LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram-521 230 :: NTR Dist. :: A.P

Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

B.Tech. (III Semester) (R17) Semester End Examinations (Supplementary) - November 2025

(2018, 2019 Regular admitted batches and 2020 Lateral Entry admitted batch only)

TIME TABLE

R17

Time : 10.00 AM to 01.00 PM **A.Y. : 2025-26**

Branch	13-11-2025 (Thursday)	14-11-2025 (Friday)	15-11-2025 (Saturday)	17-11-2025 (Monday)	18-11-2025 (Tuesday)	19-11-2025 (Wednesday)	20-11-2025 (Thursday)
ASE	17FE07 - Numerical Methods and Fourier Analysis	17AE01 - Engineering Fluid Mechanics	17AE02 - Engineering Thermodynamics	17AE03 - Strength of Materials	17AE04 - Elements of Aerospace Engineering	17ME05 - Metallurgy and Material Science	17PD03 - Professional Ethics and Human Values
CE	17FE07 - Numerical Methods and Fourier Analysis	17EE51 - Fundamentals of Electrical Engineering	17CE04 - Strength of Materials - I	17CE05 - Engineering Geology	17CE06 - Mechanics of Fluids	17CE07 - Concrete Technology	17PD03 - Professional Ethics and Human Values
CSE	17FE08 - Probability and Statistics	17FE03 - Environmental Science	17CI03 - Discrete Mathematical Structures	17CI04 - Python Programming	17CI05 - Data Structures	17CI06 - Computer Architecture	- - -
ECE	17FE07 - Numerical Methods and Fourier Analysis	17CI01 - Computer Programming	17EC05 - Signals and Systems	17EC06 - Random Variables and Stochastic Processes	17EC07 - Pulse and Switching Circuits	17EC08 - Analog Integrated Circuits	17PD03 - Professional Ethics and Human Values
EEE	17FE07 -Numerical Methods and Fourier Analysis	17EE02 - Electric and Magnetic Fields	17EE03 - Network Theory - I	17EE04 - Digital Logic Circuit Design	17CI05 - Data Structures	17EE05 - Power Generation and Utilization	17PD03 - Professional Ethics and Human Values
EIE	17FE07 - Numerical Methods and Fourier Analysis	17FE03 - Environmental Science	17EE53 - Electrical Technology	17EI02 - Transducers	17EC03 - Analog Electronic Circuits	17EC04 - Digital Electronic Circuits	- - -
IT	17FE07 - Numerical Methods and Fourier Analysis	17FE03 - Environmental Science	17CI07 - OOPs through Java	17IT01 - Operating System Principles	17CI02 - Digital Logic Design	17CI09 - Data Base Management Systems	- - -
ME	17FE07 - Numerical Methods and Fourier Analysis	17FE03 - Environmental Science	17EC50 - Basic Electronics Engineering	17ME03 - Thermodynamics	17ME04 - Mechanics of Solids	17ME05 - Metallurgy and Material Science	- - -

Note: Any omissions or clashes in the time table may please be informed to the Controller of Examinations immediately.

Date: 24-10-2025

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to: 1. Vice-Principal, Deans & HoDs 2. T&P cell, Transport in-charge & Librarian
3. Canteen, PD, Security & Hostels 4. Coordinator-Disciplinary 5. Notice Boards

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B.Tech. (III Semester) Supplementary Examinations

13/11/25

17FE07-NUMERICAL METHODS AND FOURIER ANALYSIS

(Common to All)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Applying Regula-Falsi method, find a real root of the equation $f(x) = x^3 - 4x - 9 = 0$.	6M	CO1	L3
(b)	Evaluate I=$\int_0^1 \frac{dx}{1+x}$ with n= 6 using Simpson's 1/3 rule.	6M	CO1	L3
	(OR)			
2(a)	Using Newton – Raphson method find the root of the equation $xe^x = 3$.	6M	CO1	L3
(b)	Using Trapezoidal rule, evaluate $\int_0^2 e^{-x^2} dx$, by taking h = 0.25.	6M	CO1	L3
3(a)	Find $sin48^0$ using Newton's forward interpolation formula, given $sin45^0$= 0.7071, $sin50^0 = 0.7660$, $sin55^0$ = 0.8192, and $sin60^0 = 0.8660$.	6M	CO2	L3
(b)	Applying Lagrange's interpolation, find the unique polynomial of p(x) of degree two or less such that $p(1) = 1, p(3) = 27, p(4) = 64$.	6M	CO2	L3
	(OR)			
4(a)	Using Newton's Backward difference table find y(4.5) X 0 1 2 3 4 5 Y 0 1 16 8 256 62	6M	CO2	L3
(b)	For the given data evaluate f(9) by using Lagrange's interpolation x 5 7 11 13 17 f(x) 1500 392 145 236 5202	6M	CO2	L3
5(a)	Apply Taylor's method to solve the initial value problem $\frac{dy}{dx} = y - x, y(0) = 2$ and find y(0.1).	6M	CO3	L3
(b)	Use Runge - Kutta fourth order method to obtain solution to differential equation with y(0)=1, $y' = x^2 - y$ for x= 0.1.	6M	CO3	L3
	(OR)			
6(a)	Solve $y' = y + x, y(0) = 1$ by using Picard's method to find y(0.1).	6M	CO3	L3
(b)	Use Euler's method to approximate y when x=0.1, x=0.2 for $\frac{dy}{dx} = x + y^2$ where y=0 at x=0.	6M	CO3	L3
7(a)	Fit a straight line of the form y=a+bx from the following data x 1 2 3 4 5 y 14 27 40 55 68	6M	CO4	L3

(b)	Construct a parabola from the following data by the method of least squares x: 0, 5, 10, 15, 20, 25 y: 12, 15, 17, 22, 24, 30	6M	CO4	L3
	(OR)			
8(a)	For the following data, fit a least square curve of the form $y= ae^{bx}$ where a and b are constants x: 2, 4, 6, 8, 10 y: 4.007, 11.084, 30.128, 81.897, 222.62	6M	CO4	L3
(b)	Fit a second degree polynomial for the following data x: 10, 12, 15, 23, 20 y: 14, 17, 23, 25, 21	6M	CO4	L3
9(a)	Find the Fourier series to represent the function $f(x)=x^2$ in $-\pi < x < \pi$.	6M	CO5	L3
(b)	Express the function $f(x)=e^x$ as half – range cosine series on $0 < x < \pi$.	6M	CO5	L3
	(OR)			
10(a)	Find the Fourier transformation of $f(x)=\begin{cases}1, for\|x\|<1\\0, for\|x\|>1\end{cases}$ hence evaluate $\int_0^\infty \frac{\sin x}{x}dx$	6M	CO5	L3
(b)	Evaluate Fourier cosine transform of $f(x) = 5e^{-2x} + 2e^{-5x}$, $x > 0$	6M	CO5	L3

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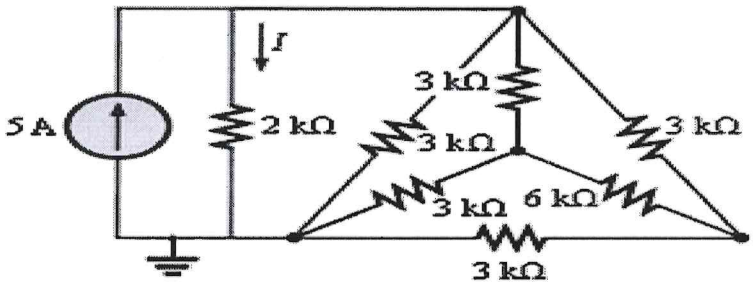
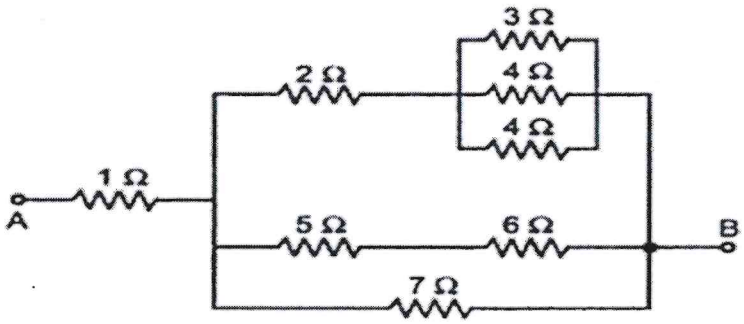
B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

