

Reg. No: _____

B.Tech I Year I Semester Supplementary Examinations Nov 2021

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

Note: for Part-A, use first 20 pages...for Part-B, use 21 page onwards

PART-A

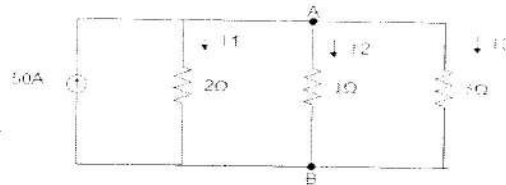
(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

- 1 a) State and prove Kirchoff's laws with suitable example 5M
- b) A 5 ohm, 10 ohm, 20 ohm, resistors are connected in series across 120V DC supply calculates Total Resistance, Total current, Voltage drop across each resistor. 5M

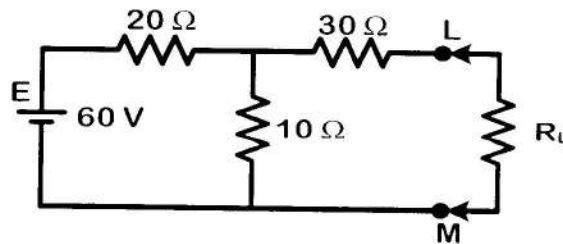
OR

- 2 a) Explain principle of AC voltages with neat diagram and waveform 5M
- b) Determine the current in all resistors in the given circuit. 5M



UNIT-II

- 3 a) State and prove Reciprocity theorem with suitable example 5M
- b) Determine the maximum power delivered to the load resistance R_L 5M



OR

- 4 a) Derive the EMF equation of a DC Generator 5M
- b) Explain 5M
 - a) Separately excited Dc Generator
 - b) Compound Dc Generator

UNIT-III

- 5 a) Explain about constructional details of dc motor 5M
- b) A 6 pole lap wound shunt motor has 500 conductors, the armature and shunt field resistances are 0.05 ohm and 25 ohm, respectively. Find the speed of the motor if it takes 120 A from dc supply of 100 V. Flux per pole is 20 mWb. 5M

OR

- 6 a) Derive the condition for maximum efficiency of the transformer 5M
 b) A 20 kVA, 2000/200V, 50Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses 5M

PART- B

(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

- 1 a) What is Doping? Describe P-and N-type semiconductors? 5M
 b) Explain the behavior of PN junction diode. 5M

OR

- 2 a) Explain the working of a PN junction diode when it is connected in forward bias and reverse bias. Draw VI Characteristics of PN Junction Diode 5M
 b) Explain the working principle of Bridge Wave Rectifier. Draw its input and output waveforms with neat circuit diagram 5M

UNIT-II

- 3 a) Discuss the operation of PNP transistor with diagram 5M
 b) Explain the functioning of Common Collector Configuration of BJT. State why this arrangement is also called an emitter follower circuit 5M

OR

- 4 a) Explain the early effect of a BJT? 5M
 b) Explain the operating region of BJT when its working? 5M

UNIT-III

- 5 a) Explain the construction and principle of operation of N-channel JFET. 5M
 b) Explain the CG configuration of JFET 5M

OR

- 6 a) Explain how the JFET working as a switch 5M
 b) Explain the static characteristics of MOSFET and draw its characteristics 5M

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B.Tech I Year I Semester Supplementary Examinations Nov- 2021

PRINCIPLES OF ELECTRICAL CIRCUITS

(ECE)

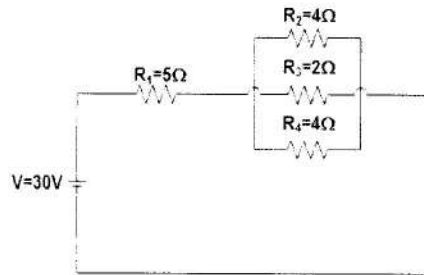
Time: 3 Hours

Max. Marks: 60

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UNIT-I

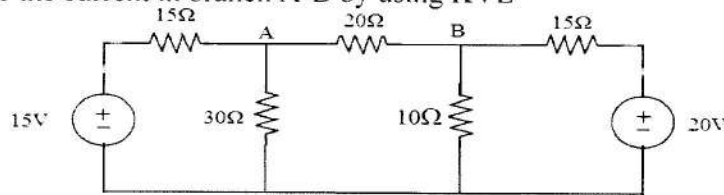
- 1 a) State and prove Kirchoff's laws with suitable examples. 6M
 b) Determine Current through each resistor in the circuit? Using Current division method?



