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. (V Semester) (R20) Semester End Examinations (Supplementary) December 2025

R20

TIME TABLE

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

Branch	24-12-2025 (Wednesday)	26-12-2025 (Friday)	27-12-2025 (Saturday)	29-12-2025 (Monday)	30-12-2025 (Tuesday)
				Open Elective - I	Program Elective - I
AI & DS	20CS12-Computer Networks	20AD04-Machine Learning	20AD05-Automata and Compiler Design	20ME81-Renewable Energy Sources	20CS24-Cloud Computing
ASE	20AE08-Aircraft Systems and Instruments	20AE09-Gas Dynamics	20AE10-Aircraft Structures-II	20EC81-Satellite Technology	20AE12-Finite Element Methods in Engineering
CE	20CE12-Design of Reinforced Concrete Structures	20CE13-Hydrology and Water Resources Engineering	20CE14-Environmental Engineering	20AD81 - Introduction to Artificial Intelligence *20ME81-Renewable Energy Sources*	20CE15-Remote Sensing and Geographical Information Systems
CSE	20CS12-Computer Networks	20AD04-Machine Learning	20CS13-Theory of Computation	20ME81-Renewable Energy Sources *20CE82-Disaster Management*	20CS16-Principles of Artificial Intelligence
CSE (AI & ML)	20CS12-Computer Networks	20AD04-Machine Learning	20CS13-Theory of Computation	20ME81-Renewable Energy Sources	20IT01 - Software Engineering
ECE	20EC09-Digital Communications	20EC10-Antennas and Wave Propagation	20EC11-Linear IC Applications	20IT81-OOP through JAVA	20EC14-Data Communication and Computer Networks
EEE	20EE12-Power Systems-II	20EE13-Electrical Machines-II	20EE14-Power Electronics	20AD81 - Introduction to Artificial Intelligence *20IT81-OOP through JAVA*	20EE16-Linear and Digital IC Applications *20EE17-Energy Conservation and Management*
IT	20CS12-Computer Networks	20AD04-Machine Learning	20CS13-Theory of Computation	20EC81-Satellite Technology *20ME81-Renewable Energy Sources*	20CS16-Principles of Artificial Intelligence 20IT02 - Internet of Everything
ME	20ME10-IC Engines and Gas Turbines	20ME11-Machine Tools and Metrology	20ME12-Design of Machine Elements-I	20EE84 - Electric Vehicles *20AD81 - Introduction to Artificial Intelligence* *20IT81-OOP through JAVA*	20ME14-Robotics

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

Date: 05-12-2025

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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24 DEC 2025

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20CS12-COMPUTER NETWORKS
(AI&DS,CSE,CSE(AI&ML) and IT)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss fiber optics with a neat diagram.	7M	CO1	L2
(b)	Discuss the functionalities of different layers in OSI model with the help of diagram.	7M	CO1	L2
	(OR)			
2(a)	Write about peer-to-peer processes and encapsulation concepts in OSI model.	7M	CO1	L1
(b)	Differentiate TCP/IP and OSI model.	7M	CO1	L2
3(a)	Design an algorithm for CRC. Calculate the checksum for given M(x) = 10011101 and the generator polynomial is g(x)= x^3 +1 using CRC on both sending side, receiving side.	7M	CO2	L3
(b)	Let us assume the even parity hamming code from the above example (111001101) is transmitted and the received code is (110001101). Now from the received code, Identify the error bits and correct them.	7M	CO2	L3
	(OR)			
4(a)	Discuss about CSMA/Collision Avoidance.	7M	CO2	L2
(b)	Discuss Selective-Repeat protocol with neat diagram.	7M	CO2	L2
5(a)	Outline IPV6 header format.	7M	CO3	L2
(b)	Discuss operations of ARP and RARP.	7M	CO3	L2
	(OR)			
6(a)	Explain Distance Vector Routing Algorithm with example.	7M	CO3	L2
(b)	Discuss about IPV4 header format.	7M	CO3	L2
7(a)	User Datagram protocol (UDP) is connection-less protocol. Justify this statement with your explanation.	7M	CO4	L3
(b)	Discuss services of Stream Control Transmission Protocol.	7M	CO4	L2
	(OR)			
8(a)	Discuss about Leaky bucket algorithm with diagram.	7M	CO4	L2
(b)	Discuss about closed-loop policies to prevent congestion control.	7M	CO4	L2
9(a)	Outline about Telnet.	7M	CO5	L2
(b)	Illustrate various domains in Domain Name service.	7M	CO5	L2
	(OR)			
10(a)	Explain the steps involved in the interaction of FTP clients and sever for listing the items in a directory.	7M	CO5	L2
(b)	Explain E-mail user agent and message formats.	7M	CO5	L2

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

20CE12-DESIGN OF REINFORCED CONCRETE STRUCTURES

(CE)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Design a R C beam subjected to a bending moment of 25 kN-m Use M20 concrete Fe 250 steel keep width as half of depth of beam by using working stress method.	14M	CO2	L3
	(OR)			
2(a)	Write the differences between Working Stress Method and Limit State Method.	4M	CO1	L2
(b)	Find the MOR of a beam section 230 mm X 450 mm deep if it is reinforced with 2 bars 16mm diameter bars in compression and tension, each at an effective cover of 40 mm, Use M20 concrete and Fe 415 steel. Using Limit State method of Design.	10M	CO2	L3
3.	A reinforced concrete beam of rectangular section 300 mm wide and 450mm effective depth having reinforcement of 4 bars 20 mm dia. the beam resist a shear force of 250 kN at support. Assume f_{ck}=20 N/mm² f_Y = 415 N/mm² design vertical and inclined stirrups.	14M	CO3	L3
	(OR)			
4.	A reinforced beam 230mm wide & 450 mm effective depth is subjected to ultimate shear force of 300kN at critical section. Design shear stirrups near the supports. Also design minimum shear reinforcement at mid-span assume concrete M20 & steel Fe 415 grade. sketch the details.	14M	CO3	L3
5.	Design a R.C.C slab for a room having inside dimensions 3.2m X 6.5 m. The slab carries a 80mm thick lime concrete at its top, the unit weight which may be taken as 20 kN/m³. Assume the slab is two short edges discontinuous. Take M20 grade concrete and Fe 415 steel.	14M	CO4	L3
	(OR)			
6.	The drawing –cum-dining room of a residential building measures 4.5 m X 6.5 m. The slab assumed to be simply supported on 300 mm walls on all the four edges. The live load is 2.5 kN/m² and load due to finishes may be taken as 1kN/m². Design the slab using M20grade concrete and mild steel.	14M	CO4	L3
7.	Design a circular column to carry an axial load of 3000 kN for the following transverse reinforcement. Take M20 grade concrete and Fe 415 steel (i) Lateral ties (ii) Helical Reinforcement.	14M	CO3	L3
	(OR)			
8(a)	Design a short column to carry a factored load of 1200kN & biaxial moments of 120kNm, 130 kN.m. Assume M20 mix Fe 415 steel.	10M	CO3	L3
(b)	A short R C column 300mm wide 400 mm deep is reinforced with 6 bars 20mm dia. with an effective cover of 50 mm determine the value of Pu. Assume M15 mix Fe 415 steel.	4M	CO3	L3
9(a)	Classify the footings with neat sketches.	7M	CO1	L2
(b)	Define footing and draw a neat sketch of Isolated square with reinforcement.	7M	CO1	L2
	(OR)			
10.	An RCC column of size 300mm X 300mm reinforced with 8-20mm dia. Bars carries a characteristic load of 1200kN. The allowable bearing pressure on soil is 150kN/m². Design an isolated square sloped footing. The materials are grade M20 concrete and HYSD reinforcement of Grade Fe 415 for both the column and footing.	14M	CO4	L3