17EE51-FUNDAMENTALS OF ELECTRICAL ENGINEERING
(CE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	(i) Differentiate Active and Passive elements. (ii) Tabulate V-I relationship across R,L,C elements.	6M	CO1	L1
(b)	Find the current I in the network of Fig. 	6M	CO1	L3
	(OR)			
2(a)	Analyze the equations for equivalent delta of star connected resistances.	6M	CO1	L4
(b)	Calculate the equivalent resistance between the two points A and B. 	6M	CO1	L3
3(a)	Define the following terms. (i) Instantaneous value (ii) Cycle (iii) Time period.	6M	CO1	L1
(b)	Derive the equation of RMS value of sinusoidal waveform.	6M	CO1	L2
	(OR)			
4(a)	Derive an expression for RMS value of a Sinusoidal voltage waveform.	6M	CO2	L3
(b)	A 100 volts ,50Hz supply is connected to a series RLC circuit If R=3Ω,L=4 Ω,C=3 Ω. Calculate (i) Find Z_T (ii) Draw impedance diagram (iii) Draw the current and voltage wave forms across R,L,C elements separately.	6M	CO2	L2

17EE51-FUNDAMENTALS OF ELECTRICAL ENGINEERING

5(a)	Mention the important parts of a transformer and explain them.	6M	CO2	L1
(b)	Derive the condition for maximum efficiency in a transformer.	6M	CO2	L1
	(OR)			
6(a)	Summarize working principle of single phase Transformer.	6M	CO2	L2
(b)	A 100 KVA Transformer ,11KV/500v,50Hz, number of turns in primary winding is 1100,then estimate the number of turns in secondary winding and also calculate primary current and secondary current.	6M	CO2	L3
7(a)	Briefly explain about distribution board system.	6M	CO3	L2
(b)	Discuss the factors affecting the selection of wiring system.	6M	CO3	L2
	(OR)			
8(a)	Explain Distribution Board System with neat sketch.	6M	CO3	L2
(b)	Explain about Electrical safety measures.	6M	CO3	L2
9(a)	State and Laws of Illumination.	6M	CO4	L2
(b)	Describe the Construction and Working Principle of Incandescent lamp.	6M	CO4	L2
	(OR)			
10(a)	Describe the Construction and Working Principle of Mercury Vapour lamp.	6M	CO4	L2
(b)	Discuss about Transport Lighting and mention the applications.	6M	CO4	L2

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

17FE03-ENVIRONMENTAL SCIENCE
(CSE,EIE,IT&ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What is meant by 'Population Explosion'? Discuss the Indian Scenario.	6M	CO1	L1
(b)	Describe the scope of environmental studies.	6M	CO1	L1
	(OR)			
2(a)	Analyse the consequences of global population growth.	6M	CO1	L2
(b)	Explain the modes of transfer of HIV/AIDS, its effects and the control measures.	6M	CO1	L2
3(a)	Identify the impacts of timber extraction on forests.	6M	CO2	L1
(b)	List out the advantages and disadvantages of solar energy.	6M	CO2	L1
	(OR)			
4(a)	Identify the environmental impacts of mining.	6M	CO2	L1
(b)	Mention the major causes for conflicts over water. Discuss one international and one inter-state water conflict.	6M	CO2	L1
5(a)	Give the structural components (biotic and abiotic components) of a forest ecosystem.	6M	CO3	L1
(b)	Find out the efforts taken towards conservation of biodiversity.	6M	CO3	L2
	(OR)			
6(a)	Discuss about the biotic and abiotic components of an ecosystem.	6M	CO3	L2
(b)	Comment up on Indian biodiversity with special reference as a mega diversity nation.	6M	CO3	L2
7(a)	Define an acid rain and explain its effects.	6M	CO4	L2
(b)	Identify the major causes of a flood. What are the measures to be taken to mitigate a flood disaster?	6M	CO4	L1
	(OR)			
8(a)	Define greenhouse effect. List out any five greenhouse gases.	6M	CO4	L1
(b)	What are the various alternatives adapted in municipal solid waste management?	6M	CO4	L1
9(a)	Discuss the salient features of Air Prevention and Control of Pollution Act, 1981.	6M	CO5	L1
(b)	What is EIA? And what are the major objectives of EIA?	6M	CO5	L2
	(OR)			
10(a)	Define consumerism. Summarize the ill effects of consumerism on environment.	6M	CO5	L2
(b)	List out the major objectives of Green Building.	6M	CO5	L1

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B.Tech. (III Semester) Supplementary Examinations

17EE02-ELECTRIC AND MAGNETIC FIELDS
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive Maxwell's first equation as applied to the electrostatics using Gauss's law.	6M	CO4	L2
(b)	Determine the field at a distance 'r' from an infinite line charge of strength of $+\rho_L$ c/m using Gauss's law.	6M	CO1	L3
	(OR)			
2(a)	State and Explain Coulomb's law for electrostatic fields in vector form.	6M	CO1	L1
(b)	Determine the electric field intensity at the point (0,0,5) due to charge Q_1=0.35 μC at the point (0,4,0) and charge Q_2=-0.55 μC at point (3,0,0).	6M	CO1	L3
3(a)	Explain and Derive the equation of Ohm's law in point form.	6M	CO2	L2
(b)	Deduce an expression for capacitance of a co-axial cable with inner radius 'a' and outer radius 'b' with length 'L'.	6M	CO2	L2
	(OR)			
4(a)	Derive Poisson's and Laplace's equations.	6M	CO2	L2
(b)	Derive the capacitance of a parallel plate capacitor.	6M	CO2	L3
5(a)	Show point form of Ampere's circuital law as Maxwell III equation.	6M	CO3	L1
(b)	Utilize Amperes Law, Determine $\bar{H}$ for infinitely sheet of current.	6M	CO3	L2
	(OR)			
6(a)	Find the magnetic field intensity due to solenoid conductor on its axis.	6M	CO3	L2
(b)	A uniform solenoid 100mm in diameter and 400mm long has 100turns of wire and a current of I = 3A .Find the magnetic field on the axis of the solenoid (i) at the center (ii) at on end (iii) half the way.	6M	CO3	L3
7(a)	Discuss in detail about Lorentz force equation and give its significance.	6M	CO3	L2
(b)	Derive the force between two parallel infinitely long straight conductors.	6M	CO3	L2
	(OR)			
8(a)	Formulate an expression for Neumann's formulae.	6M	CO3	L2
(b)	A Solenoid has 400 turns with a length of 2m having circular cross-section of 0.1m^2, find value of Self-Inductance.	6M	CO3	L3
9(a)	Derive the expression for displacement current density.	6M	CO5	L2
(b)	State and explain the Faraday's laws of electromagnetic induction.	6M	CO5	L2
	(OR)			
10(a)	Derive the Maxwell's equations for time varying fields.	6M	CO5	L3
(b)	State and prove Poynting theorem and derive an expression for Poynting vector.	6M	CO5	L2

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B.Tech. (III Semester) Supplementary Examinations

17AE02-ENGINEERING THERMODYNAMICS
(ASE)

