



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. (VI Semester) (R17) Semester End Examinations (Supplementary) - October 2025 (2018, 2019 Regular admitted batches and 2020 Lateral Entry admitted batch only)

R17

TIME TABLE

Time: 02.00 PM to 05.00 PM**A.Y. 2025-26**

Branch	24-10-2025 (Friday)	25-10-2025 (Saturday)	27-10-2025 (Monday)	28-10-2025 (Tuesday)	29-10-2025 (Wednesday)	30-10-2025 (Thursday)	31-10-2025 (Friday)
					Program Elective - II	Open Elective - I	Add on Course - II
ASE	17AE16 - Propulsion -II	17AE17 - Aircraft Structures-II	17AE18 - Flight Dynamics	17AE19 - Finite Element Methods in Engineering	17AE23 - Space Mechanics	17MB80 - Industrial Engineering and Management	17AE91 Industrial Aerodynamics
CE	17CE20 - Design of Steel Structures	17CE21 - Irrigation and Water Resources Engineering	17CE22 - Water and Waste Water Engineering	17CE23-Geo Technical Engineering - II	17CE26 - Construction Techniques and Equipment Planning 17CE25 - Railways, Airport Planning and Harbour Engineering	17MB80 - Industrial Engineering and Management	17CE91 Low Cost and Eco-Friendly Building Technology
CSE	17CS05 - Android Technologies	17CI16 - Data Mining and Data Warehousing	17CI17 - Data Communications and Computer Networks	17EC22 - Microprocessors and Microcontrollers	17CS08 - PHP Programming	17MB80 - Industrial Engineering and Management	17CS91 Software Testing Methodologies
ECE	17EC20 - Linear Control Systems	17CI07 - OOPs through Java	17EC21 - Antenna and Wave Propagation	17EC22 - Microprocessors and Microcontrollers	17EC25 - Cellular and Mobile Communications	17MB80 - Industrial Engineering and Management	17EC91 Telecommunication Switching Systems and Networks
EEE	17EE17 - Analog and Digital Signal Processing	17EE18 - Power System Analysis	17EE19 - Power Electronics	17EE20 - Measurements and Instrumentation	17EC29 - Embedded System Design	17MB80 - Industrial Engineering and Management	17EE91 Electrical Reliability Engineering
EIE	17EI10 - Process Control Instrumentation	17EI11 - Bio Medical Instrumentation	17EC10 - Digital Signal Processing	17EI12 - Opto Electronics and Laser Instrumentation	17EI13 - Virtual Instrumentation	17MB80 - Industrial Engineering and Management	17EI91 Remote Sensing
IT	17CI20 - Information Security	17CI16 - Data Mining and Data Warehousing	17IT03 - R Programming	17CI15 - Automata Theory and Compiler Design	17IT05 - Object Oriented Software Engineering 17CI24 - Image Processing	17MB80 - Industrial Engineering and Management	17IT91 Network Programming
ME	17ME20 - Heat Transfer	17ME21 - Mechanical Engineering Design - II	17ME22 - CAD/CAM	17ME23 - Finite Element Analysis	17ME26 -Modern Machining Processes 17ME24 - Automobile Engineering	17MB81 - Project Management 17MB82-Logistics and Supply Management	17ME91 Design of Experiments

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

Date: 06-10-2025**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. (VI Semester) ~~Regular~~/Supplementary Examinations

17EE17-ANALOG AND DIGITAL SIGNAL PROCESSING

(EEE)

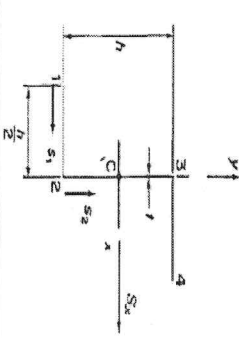
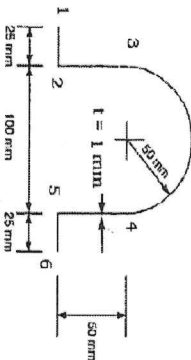
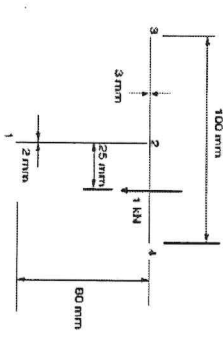
Time : 3 hours