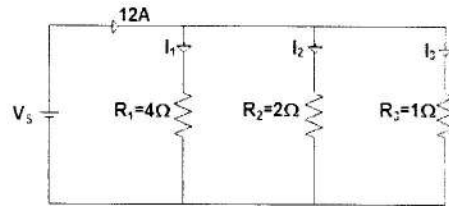
6M

OR

- 2 a) Determine the current in branch A-B by using KVL 6M
 b) Determine Current through each resistor in the circuit? Using Current division method?



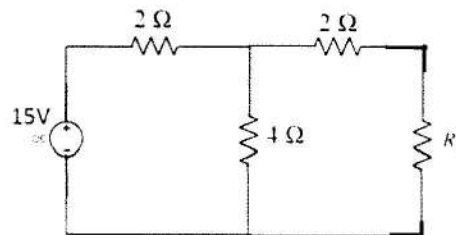
6M



6M

UNIT-II

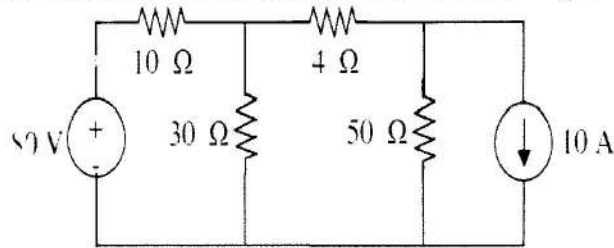
- 3 a) State & explain Super position theorem 4M
 Find load current by using Thevenin's theorem for the following circuit where $R_L = 3\Omega$.



8M

OR

- 4 Verify Superposition Theorem for 4Ω resistor for the following circuit



12M

UNIT-III

- 5 The Circuit Consists Of Resistance= 20 Ohm , Inductance = 0.05H , capacitance = $20\mu\text{F}$ in Series With a 100V Constant at $t=0$. Find the current transient

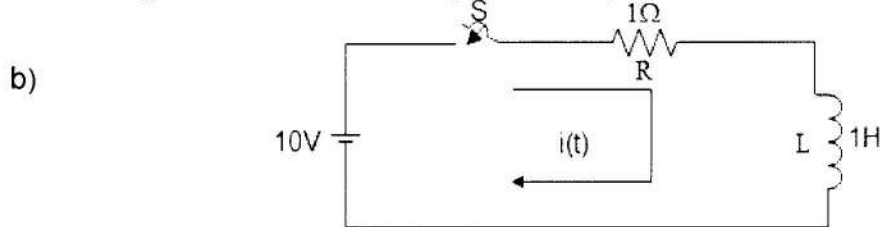
12M

OR

- 6 a) A Series RL circuit with $R=50\Omega$ and $L=10\text{H}$ has constant voltage $V=100\text{volts}$ applied at $t=0$ by the closing the switch find the complete current.

6M

A series RL circuit Switch 'S' is Closed at time $t = 0$. There is no current through 'L' Prior to Switching obtain the particular solution for $i(t)$.



6M

UNIT-IV

- 7 Derive an expression for the current and impedance for a series RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.

12M

OR

- 8 Find the peak value, the r.m.s. value, the frequency, the periodic time and the phase angle (in degrees and minutes) of the following alternating quantities:

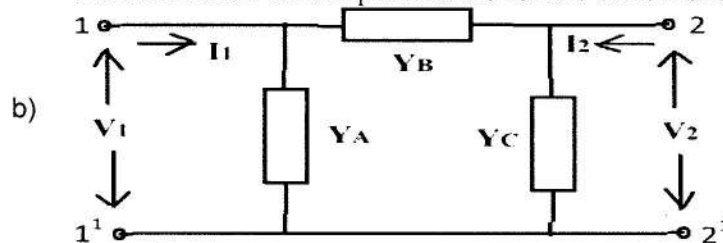
12M

- (a) $v = 90 \sin 400\pi t$ volts (b) $i = 50 \sin(100\pi t + 0.30)$ amperes
 (c) $e = 200 \sin(628.4t - 0.41)$ volts

UNIT-V

- 9 a) Explain about h-parameters in terms of y-parameters
 Find the Short-circuit parameters for the circuit shown in figure.

6M



6M

OR

- 10 Explain about Constant-K band-pass filter in detail.