Time: 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What is Quasi Static process, what are its characteristics?	6M	CO1	L2
(b)	An electric motor drives a stirrer fitted with a horizontal cylinder. The cylinder of 40 cm diameter contains a fluid restrained by a frictionless piston. During the stirring of fluid for 15 min the piston moves outward slowly by a distance of 30 cm against the atmospheric pressure of 1 bar. The current supplied to the motor is 0.5 amp. From a 24V lead-acid accumulator. If the conversion efficiency from electrical work to mechanical work output is 90%, estimate the work done on the motor, stirrer and the atmosphere.	6M	CO1	L3
	(OR)			
2(a)	Distinguish between macroscopic and microscopic point of view.	6M	CO1	L2
(b)	A new scale *N* of temperature is divided in such a way that the freezing point of ice is 100°N and the boiling point is 400°N. What is the temperature reading on this new scale when the temperature is 150°C? At what temperature both the Celsius and the new temperature scale reading would be the same?	6M	CO1	L3
3(a)	Discuss the contribution of Joule in formulating the first law of thermodynamics through his experiment.	6M	CO2	L2
(b)	1.5 kg of liquid having a constant specific heat of 2.5 kJ/kgK, is stirred in a well insulated chamber causing the temperature rise by 15^{0}C. Find the change in internal energy and work done during the process.	6M	CO2	L3
	(OR)			
4(a)	Apply first law of thermodynamics and prove that internal energy is a property of system.	6M	CO2	L3
(b)	A gas of 4 kg contained in a piston-cylinder machine. The gas undergoes a process for which $PV^{1.5}$ = C.The initial conditions are 3 bar, 0.1 m^3 and the final volume is 0.2 m^3. The specific internal energy of the gas decreases by 4.6 kJ/kg. There are no significant changes in potential energy and kinetic energy. Determine the net heat transfer for the process.	6M	CO2	L3
5(a)	From the first principles, derive the equation for change in entropy of ideal gas.	6M	CO3	L2

(b)	Two kg of water at 80°C is mixed adiabatically with 3 kg of water at 30°C in a constant pressure process atl atmosphere. Find the increase in the entropy of the total mass of water due to the mixing process ($c_p$of water = 4.187 kJ/kg K).	6M	CO3	L3
	(OR)			
6(a)	Establish the equivalence between Kelvin Planck and Clausius statements.	6M	CO3	L2
(b)	A refrigeration plant for a food store operates as a reversed Carnot heat engine cycle. The store is to be maintained at a temperature of – 5°C and the heat transfer from the store to the cycle is at the rate of 5 kW. If heat is transferred from the cycle to the atmosphere at a temperature of 25°C, calculate the power required to drive the plant.	6M	CO3	L3
7(a)	Discuss the phase change process of water by using Pressure (P)-Volume (V) diagram.	6M	CO4	L2
(b)	Calculate volume, density, enthalpy and entropy of 3 kg of steam at 90^{0}C, having a dryness fraction of 0.92.	6M	CO4	L4
	(OR)			
8(a)	Explain Mollier chart by representing all the properties on it.	6M	CO4	L2
(b)	A rigid vessel of volume 0.86 m^3 contains 1 kg of steam at a pressure of 2 bar. Evaluate the specific volume, temperature, dryness fraction, internal energy, enthalpy, and entropy of steam.	6M	CO4	L4
9(a)	With a neat sketch explain the working of Diesel cycle.	6M	CO5	L3
(b)	In an ideal Brayton cycle, air from the atmosphere at 1 atm. 300 k is compressed to 6 atm and the maximum cycle temperature is limited to 1100k by using a large air-fuel ratio. If the heat supply is 100 MW, find the thermal efficiency of the cycle and power output.	6M	CO5	L3
	(OR)			
10.	Describe the Bell-Coleman Cycle using PV and TS diagrams and derive an expression for its C.O.P.	12M	CO5	L3

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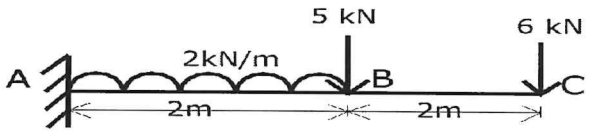
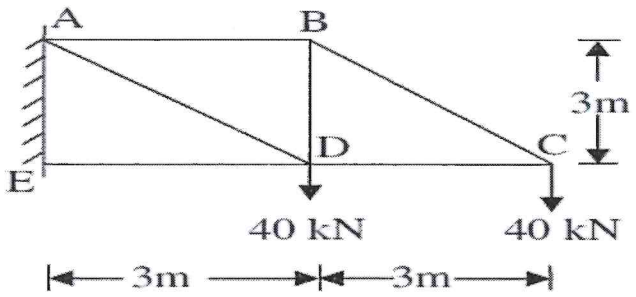
B.Tech. (III Semester) Supplementary Examinations

17CE04-STRENGTH OF MATERIALS-I
(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	A rod whose ends are fixed to rigid supports, is heated so that rise in temperature is T^0 C, Derive the expression for thermal strain and thermal stresses set up in the body if α is coefficient of thermal expansion.	6M	CO1	L1
(b)	Design a steel rod to sustain a load of 80kN with a safety factor 2.5. What is the maximum permissible length of the rod, if the allowable deformation is 0.5mm? Assume a yield stress of 230MPa and Young's modulus of 195GPa.	6M	CO1	L3
	(OR)			
2(a)	Define (i) Stress and Strain (ii) Bulk modulus and Modulus of Rigidity (iii) Hooke's Law.	6M	CO1	L1
(b)	A rectangular block 350 mm long, 100 mm wide and 80 mm thick is subjected to axial load as follows, 50 KN tensile in direction of length, 100KN compression in the direction of thickness, 60KN tension in direction of breadth. Determine the change in volume of block. Take $E=10x10^5$ N/mm^2. Poisson's ratio is 0.25.	6M	CO1	L3
3(a)	Draw the shear force and bending moment diagram for the beam. 	6M	CO2	L3
(b)	Deduce the relation between Shear force and bending moment.	6M	CO2	L2
	(OR)			
4(a)	Mention the types of beams based on various criteria.	6M	CO2	L2
(b)	Draw the shear force and bending moment diagrams for a cantilever beam of length 4 m if two anti-clockwise moments of 15 kNm and 10 kNm are applied at the mid-span and the free end, respectively.	6M	CO2	L3
5(a)	Compare the weights of two beams of the same material and of equal strength, one being circular section and solid, and the other being of hollow circular section, the internal diameter being 3/4th of the external diamete.	6M	CO3	L3
(b)	The maximum shear stress in a beam of rectangular section is 1.5 $\tau_{average}$. Judge the statement.	6M	CO3	L3
	(OR)			

6(a)	What are the assumptions made in theory of simple bending? Draw the bending stress and shear stress profiles for a rectangular beam section.	6M	CO3	L1
(b)	A cantilever beam is rectangular in section having 80 mm width and 120 mm depth. If the cantilever is subjected to a point load of 6 kN at the free end and the bending stress is not to exceed 40 MPa, find the span of the cantilever beam.	6M	CO3	L2
7(a)	Derive an expression for pure torsion $\frac{T}{J} = \frac{\tau}{r} = \frac{C\theta}{l}$	6M	CO4	L2
(b)	Find the maximum torque that can be safely applied to a shaft of 200 mm diameter if the permissible angle of twist is 10 in a length of 5 m and the permissible shear stress is 45 N/mm^2. Take N = 0.8 X 10^5 N/mm^2.	6M	CO4	L3
	(OR)			
8(a)	Differentiate between shafts series and shafts in parallel.	6M	CO4	L2
(b)	A solid steel shaft in a rolling mill transmits 20 kW of power at 2 Hz. Determine the smallest safe diameter of the shaft if the maximum shear stress (τ_{max}) is not to exceed 40 MPa and the angle of twist (θ) is limited to 6° in a length of 3 m. Use G = 83 GPa.	6M	CO4	L3
9.	Determine the forces in the various members of the truss shown in fig.2, using method of joints.  Fig.2	12M	CO5	L3
	(OR)			
10(a)	Derive an expression for longitudinal and hoop stresses for a thin cylinder of internal diameter 'd' and thickness 't' subjected to an internal pressure of magnitude 'p'.	6M	CO5	L2
(b)	A thick cylinder of internal diameter 160 mm is subjected to an internal fluid pressure of 8 N/mm^2. Compute the thickness of metal necessary for the cylinder, if the maximum hoop stress in the section is not to exceed 35 N/mm^2.	6M	CO5	L3

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B.Tech. (III Semester) Supplementary Examinations