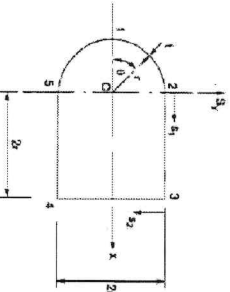
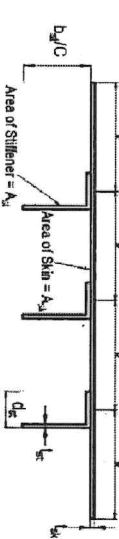
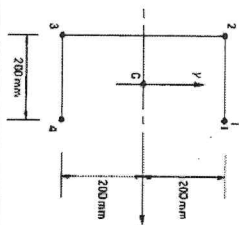
Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Give the mathematical expression for unit step and unit impulse signal and provide the relationship between them.	6M	CO1	L2
(b)	Check whether or not each of the following signals is periodic $i) x_1[n] = u[n] + u[-n]$ $ii) x_2[n] = e^{j0.2n\pi} + e^{-j0.3n\pi}$	6M	CO1	L3
(OR)				
2(a)	Briefly explain the properties of Stability, Static and Time invariance of the systems.	6M	CO1	L2
(b)	Examine the linearity and time variance property of the following system (i) $\cos[x(n)]$ (ii) $nx[n]$	6M	CO1	L3
3(a)	Evaluate the 8-point DFT for the given $x(n) = 2^n$ using DIT-FFT algorithm.	6M	CO2	L3
(b)	Use concentric circle method to perform the circular convolution of $x_1(n) = \{1,2,2,1\}$; $x_2(n) = \{1,2,3,1\}$.	6M	CO2	L3
(OR)				
4(a)	Solve the 8-point DFT of the sequence $x(n) = \{0,1,2,3,4,5,6,7\}$ using DIF-FFT algorithm.	6M	CO2	L3
(b)	Calculate the DFT of a sequence $(-1)^n$ for $N=4$.	6M	CO2	L3
5(a)	Illustrate how the analysis of discrete time invariant system can be obtained by using convolution properties of the Z- Transform.	6M	CO3	L2
(b)	Find out the Z-transform for the following discrete time sequence $x(n) = kn, n \geq 0$.	6M	CO3	L3
(OR)				
6(a)	Show that the magnitude response of FIR system is symmetric when impulse response is symmetric and N is odd.	6M	CO3	L2
(b)	Realize the following filter function using the direct form-I and II realization $y(n) = 0.251y(n-1) + 0.05y(n-2) + x(n) + 3x(n-1) + 2x(n-2)$.	6M	CO3	L2
7(a)	Write the procedure for design of low pass digital Chebyshev IIR filter with necessary equations.	6M	CO4	L3
(b)	Draw the magnitude response of Butterworth filters and Chebyshev filters and write the differences between Butterworth and Chebyshev filters.	6M	CO4	L2
(OR)				
8(a)	Illustrate how analog filter transfer function is transformed to digital filter transfer function using impulse invariant transformation.	6M	CO4	L2
(b)	For the analog transfer function, $H(s) = \frac{2}{s^2+3s+2}$, determine $H(z)$ using impulse invariant transformation if $T=1$ sec.	6M	CO4	L3
9(a)	Discuss the characteristics of Hamming and Hanning window techniques with necessary equations and sketches.	6M	CO4	L3
(b)	Design a bandpass filter to pass frequencies in the range 1 to 2 rad/sec using hanning window, with $N=5$.	6M	CO4	L3
(OR)				
10(a)	Design an FIR low pass filter using Hanning windows with pass band gain of 1dB, cutoff frequency of 400Hz, sampling frequency of 1 kHz. Assume the length of the impulse response as 7.	6M	CO4	L3
(b)	Summarize the process of inverse discrete wavelets transform computation by filter banks.	6M	CO4	L2

<p>(b) Determine the shear flow distribution in the thin-walled Z-section shown in Figure due to a shear load S_x applied through the shear center of the section. Take $I_{xx} = h^3t/3$, $I_{yy} = h^3t/12$, $I_{xy} = h^3t/8$.</p> 	6M	CO2	L3
(OR)			
<p>4(a) Determine the shear center for the circular section of radius r, and thickness t has a narrow slit.</p> <p>(b) Determine the position of the shear flow in a plane 5-6 and 5-4 of the cold-formed, thin-walled section is subjected to a shear load $S_x = 500$ N through the shear center of the cross-section shown in Figure. The thickness $t = 2$ mm of the section is constant throughout. $I_{yy} = 6.44 \times 10^5 \text{ mm}^4$.</p> 	6M	CO2	L3
<p>5(a) Derive the relation for torsion of thin-walled closed section beams (Bredt-Batho Theory).</p> <p>(b) Determine the maximum shear stress in the beam section shown in Figure stating clearly the point at which it occurs. Determine also the rate of twist of the beam section if the shear modulus G is $25\,000 \text{ N/mm}^2$.</p> 	6M	CO3	L3
(OR)			
<p>6(a) Define shear flow and discuss shear flow in closed sections.</p>	6M	CO3	L1

<p>(b) Determine the shear flow distribution in the walls of the thin-walled closed section beam shown in Figure; the wall thickness, t, is constant throughout. Take $I_{xx} = 6.24tr^3$ and $q_{s,0} = 0.325y/r$.</p> 	6M	CO3	L3
<p>7(a) Discuss the load-carrying capabilities of stressed skin.</p> <p>(b) A panel, comprising flat sheet and uniformly spaced angle section stringers, a part of whose cross-section is shown in Figure is to be investigated for strength under uniform compressive loads in a structure in which it is to be stabilized by frames a distance l apart, l being appreciably greater than the spacing b. State the modes of failure which you would consider and how you would determine appropriate limiting stresses.</p> 	6M	CO4	L2
(OR)			
<p>8(a) List the applications of thin plates in aircraft structures.</p> <p>(b) A plate 10 mm thick is subjected to bending moments M_x equal to 10 N m/mm and M_y equal to 5 N m/mm. Calculate the maximum direct stresses in the plate.</p>	6M	CO4	L1
<p>9(a) Describe the principle of structural idealization.</p> <p>(b) The singly symmetrical channel section shown in Figure has been idealized into an arrangement of direct stress-carrying booms; the boom areas are all 350 mm². Calculate the direct stresses in the booms when the section is subjected to a bending moment of 150 kN m in a vertical plane.</p> 	6M	CO5	L2
(OR)			
<p>3 of 4</p>			

