + y = \sin 2t$ and $-x + Dy = \cos 2t$. (8)

A BRIEF HISTORY OF THE COLLEGE

K.L.N. College of Engineering is the first self-financing Co-educational Engineering College in Madurai, started in 1994 by Munificence of Philanthropist and well wishers in Sourashtra Community which is a linguistic minority in Tamilnadu. This college is sponsored by the committee of eminent industrialists and academicians led by enthusiastic, educationalist and industrialist (Late) Thiru K.L.N. Krishnan. This college has the approval of All India Council for Technical Education, New Delhi and is affiliated to Anna University, Chennai.

Thiru. K.L.N. Krishnan, Founder President of this Engineering College has rendered Yeoman service to Sourashtra Arts & Science College and Sourashtra Girls Higher Secondary School, Madurai for the past several years. He also promoted a Polytechnic under the name of K.L. Nagaswamy Memorial Polytechnic College in Viraganur, Madurai in 1983. This Engineering College, functioned in the premises of the above polytechnic during the academic years 1994-95 & 1995-96 was shifted to its own premises in the year 1996.

(Late) Thiru K.L.N. Krishnan is the Founder President, and the college is now under the management of Dr. K.N.K. Ganesh as Secretary & Correspondent and other executive committee members.

Campus :



This college is situated on the South Eastern outskirts of Madurai, 11th Km on Madurai – Nedungulam Road. It is built in an area of 53.8 acres. The Campus has multistoreyed buildings consisting of well provided class rooms, drawing halls, seminar halls, conference hall, library, Air-Conditioned Computer centres, staff rooms and student rest rooms. The infrastructure also consists of five double storeyed laboratory buildings and three single storeyed workshops and Machine shop, and an automobile workshop.

The Administrative block (2 storeyed) of 1,185 sq. metre with office in the ground floor, I.T. laboratory in the first floor & class rooms in the second floor has been constructed on the eastern side.

A two storeyed block of 1,185 sq. metre consisting class room has been constructed on the southern side of the administrative block.

A two storeyed block of 1,185 sq. metre with EIE laboratory in the ground floor, DSP laboratory in the first floor & class rooms in the second floor has been constructed on the western side of the administrative block.

A two storeyed block of 2,122 sq. metre with spacious library, video library & Electronic resource section in the ground floor, class rooms in the first floor & CSE laboratory in the second floor has been constructed near the administrative block.

A single storeyed block of 1,193 sq. metre with S.M. laboratory in the ground floor CAD, CAM laboratories in the first floor & class rooms in the second floor has been constructed on the north western side of the administrative block.



Three Mechanical sheds (occupied by three Mech. Engg. Laboratory) of 2460 sq. metre have been constructed on the northern side of the mechanical block. An automobile work shop of 2304 sq. metre has been constructed on the north western side of the administrative block.

An Indoor stadium cum Auditorium of 2,221 sq. metre has been constructed on the northern side of the administrative block.

A separate double storeyed post-Graduate block of 4,020 square metre for M.B.A. and M.C.A. departments has been constructed on the South Western side of the administrative Block.

A single storeyed block of two canteens with 2,485 square metre in the ground floor and ladies rest room in the first floor has been constructed on the south western side of the Administrative Block.

A single storeyed block of 1,289 square metre for Electrical & Electronics Engg., Laboratories & class rooms in the ground floor and Electronics & Communication Laboratory and Class rooms in the first floor has been constructed on the western side of the Administrative Block.



A two-storeyed block with an area of 2,956 sq. metre has been constructed as an extension to Block III Opposite the U.G. library Block. This block comprised Physics lab, Chemistry lab and EIE Lab. D.S.P. Lab & Class rooms.



A two-storeyed block with an area of 2076 square metre for the use of EEE Dept. in the ground floor & ECE Dept. in the first & 2nd floors is now under construction as an extension to the existing EEE & ECE block on the western side of the administrative block.

A two storeyed block with an area of 2,977 sq. metre for the use of Mechanical & Automobile depts. is now under construction, as an extension to the existing Mechanical block on the North-Western side of the administrative block.

A separate building with ground floor of area of 170 sq. metre for the installation of Generator on the South-eastern side (Opposite to the Vinayagar temple) of the administrative block is under construction & (nearing completion)

In order to facilitate the easy accessibility for the students, in all, 950 numbers of computers have been installed so far. This sounds the management's conviction in providing essential infrastructure for the learning purpose in our college.

An overhead Tank of 20,000 Litre Capacity at a height of 40 feet has been constructed at a cost of Rs.4 lakhs, donated by Rotary international, Rotary District-1240, Rotary club of LEIGH-ON-SEA. Treated drinking water plant at a cost of Rs.2 lakhs has been installed near the overhead tank.

Well-furnished Men's Hostel, Mess block and canteen block are also inside the campus. The college is a quiet retreat, ideal for concentrated study, away from distractions and disturbances of a large city.

A single storeyed block of 1,330 square metre with a spacious dining hall in the ground floor and 13 rooms in the first floor for men students has been constructed on the northern side of the administrative block and is already in use. A two storeyed hostel block of 2,034 square metre adjacent to the existing hostel for men students has been constructed.



Total expenditure incurred so far towards the cost of equipments & buildings & other assets is about Rs.22.50 crores.

A VINAYAGAR Temple on the eastern side of the administrative Block has been constructed. Eight class rooms for 1 year B.E. / B.Tech 2 class room for M.E. (P.S.) students, and two staff rooms have been constructed in the ECE/EEE block.

A Ladies Hostel of 1460 sq.m. which can accommodate about 150 students is within the campus.

HISTORY OF THE DEPARTMENT

B.E. - Electrical and Electronics Engineering		M.E. - Power Systems Engineering		Ph.D.	
Year of start & History of Intake	1994, with an intake of 40	Year of start & History of Intake	2004, with an intake of 18	Year of Recognition as Research Centre	December 2012
	1996, with an intake of 60		2012, with an intake of 24	First Renewal	December 2015, December 2018
	2002, with an intake of 90				
	2011, with an intake of 120			Second Renewal	December2018, upto December 2021
Both UG & PG programs are permanently affiliated to Anna University, Chennai.					
Accreditation status					
First Accreditation	Second Accreditation	Third Accreditation	Fourth Accreditation	Fifth Accreditation	
3 YEARS W.E.F. 19-3-2004	3 YEARS W.E.F. 19-7-2008	2 YEARS W.E.F. 05-08-2013	Academic Year 2016-17,2017-18 and 2018-19, i.e., upto 30-06-2019	Academic year 2019 -2020 , 2020-2021, 2021-2022 i.e., upto 30.06.2022	

FACULTY PROFILE as on July 2019

Ph.D's	Doing Ph.D	M.E.
9	3	9
Professors	Associate Professor	Assistant Professor
5	4	12

SALIENT FEATURES OF THE DEPARTMENT

1.GENERAL

- Started offering B.E. in Electrical and Electronics Engineering in the year 1994 with an intake of 40 (No.-732-50-8/RC/94, dated 11th August 1994, AICTE), an intake of 60 in 1996, an intake of 90 in 2002 (F.No:730-52-227(E)/ET/97 dated 19.06.2002), with the latest intake of 120 in 2011 (F.No.Southern/1-400215781/2011/EOA, dated 01.09.2011, AICTE).
- Started offering M.E. in Power Systems Engineering in the year 2005 with an intake of 20 and increased intake to 24 in 2012 (F.No.Southern/1-687512981/2012/EOA, dated 10.05.2012, AICTE).
- Accredited in March 2004 (First time - F.No.NBA/ACCR-242/2003, dated 24/03/04) and Re-accredited (Second time - F.No.NBA/ACCR-242/2003, dated July 19, 2008), Re-accredited (Third time - For 2 years w.e.f. 28-08-2012), Re-accredited (Fourth time - For 3 years w.e.f. July 2016, upto 30.06.2019, F.No. 33-01/2010-NBA, dated 04.02.2017), Re-accredited (Fifth time - For 3 years w.e.f. July 2018, upto 30.06.2022, F.No. 33-01/2010-NBA, dated 22.03.2019) by National Board Accreditation, New Delhi.
- Recognized Research Centre No.4490408, Approved by Anna University, Chennai with effect from December 2012, offering guidance for M.S & Ph.D.(Full time/Part time) (Renewed upto December 2018, Lr.No. 4904/IR/EEE/AR1 dated 18.02.2016) , (Renewed upto December 2021, Lr.No. 4904/IR/EEE/AR2 dated 29.01.2019).
- Both UG and PG programs are permanently affiliated to Anna University, Chennai with effect from December 2012.
- MODROB fund of Rs.5 lakhs was allotted for the year 2011-2012 for the Power Electronics laboratory (No.8024/RIFD/MOD-131(pvt)/Policy-III/2011-2012, dated 06.03.2012).
- Department of Science and Technology (DST), sanctioned financial assistance of Rs.19,75,800/- for the project entitled '**Smart Meter for measuring Power Quality Disturbances using GSM Technology**', Dr.K.Gnanambal, Professor/EEE is the Principal Investigator (Ref. No. IDP/IND/4/2015 dated 03.08.2016).
- Department of Science & Technology (DST) sanctioned financial assistance of Rs. 36.5 lakhs for the project entitled "**Design & Development of Sensor based Sewage Block Remover & Management System**" - **Dr. S. Parthasarathy, Prof/EEE** is the Principal Investigator. (D.O. No. DST/TDT/ EAG/DDP- 03/2018 dated 11.06.2018).
- TÜV SÜD South Asia Private Limited, Chennai sanctioned a financial assistance of Rs.31.7 lakhs for the project entitled "**Investment Grade Energy Audit in street lighting system and preparing detailed project report for implementing Energy Saving mechanism in street lighting system in the 19 Designated Municipalities in Madurai Region**" -Dr. S. Venkatanarayanan, Prof/ EEE is the Principal Investigator. (PO No. 2800003104, version 5 dated 19.12.2017)

2.INFRASTRUCTURE

- Electrical machines laboratory, Control, Measurement and Instrumentation laboratory, Power Electronics laboratory, Electric circuits and Electronic devices laboratory, Research and Development laboratory and Power System Simulation Laboratory are equipped with machineries, components, signal generating, power supply measuring, recording instruments and computer systems costing Rs.2 crores. The total built up area of laboratories is 1208.21 sq.m.
- Latest softwares on Power system analysis, Power system stability, Power world simulator and Power electronics are available to study, solve, design and simulate research on Power system and Power Electronics problems to experience the real time results.
- All the class rooms are equipped with computer systems, LCD and OHP to promote the Teaching-Learning process more effectively.
- Separate library facility for EEE students with more than two thousand books on core subjects and hard copies of IEEE Journals and magazines from 1999 are available for reference. Staff and students can access the softcopy of Journals, proceedings published by IEEE, Elsevier, ASME, Springer, Mc Graw Hill.
- All laboratories are provided with sufficient computing facilities, printing facility with internet connection to simulate laboratory experiments.

3.STAFF

- Teams of well qualified, and experienced 25 faculties with cadre ratio as per AICTE, are guiding the students to attain the best educational objectives.
- Excellent research environment promotes the staff and students to participate, present and publish their research works in the National/International Journals and National/International conferences.
- Facility and experienced faculty available for guiding Ph.D.scholars.
- Staff development Programme / Faculty development programme / Workshop/ Seminar are organized regularly to share the knowledge of our experienced faculty with parent institution and other colleges staff and students and Industrial persons.

4.RESEARCH AND DEVELOPMENT

- The Research and Development section is doing research on Industrial Power Harmonics and mitigation and interact with industries in measuring, recording, analyzing and designing of filters for reducing harmonics with the help of Power Quality analyzer, as per IEEE standard.
- Consultancy work on 'Industrial Harmonic Study' and 'Energy Audit' is being carried out regularly by the experienced professors.