12M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021
BASIC ELECTRICAL & MECHANICAL ENGINEERING
 (CIVIL)

Time: 3 Hours

Max. Marks: 60

Note: for Part-A, use first 20 pages...for Part-B, use 21 page onwards

PART-A

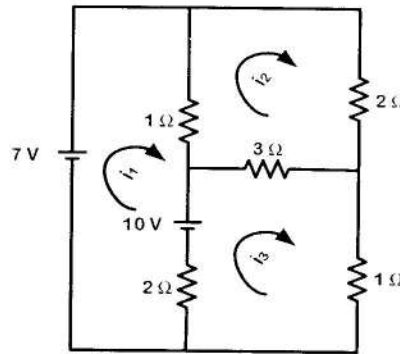
(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

- 1 a) State and explain Ohm's law. 5M
- b) State and prove Kirchhoff's laws with suitable examples. 5M

OR

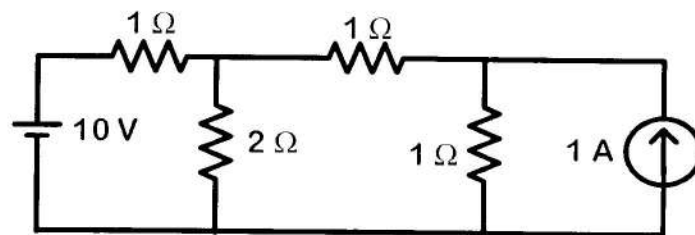
- 2 a) Find i_1, i_2, i_3 for the given circuit by using Kirchhoff's laws? 5M



- b) Explain in detail about (i) RMS value, (ii) Average value, (iii) Form factor and (iv) Peak factor 5M

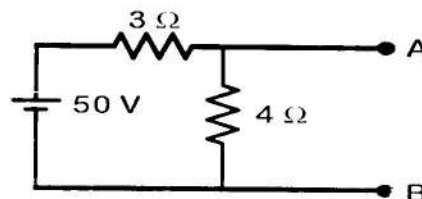
UNIT-II

- 3 a) State Super position theorem. 2M
- b) Calculate the current in 2Ω resistor in the given circuit using super position theorem. 8M



OR

- 4 a) State Norton's theorem. 2M
- b) Find Norton's equivalent circuit across AB for the circuit shown. 8M



UNIT-III

- 5 a) Discuss about the principle of operation of DC motors. 5M
 b) Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A. 5M

OR

- 6 a) Derive Torque equation of dc motor. 5M
 b) The counter emf of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary. 5M

PART- B

(Answer all Three units, 3 x 10 =30 Marks)

UNIT-IV

- 1 Describe the permanent mold casting with neat sketch and list the advantages, limitations and applications. 10M

OR

- 2 Illustrate the process of investment casting with neat sketches? Mention the advantages, limitations and applications. 10M

UNIT-V

- 3 What is a shaper? Draw the block diagram of a shaper machine with principal parts, specifications, advantages and applications. 10M

OR

- 4 a) Classify the types of CNC machine in details. 5M
 b) Explain in detail about the part programming. 5M

UNIT-VI

- 5 What is refrigeration system? Write the differences between vapour compression refrigeration and vapour absorption systems. 10M

OR

- 6 a) What is the need of automobile? Explain the four wheel automobile components with neat sketch. 6M
 b) Mention the applications of refrigeration system. 4M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021
ALGEBRA AND CALCULUS
 (Common to All Branches)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

- 1** a) Show that the equations $x + y + z = 4$; $2x + 5y - 2z = 3$; $x + 7y - 7z = 5$ are not consistent. 6M
 b) Find the Eigen value and Eigen vectors of the matrix $\begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$ 6M
- OR**
- 2** a) Find whether the following equations are consistent if so solve them $x + y + 2z = 4$; $2x - y + 3z = 9$; $3x - y - z = 2$. 6M
 b) Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 8 & -8 & 2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ 6M

UNIT-II

- 3** a) Verify Rolle's Theorem for the function $f(x) = \frac{\sin x}{e^x}$ in $(0, \pi)$ 6M
 b) $u = \sin^{-1}(x - y)$, where $x = 3t$, $y = 4t^3$, then show that $\frac{du}{dt} = \frac{1}{\sqrt{1-t^2}}$ by total derivative. 6M

OR

- 4** a) Expand $\log_e x$ in powers of $(x-1)$ and hence evaluate $\log 1.1$ correct to four decimal places using Taylor's theorem. 6M

- b) $f u = x^2 - 2y$; $v = x + y + z$, $w = x - 2y + 3z$ then find Jacobian $J \left(\frac{u,v,w}{x,y,z} \right)$. 6M

UNIT-III

- 5** a) Evaluate the integral by transforming into polar coordinates $\int_0^{\sqrt{e}} \int_0^{\sqrt{e-x^2}} \sqrt{x^2 + y^2} dx dy$. 6M

- b) Evaluate $\int_{-1}^1 \int_{-1}^1 \int_{-1}^1 (x + y + z) dx dy dz$ 6M

OR

- 6** a) Evaluate the integral by changing the order of integration $\int_0^1 \int_0^1 \frac{1}{xy} dx dy$. 6M

- b) Calculate the volume of the solid bounded by the planes $x = 0$, $y = 0$, $x + y + z = a$ and $z = 0$ 6M