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

20EC09-DIGITAL COMMUNICATIONS

(ECE)

9.22

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the principle and operation of Delta Modulation with neat sketch.	7M	CO2	L2
(b)	Find the bandwidth required for sending 4KHz signal sampled at Nyquist rate. Assume 8-bits/sample in PCM and 2 bits/sample in DPCM.	7M	CO1	L3
	(OR)			
2(a)	Compare baseband modulation techniques PCM, DPCM , DM and ADM.	10M	CO2	L2
(b)	Explain the following (i) Slope overload distortion (ii) Granular Noise.	4M	CO1	L2
3(a)	Define optimum signal receiver and describe decision boundary with necessary equations.	7M	CO3	L2
(b)	With neat diagrams explain how the modulated signal $S_i(t)$ and its coefficients (S_{ij}) are determined in the process of orthogonolization.	7M	CO3	L2
	(OR)			
4(a)	Discuss the geometric interpretation of signals with an example.	7M	CO3	L2
(b)	Explain the general procedure for formation of the orthogonal basis functions with relevant equations.	7M	CO3	L2
5(a)	Describe generation and reception of BPSK signal with neat block diagrams.	7M	CO2	L2
(b)	Derive an expression for probability of error of BASK receiver assuming the channel is Gaussian.	7M	CO2	L2
	(OR)			
6(a)	Describe generation and reception of QPSK signal with neat block diagrams.	7M	CO2	L2
(b)	Explain about coherent and non-coherent detection of digitally modulated signals along with their merits and de-merits.	7M	CO2	L2
7(a)	Discuss in detail about the following (i) Amount of information (ii) average information (iii) entropy.	7M	CO4	L2
(b)	Discuss the steps involved in Huffman coding and determine the coding efficiency of source encoder with input probabilities p1, p2, p3, p4 and p5 given as 0.2, 0.1, 0.3, 0.1 and 0.3.	7M	CO4	L3
	(OR)			
8(a)	Describe source coding theorem with necessary equations.	7M	CO4	L2
(b)	Apply the Shannon-Fano coding for the following message ensemble and calculate the following, (i) H(X) (ii) $\bar{L}$ (iii) η.	7M	CO4	L3
9(a)	Illustrate the syndrome decoding procedure for linear block codes for error detection and correction in received code word with an example.	7M	CO4	L2
(b)	Illustrate the decoding process of Convolutional codes using Viterbi decoding algorithm for a given [10 11 10 11 11 01].	7M	CO4	L3
	(OR)			
10.	For a (7;4) systematic form cyclic code with generator polynomial $g(x)=1+x+x^3$, (i) Obtain all code words (ii) Determine the generator matrix and parity check matrix (iii) Decode the received code word Y = [1 1 0 1 1 0 0] using syndrome decoding (iv) Sketch the encoder and syndrome calculator using shift register.	14M	CO4	L3

x	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
P	1/4	1/8	1/16	1/16	1/16	¼	1/16	1/8

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

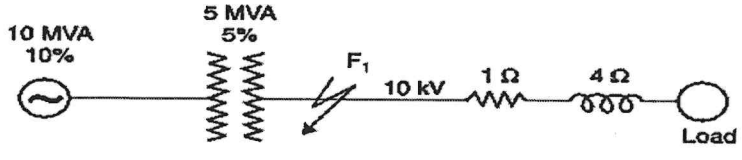
20EE12-POWER SYSTEMS-II

(EEE)

9.22

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Deduce an expression for voltage regulation of a short transmission line, showing the phasor diagram.	7M	CO1	L2
(b)	Differentiate between a nominal-T and equivalent-T representation of a transmission line.	7M	CO1	L2
	(OR)			
2(a)	Derive the expressions for the A, B, C, D constants of a medium length transmission line (T-model).	7M	CO1	L2
(b)	Determine the sending end voltage, current, power factor of a single phase 50 Hz, 76.2 kV transmission delivering a load of 12MW at 0.8 p.f. The line constants are R = 25 Ω, inductance=200mH and capacitance between lines is 2.5 μF.	7M	CO1	L4
3(a)	What are the sources of reactive power in power systems? How can it be controlled?	7M	CO2	L2
(b)	Describe with the aid of a neat sketch the construction and working of an on-load tap-changing transformer.	7M	CO2	L2
	(OR)			
4(a)	Compare the role of shunt and series capacitors in power system performance.	7M	CO2	L4
(b)	Discuss the need for using compensators in power system.	7M	CO2	L2
5(a)	Explain the procedure for Symmetrical Fault Calculations.	7M	CO3	L2
(b)	A three-phase, Y-connected, 75MVA, 27-KV synchronous generator has a synchronous reactance of 9.0 Ω per phase. Using rated MVA and voltage as base values, determine the per unit reactance. Then change this per-unit value to a 100 MVA, 30-KV base.	7M	CO3	L3
	(OR)			
6(a)	A 3-phase transmission line operating at 10 kV and having a resistance of 1Ω and reactance of 4 Ω is connected to the generating station bus-bars through 5 MVA step-up transformer having a reactance of 5%. The bus-bars are supplied by a 10 MVA alternator having 10% reactance. Calculate the short-circuit kVA fed to symmetrical fault between phases if it occurs at the high voltage terminals of the transformer. 	7M	CO3	L4

(b)	What is meant by a short-circuit? Discuss the possible causes of short-circuit in the power system.	7M	CO3	L2
7(a)	Explain the concept of sequence impedances of power system components.	7M	CO3	L2
(b)	Determine analytically the symmetrical components of voltage, if $V_a = 100\angle 0°$; $V_b = 33\angle -100°$; $V_c = 38\angle 176.5°$;	7M	CO3	L3
	(OR)			
8(a)	Derive the expressions to calculate the fault current when L-L fault occurs through fault impedance Z_f on lines b and c, line-a is healthy) on a solidly grounded un-loaded synchronous generator and develop an equivalent network showing the inter-connection of sequence networks.	7M	CO3	L2
(b)	A 3-phase, 11 kV, 25 MVA generator with X0 = 0·05 p.u., X1 = 0·2 p.u. and X2 = 0·2 p.u. is grounded through a reactance of 0·3 Ω. Calculate the fault current for a single line to ground fault. Neglect fault impedance.	7M	CO3	L4
9(a)	What is protective relay? Explain its function in an electrical system.	7M	CO4	L2
(b)	Describe the construction and working of a Buchholz relay.	7M	CO4	L2
	(OR)			
10(a)	Compare the performance of SF6 gas with air when used for circuit breaking.	7M	CO4	L4
(b)	With a neat diagram describe the construction, and principle of operation of an air-break circuit breaker.	7M	CO4	L2

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

20AD04-MACHINE LEARNING
(AI&DS,CSE,CSE(AI&ML) and IT)

9 N 2

Time : 3 hours Max. Marks: 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the process of machine learning in detail with a block diagram.	7M	CO1	L2
(b)	Discuss various basic data types in machine learning with examples.	7M	CO1	L2
	(OR)			
2 (a)	Discuss various types of machine learning with examples.	7M	CO1	L2
(b)	Explain any two factors that influence the quality of data.	7M	CO1	L2
3(a)	Discuss Principal Component Analysis in feature extraction.	7M	CO2	L2
(b)	Illustrate under-fitting and over-fitting with examples.	7M	CO2	L2
	(OR)			
4(a)	Explain the procedure of LDA with clear steps.	7M	CO2	L2
(b)	Discuss any two feature selection approaches with suitable diagrams.	7M	CO2	L2
5(a)	Illustrate multiple linear regression analysis. Give the matrix representation for n variables.	7M	CO3	L2
(b)	Fit the linear equation for the given data using the simple linear regression. Find the R^2 value for the given dataset.	7M	CO3	L3