5.STUDENTS

- Students secured 108 University Ranks in B.E.-EEE (1998 to 2018) and 18 University Ranks in M.E.-Power Systems Engineering (2007 to 2018) with **Gold medal** in 2000 (UG - EEE) and in 2011 (PG - Power Systems Engineering). Sweety Jain of 2005-2009 batch student secured 2nd rank in Anna University Examination in 2009 among 8500 students who completed degree and out of 240 Engineering colleges all over Tamil Nadu.
- IEEE student's chapter which was started in the year 1999, continuously conducting number of student technical programme. Guest lecturers from industries have been arranged periodically to promote Industry-Institute Interaction and to bridge the gap between curriculum and latest trend in industry. The college received appreciation award for IEEE Student Chapter Activities from IEEE, Madras Section for the year 2015 and 2016. The EEE department recognized as IEI Best Division Award for the Academic year 2016-2017.
- To promote innovation, latest trends in industry and employability skills, student's professional activities are conducted every year in the name of symposium and conferences.
- Workshop/Seminar is regularly conducted for students to meet out the curriculum objectives.
- Inplant trainings are arranged for second and third year students to have hands on training with industry. Industrial visits are arranged every semester to know about the various process taking places in industry.
- Placement oriented training programme were conducted every semester right from the first year to develop soft skills, attitude, aptitude, self confidence, communication skills, interview skills etc, so as to face the campus placement programme organized by the college. Professional Trainers from software companies, Bangalore, Chennai are being invited for such training programme.

K.L.N. COLLEGE OF ENGINEERING, POTTAPALAYAM – 630 612
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FACULTY LIST

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18.	N.Vimal Radha Vignesh	Assistant Professor	9894965475	nvimalvignesh@gmail.com
19.	A.Manoj	Assistant Professor	9487526428	manojhails@gmail.com
20.	V.Sindhu	Assistant Professor	9894537984	savisindhu@yahoo.co.in
21.	R.Sridevi	Assistant Professor	-	sridevirs87@gmail.com

PLACEMENT ACTIVITY – REMINDER

1. In the month of October every first year students must fill forms online in TATA CONSULTANCY SERVICES (TCS) campus recruitment using nextsteptcs.com website and must submit the following documents in the department.
 - a. SSLC and HSC mark sheet photo copy at least 5.
 - b. Latest passport size Photo at least 5.
 - c. Current address proof with parent contact cell numbers.
 - d. Create your own two E-mail id using Gmail.
 - e. Resume with Scanned copy of passport size Photo.
 - f. CT number registered in the TCS website.
2. Every semester end update CGPA in your resume and TCS profile.
3. An Engineering student from Electrical and Electronics Engineering should complete the following courses in order to enhance their software skills. This will be most helpful during their successful completion in Curriculum during 4th Semester and in the software company campus recruitment.
 - a. Should complete **C Programming / Python Programming** before joining **2nd Semester**.
 - b. Should complete **C++ Programming** before joining **3rd Semester**.
 - c. Should complete **JAVA Programming** before joining **4th Semester**. (for the successful completion of object oriented Programming theory paper and laboratory during 4th Semester)
4. An Engineering student from Electrical and Electronics Engineering should complete the **Micro Processor, Micro Controller and Embedded Systems** courses before joining **5th Semester** in order to enhance their Hardware skills. This will be most helpful during their successful completion in Curriculum from 5th to 6th Semester and in the Core company campus recruitment. (for the successful completion of Micro Processor and Micro Controller theory as well as laboratory during 5th Semester and Embedded Systems during 6th Semester)
5. From 6th Semester Summer vacation onwards all should prepare for GATE Examination because all Engineering students from Electrical and Electronics Engineering should appear GATE Examination in order to settle in their life by pursuing higher education in the reputed colleges like IIT, NIT and Anna University or else to join as a Graduate Engineer trainee in a public sector companies like IOC, BHEL, PGCI etc.,
6. Before joining 7th Semester all should get any international certification programme course like OCJP, CCNA, etc., and upload the certification details in TCS campus commune website. This will be most helpful during the TCS campus and other MNC company recruitment.

Activity	Semester							
TCS Online form Filling in nextsteptcs.com	In the month of October							
Documents to be submitted in the EEE Department/ Placement Coordinator	a. SSLC and HSC mark sheet photo copy at least 5. b. Latest passport size Photo at least 5. c. Current address proof with parent contact cell numbers. d. Create your own two E-mail id using Gmail. e. Resume with Scanned copy of passport size Photo. f. CT number registered in the TCS website.							
Updating CGPA in resume and TCS online profile	✓	✓	✓	✓	✓	✓	✓	✓
C Programming	✓	✓						
C++ Programming	✓							
JAVA Programming		✓						
Micro Processor & Micro Controller			✓					
Embedded Systems				✓				
GATE / UPSC/ TNPSC Preparation		✓	✓	✓	✓	✓		
International Certification – OCJP / CCNA					✓	✓		

GENERAL REMINDERS

I. General

1. Keep at least 5 photocopies of birth certificate, ration card, Voters ID card, College ID card, Aadhar card, 10th ,+2 mark sheets, 10th /+2 Transfer Certificates, [* all proofs to be kept in your bag, in your house and in your mail, all kept in a water proof file-remember Chennai flood]. This will be required at anytime, anywhere.
2. Apply for Savings Bank account in any of the nationalized banks in first year. Apply for LIC schemes, saving schemes right from the first year. [*Refer]
3. Get Driving license during third year of your Degree course [*Refer]
4. Get Passport before the completion of 6th semester. [*Refer]
5. Always keep ID card issued by competent authority while moving from one city to another/ one state to another. It is better to wear ID card always.(except during bathing).
6. Never share your username and password of mail accounts to anyone even in your home/ to teachers/ friends. Never reply to un trusted mail/fake messages.
7. Share only legal, ethical, non-political, educational value based information/ photos/videos with your friends or any others through social media. Posting of illegal/political/unethical/ information/comments will spoil your career. Remember that all such communications in social media/emails are continuously monitored and recorded by intelligent agencies in the country and abroad, due to security threats.
8. Don't involve teasing of students of your class, juniors or seniors in the classrooms, laboratories or in hostels. Don't loan the cell phone to anyone. Also don't keep your cell phone easily accessible by anyone.
9. Don't send obscene messages or pictures through cell phones/ internet to anyone. Defaulters will be easily tracked by Cyber Crime Agencies. Don't purchase/loan someone's laptop/mobile phone, due to theft complaints.
10. Avoid two wheeler riding for long travelling, and night travelling. Wear helmet. Follow traffic rules. Lot of accidental deaths reported due to negligence of traffic rules. About 1.5laks of people lost their life in accidents in our country every year.
11. For any transaction of money, use cheques or bank accounts(for more than Rs. 10,000/-) because finding fake notes is difficult.
12. Always keep 10 passport and stamp size photographs, 10 no.s of revenue stamps, all ID proofs whenever going for banks/pass port office.
13. Keep at least email ids and good friendship of 25 students of your branch who have been placed in different companies. Collect background information on core/IT companies(minimum 25)
14. Develop good reading habit/read News papers daily/watch news channel daily/Watch films nominated for Oscar award.Watch channels like Discovery/Nat Geo/History/ any other news channels.(not more than an hour)
15. Speak in English only. Develop good writing skills by reading books.
16. Have a Desk top/Laptop, Printer before entering 5th semester.
17. Have internet facility in home for educational purpose. Keep all NPTEL material.
18. Keep all kind of stationery in your table for use at any time [pencil, sharpener, eraser, ball point pen of different colours, sketches, bell clip, stapler, single punch, tag, gum, knife, scissors, A4 paper, cello tap, emergency lamp, scale, protractor, compass, pen drive, CD, whitener, calculator, diary, stapler pin box]

19. Never transfer/ deposit money to any unknown mail. Beware of fraud/cheating by any one.

II. Education:

20. Download Anna University examination results immediately after the publication of result from AU website. Mark sheet attestation will not be given without the above copy

21. Always keep 5 copies of AU mark sheets , of each semester. Post it on your mail.

22. Discrepancy in mark sheets such as Name, Date of Birth, CGPA awarded, register number should be corrected immediately.

23. Always keep Rs 5,000/- in a semester for the payment of Book fee/AU exam fee/Training fee/purchase of competitive exam books/Educational tour/seminar/additional course/ certification course etc. Educate your parents for the above. This may be required in a particular month or in several months spread in a semester.

24. Enroll in IEEE membership during first/second year. Attend at least one programme at Chennai.

25. Collect 5 sets of AU question papers, subject wise, in a semester(within 10 days)

26. Prepare good quality Resume. Consult TPO, placed final year students. Resume preparation is an art that ensures your quality and getting jobs in reputed concern. Update your resume, monthly (by attending value added courses, online courses, co-curricular and extracurricular activities, publishing articles in conferences, symposium, technical events, journals, News papers, inplant training, internship, new languages learnt, project developed, industrial visits, social services participated etc.)

27. Attend any courses after consulting with HOD/senior staff to avoid courses not suited to your branch.

28. Purchase text/reference books every semester.

29. Purchase competitive exam books , like Objective type QB,GATE/TANCET/IES/IAS and prepare for the exams from second year onwards.

30. Collect aptitude/reasoning/analytical/numerical/verbal/test questions from the placed students or download from the website. For successful placement, preparation from the first year in the above topics is required.

31. Collect information like Product, clients, branches, head office, annual turnover, GM,CEO, etc of 25 core companies, and 25 software companies.

32. Attend atleast one seminar/workshop/ paper presentation contest per semester, applicable to your branch of study.

33. Plan your study for current subject/assignment work/observation work/record work/aptitude training for technical /non-technical daily/weekly/monthly.

34. Decide & justify clearly, your objective before 6th semester and plan accordingly. Options are placement(ON/OFF) in core/IT companies, higher studies/ civil services , parents business , start your own business. Confused mind never take a decision.

35. Attend inplant training(Min:one week,Max:One month) during semester holidays. Avoid industrial visit (Energy waste) and educational tour (Money waste).

36. Do mini project in second, third year of your study .Update these in final year. Project should be based on the need of the society/industry.

III. Health

37. Health is wealth. Read Dalailama statement on life of a man. We work hard , earn and save money sacrificing our health. Later we spent lot of money for medical treatment due to poor healthcare.

38. Have regular exercise either in the forenoon/evening. (an hour walk is must everyday).

39. Your food habits decides what you are and how long you will live with peace. Avoid junk foods/road side eatery. Use hot water for drinking.

40. Consult doctors in case of health problems. Periodical medical checkup, once in 6 months, is necessary for health and dental care. This may require Rs.2,000/- per year. Otherwise you need to pay a lot. It is advisable to stay in a house, within 500 metre (walkable distance) from a multispecialty hospital, otherwise 250 meters from any hospital. This is required to tackle emergency situations and also to avoid paying more for transport.

41. Avoid roaming/walking during summer/rainy season.

42. Attend yoga classes/ do meditation.

43. Apply group insurance medical policy at the age of 20.

44. Follow ethics and be Nationalistic.

Developing Leadership Skills

No one is a born leader; everyone can develop leadership skills and everyone can benefit from using them. First, take time to honestly analyze yourself. Learn to understand yourself. It's the first step to understanding others. Consider these important questions:

1. What kind of leader am I? One who helps to solve problems? A leader who helps people get along? How do others see me as a leader?
2. What are my goals, purposes, and expectations in working with this particular group? Identify areas for improvement.