UNIT-IV

- 7** a) Find the directional derivative of $xyz^2 + xz$ at $(1,1,1)$ in the direction of normal to the surface $3xy^2 + y = z$ at $(0,1,1)$. 6M
 b) If $\vec{F} = (x + 2y + az)\vec{i} + (bx - 3y - z)\vec{j} + (4x + cy + 2z)\vec{k}$ is irrotational then find the constants a, b and c . 6M

OR

- 8** a) Evaluate the angle between the normal to the surface $xy = z^2$ at the points $(4,1,2)$ and $(3,3,-3)$. 6M
 b) Prove that $\nabla^2(r^n) = n(n+1)r^{n-2}$. 6M
- UNIT-V**
- 9** a) Evaluate $\int_C \vec{F} \cdot \vec{n} ds$, where $\vec{F} = 18xz\vec{i} - 12z\vec{j} + 3y\vec{k}$ and 's' is the part of the surface of the plane $2x + 3y + 6z = 12$ located in the first octant. 6M
 b) Apply Green's theorem to Evaluate $\oint_C (2x^2 - y^2) dx + (x^2 + y^2) dy$ where 'c' is the enclosed by the x-axis and upper half of the circle $x^2 + y^2 = a^2$. 6M
- OR**
- 10** a) Using Gauss Divergence Theorem, evaluate where $F = (x^2 - yz)\vec{i} + (y^2 - zx)\vec{j} + (z^2 - xy)\vec{k}$ taken over the rectangular parallelepiped $0 \leq x \leq a, 0 \leq y \leq b$ and $0 \leq z \leq c$. 6M
 b) Find the work done by a force $\vec{F} = (2y + 3z)\vec{i} + (xz)\vec{j} + (yz - x)\vec{k}$ when it moves a particle from $(0,0,0)$ to $(2,1,1)$ along the curve $x = 2t^2, y = t, z = t^3$. 6M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

ENGINEERING PHYSICS

(CIVIL)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Explain the interference in thin films by reflected light. 8M
b) Distinguish between interference and diffraction of light. 4M

OR

- 2 a) Summarize the Fraunhofer diffraction at a single slit. Obtain the condition for principle maxima and minima. 8M
b) List the engineering applications of diffraction of light. 4M

UNIT-II

- 3 a) Describe the seven crystal systems with neat diagrams. 8M
b) Explain the terms unit cell and Lattice parameters. 4M

OR

- 4 a) What are Miller indices? How they are obtained. 6M
b) Describe the X-ray powder diffraction method to analyze the crystal structure. 6M

UNIT-III

- 5 a) Discuss the terms reverberation and reverberation time. Deduce an expression for reverberation time. 8M
b) A cinema hall has a volume of 7500m^3 . What should be the total absorption in the hall if the reverberation time of 1.5s is to be maintained? 4M

OR

- 6 a) What is piezoelectric method? With necessary diagram, explain the production of ultrasonics by using piezoelectric method. 7M
b) Discuss the various detection techniques of ultrasonics. 5M

UNIT-IV

- 7 a) Discuss the behavior of wire under load. 6M
b) Derive the expression for Poisson's ratio of a material. 6M

OR

- 8 a) Classify the elastic moduli. Explain each. 6M
b) Define the terms stress and strain. Outline the Hook's law. 6M

UNIT-V

- 9 a) State and explain the Meissner's effect. 6M
b) Summarize the ac and dc Josephson effect. 6M

OR

- 10 a) Describe the terms 'surface area to volume ratio' and 'quantum confinement'. 6M
b) Elaborate synthesis method of nanomaterials by using sol-gel method. 6M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

APPLIED PHYSICS

(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Discuss the theory of interference of light due to thin films by reflection with suitable ray diagram. 4M
 b) Derive the condition for constructive and destructive interference in the case of reflected system. 8M

OR

- 2 a) Distinguish between Interference and Diffraction. 6M
 b) Explain the Grating Spectrum. 6M

UNIT-II

- 3 a) Define band gap. 2M
 b) Classify the solids into conductor, semiconductor & insulators based on band theory. 10M

OR

- 4 a) Write the significance of divergence and curl of a vector. 6M
 b) Write Maxwell's equations in differential and integral form. 6M

UNIT-III

- 5 a) Derive the relation between various Einstein's coefficients of absorption and emission of radiation. 8M
 b) Explain population inversion. 4M

OR

- 6 a) What is the acceptance angle of an optical fiber and derive an expression for it. 8M
 b) An optical fibre has a core refractive index of 1.44 and cladding refractive index of 1.40. Find its numerical aperture and acceptance angle. 4M

UNIT-IV

- 7 a) What is intrinsic semiconductor? 2M
 b) Explain the formation of p-type and n-type semiconductors with band diagram. 10M