X	1	2	3	4	5
Y	40	63	30	49	60

	(OR)			
6(a)	Discuss the assumptions to be made for creating a successful regression model.	7M	CO3	L2
(b)	Differentiate linear and logistic regression.	7M	CO3	L2
7(a)	Explain the support vector machine (SVM) model by giving the procedure of selecting hyperplane in different scenarios.	7M	CO4	L2
(b)	Discuss in detail the learning steps of classification.	7M	CO4	L3
	(OR)			
8(a)	Discuss the Random Forest model with a neat diagram.	7M	CO4	L2
(b)	Illustrate K-nearest neighbor algorithm with a suitable example.	7M	CO4	L2
9(a)	Discuss the stacking with neat diagram.	7M	CO5	L2
(b)	Describe the steps in XGBoost Algorithm.	7M	CO5	L2
	(OR)			
10(a)	Explain clearly about Q-learning algorithm.	7M	CO5	L2
(b)	Describe the steps in AdaBoost algorithm.	7M	CO5	L2

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

20AE09-GAS DYNAMICS
(ASE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Compare (i) incompressible and compressible flows (ii) low-speed and high-speed flows.	7M	CO1	L2
(b)	During a flight, a fighter aircraft attains its cruise speed of 600 m/s at 10 km altitude after taking off at 150 m/s from sea level. Assuming the speed to have increased linearly with altitude during the climb, compute the variation in Mach number with Altitude.	7M	CO1	L3
	(OR)			
2(a)	Derive isentropic relations for compressible flows.	7M	CO1	L2
(b)	Air flows through a frictional diffuser. At a station in the diffuser the temperature, pressure and velocity are 0°C, 140 kPa and 900 m/s, respectively and at a downstream station the velocity decreases to 300 m/s. Assuming the flow to be adiabatic, calculate the increase in pressure and temperature of the flow between these stations.	7M	CO1	L4
3(a)	Define critical properties. Calculate the critical pressure ratio $\left(\frac{p^*}{p_0}\right)$ and temperature ratio $\left(\frac{T^*}{T_0}\right)$ for perfect gas with γ=1.4.	4M	CO2	L2
(b)	Derive the following relationship for 1-D flow through a stream tube. $$\frac{dA}{dV} = -\frac{A}{V}(1-M^2)$$	10M	CO2	L3
	(OR)			
4(a)	Calculate the maximum mass flow rate possible through a frictionless, insulated convergent nozzle of exit area 6.5 cm^2 operating at sea level, if the stagnation conditions are 5 bar and 15°C. Also, calculate the exit temperature.	7M	CO2	L4
(b)	A convergent-divergent nozzle is designed to operate with exit Mach number of 2.5. The nozzle is supplied from an air reservoir at 6.8 bar. Assuming the flow to be reversible and adiabatic calculate (i) maximum back pressure to choke the nozzle and (ii) maximum back pressure to deliver Mach 2.5 at the exit under correct expansion conditions.	7M	CO2	L4
5(a)	Nitrogen gas passes through a normal shock with upstream conditions of p_1 = 300kPa, T_1 = 303 K, and V_1 = 923m/s. Determine the velocity V_2 and pressure p_2 downstream of the shock.	7M	CO3	L4

(b)	Consider a Mach 3 air flow (γ=1.4) at a static pressure of 3kPa. Let this flow pass over a compression corner that causes the flow to deflect through an angle θ of 10 degrees. What is the static pressure downstream of the shock? For the same flow, if the deflection angle is doubled to 20degrees, what is the increase in the shock strength (the ratio of static pressures across the shock wave) compared with when the deflection angle was 10 degrees?	7M	CO3	L4
	(OR)			
6(a)	A Mach 2 air stream passes over an expansion corner with 10^0 expansion angle. Find the Mach number of the flow downstream of the expansion fan.	4M	CO3	L4
(b)	For the flow across a normal shock wave, derive the relationship among freestream Mach number (M_1), wave angle (β) and Deflection angle (θ) which is usually called as θ-β-M relation.	10M	CO3	L3
7(a)	Air flows through an insulated duct of diameter 30mm. Determine the duct length required to accelerate the flow from Mach 0.2 to Mach 0.5. The average friction factor for the duct is 0.025.	7M	CO4	L3
(b)	Air flows through a pipe of 50 mm diameter with a friction factor of 0.006. At a certain point along the pipe length the Mach number is 0.2. Find the maximum permissible distance from the point to the exit of the pipe if choking is to be avoided.	7M	CO4	L3
	(OR)			
8(a)	Air at p_1 = 1atm and T_1 = 288K enters a heated duct. Estimate the amount of heat per unit mass necessary to choke the flow at the duct exit. Also, determine the pressure and temperature at the duct exit, for inlet Mach number of (i) M_1 =2.5and (ii) M_1 =0.5. Neglect the frictional effects.	7M	CO4	L4
(b)	How the properties will get varied in the following cases (i) Rayleigh flow with supersonic entry and with heating (ii) Rayleigh flow with subsonic entry and with heating.	7M	CO4	L2
9(a)	At a given point on the surface of the airfoil, the pressure coefficient is 0.3 at very low speeds. If the freestream Mach number is 0.6, calculate C_p at this point.	7M	CO5	L3
(b)	What is Prandtl-Glauert compressibility correction. Write its mathematical equation? How far (in terms of Mach number) this is valid in compressible flows? Discuss in detail.	7M	CO5	L2
	(OR)			
10.	Derive the expression for pressure coefficient over airfoil in terms of perturbed velocity.	14M	CO5	L3

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

20CE13-HYDROLOGY AND WATER RESOURCES ENGINEERING
(CE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain a method for estimating the missing rainfall data at a station in a basin and a method for testing the consistency of rainfall records at a station and necessary adjustment.	7M	CO1	L2
(b)	A 3-hour storm occurred at a place and the precipitations in the neighbouring rain-gauge stations P, Q and R were measured as 3.8, 4.1 and 4.5 cm, respectively. The precipitation in the neighbouring station S could not be measured since the rain-gauge bottle was broken. The normal precipitation in the four stations P, Q, R and S as per IMD Bulletin were 45, 48, 53 and 50 cm, respectively. Estimate the storm precipitation at station S.	7M	CO1	L3
	(OR)			
2(a)	The rates of rainfall for sucessive 30 min period of 210 min storm are: 3.5, 4.0, 12.0, 8.5, 4.5, 4.5 and 3.0 cm/hr. Assuming the φ-index of 3.5 cm/hr, find out the net rainfall in cm, the total rainfall and the value of W-index.	7M	CO1	L3
(b)	Explain briefly the evaporation process. What are the factors that influence the process of evaporation? Suggest a method of estimating evaporation from a storage reservoir. Recommend measures to reduce reservoir evaporation.	7M	CO1	L2
3(a)	Discuss the various factors, which affect the runoff from a basin.	7M	CO2	L2
(b)	The mass curve of an isolated storm over a watershed is given below. Time from start (h): 0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0 Cummulative rainfall (cm): 0, 0.25, 0.50, 1.10, 1.60, 2.60, 3.50, 5.70, 6.50, 7.30, 7.70 If the storm produced a direct runoff of 3.5 cm at the outlet of the watershed, estimate the ϕ-index of the storm and duration of rainfall excess.	7M	CO2	L3
	(OR)			
4(a)	State and explain different aquifer parameters.	7M	CO2	L2
(b)	A tubwell penetrates fully an unconfined aquifer. Calculate the discharge from the well in lpm from the following data: Diameter of the well - 30 cm Drawdown in the well - 3 m Effective length of the strainer under the above drawdown-10m Coefficient of permeability of the aquifer - 40 m/day Radius of zero drawdown - 300 m	7M	CO2	L3