Ask yourself these questions:

1. Do I try to be aware of how others think and feel?
2. Do I try to help others perform to the best of their abilities?
3. Am I willing to accept responsibility?
4. Am I willing to try new ideas and new ways of doing things?
5. Am I able to communicate with others effectively?
6. Am I a good problem solver?
7. Do I accept and appreciate other perspectives and opinions?
8. Am I aware of current issues and concerns on campus or in my community?

Then after analyzing your strengths and weaknesses -- take action

Devise a strategy for upgrading your skills. Here are a few strategies to consider:

1) Communicate effectively:

Effective communication is dialogue. Barriers are created by speaking down to people, asking closed questions that elicit yes or no answers, using excessive authority, and promoting a culture that depends on unanimity. If your focus is winning the argument or if you react defensively to criticism, you'll create fear of openness and hinder the organization's growth.

Try these steps to effective communication:

- Listen actively - ask open questions. Be genuinely interested in what other's say.

- Thank people for their openness -- stress how much you value it -- even if you don't like specifically what is being said.
- Point to areas of agreement before jumping on areas of disagreement - this reduces defensiveness; members won't fear being "attacked."
- Set aside your authority to create an atmosphere of partnership to reduce fear in group members.
- Promote a culture of constructive dissent - though not to the point of paralysis.
- Portray disagreement as simply a difference of opinion. Get rid of the "I'm right, you're wrong" attitude.

2) Encourage enthusiasm and a sense of belonging. Show:

- Friendliness: others will be more willing to share ideas if you're interested in them as people too.
- Understanding: everyone makes mistakes. Try to be constructive, tolerant and tactful when offering criticism.
- Fairness: equal treatment and equal opportunity lead to an equally good effort from all group members.
- Integrity: members will take tasks more seriously if you show that you're more interested in group goals than your own personal gain.

3) Keep everyone working toward agreed upon goals:

- Remind everyone of the group's purposes from time to time. It's easy to become too narrowly focused and lose sight of the larger goals.
- Provide encouragement and motivation, by showing your appreciation for good ideas and extra effort.
- Harmonize differences and disagreements between group members by stressing compromise and cooperation.
- Involve everyone in discussions and decisions, even if asking for opinions and ideas means a longer discussion.

4) Get to know the people around you Everyone has different abilities, wants, needs, and purpose in life.

To get along with others and get results, you need to get to know them.

- Interact with group members as often as possible. The only way to get to know someone is through direct personal contact.
- Become familiar with every member of your group. Take note of each person's unique qualities and characteristics.

5) Treat others as individuals

Put your knowledge and understanding of each group member to work!

- Be aware of expectations. Everyone expects something different: recognition, a chance to learn, a chance to work with other people, etc.
- Be creative. A repetitious routine can cause boredom. A successful leader thinks of new and better approaches to old ways of doing things.
- Provide rewards. Recognition by the group is a source of personal satisfaction and positive reinforcement for a job well done.
- Delegate responsibilities. If everyone shares the work, everyone can share pride in the group's accomplishments. Let each member know what's expected of him/her, available resources, deadlines, etc.

6) Accept responsibility for getting things done

- Take the initiative. Why stand around and wait for someone else to get things started?
Set an example.
- Offer help and information. Your unique knowledge and skills may be just what's needed.

- Seek help and information. Ask for advice if you need it. This will encourage group involvement and help accomplish group goals.
- Make things happen. By being decisive, energetic, and enthusiastic, you can and will help get things done!
- Know when and how to say “no.” If your time and resources are already committed, turn down extra tasks, but do it nicely.

7) Problem solve in a step - by-step way

Whether you are faced with a decision to make or a conflict to resolve, following a logical approach will help.

1. State the problem as simply and clearly as possible.
2. Gather all relevant information and available resources.
3. Brainstorm as many ideas or solutions as you can think of (with others if possible).
4. Evaluate each idea or solution and choose the best one.
5. Design a plan for using your idea or solution. Include a timetable, assigned roles, and resources to be used.
6. Follow up on your plan by asking if your idea worked and why or why not.

Tips for Effective Communication

Have courage to say what you think. Be confident in knowing that you can make worthwhile contributions to conversation. Take time each day to be aware of your opinions and feelings so you can adequately convey them to others. Individuals who are hesitant to speak because they do not feel their input would be worthwhile need not fear. What is important or worthwhile to one person may not be to another and may be more so to someone else.

Practice. Developing advanced communication skills begins with simple interactions. Communication skills can be practiced every day in settings that range from the social to the professional. New skills take time to refine, but each time you use your communication skills, you open yourself to opportunities and future partnerships.

Make eye contact. Whether you are speaking or listening, looking into the eyes of the person with whom you are conversing can make the interaction more successful. Eye contact conveys interest and encourages your partner to be interested in you in return.

Use gestures. These include gestures with your hands and face. Make your whole body talk. Use smaller gestures for individuals and small groups. The gestures should get larger as the group that one is addressing increases in size.

Manifest constructive attitudes and beliefs. The attitudes you bring to communication will have a huge impact on the way you compose yourself and interact with others. Choose to be honest, patient, optimistic, sincere, respectful, and accepting of others. Be sensitive to other people's feelings, and believe in others' competence.

Develop effective listening skills: Not only should one be able to speak effectively, one must listen to the other person's words and engage in communication on what the other person is speaking about. Avoid the impulse to listen only for the end of their sentence so that you can blurt out the ideas or memories your mind while the other person is speaking.

Enunciate your words. Speak clearly and don't mumble. If people are always asking you to repeat yourself, try to do a better job of articulating yourself in a better manner.

Pronounce your words correctly. People will judge your competency through your vocabulary. If you aren't sure of how to say a word, don't use it.

Use the right words. If you're not sure of the meaning of a word, don't use it. Grab a dictionary and start a daily habit of learning one new word per day. Use it sometime in your conversations during the day.

Slow your speech down. People will perceive you as nervous and unsure of yourself if you talk fast. However, be careful not to slow down to the point where people begin to finish your sentences just to help you finish.

K.L.N. COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

All India Installed Capacity (in MW) of Power Stations

This is a **list of states and territories of India** by installed capacity of power utilities with electricity generation mode break-up as on **31 March 2019** with figures in Megawatts.

INSTALLED CAPACITY (IN MW) OF POWER UTILITIES IN THE STATES/UTS LOCATED IN SOUTHERN REGION INCLUDING ALLOCATED SHARES IN JOINT & CENTRAL SECTOR UTILITIES										
(As on 31.03.2019)										
State	Ownership/ Sector	Modewise breakup								Grand Total
		Thermal					Nuclear	Hydro	RES (MNRE)	
		Coal	Lignite	Gas	Diesel	Total				
Andhra Pradesh	State	5010.00	0.00	235.40	0.00	5245.40	0.00	1673.60	56.18	6975.18
	Private	3873.88	0.00	3813.18	36.80	7723.86	0.00	0.00	7433.42	15157.28
	Central	1546.83	127.73	0.00	0.00	1674.56	127.27	0.00	250.00	2051.83
	Sub-Total	10430.71	127.73	4048.58	36.80	14643.82	127.27	1673.60	7739.60	24184.29
Telangana	State	5582.50	0.00	0.00	0.00	5582.50	0.00	2479.93	41.22	8103.65
	Private	839.45	0.00	831.82	0.00	1671.27	0.00	0.00	3936.44	5607.71
	Central	1806.85	149.27	0.00	0.00	1956.12	148.73	0.00	10.00	2114.85
	Sub-Total	8228.80	149.27	831.82	0.00	9209.89	148.73	2479.93	3987.66	15826.21
Karnataka	State	5020.00	0.00	0.00	127.92	5147.92	0.00	3586.60	193.89	8928.41
	Private	1958.50	0.00	0.00	25.20	1983.70	0.00	0.00	13635.91	15619.61
	Central	2427.80	401.40	0.00	0.00	2829.20	698.00	0.00	0.00	3527.20
	Sub-Total	9406.30	401.40	0.00	153.12	9960.82	698.00	3586.60	13829.79	28075.21
Kerala	State	0.00	0.00	0.00	159.96	159.96	0.00	1856.50	172.90	2189.36
	Private	615.00	0.00	174.00	0.00	789.00	0.00	0.00	190.21	979.21
	Central	861.42	281.80	359.58	0.00	1502.80	362.00	0.00	50.00	1914.80
	Sub-Total	1476.42	281.80	533.58	159.96	2451.76	362.00	1856.50	413.11	5083.37
Tamil Nadu	State	4320.00	0.00	524.08	0.00	4844.08	0.00	2178.20	122.70	7144.98
	Private	4587.67	250.00	503.10	211.70	5552.47	0.00	0.00	12292.28	17844.75
	Central	3025.32	1364.20	0.00	0.00	4389.52	1448.00	0.00	231.90	6069.42
	Sub-Total	11932.99	1614.20	1027.18	211.70	14786.07	1448.00	2178.20	12646.88	31059.15
NLC	State	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Central	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	100.00
	Sub-Total	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	100.00
Puducherry	State	0.00	0.00	32.50	0.00	32.50	0.00	0.00	0.00	32.50
	Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.14	3.14
	Central	140.80	107.60	0.00	0.00	248.40	86.00	0.00	0.00	334.40
	Sub-Total	140.80	107.60	32.50	0.00	280.90	86.00	0.00	3.14	370.04
Central - Unallocated		1426.00	358.00	0.00	0.00	1784.00	450.00	0.00	0.00	2234.00
Total (Southern Region)	State	19932.50	0.00	791.98	287.88	21012.36	0.00	11774.83	586.88	33374.07
	Private	11874.50	250.00	5322.10	273.70	17720.30	0.00	0.00	37491.40	55211.70
	Central	11235.02	2890.00	359.58	0.00	14484.60	3320.00	0.00	541.90	18346.50
	Grand Total	43042.02	3140.00	6473.66	561.58	53217.26	3320.00	11774.83	38620.18	106932.27

*Renewable Energy Sources (RES) includes small hydro projects, wind, solar, tidal, biomass and urban & industrial waste power.