OR

- 8 a) Describe the construction and working mechanism of LED. 8M
 b) Determine the wavelength of LED fabricated by the CdS material with band gap of 2.42 eV. 4M

UNIT-V

- 9 a) Prove that super conductor is a very good diamagnetic material. 8M
 b) Write the applications of superconductors. 4M

OR

- 10 a) Explain why surface area to volume ratio very large for nano materials? 8M
 b) Write the applications of nanomaterials in different fields. 4M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

APPLIED CHEMISTRY

(ECE & EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Derive the Nernst equation for a single electrode potential. 6M
 b) Describe the construction and working of Photovoltaic cell its applications 6M

OR

- 2 a) Discuss the redox-titrations of Potentiometer and give its applications? 6M
 b) Describe the construction and working of Ni- Cd Cell with cell reactions? 6M

UNIT-II

- 3 a) Derive the Schrodinger wave Equation. 8M
 b) Write the postulates of Molecular Orbital Theory. 4M

OR

- 4 a) Write the Salient features of Crystal Field Theory. 4M
 b) Explain splitting of metal d- orbital's in octahedral and tetrahedral complexes? 8M

UNIT-III

- 5 a) Write the mechanisms of addition polymerizations. 6M
 b) Write the mechanisms of Co-ordination Polymerization, Co-Polymerization with specific examples. 6M

OR

- 6 a) Write the differences between thermoplastics and thermosetting plastics. 6M
 b) Describe the preparation, properties and uses of the Bakelite. 6M

UNIT-IV

- 7 a) Explain the principle instrumentation and applications of AAS. 6M
 b) Explain the principle, Instrumentation and applications of UV-Visible spectroscopy. 6M

OR

- 8 a) Explain the instrumentation, principle and applications of HPLC Technique. 6M
 b) Explain the any three methods for the Gaseous mixtures. 6M

UNIT-V

- 9 a) Define Dielectrics? What are the characteristics of Electrical Insulators? 6M
 b) Classification of Insulating material and their applications. 6M

OR

- 10 a) Write a brief note on Carbon Nano Tubes. 6M
 b) Give an account on Fullerenes. 6M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

ENGINEERING CHEMISTRY

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Explain about demineralization of brackish water by Reverse Osmosis . 6M
b) Explain about demineralization of brackish water by Electro dialysis. 6M

OR

- 2 a) Explain in briefly about Boiler corrosion. 6M
b) How water gets hardness. Distinguish between hard water and soft water? 6M

UNIT-II

- 3 a) Write a note on sacrificial anodic protection? 6M
b) Define the importance of the Impressed Current Cathodic protection ? 6M

OR

- 4 a) What is electroplating ? Explain electroplating of Nickel and copper ? 6M
b) What is Differential Aeration cell corrosion ? Give the suitable Examples. 6M

UNIT-III

- 5 a) Write Preparation, Properties and Applications of Bakelite. 6M
b) Write Preparation, Properties and Applications of PVC. 6M

OR

- 6 a) What is the essential of propane and methanol fuel. 6M
b) What is the essential of propane and methanol fuel. 6M

UNIT-IV

- 7 a) What are Refractories ? Write their Classification. 6M
b) What is meant by composites ? 6M

OR

- 8 a) Write a note on Fiber reinforced materials. 6M
b) What are the properties of composite material. 6M

UNIT-V

- 9 a) What is colloid ? Classify the colloids based on the physical state. 6M
b) Write a note on Micelle formation. 6M

OR

- 10 a) Explain the BET Equation. 6M
b) What are the factors influencing Adsorption of gases on solids. 6M

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PRINCIPLES OF ELECTRICAL ENGINEERING

(CSE)

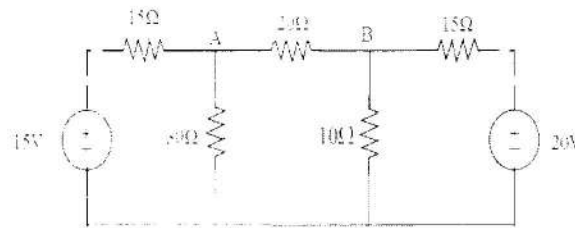
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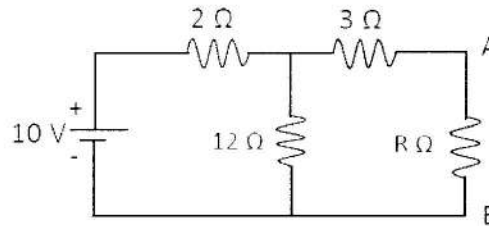
UNIT-I

- 1 a) State and explain Kirchhoff's laws? 6M
 b) Determine the current in branch A-B by using KVL 6M



OR

- 2 a) State and explain Thevenin's theorem 6M
 b) Draw the Norton's equivalent circuit for the circuit shown in figure 6M

**UNIT-II**

- 3 a) Derive an expression for RMS values of sine wave form 6M
 b) An alternating current is expressed as $I = 14.14 \sin 314t$. Determine. 6M
 (i) Maximum current (ii) RMS current (iii) Frequency
 (iv) Instantaneous current when $t = 0.02 \text{ msec}$.