25 OCT 2025

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

B.Tech. (VI Semester) Regular/Supplementary Examinations

17CI07-OOPS THROUGH JAVA

(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)	Explain Control statements in JAVA with suitable examples.	6M	CO1	L1
(b)	What would result if an expression consists of various operators with different priority? Illustrate with an example.	6M	CO1	L1
(OR)				
2(a)	How would you classify Primitive data types of JAVA Illustrate with suitable examples?	6M	CO1	L3
(b)	Develop a JAVA method that returns 'Hello' for multiples of three and 'Hai' for the multiples of five. For numbers which are multiples of both three and five return 'HelloHai'. For numbers that are neither, return the input number.	6M	CO1	L3
3(a)	Illustrate Constructor overloading in JAVA with an example.	6M	CO2	L2
(b)	Demonstrate the use of static fields and methods with a example.	6M	CO2	L3
(OR)				
4(a)	Develop a JAVA application to find the number of vowels, consonents, digits and white space characters in a string.	6M	CO2	L3
(b)	Develop a JAVA application to print the area and perimeter of a triangle having sides of 30, 40 and 50 units by creating a class named 'Triangle' without any parameter in its constructor.	6M	CO2	L4
5(a)	What is Inheritance in JAVA? Demonstrate the types of Inheritances in JAVA.	6M	CO3	L3
(b)	Distinguish between an interface and abstract class. Show how multiple inheritance is supported in java.	6M	CO3	L2
(OR)				
6(a)	What is the main idea of using the packages in JAVA? Illustrate the creation and accessing of packages with an example.	6M	CO3	L2
(b)	Develop a Java program using Synchronized Threads, which demonstrates Producer Consumer concept.	6M	CO3	L3
7(a)	Make use the concept of Applet to write an applet program to display a string "WELCOME".	6M	CO4	L1
(b)	Distinguish between Applets and standalone applications.	6M	CO4	L2
(OR)				
8(a)	Demonstrate Key Events of KeyEvent class.	6M	CO4	L2
(b)	Develop a JAVA program to display the mouse position when the mouse is clicked and display disappears when the mouse is released.	6M	CO4	L3
9(a)	Explain the purpose of Layout Managers in JAVA. Outline various Layout managers with examples.	6M	CO5	L4
(b)	Make use of Swing Components to develop a login page with the following components. (i) UserId- Text field (ii) Password-PasswordField (iii) Login- Button.	6M	CO5	L2
(OR)				
10.	Develop java GUI programs using the following swing components. (i) JTabbedPane (ii) JCheckbox (iii) JCombobox.	12M	CO5	L4

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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B.Tech. (VI Semester) Supplementary Examinations

17EE18-POWER SYSTEM ANALYSIS

(EEE)

Answered
25/10/25

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)	Explain how base quantities can be selected and derive the formula for base Impedance.	6M	CO1	L2									
(b)	Write the procedure for developing the single line diagram.	6M	CO1	L3									
(OR)													
2(a)	Derive the formula for Z_{BUS} by building an algorithm if the new element is a link with a mutual coupling to any other element.	6M	CO1	L4									
(b)	Two generators rated at 10 MVA, 13.2 kV and 15 MVA, 13.2 kV respectively are connected in parallel to a bus. The bus feeds two motors rated 8 MVA and 12 MVA respectively with rated voltage 12.5 kV. The reactance of each generator is 15% and that of each motor is 20% on its own rating. Draw reactance diagram.	6M	CO1	L3									
3.	Calculate the voltage at bus 3 at the end of first iteration for the given 3 bus system using Gauss Siedel method. The line impedances are marked on the diagram.	12M	CO2	L4									
	<table border="1"> <tr> <td>Bus 1</td> <td>Slack bus</td> <td>$V = 1.05 \angle 0^\circ$</td> <td></td> </tr> <tr> <td>Bus 2</td> <td>PV bus</td> <td>$V = 1.0$ p.u</td> <td>$P_g = 3$ p.u</td> </tr> <tr> <td>Bus 3</td> <td>PQ bus</td> <td>$P_L = 4$ p.u</td> <td>$Q_L = -2$ p.u</td> </tr> </table>				Bus 1	Slack bus	$ V = 1.05 \angle 0^\circ$		Bus 2	PV bus	$ V = 1.0$ p.u	$P_g = 3$ p.u	Bus 3
Bus 1	Slack bus	$ V = 1.05 \angle 0^\circ$											
Bus 2	PV bus	$ V = 1.0$ p.u	$P_g = 3$ p.u										
Bus 3	PQ bus	$P_L = 4$ p.u	$Q_L = -2$ p.u										
(OR)													
4(a)	Derive Static load flow equations.	6M	CO2	L3									
(b)	Explain how the buses are classified in the calculation of power flow.	6M	CO2	L2									
5(a)	Explain with a flow chart, the computational procedure for load flow solution using fast decoupled method.	6M	CO3	L3									
(b)	Explain about the sensitivities of system operating parameters.	6M	CO3	L2									
(OR)													
6(a)	Compare Gauss-Seidel, Newton Raphson, Decoupled and Fast decoupled methods with respect to (i) Number of iterations (ii) Convergence characteristics (iii) Initial values.	6M	CO3	L4									
(b)	Explain about sparsity with a suitable example.	6M	CO3	L2									
7(a)	The symmetrical components of a set of unbalanced three-phase current are $I_{a1} = 4 \angle 45^\circ$; $I_{a2} = 6 \angle 90^\circ$; $I_{a3} = 3 \angle 45^\circ$ Obtain the original un-balanced phasors.	6M	CO4	L3									
(b)	What do you understand by short circuit KVA? Explain with an example.	6M	CO4	L2									
(OR)													
8(a)	Derive the necessary equation to determine the fault current for LG fault, draw a diagram showing the interconnection of sequence networks.	6M	CO4	L4									
(b)	Explain the sequence networks for a synchronous generator.	6M	CO4	L2									
9(a)	Derive the swing equation for a single machine connected to infinite bus system.	6M	CO5	L3									
(b)	Describe the latest methods to improve the transient state stability.	6M	CO5	L2									
(OR)													
10(a)	Derive the formula for calculating critical clearing angle.	6M	CO5	L4									
(b)	Explain Transfer reactance and Inertia constant related to power system stability studies.	6M	CO5	L2									

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B.Tech. (VI Semester) Supplementary Examinations