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT AND ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

ADVANCED TRAINING INSTITUTE

(AN ISO 29990 : CERTIFIED)

Guindy, CHENNAI, Tamilnadu

Phone : 044-22501211/0252 Fax : 044-22501460, Email : atichn@vsnl.com, atichn@yahoo.com, Url : www.atichennai.org.in

ATI Chennai : Regular Course Training Schedule
Advanced Vocational Training Scheme (AVTS) - Short Term Programme
Annual Training calendar 2019-2020
(Short Term Skill Training Programme)

		GOVERNMENT OF INDIA ,MINISTRY OF SKILL DEVELOPMENT ENTREPRENEURSHIP			
		NATIONAL SKILL TRAINING INSTITUTE(NSTI/ATI) ,CHENNAI-32			
		TRAINING CALENDER FOR 2019-2020			
		ELECTRICAL CONTROL MAINTENANCE			
Sl.No	Course Code	Name of the Course	Duration	From	To
1	10101	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	01.04.2019	05.04.2019
2	10103	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	10.06.2019	14.06.2019
3	10104	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	15.07.2019	19.07.2019
4	10105	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	19.08.2019	23.08.2019
5	10106	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	23.09.2019	27.09.2019
6	10107	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	21.10.2019	25.10.2019
7	10108	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	11.11.2019	15.11.2019
8	10109	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	09.12.2019	13.12.2019
9	10110	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	30.12.2019	03.01.2020
10	10111	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	03.02.2020	07.02.2020
11	10112	PROTECTIVE RELAYS, CIRCUIT BREAKERS & SWITCHGEAR PROTECTION	1	09.03.2020	13.03.2020
12	10201	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	08.04.2019	12.04.2019
13	10203	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	17.06.2019	21.06.2019
14	10204	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	22.07.2019	26.07.2019
15	10205	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	26.08.2019	30.08.2019
16	10206	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	28.10.2019	01.11.2019
17	10207	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	02.12.2019	06.12.2019
18	10208	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	06.01.2020	10.01.2020
19	10209	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	10.02.2020	14.02.2020
20	10210	OPERATION & MAINTENANCE OF POWER TRANSFORMER	1	16.03.2020	20.03.2020
21	10301	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	22.04.2019	26.04.2019
22	10303	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	24.06.2019	28.06.2019
23	10304	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	29.07.2019	02.08.2019
24	10305	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	09.09.2019	13.09.2019
25	10306	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	30.09.2019	04.10.2019
26	10307	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	04.11.2019	08.11.2019
27	10308	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	25.11.2019	29.11.2019
28	10309	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	13.01.2020	17.01.2020

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ATI Chennai : Regular Course Training Schedule
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29	10310	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	17.02.2020	21.02.2020
30	10311	OPERATION & CONTROL OF INDUSTRIAL AC/DC MOTORS AND ITS DRIVES	1	23.03.2020	27.03.2020
31	10401	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	29.04.2019	03.05.2019
32	10402	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	27.05.2019	31.05.2019
33	10403	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	01.07.2019	05.07.2019
34	10404	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	05.08.2019	09.08.2019
35	10405	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	16.09.2019	20.09.2019
36	10406	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	14.10.2019	18.10.2019
37	10407	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	16.12.2019	20.12.2019
38	10408	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	20.01.2020	24.01.2020
39	10409	IMPORTANCE & APPLICATION OF ELECTRICAL SAFETY AT WORKPLACE & FIRST AID	1	24.02.2020	28.02.2020
ELECTRONIC CONTROL MAINTENANCE					
40	20101	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	01.04.2019	05.04.2019
41	20102	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	10.06.2019	14.06.2019
42	20103	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	15.07.2019	19.07.2019
43	20104	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	14.10.2019	18.10.2019
44	20105	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	04.11.2019	08.11.2019
45	20106	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	30.12.2019	03.01.2020
46	20107	SIEMENS S7-400 PLC PROGRAMMING (TIA PORTAL) LEVEL- 1	1	03.02.2020	07.02.2020
47	20201	8051 PROGRAMMING AND APPLICATIONS	1	08.04.2019	12.04.2019
48	20202	8051 PROGRAMMING AND APPLICATIONS	1	06.05.2019	10.05.2019
49	20203	8051 PROGRAMMING AND APPLICATIONS	1	17.06.2019	21.06.2019
50	20204	8051 PROGRAMMING AND APPLICATIONS	1	01.07.2019	05.07.2019
51	20205	8051 PROGRAMMING AND APPLICATIONS	1	05.08.2019	09.08.2019
52	20206	8051 PROGRAMMING AND APPLICATIONS	1	28.10.2019	01.11.2019
53	20207	8051 PROGRAMMING AND APPLICATIONS	1	18.11.2019	22.11.2019
54	20208	8051 PROGRAMMING AND APPLICATIONS	1	17.02.2020	21.02.2020
55	20301	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	22.04.2019	26.04.2019
56	20302	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	24.06.2019	28.06.2019
57	20303	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	29.07.2019	02.08.2019
58	20304	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	20.01.2020	24.01.2020
59	20305	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	24.02.2020	28.02.2020
60	20306	DIGITAL ELECTRONICS & THEIR APPLICATIONS	1	23.03.2020	27.03.2020
61	20401	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	29.04.2019	03.05.2019
62	20402	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	13.05.2019	17.05.2019
63	20403	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	08.07.2019	12.07.2019
64	20404	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	16.09.2019	20.09.2019
65	20405	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	09.12.2019	13.12.2019
66	20406	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	27.01.2020	31.01.2020
67	20407	PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS	1	02.03.2020	06.03.2020
68	20501	COMPUTER HARDWARE MAINTENANCE AND NETWORKING	1	20.05.2019	24.05.2019
69	20502	COMPUTER HARDWARE MAINTENANCE AND NETWORKING	1	22.07.2019	26.07.2019
70	20503	COMPUTER HARDWARE MAINTENANCE AND NETWORKING	1	21.10.2019	25.10.2019
71	20504	COMPUTER HARDWARE MAINTENANCE AND NETWORKING	1	06.01.2020	10.01.2020
72	20505	COMPUTER HARDWARE MAINTENANCE AND NETWORKING	1	10.02.2020	14.02.2020
73	20601	BASICS OF COMPUTER & MS OFFICE	1	27.05.2019	31.05.2019
74	20602	BASICS OF COMPUTER & MS OFFICE	1	26.08.2019	30.08.2019
75	20603	BASICS OF COMPUTER & MS OFFICE	1	25.11.2019	29.11.2019
76	20604	BASICS OF COMPUTER & MS OFFICE	1	16.12.2019	20.12.2019
77	20605	BASICS OF COMPUTER & MS OFFICE	1	16.03.2020	20.03.2020
78	20701	PCB DESIGNING AND REWORKING	1	03.06.2019	07.06.2019
79	20702	PCB DESIGNING AND REWORKING	1	23.09.2019	27.09.2019
80	20703	PCB DESIGNING AND REWORKING	1	02.12.2019	06.12.2019
81	20704	PCB DESIGNING AND REWORKING	1	09.03.2020	13.03.2020

List of PSUs through GATE Exam

Name of PSU	Eligible Branches	Name of PSU	Eligible Branches	Name of PSU	Eligible Branches
 ONGC Ltd.	XE, GG	 MDL	ME, EE	 NLC	ME, EE, EC, IN, MN, CE
 NHPC Limited	EE	 PSPCL Ltd	ME, EE, EC, IN, CE, CS	 NALCO	ME, EE, EC, IN, MT, CE, MN, CS, CH
 BPCL Limited	ME, EE, CH, IN, CE	 OPGC Ltd	ME, EE, CE, C & I	 RITES	CE, ME
 CEL	EC, ME, EE, XE	 IRCON International Ltd	EC, EE, IN	 NPCCL	CE
 Coal India Ltd.	ME, EE, MN, GG	 BNPM	ME, EE, EC, CH	 MECL	ME, CY, GG
 POWERGRID	EE, CE, CS	 AAI	EC, EE	 NBCC Ltd.	CE
 Indian Oil	CH, CE, CS, EE, EC, GG, IN, ME, MT, MN	 BBNL	EC, EE, CS	PAPCL	EE, EC, ME, IN, CS
 THDC India Ltd	ME, EE, CE	 NFL	EE, CS, CH, IN, XE		
 HPCL	ME, EE, CE, IN, CH, EC	 GSECL	EE, ME, MT, C & I		
 NTPC Limited	ME, EC, EE, IN	 GAIL	ME, EE, IN, CH		

Lists of TOP 10 software companies to offer jobs in India

S. No.	Name of the Company	About the company	Head quarters	Revenue	No. of Employees	Website
1.	Tata Consultancy Services	TCS was established in 1968 and is spread across 47 countries.	Mumbai, India	US\$ 13.44 billion	300,464	www.tcs.com
2.	Cognizant Technology Solutions	CTS was founded in year 1994 by Srilankan American Kumar Mahadeva.	Teaneck, New Jersey, United States	US\$ 8.84 billion	178,000	www.cognizant.com
3.	Infosys	Infosys was founded in year 1981.	Bangalore, Karnataka	US\$ 8.4 billion	160,405	www.infosys.com
4.	Wipro	Azim Premji is the Chairman & TK Kurien is the CEO of Wipro.	Mumbai, India	US\$7.3 billion	146,053	www.wipro.com
5.	Tech Mahindra	Tech Mahindra was founded in year 1986	Mumbai	\$4.09 billion	89,500	www.techmahindra.com
6.	HCL Technologies	HCL was founded by Shiv Nadar in year 1991.	Noida, Uttar Pradesh	US\$335 million	90,190	www.hcltech.com
7.	iGate	iGate was earlier known as Patni Computer Systems and was founded by Narendra Patni and his wife.	Bridgewater, New Jersey, U.S	US\$ 1.15 billion	31,000 +	www.igate.com
8.	Mphasis	MPhasis was founded by Jaithirth Rao in year 2000	Bangalore, India	US\$1.0 billion	45,426 +	www.mphasis.com
9.	Larsen &Toubro Infotech	L & T Infotech was founded in year 1997	Mumbai	US\$ 650 million	16,000+	www.lntinfotech.com
10.	Oracle Financial Services Software Limited	Oracle Financial Services Software Limited was earlier know as i-Flex Solutions Limited. It is spread across 130 countries around the globe and provides the IT solutions to the financial companies.	Mumbai, India	US\$610 million	9,682	www.oracle.com

Lists of TOP 10 core companies to offer Electrical jobs

1 | Bharat Heavy Electricals Ltd.

Corporate office – New Delhi, India | **Establishment** – 1964 |

Business – Electrical equipments | **Website** – www.bhel.com

Bharat Heavy Electricals Ltd established in the year 1964 is a leading power plant equipment manufacturer and has expertise in engineering, manufacture, construction, testing, designing and servicing of various products of the core sectors such as defense, power, industries etc. BHEL is among the top electrical companies in India and which has total 16 manufacturing divisions and four regional offices. It is currently operating more than 150 project sites across India and abroad.

2 | Alstom

Corporate office – Levallois-Perret, France | **Establishment** – 1928 |

Business – Power generation and transmission | **Website** – www.alstom.com |

Alstom a multinational corporation is one of the best electrical companies in India and world, operating in hydroelectric power transportation and generation and it is active in many core industry sector. Company has a workforce of 9000+ employees in India and over 85000+ worldwide.

3 | ABB

Corporate office – Zürich, Switzerland | **Establishment** – 1988 |

Business – Electrical equipments | **Website** – www.abb.com

ABB holds interests in robotics and mainly in the automation and power areas. ABB is active in the field of electricity grids manufacturing and other technologies in the field of automation and power. ABB is one of the few giant electrical player at global level and among the largest engineering company in the world.

4 | Siemens

Corporate office – Erlangen, Germany | **Establishment** – 1847 |

Business – Renewable energy, Power generation & transmission | **Website** – www.energy.siemens.com |

Siemens a German conglomerate is rated one the finest electrical company in India. Company's product line includes generators, steam turbines, compressors, high-voltage switching products and many more. Siemens employees more than 86000 people worldwide and it is a leading supplier of energy related products worldwide.

5 | Crompton Greaves

Corporate office – Mumbai, Maharashtra | **Establishment** – 1878 |

Business – Electrical | **Website** – www.cgglobal.com

Crompton Greaves is a part of Avantha Group which is headquartered in Mumbai. CGL deals in manufacturing, marketing and designing of power transmission and generation related products. CGL has manufacturing units in Canada, France, Hungary, UK, US, Indonesia, Ireland, India and Belgium.

6 | Bajaj Electricals Ltd.

Corporate office – Mumbai, Maharashtra | **Establishment** – 1938 |

Business – Electrical Appliances | **Website** – www.bajajelectricals.com |

Bajaj Electricals is a leader in the field of electrical equipment and headquartered in Mumbai. It is one of the top 5 electrical companies in India having 19 branch offices across India. Bajaj Electricals provides complete range of consumer durable such as fan, electrical appliances, lighting which includes tubes, lamps etc.

7 | Eason Reyrolle

Corporate office – Bangalore, Karnataka | **Establishment** – 1986 |

Business – Electric Equipments & Industrial Consumables | **Website** – www.easunreyrolle.com |

Established in 1980 Eason Reyrolle is a Power Management Products, Transmission, Distribution & Industrial Application, Systems, Solutions and Services provider having significant presence in global market as reputed electrical products manufacturer.