<table>
<tr><td>5(a)</td><td>Describe with the help of a neat sketch the methods of separation of base flow from the hydrograph of runoff indicating the situations under which you advocate them.</td><td>7M</td><td>CO3</td><td>L2</td></tr>
<tr><td>(b)</td><td>A flood hydrograph of a river draining a catchment of 189 km^2 due to a 6 hour isolated storm is in the form of a triangle with a base of 66 hour and a peak ordinate of 30 m^3/s occurring at 10hours from the start. Assuming zero base flow, develop the 6-hour unit hydrograph for this catchment.</td><td>7M</td><td>CO3</td><td>L3</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>6(a)</td><td>List the ordinates of a 8 hr UH using the given ordinates of 3-hr UH for a catchment.
<table>
<tr><td>Time (hr)</td><td>0</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td></tr>
<tr><td>3-hr UH Ordinate (m^3/s)</td><td>0</td><td>40</td><td>50</td><td>70</td><td>90</td><td>110</td><td>95</td><td>94</td><td>20</td><td>0</td></tr>
</table></td><td>7M</td><td>CO3</td><td>L3</td></tr>
<tr><td>(b)</td><td>Define an 'S-curve hydrograph' giving a neat sketch, and state its use.</td><td>7M</td><td>CO3</td><td>L2</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>7(a)</td><td>Describe various methods of irrigation mentioning their advantages, disadvantages and applicability to different field conditions.</td><td>7M</td><td>CO4</td><td>L2</td></tr>
<tr><td>(b)</td><td>Explain the terms 'duty and delta'. Derive a relationship between the two. What are the factors affecting duty? How can duty be improved?</td><td>7M</td><td>CO4</td><td>L2</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>8(a)</td><td>Describe in brief about the types of Irrigation Efficiencies.</td><td>7M</td><td>CO4</td><td>L2</td></tr>
<tr><td>(b)</td><td>Compare surface irrigation with sub-surface irmgation.</td><td>7M</td><td>CO4</td><td>L2</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>9(a)</td><td>Using Lacey's basic regime equation, derive an equation for Lacey's Scour Depth.</td><td>7M</td><td>CO5</td><td>L2</td></tr>
<tr><td>(b)</td><td>Compara Kennedy's and Lacey's silt theoriea. Why in Lacey's conception superior to that of Kennedy's?</td><td>7M</td><td>CO5</td><td>L2</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>10(a)</td><td>What are the considerations that are made for the alignment of an Irrigation Canal?</td><td>7M</td><td>CO5</td><td>L2</td></tr>
<tr><td>(b)</td><td>Using Kennedy's theory, design a Channel Section for the following data:
Discharge Q = 14 cumecs
Kutter's N = 0.0225
Critical Velocity Ratio m = 1
Side Slope 0.5 : 1
Bed Slope is 1/5000.</td><td>7M</td><td>CO5</td><td>L3</td></tr>
</table>

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26 DEC 2025

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20EC10-ANTENNAS AND WAVE PROPAGATION
(ECE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the following antenna parameters: (i) Radiation pattern (ii) Radiation efficiency (iii) Radiation intensity (iv) Radiation resistance	7M	CO1	L2
(b)	Differentiate half wave and monopole antennas.	7M	CO2	L2
	(OR)			
2.	Derive the radiation resistance of alternate current element.	14M	CO2	L4
3(a)	Summarize the characteristics of broadside and end fire arrays.	7M	CO2	L2
(b)	Analyze array of two point sources fed with currents of unequal magnitude and phase.	7M	CO2	L4
	(OR)			
4(a)	A broad side array of 8 isotropic antenna separated by distance of $\lambda/2$. Deduce radiation field in a plane containing line of array showing directions of maxima's and Nulls.	7M	CO2	L3
(b)	Use pattern multiplication method to draw resultant radiation pattern for array of 4 point sources.	7M	CO2	L3
5(a)	Demonstrate traveling wave and standing wave antennas.	7M	CO3	L2
(b)	Demonstrate the Helical antenna in the following modes with a neat sketch (i) Normal mode (ii) Axial mode.	7M	CO3	L2
	(OR)			
6(a)	Outline the characteristics of Yagi-Uda antenna.	7M	CO3	L2
(b)	Determine the directivity and HPBW for a 20 turn helical antenna operating at 3 GHz with circumference of 10 cm and spacing between the turns 0.3λ.	7M	CO3	L3
7(a)	Analyze the corner reflector antenna for different corner angles with neat diagrams.	7M	CO3	L4
(b)	Explain different types of feeding systems of a parabolic reflector.	7M	CO3	L2
	(OR)			
8(a)	Apply reflection coefficient equation for measurement of impedance of antenna using slotted line method.	7M	CO4	L3
(b)	Demonstrate the measurement of gain of antenna using direct comparison method.	7M	CO4	L2
9(a)	Summarize the different types of layers in ionosphere with suitable diagram.	7M	CO1	L2
(b)	Describe the following terms with necessary equations (i) MUF (ii) Skip distance.	7M	CO2	L3
	(OR)			
10(a)	Examine the expression for refractive index of ionosphere.	7M	CO2	L3
(b)	Describe the Ground wave propagation.	7M	CO1	L2

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

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

20EE13-ELECTRICAL MACHINES-II

(EEE)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Draw the phasor diagram of 3-phase Induction Motor.	7M	CO1	L3
(b)	A 4-pole, 3-phase induction motor operates from a supply whose frequency is 50 Hz. Calculate (i) The speed at which the magnetic field of the stator is rotating. (ii) The speed of the rotor when the slip is 0.04 (iii) The frequency of the rotor currents when the slip is 0.03 (iv) The frequency of the rotor currents at standstill.	7M	CO1	L3
	(OR)			
2(a)	Derive the equivalent circuit of 3-phase Induction Motor.	7M	CO1	L3
(b)	In a 6-pole, 3-phase, 50 Hz motor with star connected rotor, the rotor resistance per phase is 0.3 Ω, the reactance at standstill is 1.5 Ω, and an emf between slip rings on open circuit is 175V. Find (i) Slip at a speed of 950 rpm (ii) Rotor emf per phase (iii) Rotor frequency and reactance at a speed of 950 rpm.	7M	CO1	L3
3.	A 3-phase, 400 V Induction Motor gave the following test readings: No-load test : 400 V, 1250 W, 9 A Short-circuit test : 150 V, 4 kW, 38 A. Develop the circle diagram. If the normal rating is 14.91 kW, Determine from the circle diagram, the full-load values of current, p.f. and slip.	14M	CO1	L3
	(OR)			
4(a)	Derive the equations of mechanical output power and torque of 3-phase Induction Motor.	7M	CO1	L3
(b)	Describe the working of DOL starter in 3-phase Induction Motor.	7M	CO1	L2
5(a)	Discuss the double field theory in the single-phase Induction Motor.	7M	CO2	L2
(b)	List the applications of capacitor start and capacitor run Induction Motors.	7M	CO2	L2
	(OR)			
6(a)	Discuss the equivalent circuit of 1-phase Induction Motor.	7M	CO2	L2
(b)	Distinguish between shaded pole and capacitor start induction motors.	7M	CO2	L2
7(a)	Distinguish between salient and non-salient pole Rotors of Alternators.	7M	CO3	L2
(b)	Derive the equation of currents when two alternators are connected in parallel across the load.	7M	CO3	L3
	(OR)			
8.	A 3 MVA, Y-connected alternator rated at 4750 volts at 50-Hz has the open-circuit characteristic given by the following data : Field Current (A): 50, 100, 150, 200, 250, 300, 350, 400, 450 EMF (V): 1620, 3150, 4160, 4750, 5130, 5370, 5550, 5650, 5750 A field current of 250 A is found necessary to circulate full-load current on short-circuit of the alternator. Calculate the full- load voltage regulation at 0.8 p.f. lagging by using synchronous impedance method. Neglect resistance.	14M	CO3	L3
9(a)	Discuss the constructional features of 3-phase Synchronous Motor.	7M	CO4	L2
(b)	Derive the equation of power developed in the 3-phase Synchronous Motor.	7M	CO4	L2
	(OR)			
10(a)	Illustrate the various excitation systems in the Synchronous Motor.	7M	CO4	L2
(b)	Discuss the 'V' and 'inverted V' curves of Synchronous Motor.	7M	CO4	L2