**17CE22-WATER AND WASTEWATER ENGINEERING
(CE)**

Time : 3 hours

Max. Marks : 60

Answer all questions with either or choice
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Deliberate on the factors affecting population growth.	6M	CO1	L2
(b)	Calculate the total hardness and total alkalinity in terms of CaCO ₃ from the following data: Ca ²⁺ : 60 mg/L, Mg ²⁺ : 75 mg/L, CO ₃ ²⁻ : 60 mg/L, HCO ₃ ⁻ : 122 mg/L. (Molecular Weights: Ca: 40g, Mg: 24g, C: 12g, H: 1g, O: 16g).	6M	CO1	L3
(OR)				
2(a)	Describe the procedure to calculate population projection using arithmetical and geometrical increase methods.	6M	CO1	L2
(b)	Two samples of water of 600 mL and 400 mL are having pH values of 4 and 6 respectively. Compute the resultant pH when these two samples mixed together.	6M	CO1	L3
3(a)	Explain in detail the different processes of feeding the coagulant into the raw water.	6M	CO2	L2
(b)	Describe Flash mixer.	6M	CO2	L2
(OR)				
4(a)	What are the purposes served by aeration? List any four methods of aeration.	6M	CO2	L2
(b)	What is the main process involved in Plain Sedimentation? Design the sedimentation tank of a water works to treat 12 x 10 ⁶ litres of water per day. Assume the velocity of flow in the sedimentation tank as 20cm/min and the detention period of 11 hours.	6M	CO2	L4
5(a)	Distinguish between slow sand filters and rapid gravity filters.	6M	CO3	L2
(b)	Chlorine usage in the treatment of 30000 m ³ /day is 8 kg/day. The residual chlorine after 12 min contact is 0.2 mg/l. Calculate the dosage in mg/l and chlorine demand of water.	6M	CO3	L3
(OR)				
6(a)	Explain different Chlorination practices adopted in water treatment.	6M	CO3	L2
(b)	Explain the theory of Filtration as used in the purification of water. Sketch and describe an outlet for a Slow Sand Filter.	6M	CO3	L3
7(a)	Define the term Oxygen Sag Curve and determine the equation of the same.	6M	CO4	L3
(b)	Contrast the physical and chemical characteristics of sewage.	6M	CO4	L2
(OR)				
8(a)	Describe the Carbon and Nitrogen cycles of decomposition.	6M	CO4	L2
(b)	The 5-day BOD of a sewage sample at 20C is 120 mg/L. Compute the BOD at 25C and 3-days. Assume K _d = 0.23 d ⁻¹ at 20C (base e).	6M	CO4	L3
9(a)	With a neat sketch, explain the working of a trickling filter.	6M	CO5	L1
(b)	Design a septic tank for a gated community of 375 persons provided with water supply of 200 litres per person per day. Assume any data required.	6M	CO5	L3
(OR)				
10(a)	Explain the function of a soak pit with a neat sketch.	6M	CO5	L4
(b)	Differentiate between activated sludge process and trickling filter.	6M	CO5	L2

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27 OCT 2025

R17

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

**17EC21-ANTENNA AND WAVE PROPAGATION
(ECE)**

Time : 3 hours

Max. Marks : 60

Answer all questions with either or choice

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Show that radiation resistance of half wave dipole antenna is 73Ω .	6M	CO1	L1
(b)	Discuss the following antenna parameters (i) Horizontal pattern (ii) Side lobe level (iii) Beam efficiency (iv) Beam area	6M	CO1	L2
(OR)				
2(a)	A loss resistance of antenna is 25Ω . Calculate its radiation resistance if power gain is 30 and directivity is 42.	6M	CO1	L3
(b)	Determine the relation between directivity and effective aperture.	6M	CO1	L3
3(a)	Describe the characteristics of broadside and end fire arrays.	6M	CO2	L2
(b)	Analyze array of N point sources.	6M	CO2	L4
(OR)				
4(a)	Examine the Dolph-Tchebyshev array of 4 elements with $\lambda/2$ spacing between the elements for required side lobe level of -15 dB.	6M	CO2	L3
(b)	Use pattern multiplication method to draw resultant radiation pattern for array of 8 point sources.	6M	CO2	L3
5(a)	Differentiate resonant and non resonant antennas.	6M	CO3	L2
(b)	Describe constructional features and characteristics of rhombic antenna.	6M	CO3	L2
(OR)				
6(a)	Outline the characteristics of helical antenna in normal mode.	6M	CO3	L4
(b)	Determine the physical dimensions of Yagi-Uda antenna with 6 elements to operate at 20MHz .	6M	CO3	L3
7(a)	Analyze the corner reflector antenna with corner angle 45° using method of image principle.	6M	CO4	L4
(b)	Summarize the different types of horn antennas with related diagrams.	6M	CO4	L2
(OR)				
8(a)	Use Friis transmission equation for measurement of gain using 3 antennas method.	6M	CO4	L3
(b)	Illustrate the measurement of radiation pattern of antenna with neat block diagram and precautions.	6M	CO4	L3
9(a)	Demonstrate the radio wave propagation through ionosphere.	6M	CO5	L3
(b)	Summarize the characteristics of D,E,F layers in the ionosphere.	6M	CO5	L2
(OR)				
10(a)	Categorize briefly the different types of wave propagation in the atmosphere.	6M	CO5	L4
(b)	Discuss the fundamental equation of space wave propagation with related equations.	6M	CO5	L2

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B.Tech. (VI Semester) Supplementary Examinations

17CE22-WATER AND WASTEWATER ENGINEERING

(CE)