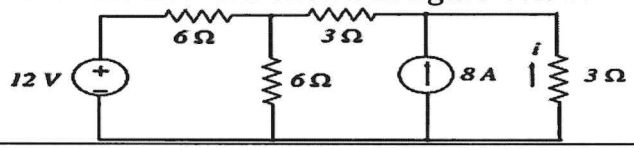
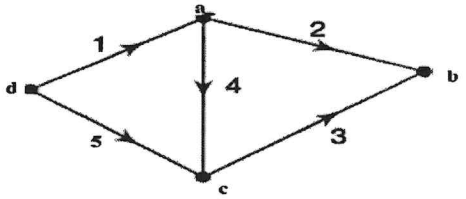
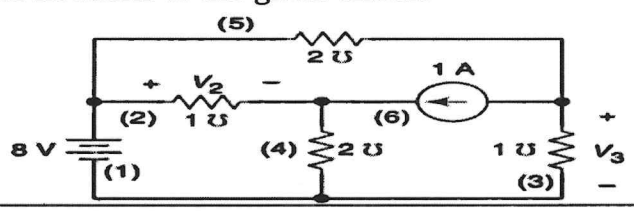
17EE03-NETWORK THEORY-I

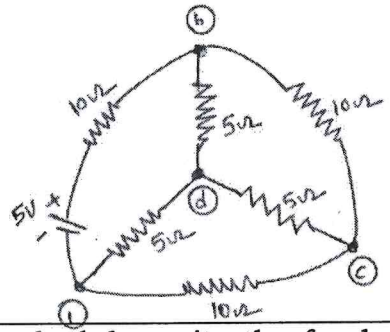
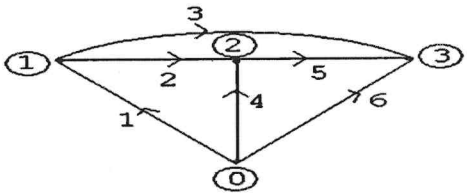
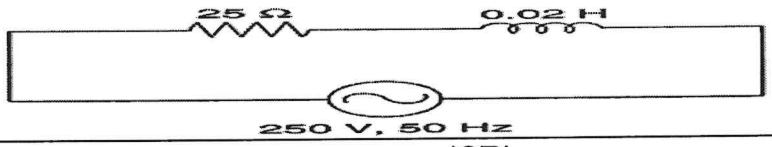
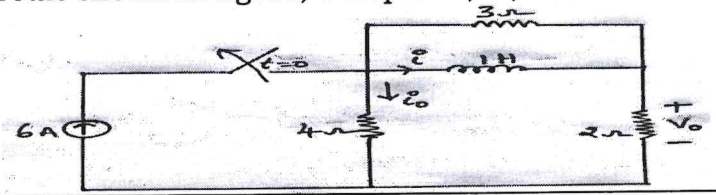
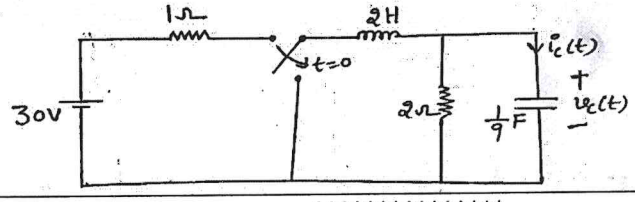
(EEE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain Linear and Non-linear elements and Active and passive elements with examples.	6M	CO1	L1
(b)	Derive the Star-Delta Transformations.	6M	CO2	L4
	(OR)			
2(a)	Summarize the procedure to calculate node voltages of an electrical network with ideal voltage source between any two nodes.	6M	CO1	L2
(b)	Apply mesh analysis and calculate the current flowing through 3 Ohms element for the network shown in figure below. 	6M	CO1	L3
3(a)	Explain self and mutual induced emfs in detail and derive the expression for coefficient of coupling.	6M	CO2	L1
(b)	Coils A and B with 50 and 500 turns respectively, are wound side by side on a closed iron circuit of section 50 cm^2 and mean length 1.2 m. Estimate (i) mutual inductance between the coils, (ii) self-inductance of each coil, and (iii) emf induced in coil B, when current in A grows steadily from 0 to 5amps in 0.01 s. (Assume relative permeability of iron as 1000 and Coe. of coupling (k) =1).	6M	CO2	L2
	(OR)			
4(a)	Explain the concept of DOT convention and state right hand thumb rule for coupled coils.	6M	CO2	L1
(b)	Two similar coils connected in series gave a total inductance of 600mH and when one of the coil is reversed, the total inductance is 300 mH. Determine the mutual inductance between the coils and coefficient of coupling.	6M	CO2	L2
5(a)	Develop cut-set schedule, write the fundamental cut-set matrix, and establish the node equations, branch voltages in terms of twig voltages to the given graph(Choose a tree with the branches 1,2,4). 	6M	CO1	L3
(b)	Draw the dual network to the given circuit 	6M	CO1	L3
	(OR)			

6(a)	For the given resistive network, Draw the graph and write the Incidence matrix and reduced incidence matrix. 	6M	CO1	L2
(b)	Develop tie-set schedule, write the fundamental tie-set matrix and establish the loop equations, branch currents in terms of loop currents to the given graph (Choose a tree with the branches 2,4,5). 	6M	CO1	L3
7(a)	Prove that pure capacitance when connected across an alternating source draws the currentleading over voltage by 90^0. Also show that power consumed by pure capacitance is zero.	6M	CO2	L2
(b)	A series RL circuit is shown in the figure. With resistance R=25Ω and inductance L=0.02H is connected across a 250V, 50Hz single-phase AC supply. Calculate (i) Impedance (ii) current (iii) Power factor (iv) Power 	6M	CO2	L3
	(OR)			
8.	For a series RLC circuit, derive the expressions for resonant frequency, Quality factor, Bandwidth and Half-power frequencies.	12M	CO2	L2
9(a)	For the circuit shown in figure, Compute i, io, and Vo for t>0 	6M	CO3	L3
(b)	Derive the charging and discharging voltage response of RC- parallel circuit and also plot the response curves.	6M	CO3	L4
	(OR)			
10(a)	Derive the charging and discharging current response of RL- series circuit and also plot the response curves.	6M	CO3	L4
(b)	Determine $V_C(t)$ and $i_C(t)$ for t>0 in circuit shown in below figure. 	6M	CO3	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (III Semester) Supplementary Examinations

17EC50-BASIC ELECTRONICS ENGINEERING

(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define mobility and conductivity of a material.	6M	CO1	L1
(b)	Summarize the types of semiconductors and mention the majority and minority carriers in it.	6M	CO1	L2
	(OR)			
2(a)	What is Energy Band Diagram? Classify materials based on Energy Bands.	6M	CO1	L2
(b)	Explain the current flow due to majority and minority carriers in semiconductors.	6M	CO1	L2
3(a)	Sketch the bridge rectifier circuit, analyze its operation when applied with a.c. input and mention the expressions for various parameters.	6M	CO2	L4
(b)	Evaluate the expression for ripple factor for a full wave rectifier using capacitor filter.	6M	CO2	L5
	(OR)			
4(a)	List out various types of Bipolar junction transistors. Sketch the symbols used for them and explain the functions of their terminals.	6M	CO2	L1
(b)	Illustrate the need of a filter in rectifiers and outline the expressions for ripple factor using various filters for a full wave rectifier	6M	CO2	L4
5(a)	Draw the circuit of voltage divider bias and explain its operation.	6M	CO2	L1
(b)	Relate the parameters α, β, γ of a transistor.	6M	CO2	L2
	(OR)			
6(a)	Evaluate the expression stability factor 'S' for a voltage divider bias circuit.	6M	CO2	L1
(b)	For a fixed bias circuit using silicon transistor V_{CC} = 10V R_B=100KΩ, R_C = 2KΩ, V_{BE} = 0.7V, V_{CE} = 4V, calculate the stability factors 'S', 'S^I' and 'S^{II}'.	6M	CO3	L2
7(a)	Draw a NAND logic diagram that implements the complement of the following function: F(A, B, C, D) = ∑(0, 1, 2, 3, 6, 10, 11, 14).	6M	CO4	L1
(b)	How are negative numbers represented? Represent signed numbers from +7 to -8 using different ways of representation.	6M	CO4	L2
	(OR)			
8(a)	Convert the following hexadecimal numbers to binary, octal numbers (i) $(357)_{16}$ (ii) $(3AF.21)_{16}$ (iii) $(ABCD.ABCD)_{16}$	6M	CO4	L2
(b)	Interpret two-input Ex-OR and Ex-NOR gates using NAND and NOR gates.	6M	CO4	L2
9(a)	Create the 8X1 multiplexer using logic gates and predict its functional operation.	6M	CO5	L3
(b)	Implement the S-R flip-flop with logic gates and create the functional and excitation table.	6M	CO5	L1
	(OR)			
10(a)	Develop a circuit that used to convert given four bit binary code into gray code.	6M	CO5	L3
(b)	Describe inverting summing amplifier circuit using IC-741 Op-amp.	6M	CO5	L1