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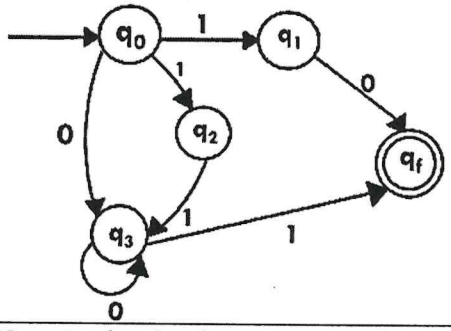
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20AD05-AUTOMATA AND COMPILER DESIGN
(AI&DS)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Construct DFA which does not accepts set of all strings containing three consecutive zero's.	7M	CO1	L2
(b)	Construct Finite Automata for the language (1+10+110)*0.	7M	CO1	L2
	(OR)			
2(a)	Find the regular expression for the languages accepted by the following automata. 	7M	CO1	L2
(b)	Use Arden's theorem and Prove that (1+00*1)+(1+00*1)(0+10*1)*(0+10*1)=0*1(0+10*1)*.	7M	CO1	L2
3(a)	Show that { $a^m b^n c^p$ | m<n or n<p} is not deterministically context-free.	7M	CO2	L3
(b)	Convert the grammar S→0AA, A→0S/1S/0 to a PDA that Accepts the same Language by Empty Stack.	7M	CO2	L2
	(OR)			
4(a)	Find a grammar equivalent to S→AB/AC,A→ Aa/bAa/a, B→bbA/aB/AB, C→aCa/aD D→aD/bC with no useless symbols and put it into CNF.	7M	CO2	L3
(b)	Construct the Leftmost derivation, Rightmost derivation, and Parse Tree, by considering the CFG with {S,A,B} as the non-terminal alphabet, {0,1} as the terminal alphabet, S as the start symbol and the following set of production rules S → A1B, A → 0A / ∈ , B → 0B / 1B / ∈ For the string w = 00101.	7M	CO2	L3
5(a)	Describe the lexical errors and various error recovery strategies with suitable examples.	7M	CO3	L2
(b)	Construct predictive parse table for the following grammar. E -> E + T/T T -> T *F/F F -> F /a/b	7M	CO3	L2
	(OR)			

6(a)	Discuss how does lexical analysis work and explain the differences between a lexeme, a pattern, and a token.	7M	CO3	L2
(b)	Construct CLR(1) Parsing table for the grammar S→AA, A→aA|b.	7M	CO3	L3
7(a)	Describe in detail about the Translation scheme of SDD.	7M	CO4	L2
(b)	Discuss the Representation of Three address Code with suitable examples.	7M	CO4	L2
	(OR)			
8(a)	Write down the SDT for the following CFG. L→E E→E1+T E→T T→T1*F T→F F→(E) F→digit	7M	CO4	L2
(b)	Illustrate the SDT for Boolean Expressions.	7M	CO4	L2
9(a)	List and explain the various issues in the design of code generators.	7M	CO5	L2
(b)	Discuss about Principal Source of Optimization.	7M	CO5	L2
	(OR)			
10(a)	What is DAG? Construct the DAG for the following basic block? D := B-C E :=A+B B := B+C A := E-D	7M	CO5	L2
(b)	List and discuss about Loop optimization techniques in detail.	7M	CO5	L2

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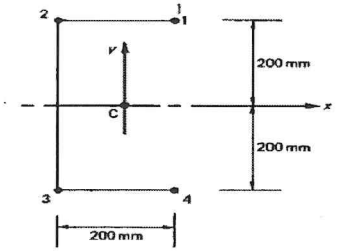
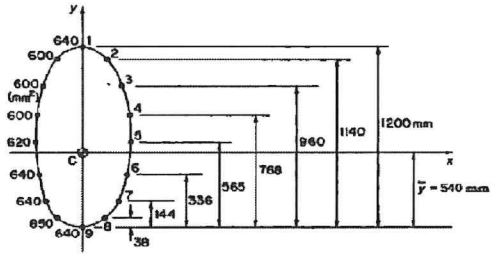
(b)	Discuss the load-carrying capabilities of stressed skin.	7M	CO4	L2
	(OR)			
8(a)	List the applications of thin plates in aircraft structures.	7M	CO4	L1
(b)	A plate 10 mm thick is subjected to bending moments M_x equal to 10 N m/mm and M_y equal to 5 N m/mm. Calculate the maximum direct stresses in the plate.	7M	CO4	L3
9(a)	Describe the principle of structural idealization.	7M	CO5	L2
(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 350mm². Calculate the direct stresses in the booms when the section is subjected to a bending moment of 150 kN-m in a vertical plane. 	7M	CO5	L3
	(OR)			
10(a)	Describe the function of the wing spar and box beam in an aircraft wing.	7M	CO5	L2
(b)	The fuselage section as shown in Figure is subjected to a bending moment of 100 kN-m applied in the vertical plane of symmetry. If the section has been completely idealized into a combination of direct stress carrying booms and shear stress only carrying panels, determine the direct stress in booms 1 to 5 only. Take I_{xx}= 1854 × 10⁶ mm⁴. 	7M	CO5	L3

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27 DEC 2025

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

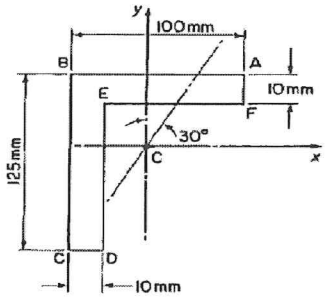
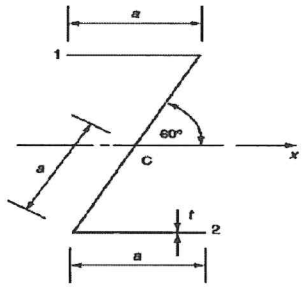
Rasool 27/12/25

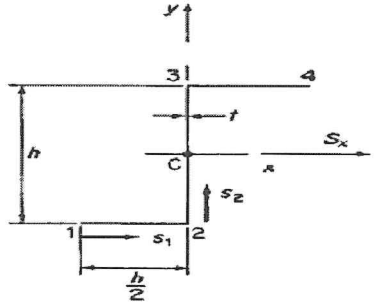
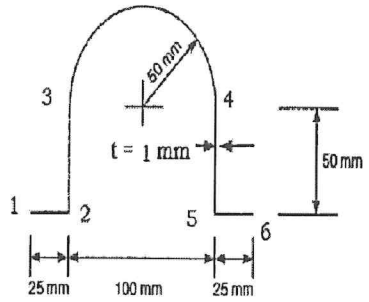
20AE10-AIRCRAFT STRUCTURES-II