8 | Schneider Electrical

Corporate office – Rueil Malmaison, France | **Establishment** – 1981 |

Business – Electric Equipment | **Website** – www.schneider-electric.co.in |

Schneider Electric a French company established in the year 2000 is among the top electrical companies in India which is involved in energy management. Company has a workforce of more than 17000 employees and has 31 global manufacturing Plants.

9 | Wipro Lighting

Corporate office – Pune, Maharashtra | **Establishment** – |

Business – Lamps, Luminaires and Accessories | **Website** – www.wiprolighting.com |

Wipro lightings a part of Wipro group and a leading electrical company in India producing Lamps, luminaries and accessories. Company's product portfolio comprises of high end lighting control and architectural dimming system, high intensity discharge lamp Luminaries, brightness management lighting products etc.

10 | Kelvin Electrical

Corporate office – Al-Ain, U.A.E | **Establishment** – 2005 |

Business – | **Website** – www.kelvin-electrical.com

Kelvin Electrical LLC founded in 2005 is based in United Arab Emirates (UAE). Kelvin Electrical deals in Cable Management Systems, Interior, Architectural, Exterior and Special lighting, Cable Support Systems, Raised Floor, Wiring Accessories etc.

K.L.N. COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL & ELECTRONICS
ENGINEERING

Lists of core companies to offer Electrical jobs in India

Types of Electrical Core Companies

1. [Electrical motors and Generators](#)
2. [Consultancy \(Electrical Engineering\)](#)
3. [Electrical appliances](#)
4. [Electrical components companies](#)
5. [Lighting & luminaries](#)
6. [Power Generation](#)
7. [Electric wires & Cables](#)
8. [Electrical exporters](#)
9. [Measurements & Instrumentation](#)
10. [Power Distribution](#)
11. [Transformers](#)
12. [Green Energy Companies in India](#)
13. [Internationally renowned MNC'S](#)
14. [Top 20 core companies in India to offer electrical jobs](#)
15. [Exclusive Government jobs for Electrical Engineers](#)

Electrical motors and Generators

1. Ajay Engineers <http://www.ajayengineers.com>
2. All India Electric Motor Manufacturers' Association <http://www.aiemma.com/>
3. Aqua Brand Submersible Sewage Pump <http://www.aquapumps.com>
4. Compact <http://www.compactlighting.net>
5. Crown Electric Company <http://www.crown-gear.com>
6. Lawkim <http://lawkimindia.com/>
7. MMC Electric Company <http://www.dynafluxindia.com>
8. MS Enterprises and Trimega Power Corporation <http://www.msein.com>
9. National Electrical Industries - Ahmedabad. <http://www.elmomachines.com/>
10. Numeric Power Systems <http://www.numericups.com>
11. Pranshu Electricals <http://www.pranshuelec.com/>
12. Reva Industries <http://www.reva.com/>
13. Rotomag Motors & Controls Pvt. Ltd. <http://www.rotomag.com>
14. Rudrashakti Electronics <http://www.rudrashakti.com>
15. Sanjay Diesels - Diesel Generating Sets. <http://www.dgsets.com/>
16. Venus Industrial Corporation <http://www.venusind.com/>
17. A-One Industries. <http://www.aoneindustries.com/contactus.html>

Consultancy (Electrical Engineering)

1. APJ Projects <http://www.apjprojects.com>
2. Consolidated Consultants and Engineers Pvt. Ltd <http://www.consolidatedconsultants.com>
3. DSON Enterprises <http://www.dsonenterprises.com>
4. Eltech Engineers <http://www.eltechindia.com/>
5. John Mech-El Technologies (P) Ltd <http://www.johnmech-el.com/>
6. Mandvi Electric Works <http://www.bicserve.com/>
7. Miraj Instrumentation Services <http://www.mirajinstrumentation.com>
8. PG Associates <http://www.engineeringconsultant.in>
9. Power Gem Engineers - Consultants in Power Generation. <http://www.powergem.com/>
10. Secon Engineers <http://www.seconindia.com>
11. Shanti Enterprises Electricals Limited <http://www.shantielectricals.com>
12. Shashi Electricals <http://www.shashielectricals.com>
13. SK Systems <http://www.sksystem.com>
14. Tata Consulting Engineers <http://www.tce.co.in>
15. Nutronics India <http://www.nutronicsindia.com/>

Electrical appliances

1. Ajay Industrial Corporation <http://www.ajayindustrial.com/>
2. Ankit Electricals <http://www.ankitelectricals.com>
3. A.P.C. System & Products Pvt. Ltd <http://www.apcsp.com>
4. Arka Trading & Services <http://www.mfdplaza.in>
5. Bajaj Electricals Ltd - Part of Bajaj Group. <http://www.bajajelectricals.com/>
6. Electroil <http://www.electroil.com/>
7. Eveready Industries India Ltd <http://www.evereadyindustries.com/>
8. Graftec india <http://graftec.trade-india.com>
9. Indexelectronics <http://www.indexelectronics.com>
10. Khaitan Group <http://www.khaitan.com/>
11. Lloyd Electric & Engineering Limited <http://www.lloydengg.com/>
12. Modern Electrical Stores <http://www.modernelectricalsindia.com/>
13. Needo electronics and electricals pvt. Ltd. <http://www.needoindia.com>
14. Picasso home products <http://www.picassoappliances.com/>
15. Polar Industries Ltd <http://www.polarinc.com/>
16. Rajshree India Ltd. <http://www.rajshreefans.com>
17. Shilpa Electricals <http://www.shilpaelectricals.com/>
18. Super Impex <http://www.superimpex.com>
19. Tri Star Engineering Industries <http://www.tristarengg.com>
20. Vijay Electricals <http://www.vijayelectricalspune.com/>
21. Vxl Technologies Ltd. <http://www.vxl.design.com>
22. XtremeWorx <http://www.xtremeworx.net>

Electrical components companies

1. Ace Bimetalliks India Pvt. Ltd. <http://www.aceelectricals.com>
2. Aditron India Pvt. Ltd. (Engineering Division) <http://www.aiplen.com>
3. Admir Ovens <http://www.admir.com>
4. Arvind Anticor Ltd <http://www.picklingplant.com>
5. Asiatic Electronic Industries. <http://www.asiatic-india.com/>
6. Axis Electrical Components India Pvt. Ltd. <http://www.axis-india.com>
7. Balar Marketing Pvt. Ltd <http://www.allelectricalproducts.com/>

8. Bhartia Industries Limited <http://www.bchindia.com>
9. Brass Copper & Alloy (I) Ltd. <http://www.hexworldwide.com>
10. Brightech Valves and Controls Pvt. Ltd. <http://www.brightechvalves.com>
11. Caltech Engineering Services <http://www.caltechindia.com>
12. Color Design India <http://www.colordesigntech.com/>
13. Consult Techniques (I) Pvt. Ltd <http://www.consulttechnique.com/>
14. Deki Electronics Ltd. <http://www.dekielectronics.com>
15. Elpro International Limited <http://www.elproindia.com/>
16. Elymer <http://www.elymer.com>
17. E S Electronics (India) Pvt. Ltd <http://www.energysaversindia.com/>
18. Finetech Engineering Corporation <http://www.finetechindia.com>
19. Gayatri Control, Ahmedabad <http://www.gayatricontrol.com/>
20. Gemscab Industries Ltd <http://www.gemscab.com/>
21. Hallmark Electronics <http://www.hallmarkelect.com/>
22. India International House Ltd <http://www.builderhardware.com/>
23. Jaykrishna magnetics pvt.ltd <http://www.jkmagnetics.com>
24. Leotech Group <http://www.leotechindia.com/>
25. Maxx Mobile Phone Accessories Pvt. Ltd <http://www.maxmobile.co.in>
26. Mehta Engineering Enterprise <http://www.mehtaswitch.com>
27. Mehta Tubes Ltd <http://www.mehta-group.com/>
28. Mellcon Engineers <http://www.mellcon.com>
29. Micromot Controls <http://www.micromotcontrols.com>
30. Muskaan Engineers <http://www.electricitysaver.com/>
31. Neelam Import Pvt. Ltd. <http://www.cellking.org>
32. Onload Gears <http://www.onloadgears.com/>
33. Orton Engineering Pvt. Ltd, Thane <http://www.ortonengineering.com/>
34. Persang Alloy Industries <http://www.webmasterindia.com/persangalloy>
35. PMT Engineers <http://www.pmtengineers.com>
36. Powercap Systems (Madras) Pvt. Ltd <http://www.transformersindia.com/>
37. Powertek Equipment Company <http://www.powertekindia.com/>
38. Pragati Electrocom Pvt. Ltd <http://www.pragatielectrocom.com/>
39. Pran Electronics Pvt. Ltd. <http://www.pranelectronics.com>
40. Precicraft Components India Pvt. Ltd <http://www.precicraft.com/>
41. Prima Automation India Pvt. Ltd <http://www.prima-automation.com/>
42. Rittal India Pvt Ltd <http://www.rittal-india.com>
43. Sanghi Yantra Udyog <http://www.skyuindia.com/>
44. SKN - Bentex Group of Companies. <http://www.sknbentex.com/>
45. South India Industrial Suppliers http://siis-india.com/bus_bar_support.html
46. Square Automation Pvt. Ltd <http://www.squareautomation.com/>
47. Sudhir Switchgears <http://www.sudhirschwitchgears.com>
48. Syntron Controls <http://www.syntron-controls.com>
49. Torque Master Tools Pvt. Ltd <http://www.torquemasterindia.com/>
50. United Core <http://www.unitedcores.com/>
51. Utiliti Controls <http://www.utiliticontrols.com/>
52. valrack modular systems pvt.ltd <http://www.valrack.com>
53. Wavetronics <http://www.wavetronicsindia.com>

54. Rane Holdings Limited <http://www.rane.co.in>

Lighting & luminaries

1. A.K. Electricals <http://www.akelectricals.com/>
2. APCO India http://www.indiabizclub.net/Electrical/APCO_INDIA.html
3. Aquascape engineers <http://www.fountainsnozzles.com>
4. Arihant Enterprises : <http://www.arihantsecurityindia.com/>
5. Atlas Electricals www.indiabizclub.net/Electrical/ATLAS_ELECTRICALS.html
6. Baliga Lighting <http://www.baliga.com/>
7. Crompton Greaves Limited. <http://www.cglonline.com/>
8. Decon Lighting <http://deconlighting.com>
9. GE Lighting India <http://www.gelighting.com/india/index.html>
10. Jain Industrial Lighting Corporation <http://www.indiamart.com/jilco/>
11. Jayanta Lamp Industries Pvt.Ltd : <http://www.jayantagroup.com>
12. Kuber Lighting Pvt Ltd <http://www.kuber.biz>
13. Litray Lighting : <http://www.litraylighting.com/>
14. Mindscreen Pvt. Ltd. <http://www.mindscreenfilms.com/>
15. Peralites <http://www.indiabizclub.net/Electrical/PEARLITES.html>
16. Sam International <http://www.indiamart.com/>
17. Shyam Electricals - <http://www.shyamelectricals.com/>
18. Hpl Electric & Power Pvt.Ltd <http://www.hplindia.com>