Time : 3 hours

Max. Marks : 60

Answer all questions with either or choice
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Deliberate on the factors affecting population growth.	6M	CO1	L2
(b)	Calculate the total hardness and total alkalinity in terms of CaCO ₃ from the following data: Ca ⁺² : 60 mg/L, Mg ⁺² : 75 mg/L, CO ₃ ⁻² : 60 mg/L, HCO ₃ ⁻ : 122 mg/L. (Molecular Weights: Ca: 40g, Mg: 24g, C: 12g, H: 1g, O: 16g).	6M	CO1	L3
(OR)				
2(a)	List out the possible sources of water and broadly discuss their impurities at the time of availability.	6M	CO1	L2
(b)	State the possible sources and impacts of the following impurities in water: Fluoride, Hardness, Nitrate, Chlorides.	6M	CO1	L2
3(a)	Distinguish between preliminary treatment and primary treatment of wastewater.	6M	CO2	L2
(b)	Explain the process of Sedimentation in the treatment of water. Discuss the difference between Plain Sedimentation and Coagulation.	6M	CO2	L2
(OR)				
4(a)	Explain in detail the different processes of feeding the coagulant into the raw water.	6M	CO2	L2
(b)	Describe Flash mixer.	6M	CO2	L2
5(a)	Distinguish between slow sand filters and rapid gravity filters.	6M	CO3	L2
(b)	Chlorine usage in the treatment of 30000 m ³ /day is 8 kg/day. The residual chlorine after 12 min contact is 0.2 mg/l. Calculate the dosage in mg/l and chlorine demand of water.	6M	CO3	L3
(OR)				
6(a)	Explain the theory of filtration as used in the purification of water.	6 M	CO3	L2
(b)	For disinfecting water supply, it is required to treat 500,000 litres of daily supply with 0.5ppm of chlorine. If the disinfectant is available in the form of bleaching powder containing 30% of available chlorine, calculate the amount of bleaching powder required to treat the daily flow of water.	6M	CO3	L3
7(a)	Explain the following (i) Rising velocity (ii) Settling velocity (iii) Scrapers.	6M	CO4	L2
(b)	Determine the diameter and detention period of a Primary sedimentation for treating sewage from a town with average flow of 5 MLD and peak flow of 10MLD. Assume SOR=25m/d.	6M	CO4	L3
(OR)				
8(a)	Discuss the purpose, types, and alignment of screens used in sewage treatment.	6M	CO4	L2
(b)	A grit channel is to be designed for removing inorganic particles of 0.2mm size of specific gravity 2.65 from sewage at 25C. A flow velocity of 0.3 m/s is used in the channel carrying a discharge of 10 MLD. Compute the dimensions of the channel.	6M	CO4	L3
9(a)	Describe briefly about the disposal of sludge in water bodies.	6M	CO5	L3
(b)	Explain with neat sketch the working principle of standard rate trickling filter.	6M	CO5	L3
(OR)				
10(a)	Explain the function of a soak pit with a neat sketch.	6M	CO5	L4
(b)	Differentiate between activated sludge process and trickling filter.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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

B.Tech. (VI Semester) Supplementary Examinations

17EE19-POWER ELECTRONICS

(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)	With the help of neat diagram, explain the two-transistor model of an SCR.	6M	CO1	L3
(b)	Discuss various triggering methods of an SCR with relevant diagrams.	6M	CO1	L2
(OR)				
2(a)	Explain the design of snubber circuit used for a SCR, how it provides different voltage protections?	6M	CO3	L4
(b)	Explain the operation of an SCR with the help of its V-I characteristics, clearly indicating different regions of operation.	6M	CO1	L3
3.	Draw the circuit diagram & relevant wave forms of a single – phase full wave controlled rectifier with RL load and find dc output voltage.	12M	CO2	L3
(OR)				
4(a)	With the help of a neat circuit diagram and waveforms, explain the operation of Class A commutation circuit of an SCR.	6M	CO1	L3
(b)	A single –phase Full Wave Controller is connected with a load of $R = 5 \Omega$ with an input voltage of 230 V, 50 Hz. If the firing angle of thyristor is 45° , determine (i) average output voltage (ii) output current.	6M	CO2	L3
5(a)	With neat circuit and waveform, explain the operation of a single-phase AC voltage controller with resistive load using phase control.	6M	CO2	L3
(b)	Explain the working of a single-phase AC voltage controller feeding an RL load. Show the effect of load nature on output voltage waveform.	6M	CO2	L4
(OR)				
6(a)	Draw and explain the operation of a single-phase step-down cycloconverter with neat output waveform.	6M	CO2	L3
(b)	With circuit and waveforms, explain the operation of a single-phase step-up cycloconverter.	6M	CO2	L3
7(a)	Explain Time Ratio Control (TRC) method used in chopper control. Distinguish between constant frequency and variable frequency control.	6M	CO3	L2
(b)	Describe Current Limit Control strategy of a chopper with neat sketch.	6M	CO3	L3
(OR)				
8(a)	With neat circuit diagram and waveform, explain the operation of a step-down (buck) chopper.	6M	CO2	L3
(b)	Explain the working of a step-up (boost) chopper with circuit diagram and voltage relationship.	6M	CO2	L3
9.	Explain the working of a three phase inverter with 120 degree mode of conduction with three phase delta connected resistive load.	12M	CO2	L3
(OR)				
10(a)	With necessary waveforms explain the working of single phase full bridge inverter with RL load and also derive the expression for RMS value of output voltage	6M	CO2	L4
(b)	Discuss and compare various PWM techniques used in inverters.	6M	CO4	L2

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B.Tech (VI Semester) Supplementary Examinations

17EC21-ANTENNA AND WAVE PROPAGATION

(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)	Explain the following terms in detail. (i) Beam Area (ii) Effective length.	6M	CO1	L1
(b)	Find directivity, efficiency and effective area of an antenna if it's $R_{rad}=80\Omega$, $R_{Loss}=20\Omega$. The power gain is 10dB and antenna operating frequency is 100 MHz.	6M	CO1	L3
(OR)				
2(a)	Write short note on Directivity and power gain of antenna.	6M	CO1	L2
(b)	What is the relation between gain and effective area of antenna?	6M	CO1	L2
3(a)	Discuss about the different types of antenna arrays.	6M	CO2	L2
(b)	Explain the principle of Binomial array for 5 elements.	6M	CO2	L2
(OR)				
4.	Define Array Factor. Derive field pattern equation for 2 elements with equal amplitude and opposite phase.	12M	CO2	L4
5.	Explain the working principle of a helical antenna in both normal mode and axial mode.	12M	CO3	L2
(OR)				
6(a)	With a neat sketch explain the operation of Yagi-Uda antenna.	6M	CO3	L2
(b)	Write short notes on Rhombic antenna with neat diagram.	6M	CO3	L2
7(a)	Explain the principle of horn antenna with neat sketch.	6M	CO4	L2
(b)	Explain the significance, merits and demerits of lens antennas.	6M	CO4	L4
(OR)				
8(a)	Explain about various reflector antennas.	6M	CO4	L2
(b)	What is antenna gain and demonstrate the measurement of gain of antenna using direct comparison method.	6M	CO4	L3
9(a)	Describe briefly the characteristics of ground wave propagation.	6M	CO5	L2
(b)	Write a short notes on : (i) Critical Frequency (ii) MUF.	6M	CO5	L1
(OR)				
10(a)	Explain about tropospheric scattering.	6M	CO5	L2
(b)	Explain Duct propagation in detail.	6M	CO5	L2