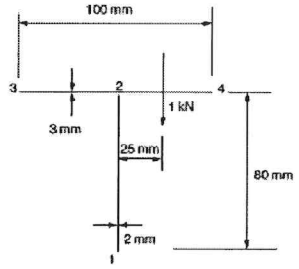
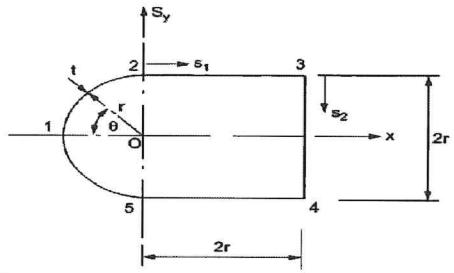
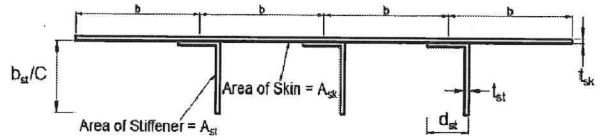
(ASE)

Time : 3 hours | Max. Marks :70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the direct stress distribution for symmetrical and unsymmetrical cross-sections.	7M	CO1	L2
(b)	Figure. shows the section of an angle purlin. A bending moment of 5000 N-m is applied to the purlin in a vertical plane. If the sense of the bending moment M_x is positive, calculate the direct stress at points B, C, and D in the purlin. Take I_{xx}= 3.37 × 10⁶ mm⁴, I_{yy} = 1.93 × 10⁶ mm⁴, I_{xy}= 1.50 × 10⁶ mm⁴. 	7M	CO1	L3
	(OR)			
2(a)	The thin-walled beam section shown in Figure. is subjected to a bending moment $M_y$is applied in a positive sense. Find the position of the neutral axis for the cross-section. Take I_{xx}= $2a^3t$, I_{yy} = $a^3t/3$, I_{xy}= $1.732a^3t/6$. 	4M	CO1	L3

(b)	Derive the direct stress (σ_z) distribution equation due to bending for a beam having an unsymmetrical cross-section.	10M	CO1	L3
3(a)	List out the assumptions of the theory of shear flow for thin-walled sections.	7M	CO2	L1
(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 $I_{xx}= h^3t/3$, $I_{yy} = h^3t/12$, $I_{xy}= h^3t/8$. 	7M	CO2	L3
	(OR)			
4(a)	Determine the shear center for the circular section of radius 'r', and thickness 't' has a narrow slit.	7M	CO2	L3
(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 × 10^5 mm^4. 	7M	CO2	L3
5(a)	Derive the relation for torsion of thin-walled closed-section beams (Bredt–Batho Theory).	7M	CO3	L3

(b)	Determine the maximum shear stress in the beam section shown in Figure clearly stating the point at which it occurs. Also, determine the rate of twist of the beam section if the shear modulus G is 25,000 N/mm^2. 	7M	CO3	L3
	(OR)			
6(a)	Define shear flow and discuss shear flow in closed sections.	7M	CO3	L1
(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 $q_{s,0} = 0.32S_y/r$. 	7M	CO3	L3
7(a)	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. 	7M	CO4	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20CE14-ENVIRONMENTAL ENGINEERING

(CE)

Time : 3 hours | Max. Marks: 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the different sources of water and their impurities in nature.	7M	CO1	L2
(b)	Explain the sources and impacts of (i) Chlorides (ii) Temperature (iii) Total hardness.	7M	CO1	L2
	(OR)			
2(a)	Discuss the population prediction using Master Plan method.	7M	CO1	L2
(b)	List out the various types of viruses and bacteria present in nature. Deliberate the impact of bacteria in water environment.	7M	CO1	L2
3(a)	Discuss briefly the function and operating principles of treatment processes such as aeration, sedimentation, coagulation, and filtration.	7M	CO1	L2
(b)	Design a rectangular sedimentation tank: (i) Volume of water to be treated = 6 MLD (ii) Detention period = 4 hrs (iii) velocity of flow = 10cm/min, longitudinal slope = 1%, water depth = 3m.	7M	CO2	L3
	(OR)			
4(a)	Illustrate the purpose and orientation of a flash mixer and flocculator in water treatment using neat sketch.	7M	CO1	L2
(b)	The surface overflow rate adopted in a sedimentation tank is 30 m/d. The water temperature is 20C. Determine the size of the particles that are removed with 100% efficiency with a specific gravity of 2.5.	7M	CO2	L3
5(a)	Compare the salient features of RSF and SSF.	7M	CO3	L2
(b)	Explain the break-point chlorination and its use in disinfection.	7M	CO3	L2
	(OR)			
6(a)	Discuss the following: (i) Plain chlorination (ii) Pre chlorination (iii) Post chlorination (iv) Double chlorination (v) Super chlorination.	7M	CO3	L2
(b)	Raw water is to be disinfected with chlorine to obtain 99% kill of microorganisms. The number of micro-organisms remaining alive (N_t) at time t, is modelled by $\mathbf{N_t = No\ (e^{-kt})}$, where No is number of microorganisms at t = 0, and k is the rate of kill. The wastewater flow rate is $30 m^3/h$, and k = 0.2 min^{-1}. If the depth and width of the chlorination tank are 1.5 m and 1.0m, respectively, calculate the contact time and length of the tank.	7M	CO3	L3
7(a)	Define BOD and COD. Discuss the relation between them and state how they are important in wastewater treatment.	7M	CO1	L2
(b)	A primary sedimentation tank is provided with an area of 400 m^2 at an average flow of 10 MLD of sewage. Determine its SOR and diameter. If the detention time provided in the tank is 2 hours, determine the side water depth. If the SOR at the peak flow is 50 m/d, compute the ratio of peak flow to average flow.	7M	CO4	L3
	(OR)			
8(a)	Discuss the objective, construction and working of a primary sedimentation tank using a neat sketch.	7M	CO4	L2
(b)	The 5-day BOD of a sewage sample is 200 mg/L at 20C. Determine its 3-d BOD at 30C. Assume, Kd = 0.23d^{-1} @ 20C (base e).	7M	CO4	L3
9(a)	Differentiate between complete mix and diffused aeration processes using neat sketches.	7M	CO5	L2
(b)	Illustrate the following types of settling in wastewater treatment: (i) Discrete (ii) Flocculent (iii) Hindered and (iv) Compression settling.	7M	CO5	L2
	(OR)			
10(a)	A waste sludge contains 100 kg/d of dry solids with a specific gravity of 1.01. Assuming 5% solids in the sludge, compute its volume.	4M	CO5	L2
(b)	Define MLSS, Sludge recycle and Sludge Volume index in wastewater treatment. Explain their importance and state the relation between them.	10M	CO5	L2