Power Generation

1. Advance Engineering Company - <http://www.advanceengineering.com/>
2. APGENCO <http://www.apgenco.com/>
3. Birla Power Solutions Limited <http://www.birlapower.com>
4. Dyna Hitech Power Systems Ltd <http://www.dynahitech.com>
5. Essar Group <http://www.essar.com/Group/group.asp>
6. Essar Power Ltd. <http://www.essar.com/>
7. Jindal Steel & Power Ltd. <http://www.jindalsteelpower.com>
8. Kaiga Atomic Power Station <http://www.npcil.org/docs/kaigaps.htm>
9. Kakrapar Atomic Power Station <http://www.npcil.org/docs/kaps.htm>
10. Kirloskar Electric Co <http://www.kirloskar-electric.com/>
11. Lanco Industries <http://www.lancogroup.com/groups/kpower/kpower.html>
12. Madras Atomic Power Station (MAPS) <http://www.npcil.org/>
13. Magnum Power Generation Ltd <http://www.magnumgrouponline.com/power/>
14. Narora Atomic Power Station <http://www.npcil.org/docs/naps.htm>
15. National Thermal Power Corporation (NTPC) <http://www.ntpc.co.in>
16. NEPC India Ltd <http://www.nepcindia.com>
17. PTC India <http://www.ptcindia.com>
18. Rajasthan Atomic Power Station (RAPS) <http://www.npcilraps.com/>
19. Rajasthan Renewable Energy Corporation Limited (RRECL) <http://www.rrecl.com/>
20. Reliance Energy <http://www.rel.co.in>
21. Tarapur Atomic Power Station <http://www.npcil.org/docs/taps.htm>
22. Tata Electric Companies <http://www.tata.com>
23. Tata Power <http://www.tatapower.com/>
24. Techno Instrument India Pvt.Ltd web site url: <http://www.tiiindia.com/>
25. Torrent Power web site url: <http://www.torrentpower.com/>

26. Uttar Pradesh Power Corporation Ltd <http://www.uppcl.org/>
27. ABB Ltd www.abb.co.in/
28. Adani Power Ltd www.adanipower.com/
29. Aplab Ltd www.aplab.com/
30. BF Utilities Ltd www.bfutilities.com/
31. CESC Ltd. www.cescltd.com/
32. CMI Ltd. www.cmilimited.com.au/
33. DLF Power Limited www.eipowertech.com/dlf_power_limited.htm
34. DPSC Ltd www.dpscl.com/
35. Energy Development Company Ltd www.energy.com.ph/
36. Entegra Ltd www.entegra.co.in/
37. GMR Infrastructure Ltd www.gmrgroup.in/
38. Gujarat Industries Power Company Ltd www.gipcl.com/
39. GVK Power & Infrastructure Ltd www.gvk.com/
40. HBL Power Systems Ltd www.hbl.in/
41. Indowind Energy Ltd www.indowind.com/
42. Indo power projects Ltd www.indopowerprojects.in/
43. Jaiprakash Power Ventures Ltd www.jppowerventures.com/
44. Kalpataru Power Transmission Ltd www.kalpatarupower.com/
45. KSK Energy Ventures Ltd www.ksk.co.in/
46. National Wind & Power Corpn. Ltd www.nationalwind.com/
47. Neyveli Lignite Corpn. Ltd www.nlcindia.com/
48. NHPC Ltd. www.nhpcindia.com/
49. NTPC Limited www.ntpc.co.in/
50. Power Grid Corpn. Of India Ltd www.powergridindia.com/
51. PTC India Ltd www.ptcindia.com/
52. Reliance Power Ltd www.reliancepower.co.in/
53. Savant Infocomm Ltd www.savant-infocomm.com/
54. Sun Source (India) Ltd www.sunsource.in/about_us.htm
55. Suryachakra Power Corpn. Ltd www.suryachakra.in/
56. Suzlon Energy Limited www.suzlon.com/

Electric wires & Cables

1. Aksh Optifibre Limited <http://www.akshoptifibre.com/>
2. Anant Distributors Private Ltd. <http://www.proflexcable.com/>
3. Brimson Cables Private Ltd <http://www.brimsoncable.com/>
4. Capital Cables India Limited - <http://www.indiantrade.com/cci/>
5. Colt Cables Private Limited <http://www.coltcables.com/>
6. Cords Cable Industries Ltd <http://www.cordscable.com/>
7. Delton Cables Limited - <http://www.deltoncables.com/>
8. Fort Gloster Industries Limited <http://www.glostercables.com/>
9. Kaydour Cables India <http://www.kaydourcables.com>
10. KEI Industries Limited <http://www.kei-ind.com/>
11. Lapp India <http://www.lappindia.com/>
12. National Cable Industries <http://www.nationalcables.com/>
13. Navinbhai Cables Private Ltd <http://www.ncplindia.com/>
14. Neolex Cables <http://www.neolexcable.com/>

15. North Eastern Cables Private Ltd <http://www.khetangroup.com/>
16. Novoflex Marketing Private Limited. <http://www.novoflexgroup.com/>
17. Polycab Wires Private Limited <http://www.polycab.com/>
18. Q-Flex Cables Limited <http://www.qflexcable.com/>
19. Ravin Cables limited - Primecab brand of cables. <http://www.primecab.com/>
20. Relemac India <http://www.relemacindia.com>
21. RollRing Industries - Calicut, Kerala. <http://www.rollring.com/>
22. Samdaria Electricals <http://www.samdariaelectricals.co.in/>
23. Satish Enterprises <http://www.satishenterprise.com/>
24. Shree Nakoda Cables Private Limited. <http://www.nakodacables.com/>
25. Skytone Electricals (India) <http://www.skytonecables.com/>
26. Surbhi Cables Industries Private Limited. <http://www.indiamart.com/surbhi/>
27. Surbhi Telelink Pvt. Ltd <http://www.surbhiindia.com/>
28. Torrent Cables Ltd <http://www.torrentcables.com/>
29. Universal Cables <http://www.universalcablesLtd.com>
30. Usha Martin <http://www.ushamartin.com>
31. Weather Crafts Ltd <http://www.weathercraft.com/>
32. Finolex Cables Limited <http://www.finolex.com>

Electrical exporters

1. Arbariya steels <http://www.arbariya.com/>
2. Bajaj International Pvt. Ltd. <http://www.bajajinternational.com/>
3. Biax <http://www.biaxmetals.com/>
4. Brightech Valves and Controls Pvt Ltd <http://www.brightechvalves.com>
5. Dynamic Scaffolding & Equipment Co <http://www.dynamicscaffolding.com/>
6. Excel Metal And Engg. Industries <http://www.excelmetal.net>
7. Impex Trading Company <http://www.impextradingco.com>
8. Miltop Trading Company <http://www.miltop.com/>
9. Om(India)Exports <http://omindiaexpo.com>
10. Oriental Export Corporation <http://www.indialinks.com/oriental/>
11. Sevana Electrical Group <http://www.sevana.com/>
12. Veejay Lakshmi Engineering Works Limited <http://www.veejaylakshmi.com>
13. Vishal Electromag Industries <http://www.vishalmotor.com>
14. Vaibhav Electricals <http://www.vaibhavelectricals.com>
15. Industrial Forging Industries <http://www.ifi-india.net/>
16. Imperial Brass Component <http://electronics-electrical.exportersindia.com>
17. M/s Horizon Exports <http://www.horizonexport.net>
18. Golden Crest Marketing Network Pvt. Ltd. <http://www.aceenergy.co.in/>
19. Shree Krishna Enterprises <http://www.shreekrishnaenterprises.co.in/>
20. Sahiba International Trading Company <http://www.sahibainternational.com>
21. Pushpak Metals web site url: <http://www.pushpakmetals.com/>
22. IEEMA <http://www.ieema.org>
23. ELSTER METERING (P) LTD <http://www.elstermetering.com/>
24. Shivam Electronics <http://www.shivamelectronics.com>
25. SUBRTO <http://www.subrtoburnishing.com/>
26. Unitek Engineers <http://www.unitekengineers.com>
27. Euro Technologies <http://www.eurotapes.in/>

Measurements & Instrumentation

1. Active Control Pvt Ltd <http://www.indiamart.com/activecontrols/>
2. Autometers Alliance Limited. <http://www.autometers.com/>
3. EIP Bulk Control Pvt Ltd <http://www.eipbulkcontrols.com/>
4. IMP Power Limited <http://www.imp-power.com/>
5. Instruments International <http://www.indorecity.com/ii/index.html>
6. Kanji Precision Works <http://www.kanjimeters.com>
7. Mittal Enterprises <http://www.indiamart.com/mittalenterprises/>
8. Modsonic <http://www.modsonic.com/>
9. Nippon Instruments <http://www.nipponinstruments.com/>
10. Poonawala Electro Weigh <http://www.peweigh.com>
11. Prok Devices <http://www.prokdvs.com>
12. Shanti Instruments <http://www.shanti-instruments.com>
13. Texlab Industries <http://www.texlabindia.com>
14. Vasavi Electronics <http://www.vasavi.com>
15. VPL Infotech <http://vplinf.com>

Power Distribution

1. Areva T&D India <http://www.areva-td.co.in/>
2. BSES Yamuna Power Ltd and BSES Rajdhani Power Ltd. <http://www.bsedelhi.com/>
3. Central Power Distribution Company of Andhra Pradesh Limited <http://www.apcentralpower.com/>
4. CESC Limited <http://www.cescltd.com>
5. Eastern Power Distribution Company of Andhra Pradesh Limited <http://www.apearternpower.com/>
6. Elpro International Limited <http://www.elproindia.com/>
7. Gujarat Electricity Board <http://www.gseb.com>
8. Haryana Power Utilities <http://www.haryanaelectricity.com/>
9. Hubli Electricity Supply Company Limited (HESCOM) <http://www.hescom.org/>
10. Maharashtra State Electricity Distribution Company Limited <http://www.mahadiscom.in>
11. Natinal Hydroelectric Power Corporation of India <http://www.nhpcindia.com>
12. Noida Power Company Ltd <http://www.noidapower.com>
13. North Delhi Power Limited <http://www.ndplonline.com/>
14. Power Grid Corporation Of India <http://www.powergridindia.com>
15. Southern Power Distribution of Andhra Pradesh <http://www.apspdcl.in>
16. Transmission Corporation of Andhra Pradesh (AP TRANSO) <http://www.aptranscorp.com/>

Transformers

1. Emco Limited <http://www.emcoindia.com>
2. Golecha Electro Stampings. <http://www.golecha.com/>
3. Intaf India <http://www.intafindia.com/>
4. Kappa Electricals Private Ltd <http://www.kappaelectricals.com/>
5. Kotsons Transformers <http://www.kotsons.com/>
6. Mahindra Electrical Works <http://www.mewindia.com>
7. Marson's Electricals <http://www.marsonselectricals.com/>
8. P.M. Electronics Limited. <http://www.indiamart.com/pme/>
9. Prismatic India <http://www.wind-it.com/>

10. Raksan Transformers Private Ltd <http://www.raksantransformers.com/>
11. Roland Electronics and devices Private Ltd. <http://www.redpl.com/>
12. Sai Electricals <http://www.saielectricals.com/>
13. Tesla Transformers Limited <http://www.teslatransformers.com/>
14. Transformers and Electricals Kerala Limited. <http://www.telk.com/>
15. Transformers and Rectifiers (India) Ltd. <http://www.jmtril.com>
16. T.S. International <http://www.transformers-reactors.com>

Green Energy Companies in India

1. **Suzlon Energy:** Suzlon is of course the first company that comes to mind. They are one of the leading wind energy companies in India are one of the better known alternative energy companies in India. Here are some details from their website.

Conceived in 1995 with just 20 people, Suzlon is now a leading wind power company with:

- Over 16,000 people in 25 countries
- Operations across the Americas, Asia, Australia and Europe
- Fully integrated supply chain with manufacturing facilities in three continents
- Sophisticated R&D capabilities in Belgium, Denmark, Germany, India and The Netherlands
- Market leader in Asia, Suzlon Market Share (Combined with REpower) rose to 9.8% thereby making Suzlon 3rd * largest wind turbine manufacturing company in the world.