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

**17EE20-MEASUREMENTS AND INSTRUMENTATION
(EEE)**

Time : 3 hours

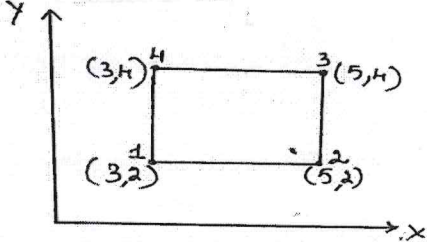
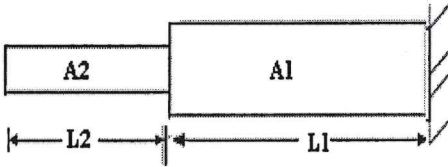
Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	How would you extend the range of DC ammeters and voltmeters? Discuss with suitable diagrams.	6M	CO1	L2
(b)	Compare the attraction and repulsion type instruments.	6M	CO1	L2
(OR)				
2(a)	Discuss with the neat sketches the working of an attraction type MI instrument.	6M	CO1	L2
(b)	Illustrate Functional elements of an instruments.	6M	CO1	L2
3(a)	Derive the expression for finding the unknown resistance using Wheatstone bridge.	6M	CO2	L3
(b)	Explain how the inductance is measured using Anderson bridge and derive the condition for bridge balance.	6M	CO2	L3
(OR)				
4(a)	Describe construction and working of Megger.	6M	CO2	L1
(b)	Derive equation of balance for an Anderson,s bridge.	6M	CO2	L3
5(a)	Explain the working principle and operation of Electrical Resonance type frequency meter with neat diagram.	6M	CO3	L1
(b)	Derive the expression for transformation Ratio of a C.T. referred to primary and Secondary side with the help of Phasor diagram.	6M	CO3	L3
(OR)				
6(a)	Differentiate between current transformer and potential transformer.	6M	CO3	L2
(b)	Demonstrate the construction and working of power factor meter.	6M	CO3	L2
7(a)	Explain the operation of single phase induction type energy meter.	6M	CO1	L3
(b)	A 50 A , 230 V meter on full load test makes 61 revolutions in 37 sec. If the normal disc speed s 520 revolutions per kwh, find the percentage error.	6M	CO1	L3
(OR)				
8(a)	Describe the construction and theory of operation of a single phase electrodynamicometer type wattmeter.	6M	CO4	L1
(b)	Contrast advantages and disadvantages of wattmeter.	6M	CO4	L2
9(a)	Demonstrate the principle of the Strain gauges.	6M	CO5	L3
(b)	Predict with a neat diagram, discuss Piezoelectric transducers.	6M	CO5	L3
(OR)				
10(a)	Explain in detail about the construction and working of LVDT.	6M	CO4	L2
(b)	Derive the expression for piezoelectric voltage in terms of force / pressure applied on a piezoelectric material.	6M	CO4	L3

17ME23-FINITE ELEMENT ANALYSIS

6.	<p>The nodal displacements of four node quadrilateral element shown in figure are given as $Q = [0, 0, 0.01, 0.02, 0.05, 0.01, 0.10, 0.01]^T$ cm. Take $E = 20 \times 10^6$ N/cm² and $\mu = 0.25$. Evaluate the Jacobian matrix and strain displacement matrix of the element at $\xi = 0$ & $\eta = 0$. Assume plane stress condition.</p> 	12M	CO3	L3
7(a)	Formulate the element equation for 1-D steady state heat transfer of a fin from basics.	4M	CO4	L2
(b)	Heat is generated in a large plate (thermal conductivity $k = 0.8$ W/m°C) at the rate of 4000 W/m ³ . The plate is 0.25 m thick. The outside surfaces of the plate are exposed to ambient air at 30°C with a convective heat transfer coefficient of 20 W/m ² °C. Enumerate the temperature distribution in the wall.	8M	CO4	L3
(OR)				
8.	A composite wall consists of 4 cm thick wood, 10 cm glass fiber insulation and 1 cm thick plaster. If the temperature on wood and plaster faces are 20°C and -20°C respectively. Estimate the temperature distribution in the wall. Assume the thermal conductivity of wood, glass fiber and plaster are 0.17 , 0.035 and 0.5 W/m respectively and colder side heat transfer coefficient is 25 W/m ² K.	12M	CO4	L3
9(a)	Derive the mass matrix for bar element.	4M	CO5	L3
(b)	<p>Compute the Global stiffness and mass matrices for the stepped bar shown in figure $A_1 = 1100$ mm², $A_2 = 800$ mm², $E = 2 \times 10^5$ N/mm², $L_1 = 200$ mm, $L_2 = 400$ mm and mass density = 7250 kg/mm³.</p> 	8M	CO5	L3
(OR)				
10(a)	Derive the mass matrix for beam element.	6M	CO5	L2
(b)	Determine the natural frequencies of simply supported beam of span 800 mm and area of cross-section is 75 mm x 25 mm. Take Young's Modulus $E = 200$ GPa and weight density = 7850 Kg/m ³ . Use one element model.	6M	CO5	L3

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B.Tech. (VI Semester) Supplementary Examinations