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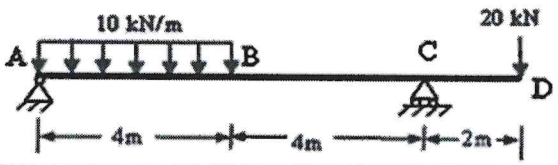
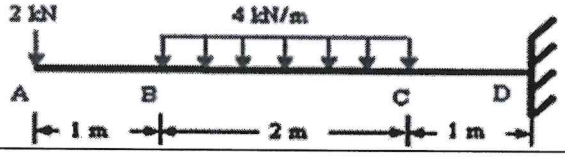
B.Tech. (III Semester) Supplementary Examinations

17AE03-STRENGTH OF MATERIALS
(ASE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define the following (i) Poisson's ratio (ii) modulus of rigidity. An elastic rod of 25 mm in diameter, 200 mm long extends by 0.25mm under a tensile load of 40Kn.Find the intensity of stress, strain and the elastic modulus for the material of the rod.	6M	CO1	L2
(b)	A reinforced concrete column is 300mm* 300mm in section. The column is provided with 8 bars of 20mm diameter. the column carries a load of 360kn.Find the stress in concrete and the steel bars. Take $E_S=2.1*10^5$ N/mm^2 and $E_C=0.14*10^5$ N/mm^2.	6M	CO1	L1
	(OR)			
2(a)	A string 4 mm in diameter has original length 2 m. The string is pulled by a force of 200 N. If the final length of the spring is 2.02 m, determine: (i) stress (ii) strain (iii) Young's modulus.	6M	CO1	L3
(b)	What will be the instantaneous stress and elongation of a 25 mm diameter bar, 2.6 m long, suspended vertically, if a mass of 10 kg falls through a height of 300 rnm onto a collar which is rigidly attached to the bottom end of the bar ? Take E = 200 GPa.	6M	CO1	L3
3(a)	Sketch the SFD and BMD. 	6M	CO2	L3
(b)	Sketch the SFD and BMD. 	6M	CO2	L3
	(OR)			
4.	A simply supported beam ABC with supports at A and B,6m apart and with an overhang BC 2 m long carries a UDL of 15KN/m over the whole length. Draw S.F.D and B.M.D.	12M	CO2	L3
5(a)	Derive theory of pure torsion equation $T/J = G\theta/L = \tau/r$.	6M	CO3	L3

(b)	Determine the diameter of a solid shaft which will transmit 90kW at 160 rpm if the shear stress in the shaft is limited to 60 N/mm^2. Find also the length of the shaft, if the twist must not exceed 1 degree over the entire length. Take $G = 8 \times 10^4 N/mm^2$.	6M	CO3	L3
	(OR)			
6(a)	Derive the section modulus for following. (i) Rectangular section (ii) Hollow rectangular section (iii) Solid Circular section (iv) Hollow circular section.	6M	CO3	L3
(b)	Calculate the maximum bending stress induced in the rectangular beam of 60mm wide and 150 mm deep is simply supported over a span 0f 6 m. The beam is subjected to central point load of 12 kN.	6M	CO3	L3
7.	A solid shaft of 150mm diameter transmits 1800Kw at 600 rpm and is also subjected to an axial thrust of 250KN.If the maximum principal stress is not to exceed $80N/mm^2$.Find what additional Bending moment may be safely carried. What will be the direction of the maximum principal stress?	12M	CO4	L3
	(OR)			
8(a)	A timber beam 100mm wide and 150mm deep supports a UDL over a span of 2m.If the safe stresses are $28N/mm^2$ longitudinally and $2N/mm^2$ in transverse shear. Calculate the maximum load which can be supported by the beam.	6M	CO4	L3
(b)	A, Cantilever of I section 30cm*15cm with a uniform thickness of flange and web equal to 3cm carries a UDL. Find the length of the cantilever if the maximum bending stress is 4 times the maximum shear stress.	6M	CO4	L3
9(a)	Distinguish between cylindrical shell and spherical shell, Derive a formula for the hoop stress in a thin spherical shell subjected to an internal pressure.	6M	CO5	L3
(b)	A spherical shell of 1 m diameter is subjected to a pressure of 2.4 Mpa. What is the stress induced in the vessel plate, if its thickness is 15 mm?	6M	CO5	L3
	(OR)			
10(a)	Derive the relation between slope, deflection and radius of curvature.	6M	CO5	L3
(b)	A simply supported beam of length L is subjected to a central load of W. Find the maximum slope and deflection of the beam.	6M	CO5	L3

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B.Tech. (III Semester) Supplementary Examinations

17EE04-DIGITAL LOGIC CIRCUIT DESIGN
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What is an XS-3 code? Obtain the XS-3 code for the decimal numbers 0 to 15.	6M	CO1	L2
(b)	Determine the Hamming code for the word 10111 with odd parity.	6M	CO1	L3
	(OR)			
2(a)	Determine the 1's and 2's complement of the following binary numbers. (i) 11100101 (ii) 0111000 (iii) 1010101 (iv) 011001	6M	CO1	L1
(b)	What is BCD code? How the BCD code can be represented for decimal numbers 0 to 15?	6M	CO1	L2
3(a)	Determine the canonical sum-of-products representation of the following functions: $f(x,y,z) = z + (x' + y)(x + y')$ $f(x,y,z) = x + (x'y' + x'z)'$	6M	CO2	L3
(b)	Find the minimal sum-of-products and minimal product-of-sums expressions for $f(w,x,y,z) = \prod(1,4,5,6,11,12,13,14,15)$	6M	CO2	L3
	(OR)			
4(a)	Find the complement of the following Boolean function and reduce to a minimum number of literals. B'D + A'BC' + ACD + A'BC.	6M	CO2	L2
(b)	What is positive and negative logic? Give one example of each.	6M	CO2	L2
5(a)	Design a combinational circuit for 3 bit magnitude comparator.	6M	CO3	L3
(b)	Implement Full Adder using PLA.	6M	CO3	L3
	(OR)			
6(a)	Design the logic diagram of 2-bit magnitude comparator.	6M	CO3	L3
(b)	Develop the logic diagram of 1×8 DEMUX using 1×4 DEMUX.	6M	CO3	L3
7(a)	Discuss the types of triggering methods of flip-flops.	6M	CO4	L3
(b)	Describe the working of buffer and controlled buffer registers.	6M	CO4	L2
	(OR)			
8(a)	Describe the operation of clocked D Flip-flop and derive its characteristic equation.	6M	CO4	L3
(b)	Illustrate the operation of buffer and controlled buffer registers.	6M	CO4	L2
9(a)	Illustrate the following terms (i) State box (ii) Decision box (iii) Conditional output box.	6M	CO5	L1
(b)	Draw the state diagram and ASM chart for Mod-6 Counter.	6M	CO5	L3
	(OR)			
10(a)	What are the limitations of finite state machine?	6M	CO5	L1
(b)	Explain standard form of mealy and moore sequential circuits.	6M	CO5	L3

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B.Tech. (III Semester) Supplementary Examinations