2. **Orient Green Power Limited:** Primarily engaged in the Wind and Biomass energy space. Currently wind constitutes the majority of their energy portfolio, so this is another one of India's wind energy companies. As of March 31, 2010, their total portfolio of operating projects included

193.1 MW of aggregate installed capacity, which comprised 152.6 MW of wind energy projects and 40.5 MW of biomass projects. Their portfolio of committed and development projects included approximately 815.5 MW of prospective capacity, which comprised an estimated 622.0 MW of wind energy projects, 178.5 MW of biomass projects and a 15.0 MW small hydroelectric project

3. **Indowind Energy Limited:** Indowind Energy Limited is also a wind energy company that develops wind farms for sale, manages the wind assets, and generates green power for sale to utilities and corporates. Turnkey implementation of Wind Power Projects, from concept to commissioning. Wind Asset Management Solution for installed assets, including operations, billing, collection of revenue to project customers. Supply of Green Power to Customers. CERs (Carbon Credit) Sales and Trading.

4. **Suryachakra Power Corporation Limited:** SPCL is the flagship company of Suryachakra Group with interests in Power generation – renewable energy (biomass, Solar, hydro, Wind) and Clean Technology / Ultra Super Critical Thermal Power Plants (coal, Gas), Engineering Consultancy and Urban infrastructure development activities. Suryachakra Power Corporation Limited has established 3 wholly owned subsidiaries for setting up of renewable energy (biomass) power projects and also acquired stake in Sri Panchajanya Power Private limited, which was setting up a 10 MW Biomass Power Plant at Hingoli, Maharashtra.
5. **NEPC India:** This is a Public Limited Company promoted by the Khemka Group with the primary objective of promoting wind energy. This successful Group has a multi crore turnover from diversified activities in the field of Power Generation from Wind Energy and manufacture and marketing of Wind Turbine Generator (a renewable energy device).
6. **Azure Power:** Azure Power is the green energy space as it is one of the solar energy companies in India. It is a solar power company, and they are supplying power to 20,000 people in 32 villages in Punjab.
7. **AuroMira Energy:** Auro Mira is also a green technology energy company that is private, and present in the Biomass, Small Hydel and Wind Sectors. It plans to develop over 1000 MW capacity by 2012. AME is presently focusing in Biomass, Small Hydro and Wind Sectors. AME plans to invest \$ 900 Million to develop, own and operate over 1000 MW in clean energy in addition to WTG manufacture and to develop over 15000 acres of energy plantation in the next five years. AME intends to foray into other clean energy technologies, solar, bio-diesel etc. in the future.
8. **Husk Power Systems:** This is truly an alternate energy company which owns and operates 35-100 kW “mini power-plants” that use discarded rice husks to deliver electricity to off-grid villages in the Indian “Rice Belt
9. **RRB Energy Limited:** This company is in the field of Wind Power Generation, and is an ISO 9001:2008 and ISO 14001:2004 certified Company. RRBEL is also an Independent Power Producer having established wind farms of aggregate megawatt capacity.
10. **Moser Baer Solar Limited:** This is a subsidiary of Moser Baer that is one of the solar energy companies as well. The Group’s photovoltaic manufacturing business was established between 2005 and 2007 with the primary objective of providing reliable solar power as a competitive non- subsidized source of energy.

Internationally renowned MNC's to offer electrical jobs

Cisco, Hewlett Packard, Intel, AMD, IBM, Ford, General Electric, General Motors, Lockheed Martin, Lucent Technologies, Moog, Micron, Motorola, Nokia, Qualcomm, Rockwell, Sun Microsystems, Atto Technology, MTI and Texas Instruments.

Top core companies in India to offer electrical jobs

1. Bharat Sanchar Nigam Limited
2. Tata Consultancy Services
3. Bharti Airtel Limited
4. Wipro Ltd
5. Infosys Technologies Limited
6. Hewlett-Packard India
7. HCL Infosystems Limited
8. Reliance Communications Ltd
9. LG Electronics India Pvt Ltd
10. IBM India Pvt Ltd
11. Videocon Industries Ltd
12. HCL Technologies Limited
13. Satyam Computer Services Ltd
14. Siemens Ltd.
15. Samsung India Electronics Pvt. Ltd.
16. Mahanagar Telephone Nigam Ltd
17. Redington (India) Limited
18. Cognizant Technology Solutions
19. Idea Cellular Ltd
20. Videsh Sanchar Nigam Limited

Exclusive Government jobs for Electrical Engineers

1. ISRO
2. DRDO
3. BEL
4. BHEL
5. GAIL
6. SAIL
7. HAL
8. HPCL
9. NTPC
10. ONGC
11. IOCL
12. RRB
13. ECIL
14. APGENCO
15. APTRANSCO

ANNA UNIVERSITY
CENTRE FOR UNIVERSITY INDUSTRY COLLABORATION (CUIC)

**A READY RECKONER FOR ENHANCING PLACEMENT
ACTIVITIES**

Dr. T .Thyagarajan, Director-

CUIC ROLES AND RESPONSIBILITIES OF PLACEMENT REPRESENTATIVES

- Collect list of HR contact details through your friends/ relatives/ Newspaper/ Faculty members/ Seniors /Alumni
- Pass on the HR Contact details to Placement Officer for sending official invitations
- Ensure Placement Officer contact details in all the Department Brochures, to have single point contact
- Keep the hard and soft copies of Curriculum and Syllabus
- Keep the contact details (Email, Landline No. & Mobile No.) of all your classmates
- Keep the completed details about each student (SSLC, HSC, Semesterwise GPA, CGPA, D OB, Community, History & Current Arrears)
- Keep the contact details of other Placement Representatives
- Generate comprehensive Question Bank (Both Technical and Non-Technical)
- Collect Aptitude Questions/ GD Topics/ Interview Questions to create Question Bank
- Give training to the needy students
- Avoid spreading Rumors / False / Assumed information (This will lead to blacklisting)
- Avoid accepting false information / Track records from students (This will lead to rejection of offer)
- Avoid arguing with company HRs about previous year's branch preferences

TIPS TO FACE INTERVIEWS

- Maintain Professional Ethics and Moral Standards
- Read Frequently Asked Questions by interviewers and prepare the answers and practice them
- Prepare a Comprehensive Resume
- Practice with Mock Aptitude Test / Mock GD / Mock Interview etc.,
- Prepare well in fundamental & core subjects of respective branches
- Update database after declaration of revaluation / Arrear result
- View the placement Notice Board regularly
- As far as possible change of contact details should be avoided
- Visit the company's website before attending the Pre Placement Talk (PPT) to get clear idea
- Avoid Wearing Jeans / T-shirts/ Cheppal / Half sleeves
- Be punctual for PPT as well as for Test / Interview
- Avoid standing outside or near the PPT hall
- Occupy first benches also, during the PPT
- Maintain Gender separation during the PPT
- Maintain discipline during PPT
- Avoid coming late to the PPT/test/interview

- Ask only relevant / valid questions during the PPT
- Carry Pen, Pencil, Eraser, Passport Size Photograph etc., for the test
- Avoid contacting the HR directly. It should be through CUIIC only.
- Carry Resume / Copy of Mark Sheets / Community / Co-curricular / Extra-curricular Certificate etc for the interview
- Bring OBC Certificate for PSU interview
- Bring doctor certificate for differently abled physique
- Inform at the beginning itself about colour blindness, hearing disorder to avoid disqualification at the end.
- Attend the interview with clean dress (tucked-in) and neatly shaved to maintain dignity and decorum
- Wish the interviewer while entering the room. Thank the interviewer before leaving the room
- During the interview, relax and avoid showing your nervousness obvious
- Speak loudly, clearly; sit up straight; try to look at the interviewer's eyes when you speak to him/her
- Be honest in your approach
- Keep your answers brief and to the point.
- Do not give 'YES' or 'NO' replies.
- Don't discuss your personal difficulties
- Show your enthusiasm and willingness
- Exhibit your skills and abilities.
- Avoid passing bad comments/Remarks about the College/University/Staff during the interview
- Prepare in advance, the questions you want to ask about the job and company
- Be available till the announcement of results
- Maintain silence during announcements of results
- Do not exhibit bad mannerism during the placement activity

FREQUENTLY ASKED QUESTIONS (FAQ)

- Tell me about yourself
- What are your long range goals, ambitions, future plans?
- What do you want to be doing 5 or 10 years from now?
- How do you feel that you can contribute to this job?
- What are your hobbies?
- What are your strengths? Your weaknesses?
- What are your big accomplishments?
- What are your special abilities?
- Why you think that you are suitable for this kind of job?
- What is your career goal?
- What do you know about our company?
- Why are you applying for a job with us?
- What salary do you expect?
- Do you have any plans to go back to school?
- What kind of job profile you enjoy the most, the least and why?
- I have interviewed others for this job, why should I give you the job?
- Would you be willing to take an aptitude test?
- Can you tell me any thing about yourself that you think I might want to know?
- What is the lowest salary you would accept?
- Can you handle criticism? How do you deal with it?
- Do you have any questions?

HRE EXPECTATIONS

- Sincerity and honesty in the answers
- Attentiveness in listening to the questions

- Body language: gesture, posture, eye contact and confidence level
- Stress handling capability
- Positive approach in answering the questions
- Exhibition of skills, accomplishments and talents
- Enthusiasm and motivation level
- Command over communication skills
- Willingness and positive approach
- Exhibition of talents and accomplishments

POINTS DECIDED BY THE ORGANISATION

- Interview time and venue
- Decision on allowing identical branches
- Execution of Bond
- Change in eligibility criteria
- Place of work
- Percentage cut-off/ history of arrears / standing arrears
- Postponement of dates/cancellation
- The number of recruits, on-board date

USEFUL WEBSITES FOR APTITUDE, GD, TECHNICAL & HR INTERVIEW

<http://www.indiabix.com>
<http://www.fresherworld.com>
<http://www.placementpapers.net>
<http://www.allinterview.com>
<http://www.geekinterview.com>
<http://www.careersvalley.com>
<http://www.sampleplacementpapers.com>
<http://www.chetanasinterview.com>
<http://www.ittestpapers.com>
<http://www.indianfresher.com>
<http://www.freeplacementpapers.com>
<http://www.educationindiaeworld.com>
<http://www.jobsnresults.com>
<http://www.psychometric-success.com>
<http://testfunda.com>
<http://www.test4free.com>
<http://www.placementexpress.com>

TECHNICAL

<http://www.mechanicalengineeringblog.com>
<http://www.indiabix.com>

USEFUL WEBSITES FOR ENGLISH COMMUNICATION

<http://www.nonstopenglish.com>
<http://www.talkenglish.com>
<http://www.freeenglishnow.com>
<http://www.ego4u.com>
<http://www.focusenglish.com>
<http://www.bbc.co.uk/worldservice/learningenglish>
<http://www.englishclub.com>

<http://www.easyenglish.com>
<http://learnenglish.britishcouncil.org>
englishbee.net
http://www.english4today.com/free_content.cfm
<http://www.english-the-international-language.com>
<http://www.teachingenglish.org.uk>
<http://esl.about.com>
<http://www.learnenglis>
h.de
<http://www.busuu.com>
<http://free-esl.com>

‘FACTS’ TO PERFORM WELL IN THE PLACEMENTS

- F** - Clear the subjects in **F**irst attempt
- Learn **F**oreign Language (German, Japanese, French, Chinese)
- A** - Have right **A**ttitude
- C** - Have good **C**ommunication Skills
- Maintain a **C**GPA above 7.5
- T** - **T**hink Positive
- Develop creative **T**hinking
- S** - Be **S**agacious. Express your wisdom and Exhibit your Talents

K.L.N. College of Engineering.