17CE26-CONSTRUCTION TECHNIQUES AND EQUIPMENT PLANNING

(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)	Explain briefly about stabilizing construction procedure for soil with cement.	6M	CO1	L2
(b)	A track type dozer equipped with a power shift can push an average blade load of 6.15 lcy..The material being pushed is silty sand. The average push distance is 90ft.what production, in loose cubic yards can be expected? Push time 2mph average speed (sandy material).	6M	CO1	L3
(OR)				
2(a)	Explain briefly the history of construction equipments.	6M	CO1	L1
(b)	Describe in detail about various equipments used in earth work excavation, filling and hauling.	6M	CO1	L1
(OR)				
3(a)	Explain in detail the significance and application of Power shovels.	6M	CO2	L2
(b)	What is hoe and why is it used?	6M	CO2	L1
(OR)				
4(a)	Describe the various applications of a bulldozer.	6M	CO2	L2
(b)	List various operations that can be performed by a bulldozer.	6M	CO2	L1
(OR)				
5(a)	Explain the various types of crane hazardous identified by OSHA.	6M	CO3	L2
(b)	Write down applications, common dimensions and capacities for rough terrain crane with neat sketch.	6M	CO3	L3
(OR)				
6(a)	Discuss the factors to be considered when choosing the right crane for project.	6M	CO3	L2
(b)	Write a short note on crane accidents.	6M	CO3	L1
(OR)				
7(a)	Explain briefly about GAS laws.	6M	CO4	L2
(b)	Define following (i) Centrifugal compressor (ii) Compression ratio (iii) Compressor efficiency (iv) Discharge pressure (v) Diversity Factor (vi) Load Factor.	6M	CO4	L1
(OR)				
8(a)	Describe briefly about procedure for driving concrete piles	6M	CO4	L2
(b)	Define following (i) Absolute pressure (ii) Absolute temperature (iii) Atmospheric pressure (iv) density of air (v) Fahrenheit temperature (vi) Gauge pressure.	6M	CO4	L1
(OR)				
9(a)	What are the advantages of steel formwork over wooden formworks?	6M	CO5	L1
(b)	Write a short note on design of formwork.	6M	CO5	L1
(OR)				
10(a)	What is formwork and why it is required?	6M	CO5	L2
(b)	How to prevent nuisance during construction work?	6M	CO5	L1

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

**17EC29-EMBEDDED SYSTEM DESIGN
(EEE)**

Time : 3 hours

Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

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Q.No	Questions	Marks	CO	BL
1(a)	Describe custom-single purpose processor design with GCD example.	8M	CO3	L2
(b)	Distinguish between flexibility and maintainability design metrics.	4M	CO2	L2
(OR)				
2(a)	Describe the characteristics of an Embedded system.	6M	CO1	L2
(b)	Illustrate the combinational logic design with an example.	6M	CO1	L3
(OR)				
3(a)	Explain the Finite-State machine with datapath model with an example.	8M	CO3	L2
(b)	Write a short note on the following (i) Windows CE and (ii) QNX.	4M	CO3	L1
(OR)				
4(a)	Differentiate computation models, languages and implementation in concurrent process model.	6M	CO2	L2
(b)	Summarize how the operations are implemented using general-purpose processors.	6M	CO2	L2
(OR)				
5(a)	Describe the working principle of Analog to Digital converters with its applications.	6M	CO1	L2
(b)	Describe about Real Time Clocks in Embedded system.	6M	CO1	L2
(OR)				
6(a)	Explain the working principle of stepper motor controllers with necessary block diagrams.	6M	CO2	L2
(b)	Mention the data transfer procedure in serial transmission using UARTs.	6M	CO2	L2
(OR)				
7(a)	Explain the need for communication.	6M	CO4	L2
(b)	Explain the protocol architecture of IEEE 1394 with a neat diagram.	6M	CO4	L2
(OR)				
8(a)	Discuss about a simple bus protocol with neat diagrams.	6M	CO4	L2
(b)	What is the need for multi-level bus architecture? Also explain the two-level bus architecture.	6M	CO4	L2
(OR)				
9(a)	Illustrate the design process for waterfall model and spiral model.	6M	CO4	L2
(b)	Discuss about standard semi-custom IC technology.	6M	CO1	L2
(OR)				
10(a)	Explain simplified version of a CMOS transistor and implement the NAND logic.	6M	CO4	L2
(b)	Discuss about formal verification and simulation methods.	6M	CO4	L2

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

17MB80-INDUSTRIAL ENGINEERING AND MANAGEMENT

(ASE,CE,CSE,ECE,EEE,EIE&IT)

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 types and evaluation of mechanistic and organic structures of organization and suitability design.	6M	CO1	L2
(b)	Describe briefly about the different approaches carried in an organization with suitable examples.	6M	CO1	L2
(OR)				
2(a)	Demonstrate responsibility delegation procedures of the authority.	6M	CO1	L2
(b)	Outline any three organization structures with illustrated diagrams.	6M	CO1	L2
(OR)				
3(a)	Describe the different methods of production.	6M	CO2	L2
(b)	Discuss the factors to be considered for the selection of a location for a factory construction.	6M	CO2	L2
(OR)				
4(a)	Summarize the basic procedures involved in method study and work study.	6M	CO2	L2
(b)	Identify the factors that influence the plant location identification.	6M	CO2	L1
(OR)				
5(a)	Define Materials Management and explain its objectives.	6M	CO3	L1
(b)	What is the need of inventory controlling techniques?	6M	CO3	L1
(OR)				
6(a)	What are the objectives of MRP? Explain its advantages and disadvantages of MRP.	6M	CO3	L1
(b)	Discuss the various control charts for attributes. Explain them briefly.	6M	CO3	L3
(OR)				
7(a)	Define Human Resource Management. Explain the important functions of HRM.	6M	CO4	L2
(b)	Explain and evaluate any four methods of Merit rating.	6M	CO4	L2
(OR)				
8(a)	How the recruitment procedure differs from selection procedure?	6M	CO4	L1
(b)	Elucidate the functions of human resources management.	6M	CO4	L2
(OR)				
9(a)	What is project management? Explain the role of Networking Technique in effective project management.	6M	CO5	L1
(b)	Enumerate the steps involved in PERT.	6M	CO5	L2
(OR)				
10(a)	What is PERT? Define optimistic time, pessimistic time and most likely time and explain how you will estimate the expected time to complete the activity in PERT technique.	6M	CO5	L2
(b)	Distinguish between CPM and PERT.	6M	CO5	L2