17ME03-THERMODYNAMICS
(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define zeroth law of thermodynamics. Show the relation between degree centigrade scale and Fahrenheit scale.	4M	CO1	L1
(b)	A temperature scale of certain thermometer is given by the relation t = a ln p + b, where a and b are constants and p is the thermometric property of the fluid in the thermometer. If at the ice point and steam point the thermometric properties are found to be 1.5 and 7.5respectively what will be the temperature corresponding to the thermometric property of 3.5 onCelsius scale.	8M	CO1	L3
	(OR)			
2(a)	Classify thermodynamic systems with neat diagrams.	6M	CO1	L1
(b)	Differentiate between intensive and extensive properties.	6M	CO1	L2
3.	Obtain the steady flow energy equation with assumptions and deduce the expressions for nozzle, turbine, compressor, and pump.	12M	CO2	L3
	(OR)			
4(a)	Explain the Joules equivalent of heat with diagram.	6M	CO2	L2
(b)	If a gas of volume 6000 cm^3 and at a pressure of 100 kPa is compressed quasi-statically according to $PV^2 = C$ until the volume becomes 2000 cm^3, determine the final pressure and the work transfer.	6M	CO2	L3
5(a)	Differentiate between heat engine, heat pump and refrigerator.	6M	CO3	L2
(b)	One kg of water at 273 K is brought in to contact with a heat reservoir at 373 K. When the water has reached 373 K.Determine the entropy change of water, heat reservoir and of the universe.	6M	CO3	L3
	(OR)			
6(a)	Establish the relation among efficiency of heat engine, COP of heat pump and refrigerator with neat sketch.	6M	CO3	L3
(b)	What is entropy? How second law of thermodynamics is connected to entropy.	6M	CO3	L1
7(a)	Why is water treated as a pure substance? Discuss it on usingvarious p-tplane surfaces?	6M	CO4	L2

(b)	Half kg Helium and half kg Nitrogen are mixed in a mixing chamber at 293 K and 100 kPa of total pressure. Calculate (i) mole fraction of components (ii) Volume fraction of components (iii) Volume of the mixture (iv) Partial Pressures of the components.	6M	CO4	L3
	(OR)			
8(a)	What is equation of state?	4M	CO4	L1
(b)	Find the enthalpy and entropy of steam when the pressure is 2 MPa and the specific volume is 0.09 m^3/kg.	8M	CO4	L3
9(a)	Show that the efficiency of the Otto cycle depends only on the compression ratio.	6M	CO5	L3
(b)	A Diesel engine has a compression ratio of 14 and cut-off takes place at 6% of the stroke. Find the air standard efficiency.	6M	CO5	L3
	(OR)			
10(a)	Define the term 'mean effective pressure' and how that could it be determined.	4M	CO5	L1
(b)	Describe the working of Otto cycle.	8M	CO5	L2

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B.Tech. (III Semester) Supplementary Examinations

17CE06-MECHANICS OF FLUIDS

(CE)

9, 25

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the following using neat sketches: (i) Pressure (ii) Rotational flow (iii) Incompressible flow.	6M	CO1	L2
(b)	A differential U-tube manometer is connected to two points A & B in a horizontal pipe carrying water. If the difference in mercury level in the two legs of manometer is 250mm of mercury, calculate the pressure difference between A and B.	6M	CO1	L3
	(OR)			
2(a)	Define hydrostatic pressure and using neat sketches. Prove that hydrostatic pressure is proportional to depth of fluid element.	6M	CO1	L2
(b)	A circular plate of 4m in diameter is placed vertically below the water surface such that the top edge is 2m below free water level. Calculate the total hydrostatic force on the plate and center of pressure.	6M	CO1	L3
3(a)	Liquids are often considered as incompressible while gases are considered as compressible flows. Justify.	6M	CO2	L2
(b)	In a two-dimensional flow, the velocity components are given as: $u = 2x - x^2y + (y^3/3)$, $v = xy^2 - 2y - (x^3/3)$. Check for the possibility of flow and calculate the magnitude of velocity at (1, 2).	6M	CO2	L3
	(OR)			
4(a)	Discuss the Lagrangian and Eulerian methods of fluid flow with neat sketches.	6M	CO2	L2
(b)	The velocity components in a three-dimensional flow are: $u = x^2 + y^2z^3$, $v = -(xy + yz + zx)$. Determine the missing component of velocity distribution such that continuity equation is satisfied.	6M	CO2	L3
5(a)	Illustrate the following (i) Venturimeter (ii) Orifice meter.	6M	CO3	L3
(b)	Explain the momentum equation and mention some of its engineering applications. Explain any one application of momentum equation.	6M	CO3	L2
	(OR)			
6(a)	Develop the Bernoulli's equation of motion along a stream line and list out limitations of Bernoulli's equation.	6M	CO3	L5
(b)	A right angled V-notch is used for measuring a discharge of 30 l/s. an error of 2mm was made in measuring the head over the notch. Determine the percentage error. Take Cd=0.62.	6M	CO3	L3
7(a)	Describe with neat sketch the Reynold's experiment and define Laminar and Turbulent flow.	6M	CO4	L2
(b)	At a sudden enlargement of a water main from 240 mm to 480 mm diameter, the hydraulic gradient rises by 10 mm. Predict the rate of flow.	6M	CO4	L3
	(OR)			
8(a)	Explain pipes in series and pipe in parallel with a neat sketch. Also write about Hydraulic Gradient line and Total energy line.	6M	CO4	L2
(b)	Discuss the minor losses in pipe in series and parallel.	6M	CO4	L2
9(a)	Define and explain the following: (i) Scale ratios (ii) Advantages of model testing.	6M	CO5	L2
(b)	Explain the procedure of dimensional analysis using Buckingham π-theorem.	6M	CO5	L2
	(OR)			
10(a)	Derive Euler's number and Weber number and state their applications of usage in fluid mechanics.	6M	CO5	L2
(b)	Justify the need for conducting dimensional analysis using suitable example.	6M	CO5	L4

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B.Tech. (III Semester) Supplementary Examinations

17EC07-PULSE AND SWITCHING CIRCUITS
(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	A symmetrical square wave of amplitude ±0.5V and frequency 2 kHz is impressed on an RC low-pass circuit. If R=5KΩ, c=0.1μf, Illustrate and plot the steady-state output with respect to time.	6M	CO1	L3
(b)	Obtain the output equation of a high pass RC circuit when the pulse input is applied and also sketch the all input and output waveforms.	6M	CO1	L3
	(OR)			
2(a)	Examine the response of RC low pass circuit applied with a ramp signal as input and obtain the expression for transmission error.	6M	CO1	L3
(b)	A 1 KHZ square wave output from an amplifier has a rise time t_r =350 ns and tilt=50%. Determine the upper and lower 3-dB frequencies.	6M	CO1	L3
3(a)	Design a diode clamper to restore a dc level of +10 V to an input signal of peak to peak value 15 V. Assume the drop across the diode is 0.7 V and the signal frequency is 2 kHz.	6M	CO2	L3
(b)	A 100V peak square wave with an average value of 0V and a period of 20ms is to be negatively clamped at 25V. Plan the input and output waveforms and necessary circuit diagram.	6M	CO2	L3
	(OR)			
4(a)	Model the necessary slicing circuit and output wave form for the expected square wave between -2V to -5V when a sinusoidal input is given of voltage 10V.	6M	CO2	L3
(b)	Choose the negative peak clipping below -5V and make use of the concept of shunt clipper circuits and draw the required circuit diagram. Also draw the transfer characteristics.	6M	CO2	L3
5(a)	Explain how a BJT can be used as switch. Explain Turn-ON and Turn-OFF times of the switching transistor with the help of relevant waveforms.	6M	CO3	L2