OR

- 4 Derive an expression for the current and impedance for a series RL and RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams. 12M

UNIT-III

- 5 Explain the Constructional details of D.C machine with neat sketch. 12M

OR

- 6 Explain about the Working principle of a D.C generator. 12M

UNIT-IV

- 7 Draw the constructional diagram of a single-phase transformer and explain all the parts. 12M

OR

- 8 Explain the Working principle of single-phase transformer. 12M

UNIT-V

- 9 Define torque. Explain various types of torques in measuring instruments. 12M

OR

- 10 Explain operating principle of Permanent Magnet Moving Coil (PMMC) instruments. 12M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

THERMAL AND FLUID ENGINEERING

(EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Draw a neat sketch of a Thermal Power Plant. 6M
 b) Explain different types of thermodynamic systems? 6M

OR

- 2 a) What is coal handling system? List of it types. 6M
 b) Explain following terms state, path, process and cycle? 6M

UNIT-II

- 3 a) Draw the P-T and T-S diagram for a pure substance. 6M
 b) Briefly explain about economizer. 6M

OR

- 4 1000 kg of steam at a pressure of 16 bar and 0.9 dry is generated by a boiler per hour. 12M
 The steam passes through a super heater via boiler stop valve where its temperature is raised to 380°C. If the temperature of feed water is 30°C, determine (i) The total heat supplied to feed water per hour to produce wet steam. (ii) The total heat absorbed per hour in the super heater. Take specific heat for superheated steam as 2.2 Kj/kg K.

UNIT-III

- 5 a) Define the following fluid properties: Density, specific volume and specific gravity of a fluid. 6M
 b) Derive an expression for surface tension inside the liquid droplet. 6M

OR

- 6 a) Derive an expression for capillary rise and fall in a glass tube. 6M
 b) The capillary rise in the glass tube is not to exceed 0.2mm of water. Determine its minimum size, given that surface tension for water in contact with air = 0.0725 N/m. 6M

UNIT-IV

- 7 a) Derive Euler's equation of motion. 6M
 b) Discuss the impulse momentum equation? 6M

OR

- 8 a) Write a short note on Pipes in Series and Pipes in Parallel. 6M
 b) Enlist the major and minor losses in pipes. 6M

UNIT-V

- 9 a) Derive an expression for the hydraulic efficiency when a liquid jet strikes a single fixed curved vane. 6M
 b) A jet of 50 mm diameter delivers a stream of water at 20 m/s perpendicular to a plate that moves away from the jet 5 m/s. Find the force on the plate, work done and efficiency of jet. 6M

OR

- 10 Explain the working principle of a Pelton wheel with a neat sketch and also derive equation for hydraulic efficiency 12M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

COMMUNICATIVE ENGLISH

(Common to EEE, ECE & ME)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Write a complaint letter to the Inspector, I town police station of your town, requesting him/her to find out your missing scooter. 6M
b) Explore the importance of creative thinking. 6M

OR

- 2 a) Sketch the character of Subbaiah in the short story Half a Rupee Worth. 6M
b) Explain the meaning of the phrase 'Rice was in his blood' in the short story Half a Rupee Worth. 6M

UNIT-II

- 3 a) Define different types of sentences with two examples for each. 6M
b) Critically analyze various factors of human mindset. 6M

OR

- 4 a) Bring out the cruelty inflicted on dalits in the story The Thakur's Well. 6M
b) How could Gangi realize that the oppression of women exists everywhere? 6M

UNIT-III

- 5 a) As you are the safety engineer, prepare a report to submit it to the Chairman of Lakshmi Cotton Mills, Vijayawada, on a fire accident that recently occurred in a godown of the factory. 6M
b) Bring out the relationship between emotional intelligence and work efficiency. 6M

OR

- 6 a) What is the message given by Naheed through her poem 'I Am Not That Woman'? 6M
b) Examine 'I Am Not That Woman' as a poem of women empowerment. 6M

UNIT-IV

- 7 a) Write notes on the use of graphics for understanding information with suitable examples. 6M
b) Bring out the importance of 'Time Management'. 6M

OR

- 8 a) What was the response of the woman in the short story 'What Is My Name', after finding her name? 6M
b) Critically analyze 'What Is My Name' as a story of search for identity. 6M