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

B.Tech- (VI Semester) Supplementary Examinations

17CE91-LOW COST AND ECO-FRIENDLY BUILDING 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)	Discuss the various traditional building materials used in rural and low-cost housing.	6M	CO1	L2
(b)	Differentiate between burnt and unburnt bricks. Explain their suitability for different climatic and structural conditions.	6M	CO1	L3
(OR)				
2(a)	Describe the constructional use of laterite bricks, lime bricks and sand-lime blocks. Discuss their performance in terms of strength, durability, and sustainability.	6M	CO1	L2
(b)	Explain the advantages of modern masonry units such as lightweight concrete blocks, fly ash bricks, and wood-cement products. Discuss their contribution to sustainable construction.	6M	CO1	L3
3.	Explain the structural properties of alternate building materials and finishes such as ferrocement, polymers, earth floors and earth plasters. Discuss their advantages in practical applications.	12M	CO2	L2
(OR)				
4(a)	Explain the utilization of industrial and agricultural wastes such as fly ash, red mud, and straw bale in building construction. Discuss their role in waste management.	6M	CO2	L3
(b)	Discuss the practical applications of locally available building materials such as soil, lime, and stone dust etc in sustainable rural housing. Explain how these materials contribute to cost-effective construction.	6M	CO2	L2
5(a)	Describe the various types of foundations used in building construction and the factors influencing their selection.	6M	CO3	L2
(b)	Describe the construction techniques and advantages of stabilized earth wall construction. Discuss their suitability for sustainable and low-cost housing.	6M	CO3	L2
(OR)				
6(a)	Compare the structural and functional characteristics of brick masonry walls, cellular concrete blocks, hollow concrete blocks and precast concrete panels. Explain how these materials improve construction efficiency and performance.	6M	CO3	L1
(b)	Explain briefly about the different innovative roofing systems such as catenary hollow clay blocks, brick shell roofs and cellular lightweight concrete roofing. Discuss their structural suitability for modern building applications.	6M	CO3	L2
7(a)	Discuss the various areas where prefabrication techniques have been successfully introduced in building and infrastructure projects.	6M	CO4	L3
(b)	Describe the different types of joints used in precast concrete structures.	6M	CO4	L2
(OR)				
8(a)	Explain the important codal provisions related to wind-resistant design of buildings as per IS 875 (Part 3).	6M	CO4	L2
(b)	Discuss the role and importance of cyclone-resisting core units in minimizing structural damage.	6M	CO4	L3
9(a)	Discuss the traditional practices followed in rural house construction in India.	6M	CO5	L2
(b)	Discuss various sustainable and low-cost construction technologies suitable for rural areas with examples.	6M	CO5	L3
(OR)				
10(a)	Describe the mud house construction technology and explain different methods used in constructing mud walls and mud roofs.	6M	CO5	L2
(b)	Explain the methods of providing fire-retardant treatment for thatched or trench roofs.	6M	CO5	L2

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**B.Tech. (VI Semester) Supplementary Examinations
17EE91-ELECTRICAL RELIABILITY ENGINEERING
(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)	Define Reliability of a system and explain the importance of failure rate and repair rate in system reliability.	6M	CO1	L1
(b)	A system design requires 100 identical components in series. If the overall reliability must not fall below 0.97, calculate the minimum reliability of each component.	6M	CO2	L3
(OR)				
2(a)	List out the rules for combining probabilities.	6M	CO1	L1
(b)	A system consists of 15 identical components, each with reliability 0.9. All must work for system success. Compute the system reliability.	6M	CO1	L2
3(a)	Explain exponential distribution with graphs.	6M	CO1	L2
(b)	Explain the terms: MTBF, MTTR, and Availability with suitable formulas and examples.	6M	CO2	L2
(OR)				
4(a)	A simple electronic circuit consists of 6 transistors each having a failure rate of 10^{-6} f/hr, 4 diodes each having a failure rate of 0.5×10^{-6} f/hr, 3 capacitors each having a failure rate of 0.2×10^{-6} f/hr, 10 resistors each having a failure rate of 5×10^{-6} f/hr and 2 switches each having a failure rate of 2×10^{-6} f/hr. Assuming connectors and wiring are 100% reliable (these can be included if considered significant), evaluate the equivalent failure rate of the system and the probability of the system surviving 1000 hr and also 10 000 hr if all components must operate for system success.	8M	CO2	L3
(b)	Derive the reliability of a 2-component series system using exponential probability distribution.	4M	CO1	L1
5(a)	Derive the limiting state probabilities of a two-state repairable component with failure rate λ and repair rate μ .	6M	CO2	L3
(b)	Draw the state space diagram for two component repairable systems.	6M	CO2	L1
(OR)				
6(a)	Consider a 3-state system with the following transition probabilities: $1 \rightarrow 2$ (0.01), $1 \rightarrow 3$ (0.5), $2 \rightarrow 1$ (0.05), $2 \rightarrow 3$ (0.01). Evaluate the limiting probabilities of each state.	6M	CO2	L3
(b)	Derive expressions for frequency and duration of system unavailability in a two-state Markov model.	6M	CO2	L4
7(a)	Explain the reliability model of a power generation system with neat block diagram.	6M	CO2	L2
(b)	Discuss the concept of generation capacity evaluation and its importance in electrical reliability.	6M	CO2	L2
(OR)				
8(a)	Derive the recursive relation algorithm for unit removal in a generation system.	6M	CO2	L3
(b)	Describe the Loss of Load Expectation (LOLE) index in a generation system with an example.	6M	CO2	L4
9(a)	Explain the concept of cumulative frequency of encountering merged states in a Markov system.	6M	CO2	L2
(b)	Consider a 3-state system with equal transition probabilities. Derive the expected duration of residing in each state.	6M	CO1	L4
(OR)				
10(a)	Explain how reliability engineering principles are applied in real-world critical systems.	6M	CO2	L2
(b)	Explain different generation system reliability indices.	6M	CO1	L2