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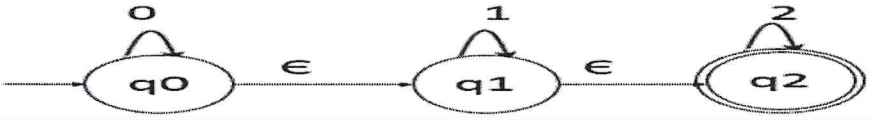
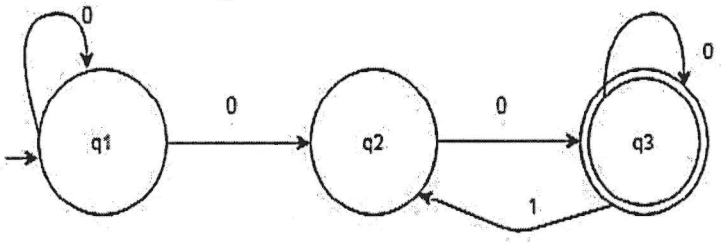
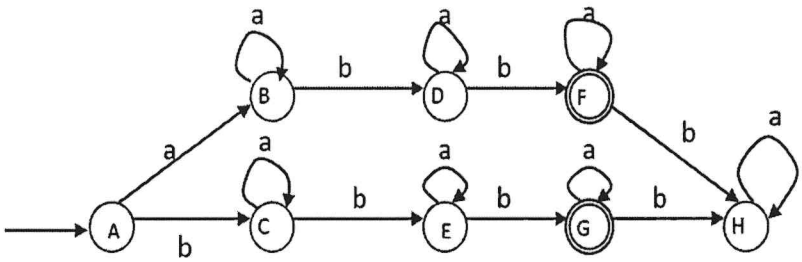
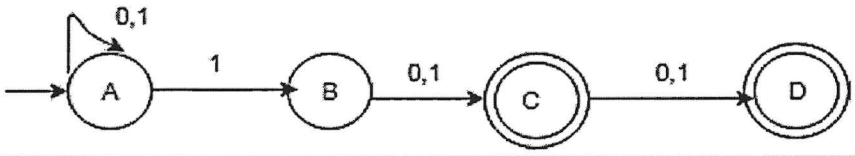
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20CS13-THEORY OF COMPUTATION

(CSE,CSE(AI&ML) and IT)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define nondeterministic finite automata(NFA) and Construct the NFA for the language. L={a^n b^m | n, m>=1}	7M	CO1	L3
(b)	Convert the ε-NFA to NFA. 	7M	CO1	L3
	(OR)			
2(a)	Convert the following NFA to DFA. 	7M	CO1	L3
(b)	Minimize the states of the DFA given below. 	7M	CO1	L3
3(a)	Write regular expression for the language L={1^n 0^m |n>=1, m>=0} .	7M	CO2	L3
(b)	Explain the closure properties of regular sets.	7M	CO2	L3
	(OR)			
4(a)	Design an ϵ-NFA for the regular expression (0+1)*01.	7M	CO2	L3
(b)	Construct regular expression corresponding to the following state diagram. 	7M	CO2	L3
5(a)	Design a PDA to accept the language L= {$0^{2n}1^n$ | n ≥ 1}.	7M	CO3	L3

(b)	Find the Greibach normal form grammar equivalent to the following CFG: $S \rightarrow AB$ $A \rightarrow BS \mid 1$ $B \rightarrow SA \mid 0$	7M	CO3	L3
	(OR)			
6(a)	Convert the grammar {S→ABaC|ABa, A→Aa|a, B→BaB|b, C→CC} to Chomsky normal form.	7M	CO3	L3
(b)	Define Ambiguous Grammar. Check whether the grammar S→aAB, A→bC/cd, C→cd, B→c/d Is Ambiguous or not.	7M	CO3	L3
7(a)	Construct Turing Machine for the following functions: (i) F(X)=X+1 (ii) F(A+B)=C.	7M	CO4	L3
(b)	Write the properties of recursive languages and recursively enumerable languages.	7M	CO4	L2
	(OR)			
8(a)	Construct a Turing Machine for language $L = \{0^n 1^n 2^n \mid n \geq 1\}$.	7M	CO4	L3
(b)	Discuss the variants of Turing machine.	7M	CO4	L2
9(a)	Describe the following: (i) Church Turing Thesis (ii) Rice Theorem	7M	CO5	L2
(b)	Write a note on Universal Turing machines.	7M	CO5	L2
	(OR)			
10(a)	Interpret the following: (i) Undecidable Problems (ii) Universal and Diagonalization of Languages (iii) Halting Problem	7M	CO5	L2
(b)	Define Post's correspondence problem with suitable example explain it.	7M	CO5	L2

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H.T.No										

27 DEC 2025

R20

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.

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

20EC11-LINEAR IC APPLICATIONS
(ECE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Summarize MSI, LSI, VLSI and ULSI technologies.	7M	CO1	L2
(b)	Discuss the advantages and disadvantages of integrated circuits.	7M	CO1	L2
	(OR)			
2.	Analyze the Dual input, balanced output configuration of differential amplifier using DC and AC analysis.	14M	CO3	L4
3(a)	Interpret full wave rectifier by using Op-Amp.	7M	CO2	L2
(b)	Construct adder and subtractor circuit of Op-amp.	7M	CO2	L2
	(OR)			
4(a)	Illustrate differential amplifier using op amp and determine the output voltage.	7M	CO1	L2
(b)	Differential amplifier uses a transistor with β=100 and is biased at I_{CQ}=100 μA. Determine the value of R_C and R_E if $\lvert A_{DM} \rvert$=500 and CMRR=80dB.	7M	CO2	L2
5(a)	Derive the gain of second order low pass filter using op-amp.	7M	CO2	L3
(b)	Design a wide band-pass filter with f_L=200Hz, f_H=2kHz and a pass band gain=4 and also calculate the Q for the filter.	7M	CO4	L3
	(OR)			
6(a)	With neat circuit diagram explain how RC phase shift oscillator generates oscillations?	7M	CO2	L2
(b)	Derive the frequency of oscillations of RC phase shift oscillator.	7M	CO2	L3
7(a)	Analyze the IC 555 timer with waveforms and explain the function of each block.	7M	CO3	L3
(b)	Derive the pulse width duration of a monostable multivibrator using 555timer.	7M	CO2	L3
	(OR)			
8(a)	Interpret the principle of operation of phased locked loop with suitable block diagram.	7M	CO2	L2
(b)	Summarize any two applications of PLL.	7M	CO2	L2
9(a)	Illustrate inverted R-2R ladder DAC.	7M	CO1	L2
(b)	For 4-bit binary weighted resistor DAC, Calculate resistor values if the smallest resistor is 25Ω.	7M	CO2	L2
	(OR)			
10(a)	Discuss the working of dual slope ADC and describe its special features.	7M	CO2	L2
(b)	A 8 bit ADC outputs are all 1's when Vi =5.1 V. Find it's (i) Resolution (ii) Digital output when Vi =1.28 V.	7M	CO2	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B. Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.

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

20EE14-POWER ELECTRONICS
(EEE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain two transistor analogy of SCR.	7M	CO1	L2
(b)	Explain the operation of snubber circuit in detail.	7M	CO1	L2
	(OR)			
2(a)	Explain the static characteristics of SCR and write any two turn ON methods of SCR.	7M	CO1	L2
(b)	Describe the operation of UJT firing circuit.	7M	CO1	L2
3.	Explain the operation of single phase fully controlled bridge converter with RL load under continuous conduction with neat circuit diagram and relevant waveforms. Also derive its average and rms voltage.	14M	CO2	L3
	(OR)			
4(a)	Differentiate semi controlled and full controlled rectifiers.	7M	CO2	L2
(b)	A 3-phase full converter is operated from a 3-ph Y-connected 208V, 60Hz supply and the load resistance is R=10Ω. If it is required to obtain an average output voltage of 50% of the maximum possible output voltage, calculate (i) Delay Angle (ii) The rms and average output currents.	7M	CO2	L3
5.	Explain the operation of TRIAC and its characteristics. Derive the average and rms value of single phase AC voltage controller employing TRIAC.	14M	CO3	L2
	(OR)			
6(a)	Brief about cycloconverters.	4M	CO3	L1
(b)	Explain the operation of single-phase bridge configuration of cycloconverter with R load.	10M	CO3	L2
7(a)	Analyze a Buck converter with neat circuit diagram and necessary equations.	7M	CO4	L2
(b)	Explain the principle of operation of Boost converter with relevant diagrams.	7M	CO4	L2
	(OR)			
8(a)	Briefly explain choppers.	4M	CO4	L2
(b)	Discuss in detail various Chopper Classifications.	10M	CO4	L2
9(a)	Discuss in detail about Current Source Inverter.	7M	CO5	L2
(b)	Explain various modulation techniques.	7M	CO5	L2
	(OR)			
10(a)	Explain about 1- phase full bridge inverters with R load.	7M	CO5	L2
(b)	Explain various PWM techniques.	7M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.