UNIT-V

- 9 a) What are the steps involved in the preparation of formal oral presentation? 6M
b) Examine the importance of 'goal setting'. 6M

OR

- 10 a) Discuss the influence of his father on A.P.J. Abdul Kalam. 6M
b) Write notes on Kalam's views on prayer and spirituality. 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Nov 2021
C PROGRAMMING AND DATA STRUCTURES
(Common to CE & CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Write about different looping statements with suitable examples. 6M
b) Write a program to print first n terms in Fibonacci series. 6M

OR

- 2 a) Differentiate break, continue and goto statements. 6M
b) Define a type conversion. What are different types of types conversions explain with example. 6M

UNIT-II

- 3 Determine various types of Arrays with examples. 12M

OR

- 4 a) Describe about type qualifiers in C. 6M
b) Determine any four preprocessor commands. 6M

UNIT-III

- 5 a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable. 6M
b) Explain the concept of pointer to pointers with examples. 6M

OR

- 6 Discuss below terms with examples: 12M
(a) Nested structures. (b) Array of structures.

UNIT-IV

- 7 What is a stack? What are various operations that can be performed on them? Explain with an example. 12M

OR

- 8 Implement the following single linked list operations: 12M
a).Insertion of a node
b).Deletion of a node c).Searching an element

UNIT-V

- 9 Sort the following numbers using selection sort and insertion sort: 45, 25, 10, 2, 9, 85, 102, 1 12M

OR

- 10 Explain the difference between merge sort and quick sort with suitable examples 12M

Reg. No:

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

ENGINEERING CHEMISTRY

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Explain about demineralization of brackish water by Reverse Osmosis . 6M
b) Explain about demineralization of brackish water by Electro dialysis. 6M

OR

- 2 a) Explain in briefly about Boiler corrosion. 6M
b) How water gets hardness. Distinguish between hard water and soft water? 6M

UNIT-II

- 3 a) Write a note on sacrificial anodic protection? 6M
b) Define the importance of the Impressed Current Cathodic protection ? 6M

OR

- 4 a) What is electroplating ? Explain electroplating of Nickel and copper ? 6M
b) What is Differential Aeration cell corrosion ? Give the suitable Examples. 6M

UNIT-III

- 5 a) Write Preparation, Properties and Applications of Bakelite. 6M
b) Write Preparation, Properties and Applications of PVC. 6M

OR

- 6 a) What is the essential of propane and methanol fuel. 6M
b) What is the essential of propane and methanol fuel. 6M

UNIT-IV

- 7 a) What are Refractories ? Write their Classification. 6M
b) What is meant by composites ? 6M

OR

- 8 a) Write a note on Fiber reinforced materials. 6M
b) What are the properties of composite material. 6M

UNIT-V

- 9 a) What is colloid ? Classify the colloids based on the physical state. 6M
b) Write a note on Micelle formation. 6M

OR

- 10 a) Explain the BET Equation. 6M
b) What are the factors influencing Adsorption of gases on solids. 6M

Reg. No:

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B.Tech I Year I Semester Supplementary Examinations Nov 2021

BASIC ELECTRONICS ENGINEERING

(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) With the help of Energy band diagram define the following terms: 6M
i) valence band, ii) conduction band, and iii) band gap
b) With the help of Energy band diagrams explain Semiconductors. 6M

OR

- 2 a) Explain the differences between intrinsic and extrinsic semiconductors. 6M
b) Explain in detail about mass action law. 6M

UNIT-II

- 3 a) With the help of V-I Characteristics explain the action of PN junction diode under forward condition. 6M
b) Plot the graph for different breakdown mechanisms in semiconductors. 6M

OR

- 4 a) Explain the terms i) Transition capacitance C_T of a PN diode. 6M
b) The reverse saturation current of a silicon PN junction diode is $10\mu\text{A}$. Solve the diode current for the forward bias voltage of 0.6V at 25°C . 6M

UNIT-III

- 5 a) Define and formulate the following terms i) Ripple Factor ii) efficiency of FWR 6M
b) A HWR uses a diode with 50Ω internal resistance, if RMS input is 110V and $R_L=1000\Omega$ then calculate: 6M
i) Peak output current ii) DC output current

OR

- 6 a) Describe the operation of inductor filter with the help of circuit diagram and waveforms. 6M
b) Compare full wave rectifier with half-wave rectifier. 6M

UNIT-IV

- 7 a) Compare the performance of a transistor in different configurations. 6M
b) Derive the relationship between α and β . 6M

OR

- 8 a) Define Stability Factor S , Stability Factor S' and Stability Factor S'' 6M
b) Derive the relation among I_C , I_B and I_{CBO} . 6M