(b)	Draw and explain the working of a self bias bistable multivibrator. List the advantages of this circuit over a fixed bias bistable multivibrator.	6M	CO3	L3
	(OR)			
6(a)	Demonstrate the switching times of transistor.	6M	CO3	L2
(b)	Explain the operation of self-biased transistor binary.	6M	CO4	L3
7(a)	If V_{CC} is large compared with the junction voltages in a collector-coupled one-shot , prove that the gate width is given by $\mathbf{T \approx \tau \ln 2 + \{\tau/2Vcc\ [2Vr - V_{BE}(sat) - V_{CE}(sat)]\}}$ and $\mathbf{\Delta T/T = (2\ \Delta Vr - \Delta V_{BE}(sat) - \Delta V_{CE}(sat))/1.38V_{CC}}$.	6M	CO4	L5
(b)	With the help of a neat circuit diagram and wave forms, explain the working of an astablemultivibrator and also derive an expression for the frequency of oscillation of an astablemultivibrator.	6M	CO4	L2
	(OR)			
8(a)	Discuss in detail the role of discriminator levels V_1 and V_2 in an emitter coupled binary. And also explain briefly to calculate discriminator levels with suitable circuit diagrams.	6M	CO4	L4
(b)	A collector-coupled monostable multivibrator is to operate from a $\pm$ 12 V supply. Transistor collector currents are to be 3 mA, and the transistors used have $h_{FE(min)} = 70$. Design a suitable circuit to give an output pulse width of 330 µsec.	6M	CO4	L3
9(a)	Why pedestal is seen in the output of a sampling gate and explain how it can be reduced?	6M	CO5	L2
(b)	Contrast how the sampling gates are differing from the general logic gates and explain the basic principle of sampling gate.	6M	CO5	L2
	(OR)			
10(a)	Define Sweep Speed Error $\mathbf{e_s}$, Transmission $\mathbf{e_t}$ and Sweep Deviation Error $\mathbf{e_d}$ and give their relationship.	6M	CO5	L2
(b)	Describe the principle of operation of UJT. Also explain why UJT has a negative resistance region.	6M	CO5	L2

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L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.::A.P.

B.Tech. (III Semester) Supplementary Examinations

17CI05-DATA STRUCTURES
(CSE&EEE)

Time: 3 hours | Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Design functions to subtract 2 polynomials.	6M	CO1	L3
(b)	Write a program to implement list using arrays.	6M	CO1	L3
	(OR)			
2(a)	What are the differences between singly linked list and doubly linked list?	6M	CO1	L2
(b)	Give any two advantages and disadvantages of doubly linked list with an example.	6M	CO1	L3
3(a)	What are the applications of stack? Explain one of them.	6M	CO2	L2
(b)	Where stack is used in real world?	6M	CO2	L2
	(OR)			
4(a)	Write an algorithm for evaluating postfix expression.	6M	CO2	L2
(b)	Classify the types of Deque.	6M	CO2	L2
5(a)	Why merge sort needs extra space? Explain it with an example.	6M	CO3	L3
(b)	Which process is used in merge sort? Explain it with an example.	6M	CO3	L3
	(OR)			
6(a)	Write an algorithm for linear search. Discuss all test cases.	6M	CO3	L2
(b)	What are the best case and worst case for quicksort? Explain it with one example.	6M	CO3	L3
7(a)	How many binary trees are possible with 3 nodes?	6M	CO4	L2
(b)	How does a binary tree different from a binary search tree? Explain it with an example.	6M	CO4	L3
	(OR)			
8(a)	Write a program for recursive and non-recursive post-order traversal of binary search tree (BST).	6M	CO4	L2
(b)	Construct binary tree for { 1, 3, 14, 13, 5, 17, 6, 8, 9 } and display elements by using post-order traversal.	6M	CO4	L3
9(a)	Explain DFS and BFS with suitable examples.	6M	CO5	L2
(b)	Is hashing reversible? If no, Justify your answer.	6M	CO5	L2
	(OR)			
10(a)	Which is the best algorithm for graph traversal? Why?	6M	CO5	L2
(b)	What are the issues in hashing? Which problems can be solved by using hashing?	6M	CO5	L2

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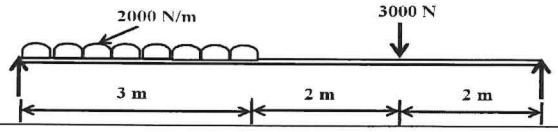
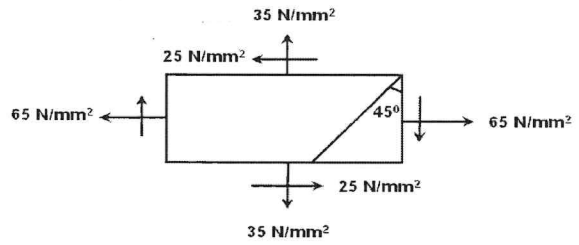
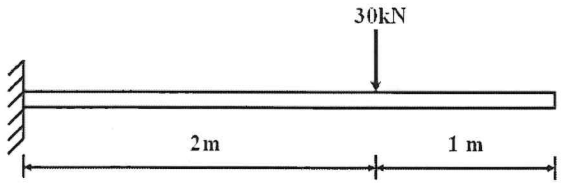
B.Tech. (III Semester) Supplementary Examinations
17ME04-MECHANICS OF SOLIDS
(ME)

9.12.25

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No.	Questions	Marks	CO	BL
1(a)	A rod is 2000mm long at a temperature of 10^0C. Determine the expansion of the rod, when the temperature is raised to 80^0C. If this expansion is prevented, evaluate the stresses induced in the material of the rod. Take E=2x10^5N/mm^2 and linear expansion of the material α=0.000012 per degree centigrade. Also state the nature of stress set up.	6M	CO1	L2
(b)	A composite tube consists of a steel tube 150mm internal diameter and 10mm thickness and an outer brass tube 170mm internal diameter and 10mm thickness. The two tubes are of the 150mm length. The compound tube carries an axial load of 1000kN. Determine (i) Stress in the tubes (ii) Load carried by each tube and (iii) Amount of change in length. Take E_s=2x10^5N/mm^2 and E_b=1x10^5N/mm^2.	6M	CO1	L3
	(OR)			
2(a)	Deduce the relationship between modulus of elasticity and modulus of rigidity.	6M	CO1	L2
(b)	A steel bar 3 m long, 30 mm breadth and 15 mm thick is subjected to a pull 30 kN in the direction of its length. Find the change in length, breadth and thickness. Take E=2x10^5 N/mm^2 and Poisson's ratio=0.3.	6M	CO1	L3
3(a)	Deduce the relationship among load, shear force and bending moment.	6M	CO1	L2
(b)	A cantilever beam of length 2m carries a point load of 1kN at its free end and another load of 2kN at a distance of 1m from the free end. Draw the shear force and bending moment diagrams for the cantilever beam.	6M	CO1	L4
	(OR)			
4.	Draw the shear force and bending moment diagrams for the simply supported beam as shown in figure.  	12M	CO2	L3
5(a)	A cantilever of length 2 meter fails when a load of 2000N is applied at the free end. If the section of the beam is 40mm x 60mm, find the stress at the failure.	6M	CO3	L3
(b)	A rectangular beam 200mm deep and 300mm wide is simply supported over a span of 8m. What uniformly distributed load per meter the beam may carry, if the bending stress is not to exceed 120N/mm^2.	6M	CO3	L3
	(OR)			