How to prepare for Anna University Examinations.

Don't study just for passing the tests/exams. Ensure that you understood the concepts and you can explain/ demonstrate/justify/analyze/ answer/ argue/ design /implement/draw/develop any mathematical model, based on what you have learnt. If you are confident enough, you can successfully solve any question papers/technical interviews/competitive examinations at any time without fear/confusion/ delay. Remember that, you will be working in an environment, after graduation, where all the process/operation of machineries/equipment's are based on the basic scientific and engineering concepts what you have studied from first year to final year of your Engineering programme, where you are the only person to solve any problems aroused. You can't get away/escape from these. Hence, it is a lifelong learning, a wonderful experience.

Syllabus, books (at least 2-one Text books as prescribed in the syllabus, -one local author book) previous year question papers(atleast10), class notes, are your God/religion/food/ destiny/light. Ensure that you have studied all the contents of the syllabus, prepared correct answers for all questions in the AU question paper. Remember that ignoring any one word in the syllabus means you are losing 5 to 10 marks in each unit in the AU exams. Similarly, ignoring any one questions in the previous year question paper means you are losing 10 marks in each unit of AU exams. Don't expect that your Professor would cover 100% of the syllabus. Even if he/she has covered 100% of the syllabus don't think that he/she has covered 100% of each line in the syllabus. It is your responsibility to prepare 10% in excess of each lines in each units of the syllabus in addition to the contents taught by your Professors. This is possible by referring the books and the questions asked in the competitive exam books like GATE/TANCET/IES.

Plan your studies –right from the second week of the commencement of the classes till the semester examination is over. In a year, you will be attending the college only for 200 days(including theory/practical exams-8hours /day). You have 165 days (24 hours /day) away from the college. Prepare a time table from Monday-Friday. Take a rest on Saturday and Sunday. Allocate 3-4 hours in the evening for study.1-2 hours for completing assignments/observation/record note work. Remaining 2-3 hours for studying subjects A,B.(Mon),C,D(Tue)E,F(Wed), A,B(Thu),C,D(Fri),E,F(Sat or Sun).Each day, in addition to studying subjects for the current syllabus, you should refer competitive exam books (GATE/TANCET/IES/ Objective type questions –technical) corresponding to the current syllabus. This parallel preparation will ensure that you have prepared for state level and National level examinations there by you will be meeting the expectations of the Engineering Educational Objectives. Your preparation for AU examination should be vigorous (minimum), 15 days from the commencement of the exam and it should be maximum 2 days before the exam. You need to allocate for 8 hours per day during minimum days (early morning-6AM-10AM with a break for an hour, 10AM-12 Noon-sleep/rest,12 noon- 2PM-study,2PM-5PM-sleep/rest,6PM-10PM –study). Repetition/memorizing is required to retain certain contents to improve confidence on the subject. During rest time you can have group discussion with your friends or you can teach slow learners, thereby you will gain more knowledge and also help others.

Presentation – AU Exam-General complaints by students that the valuation is not fair or poor valuation. Remarks of examiners that there is nothing in the answer paper. Parents may say that either “college is not good” or “it is a fate”. Public may say “poor quality” and the experts may comment that 159 “only 20% are employable”. These statements will go on for centuries. Many students believes that they have written

right answers mostly (but many of them actually wrong) and few examiners assumed certain answers by students are wrong (but many of them are actually correct). It is 70% true that students are not presenting the answers well and it is 30% true that the valuation is not fair. But it is 95% true that the deserved students are getting expected results in most of the papers. This is because of good presentation. Good presentation involves many factors such as legible writing, good handwriting, answering correctly (100% correct), all answers with mathematical modeling/pictorial representation/drawing/layout/sketches with different colors, writing 7 pages for 16 mark questions with valid points and sketches, 4 pages for 8 marks with valid points and sketches/drawings/equations, characterizes,. Such students will solve problems correctly without any overwriting/ strikeouts. Simply, they do not cheat. These are the in-born qualities or developed over the years due to good habits, friendship, good character, obedience, hard work, well brought up by parents and blessing by God. Everyone can become like them if their attitude is good. Fear of God is the beginning of Wisdom. The examiners will know about your quality, just by referring the way you have answered Part-A- questions. A well prepared student would get a maximum of 18 out of 20. This impresses the examiner so that they will award a maximum of 14-16 for each part-B-question. Most of the students would answer wrongly in the Part-A-questions. This is due to their poor preparation during Class tests/internal tests, frequently taking leave, lot of diversion, skipping the classes for attending Co-Curricular/ /extra-curricular activities etc inside or outside the college.. Attending the classes is more important than attending college. Students are expected to attend 98%classes to maintain the continuity of the subjects learnt. One-day absence means it will take a week to study on his/her own. If he/she fails to study on his/her own to review the classes not attended means a loss of 10 marks in the exams.

Know well about Why one should apply for revaluation without /with Photocopy, schedule and fees to be paid. Sometimes a well-deserved students get low CGPA than he/she expected or even may fail. This may be due to error in valuation/data entry. Hence such students should not hesitate to apply for revaluation with/without photocopy. The parents should also be informed, all about these unfortunates (the misunderstanding between parents /sons/daughter/faculty may lead to unnecessary things). 90% of those deserved students who applied for revaluation with photo copy benefitted after revaluation. Ignorance/communication failure of these formalities, by deserved students, may damage their life. Some students failed in revaluation secured “O” grade in the REVIEW, shows some hope in the examination system and the better prospect of the students.

Need to maintain high CGPA in every semester. This is possible only when one gets “O” grade in all practical’s (from first to eighth semester). Those who are regular in attending the lab classes, submitting the observation and record note in time, disciplined behavior with staff and students in the class room/laboratory/campus etc. will impress the faculty in-charge of practical’s, so that he/she will help such students during regular lab classes. This will improve the students to do the lab experiments with confidence and fetch them to get more marks. This will reflect in internal assessment marks also. Classification of degree- First class with distinction- More than 8.5 CGPA (passed all subjects in first attempt), First class- More than 7.0 CGPA at the end of eighth semester, less than this would be second class.



K.L.N. COLLEGE OF ENGINEERING
POTTAPALAYAM - 630 612 (11KM from Madurai City)
SIVAGANGAI DISTRICT, TAMILNADU, INDIA
(Sponsored by K.L.N. Sourashtra College of Engineering Council)



Approved by AICTE, New Delhi

All UG courses are permanently Affiliated to Anna University,
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Approved as Nodal Centre for Quality Improvement Cell by Anna University,
Chennai. Approved Research Centres for MECH, EEE, ECE & CSE by Anna
University, Chennai. An ISO 9001:2015 Certified Institution. – A Sourashtra
Linguistic Minority Institution Accredited by NBA, New Delhi for B.E. – MECH, EEE,
ECE, CSE & B.Tech – IT,

for Three Academic Years, 2016-2017 to 2018-2019 (i.e.) upto
30.06.2022

Accredited by NAAC for the period of 5 years from 30.11.2018

Ph: 0452 – 6562171 & 2, 0452 – 2090971 & 2, Fax: 0452 – 2090070, Email –
info@klnce.edu

VISION AND MISSION OF THE COLLEGE

VISION

To become a Premier Institute of National Repute by Providing Quality Education, Successful Graduation, Potential Employability and Advanced Research & Development through Academic Excellence.

MISSION

To Develop and Make Students Competent Professional in the Dynamic Environment in the field of Engineering, Technology and Management by emphasizing Research, Social Concern and Ethical Values through Quality Education System.

VISION AND MISSION OF THE DEPARTMENT

VISION

To become a high standard of excellence in Education, Training and Research in the field of Electrical & Electronics Engineering and allied applications.

MISSION

To produce excellent, innovative and Nationalistic Engineers with Ethical Values and to advance in the field of Electrical & Electronics Engineering and allied areas.

COURSES OFFERED

UG COURSES - B.E. / B.TECH

1. Mechanical Engineering (Accredited by NBA)
2. Electrical & Electronics Engineering (Accredited by NBA)
3. Electronics & Communication Engineering (Accredited by NBA)
4. Computer Science & Engineering (Accredited by NBA)
5. Information Technology (Accredited by NBA)
6. Automobile Engineering
7. Electronics & Instrumentation Engineering

PG COURSES

1. Master of Computer Applications
2. Master of Business Administration
3. M.E. – CAD / CAM
4. M.E. – Communication Systems
5. M.E. – Power Systems Engineering
6. M.E. – Computer Science & Engineering
7. M.E. – Computer Science & Engineering (with Specialization in Networks)
8. K.L.N. COLLEGE OF ENGINEERING

9. DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Skills / Do you know

S.No.	Skill / Reminders	Priority	S.No.	Skill / Reminders	Priority
1.	Advanced Training Institute	Medium	51	Internshala	Medium
2.	Alumni	Medium	52	Internship	Medium
3.	Android Developer	Medium	53	IoT	High
4.	Anna University regulations	High	54	IVTL	Medium
5.	Aptitude Test	High	55	Jasmine	High
6.	Artificial Intelligence	High	56	JAVA	Medium
7.	Battery Technology	High	57	Journal Publications	Medium
8.	BEC	Medium	58	Judgment and Decision Making	Medium
9.	Big Data	Medium	59	Linear Integrated Circuits	High
10.	Block chain	Low	60	Mind Tree	Medium
11.	Board of Apprenticeship Training	Medium	61	Mobile Applications	Low
12.	Bond rules	Low	62	National Instruments	Medium
13.	BPO	Low	63	Negotiation	Medium
14.	BSNL	Medium	64	Networking	Medium
15.	C, C++	High	65	NPTEL	High
16.	Cadence	High	66	NSIC	Medium
17.	CAT	Low	67	Open source	Low
18.	CCNA	Medium	68	Passport	High
19.	Cloud computing	Medium	69	People Management	High
20.	Code vita	High	70	Power System Analysis	High
21.	Cognitive Flexibility	Medium	71	Programming Logic	Medium
22.	Complex Problem Solving	High	72	Project contest	High
23.	Conference Publications	High	73	Python Programming	High
24.	Co-ordinating with others	High	74	References	Medium
25.	Core companies	High	75	Resume	High
26.	Creativity	High	76	Robotics	Medium
27.	Critical Thinking	Medium	77	Second class	Medium
28.	Cyber security	Medium	78	Service orientation	Medium
29.	Data Mining	Medium	79	Skill rack	High
30.	Data pattern	High	80	Smart India Hackathon	High
31.	Data Science	Medium	81	Software companies	Medium
32.	Data Structure	Medium	82	Software Developer	Medium
33.	Digital Logic Circuits	High	83	Start up companies	Medium
34.	Driving License	High	84	STEP	Medium
35.	E mail writing	High	85	Symposium	Medium
36.	Electric Vehicle	High	86	TANCET	Medium
37.	Electrical Machines	High	87	TANGEDCO	Medium
38.	Electronic Devices & Circuits	High	88	TCS Ninja	High
39.	Embedded systems	High	89	Technical Aptitude	High
40.	Emotional Intelligence	Medium	90	Tell about yourself	High
41.	First class	High	91	Tessolve	High
42.	First class with Distinction	High	92	Texas Instruments	High
43.	GATE	High	93	TOFEL	Low
44.	GMAT	Low	94	Unmanned Aerial Vehicle	Medium
45.	GRE	Low	95	Unmanned Under water vehicle	Medium
46.	Hacker Rank	Medium	96	Very Large Scale Integrated circuits	Medium
47.	IEEE	High	97	Vocabulary Test	High
48.	IEI	Medium	98	Web Applications	Low
49.	Industrial Automation	Medium	99	Wireless communication	Low
50.	Implant Training	High	100	Zoho	Medium