UNIT-V

- 9 a) Explain the construction and working principle of N-channel JFET. 6M
b) Sketch and explain the n-channel JFET output characteristics under applied bias. 6M

OR

- 10 a) List difference between depletion and enhancement MOSFET. 6M
b) Explain the voltage divider bias circuit of FET 6M

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B.Tech I Year I Semester Supplementary Examinations Nov 2021
ENGINEERING GRAPHICS
 (EEE, ECE & MECH)

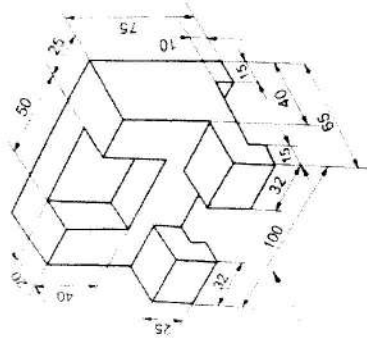
Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

- 1 a) Construct a hyperbola with the distance between the focus and directrix as 50 mm and eccentricity as $\frac{3}{2}$. Also, draw normal and tangent to the curve at a point 30 mm from the directrix. 6M
 b) Construct an ellipse when the distance between the focus and the directrix is 50 mm and the eccentricity is $\frac{2}{3}$. Draw tangent and normal at a point 40 mm from the directrix. 6M
- UNIT-I**
- OR
- 2 a) Draw a hypo cycloid of a circle of 50 mm diameter, which rolls inside another circle of 180 mm diameter for one revolution counter clockwise. 6M
 b) Draw an involute of a circle of 40 mm diameter. Also, draw a normal and a tangent at a point 95 mm from the centre of the circle. 6M
- UNIT-II**
- 3 a) A point 25mm above xy line is the plan view of two points C and S. The elevation of C is 30mm above H.P while that of the point S is 15mm below H.P. Draw the projections of the points and state their positions with reference to the principle planes and the quadrants in which they lie. 6M
 b) Two points A and B are in the H.P. The point A is 30mm in front of the V.P., while B is behind the V.P. The distance between their projectors is 75mm and the line joining their top views makes an angle of 45° with xy. Find the distance of the point B from the V.P. 6M
- OR
- 4 A line PQ 70mm long has its end P 15mm above HP and 20mm in front of V.P. Its Top view and Front view measures 60mm and 40mm respectively. Draw the projections of the line and determine its inclinations with HP and VP. 12M
 b) Draw the projections of a circle of 50mm diameter resting in the H.P and a point A on the circumference. Its plane is inclined at 45° to the HP and the top view of the diameter AB making an angle of 30° with the VP. 12M
- OR
- 6 A hexagonal pyramid of a base edge 20 mm and altitude 50 mm rests on one of its base edges on the HP such that the slant face (triangular surface) containing the resting edge is perpendicular to the HP. The resting edge is inclined at 45 degree to the VP. Draw the projections of the pyramid. 12M

- 7 A hexagonal prism of side of base 30 mm and length of axis 75 mm, is resting on its base on HP. It is cut by a section plane inclined 35 degree to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section. 12M
- OR
- 8 A cone of base diameter 50mm and axis 60mm resting on its base on H.P. A section plane perpendicular to V.P and inclined at 45° to H.P bisects the axis of the cone. Draw the development of its lateral surface. 12M
- UNIT-V**
- 9 Draw three views of the blocks shown pictorially in figure according to first angle projection. 12M



- 10 Draw the isometric view of a pentagonal prism of base side 30 mm and axis 60 mm. The prism rests on its base on the HP with a vertical face perpendicular VP. 12M

Reg. No:

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B.Tech I Year I Semester Supplementary Examinations Nov 2021
ENGINEERING MATERIALS

(CIVIL)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) List the characteristics of good building stones. 7 M
 b) Write short notes on Precautions in blasting. 5 M

OR

- 2 Briefly explain the process involved in the manufacturing of bricks. 12 M

UNIT-II

- 3 Describe with flow diagrams the dry and wet process of manufacture of cement. 12 M

OR

- 4 What is meant by workability of concrete? How is it tested in field and in laboratory? 12 M

UNIT-III

- 5 a) Distinguish between softwood and hard wood. 5 M
 b) What are dry and wet rots? How are they caused and prevented? 7 M

OR

- 6 a) State the characteristics of good timber. 6 M
 b) What are the various ingredients of paints? State the functions of each of them. 6 M

UNIT-IV

- 7 What are smart materials? Explain their applications in civil engineering field? 12 M

OR

- 8 Describe in detail testing of steel sections. 12 M

UNIT-V

- 9 With significance briefly explain about crushing test and impact test on coarse aggregate. 12 M

OR

- 10 Explain the following tests for bitumen 12 M
 (i) Flash point and fire point test
 (ii) Softening point