6(a)	In a hollow circular shaft of outer and inner diameters of 200mm and 100mm respectively. Estimate the maximum torque which the shaft can safely transmit if the shear stress is not to exceed 40 N/mm^2.	6M	CO3	L3
(b)	Find the maximum shear stress induced in a solid circular shaft of diameter 150mm when the shaft transmits 150kW power at 180r.p.m.	6M	CO3	L3
7(a)	The principal stresses at a point in a bar are 200N/mm^2 (tensile) and 100N/mm^2 (compressive). Determine the resultant stress in magnitude and direction on a plane inclined at 60^0 to the axis of the major principal stress.	6M	CO4	L2
(b)	A point in a strained material is subjected to stresses shown in figure. Evaluate the magnitude and directions of principal stresses and maximum shear stress. Check the answer analytically.  	6M	CO4	L3
	(OR)			
8(a)	Prove that the maximum shear stress in a circular section of a beam is 4/3 times the average shear stress.	6M	CO4	L2
(b)	A rectangular beam 100mm wide is subjected to a maximum shear force of 100kN. Estimate the depth of the beam if the maximum shear stress is 6N/mm^2.	6M	CO4	L3
9(a)	Compute the maximum slope and maximum deflection of the cantilever shown in figure. Take E=2.1x$10^5$$N/mm^2$ and I=2x$10^8$$mm^4$.  	6M	CO5	L3
(b)	A rectangular simply supported beam of span 3m and cross section 200mm x 300mm carries a point load of 100kN at its mid span. Find the maximum slope and deflection of the beam if E=0.2x$10^5$$N/mm^2$.	6M	CO5	L3
	(OR)			
10(a)	A cylinder of internal diameter 0.5m contains air at a pressure of 7N/mm^2. If the maximum permissible stress induced in the material is 80N/mm^2, estimate the thickness of the cylinder.	6M	CO5	L3
(b)	A thick cylinder of internal diameter 160mm is subjected to an internal fluid pressure of 8N/mm^2. Compute the thickness of metal necessary for the cylinder, if the maximum hoop stress in the section is not to exceed 35N/mm^2.	6M	CO5	L3

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B.Tech. (III Semester) ~~Regular~~/Supplementary Examinations

17CE07-CONCRETE TECHNOLOGY

(CE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe the steps for the manufacturing of cement by wet process.	6M	CO1	L2
(b)	Mention various types of cement, indicating briefly the purpose of each type.	6M	CO1	L2
	(OR)			
2(a)	Discuss the role of C_3S, C_2S C_3A and C_4AF in properties of cement.	6M	CO1	L2
(b)	Discuss the qualities of water to be used in concrete making.	6M	CO1	L2
3(a)	Demonstrate how do you measure the workability by using slump cone test with sketch.	6M	CO2	L3
(b)	Discuss the importance of compressive strength, tensile strength of concrete.	6M	CO2	L2
	(OR)			
4(a)	Describe segregation and bleeding of concrete.	6M	CO2	L2
(b)	Enumerate different types of shrinkage, with factors influencing it.	6M	CO2	L1
5(a)	Discuss how quality control of concrete is achieved during construction.	6M	CO3	L2
(b)	Describe the types of super plasticizers, their chemical composition difference and their effects in concrete.	6M	CO3	L1
	(OR)			
6(a)	Describe the factors affecting the properties of fibre reinforced concrete.	6M	CO3	L2
(b)	Name the various types of plasticizers used in concrete and discuss the action in detail.	6M	CO3	L1
7(a)	Define light weight concrete and explain the classification of lightweight concrete.	6M	CO4	L1
(b)	Discuss in detail self-compacting concrete.	6M	CO4	L2
	(OR)			
8(a)	Describe light weight aggregate concrete and it's applications.	6M	CO4	L1
(b)	Discuss the following terms (i) Shotcrete (ii) Polymer concrete.	6M	CO4	L2
9.	Design M40 grade concrete for the following data: Maximum nominal size of aggregate - 20 mm(angular) Type of cement = OPC 43, Degree of workability, slump of concrete - 100 mm, Type of exposure – severe, Chemical admixture - super plasticizer Test data for concrete making materials Specific gravity: cement = 2.88, coarse aggregate = 2.74, fine aggregate = 2.65 chemical admixture = 1.14 Water absorption: Coarse aggregate = 0.5% Fine aggregate=1%, Sand is conforming to zone II. Assume any data required.	12M	CO5	L3
	(OR)			
10(a)	Discuss the design procedure of ACI method.	6M	CO5	L3
(b)	Differentiate between, 'Nominal mix' and 'Design mix'.	6M	CO5	L2

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B.Tech. (III Semester) Supplementary Examinations

17EE05-POWER GENERATION AND UTILIZATION
(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Draw a neat diagram of storage type hydro-electric power plant and describe the function of each component used in the plant.	6M	CO1	L3
(b)	Give the comparison between steam, hydro-electric power plants.	6M	CO1	L2
	(OR)			
2(a)	How the hydel plants are classified? With a neat sketch, explain pump storage plants for peak load.	6M	CO1	L2
(b)	Draw schematic arrangement of Thermal power station and describe energy conversion process of it.	6M	CO1	L2
3(a)	Illustrate with a neat sketch the various parts of a nuclear reactor.	6M	CO2	L2
(b)	Demonstrate the factors for the choice of site for a nuclear power plant.	6M	CO2	L2
	(OR)			
4(a)	Describe with layout the working of solar Photo Voltaic (PV) power plant.	6M	CO2	L2
(b)	Draw Schematic diagram of simple gas turbine power plant and state any 2 applications of Gas turbine Power Plant.	6M	CO2	L2
5.	Explain different types of tariffs.	12M	CO3	L3
	(OR)			
6(a)	Define load curve, load duration curve and integrated load duration curve.	6M	CO3	L2
(b)	Calculate annual bill of a consumer whose maximum load is 100KW, power factor is 0.8 lagging and load factor is 60%. The tariff used is Rs75 per KVA of maximum demand plus 15 paise per Kwh consumed.	6M	CO3	L3
7(a)	Explain the construction and working of Mercury Vapour lamp with neat sketch.	6M	CO4	L2
(b)	Write short notes on the following (i) Street lighting (ii) Flood lighting.	6M	CO4	L3
	(OR)			
8(a)	Define the following terms (i) MSCP (ii) Co-efficient of utilization (iii)Illumination (iv) Luminous Intensity.	6M	CO4	L2
(b)	Write short notes on polar curves.	6M	CO4	L3
9(a)	Describe various welding processes.	6M	CO5	L2
(b)	Give the comparison between AC and DC welding.	6M	CO5	L3
	(OR)			
10(a)	Illustrate direct resistance heating with neat sketch.	6M	CO4	L2
(b)	What is electric welding? What are the methods of electric welding, discuss any one method?	6M	CO4	L1

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B.Tech. (III Semester) Supplementary Examinations

17ME05-METALLURGY AND MATERIAL SCIENCE
(ASE&ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Construct and explain Closed packed hexagonal structure.	6M	CO1	L3
(b)	Identify the Hume Rothary rules and explain.	6M	CO1	L3
	(OR)			
2(a)	Define atomic packing factor and calculate packing factor for B.C.C structure.	6M	CO1	L2
(b)	Explain the importance of alloying element in metals with examples.	6M	CO1	L2
3(a)	Differentiate between eutectic and partial eutectic systems.	6M	CO2	L2
(b)	Construct and describe Cu-Ni equilibrium diagram.	6M	CO2	L2
	(OR)			
4(a)	Describe the classification of equilibrium diagrams.	6M	CO2	L2
(b)	Derive the lever rule as applied to equilibrium diagrams.	6M	CO2	L2
5(a)	Discuss the necessity of Aluminum alloys over plain Aluminum and write about Al alloys designation.	6M	CO3	L4
(b)	Differentiate Brass and Bronze.	6M	CO3	L5
	(OR)			
6(a)	Differentiate White cast iron and Malleable cast iron with respect to their structure, properties and applications.	6M	CO3	L4
(b)	Why the machine tool beds are manufactured from Grey Cast Iron? Explain.	6M	CO3	L5
7(a)	What test is used for determining the hardenability of steels? Explain.	6M	CO4	L3
(b)	With the help of TTT diagram explain how the bainite is formed.	6M	CO4	L2
	(OR)			
8(a)	Enumerate and explain the stages of heat treatment process.	6M	CO4	L2
(b)	Explain the effect of cold working and hot working process on material properties.	6M	CO4	L2
9(a)	What is the Rule of mixture? Derive an equation for the modulus of Elasticity of the Composite in the terms of Elastic modulie of the matrix and the fiber material.	6M	CO5	L2
(b)	Explain in detail about the Ceramic Matrix Composites.	6M	CO5	L2
	(OR)			
10(a)	Explain in details about the General Characteristics of C-C Composites.	6M	CO5	L2
(b)	Describe with a suitable sketch the SMC process employed for manufacturing of FRP composites.	6M	CO5	L2

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