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

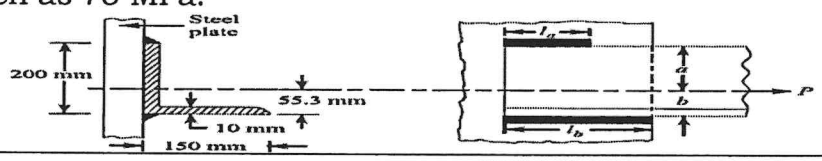
20ME12-DESIGN OF MACHINE ELEMENTS-I

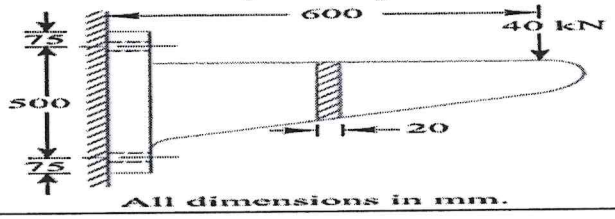
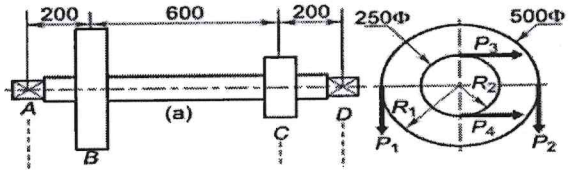
(ME)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Enumerate the basic procedure of machine design.	7M	CO1	L2
(b)	An axle 1 metre long supported in bearings at its ends carries a fly wheel weighing 30 kN at the centre. If the stress (bending) is not to exceed 60 MPa, find the diameter of the axle.	7M	CO1	L3
	(OR)			
2(a)	Discuss shear stress theory of failure and its importance in the design.	4M	CO1	L2
(b)	The shaft is subjected to a bending moment of 3500 N-m and turning moment of 2500 N-m. Determine the diameter of shaft using (i) the maximum principal stress; (ii) The maximum shear stress; and (iii) The maximum distortion strain energy theory of yielding. Take yield strength in tension is 400MPa and factor of safety is 3.	10M	CO1	L3
3(a)	Discuss various methods to reduce stress concentration of a machine element.	7M	CO2	L2
(b)	Machine component is subjected to a flexural stress which fluctuates between +300 MN/m² and –150 MN/m². Determine the value of minimum ultimate strength according to Goodman relation. Take Endurance strength = 0.5 Ultimate strength; and factor of safety = 2.	7M	CO2	L3
	(OR)			
4(a)	Explain the Soderberg method for combination of stresses.	4M	CO2	L2
(b)	A steel rod is subjected to a reversed axial load of 180 kN. Find the diameter of the rod, according to Soderberg relation for a factor of safety of 2. Neglect column action. The material has an ultimate tensile strength of 1070 MPa and yield strength of 910 MPa. The endurance limit in reversed bending may be assumed to be one-half of the ultimate tensile strength. Other correction factors may be taken as follows: For axial loading = 0.7; For machined surface = 0.8 ; For size = 0.85 ; For stress concentration = 1.0.	10M	CO2	L4
5(a)	Describe the eccentric loaded welded joints.	4M	CO3	L2
(b)	A 200 × 150 × 10 mm angle is to be welded to a steel plate by fillet welds as shown in Fig. If the angle is subjected to a static load of 200 kN, find the length of weld at the top and bottom. The allowable shear stress for static loading may be taken as 75 MPa. 	10M	CO3	L3
	(OR)			

6(a)	Write a short note on bolts of uniform strength.	4M	CO3	L2
(b)	A wall bracket, as shown in Fig., is fixed to a wall by means of four bolts. Find the size of the bolts. The safe stress in tension for the bolt and bracket may be assumed as 70 MPa 	10M	CO3	L3
7(a)	Differentiate equivalent bending moment and equivalent twisting moment.	4M	CO4	L2
(b)	A mild steel shaft transmits 20 kW at 200 r.p.m. It carries a central load of 900 N and is simply supported between the bearings 2.5 meters apart. Determine the size of the shaft, if the allowable shear stress is 42 MPa and the maximum tensile or compressive stress is not to exceed 56 MPa. Calculate size of the shaft will be required.	10M	CO4	L3
	(OR)			
8.	The layout of a transmission shaft carrying two pulleys B and C and supported on bearings A and D is shown in fig. Power is supplied to the shaft by means of a vertical belt on the pulley B, which is then transmitted to the pulley C carrying a horizontal belt. The maximum tension in the belt on the pulley B is 2.5 kN. The angle of wrap for both the pulleys is 180° and the coefficient of friction is 0.24. The shaft is made of plain carbon steel 30C8 (Syt = 400 N/mm²) and the factor of safety is 3. Determine the shaft diameter on strength basis. 	14M	CO4	L4
9(a)	List various keys and explain any two keys with neat sketches.	7M	CO5	L2
(b)	A 45 mm diameter shaft is made of steel with a yield strength of 400 MPa. A parallel key of size 14 mm wide and 9 mm thick made of steel with a yield strength of 340 MPa is to be used. Find the required length of key, if the shaft is loaded to transmit the maximum permissible torque. Use maximum shear stress theory and assume a factor of safety of 2.	7M	CO5	L3
	(OR)			
10.	It is required to design a bushed-pin type flexible coupling to connect the output shaft of an electric motor to the shaft of a centrifugal pump. The motor delivers 20 kW power at 720rpm. The starting torque of the motor can be assumed to be 1.5 times the rated torque. The allowable bearing pressure is 0.7MPa. Design the coupling and specify the dimensions of its components.	14M	CO5	L4

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

20ME81-RENEWABLE ENERGY SOURCES

(AI&DS,CE,CSE,CSE(AI&ML) and IT)

Time : 3 hours | Max. Marks : 70

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

Q.No	Questions	Marks	CO	BL
1(a)	How are the needs for renewable energy being met through recent developments?	7M	CO1	L2
(b)	Classify energy resources.	7M	CO1	L2
	(OR)			
2(a)	Describe the working of solar water heating system.	7M	CO1	L1
(b)	Define solar collector and classify different solar collectors.	7M	CO1	L2
3(a)	Illustrate the working of HAWT.	10M	CO2	L1
(b)	Define wind energy and listout the characteristics of wind.	4M	CO2	L2
	(OR)			
4(a)	Explain the single flash system geothermal power plant.	7M	CO2	L1
(b)	List out merits and demerits of geothermal energy.	7M	CO2	L2
5(a)	Classify the tidal power plants.	7M	CO3	L2
(b)	What are the site requirements for tidal power plants?	7M	CO3	L2
	(OR)			
6(a)	Elaborate the working of heaving float type wave energy device.	7M	CO3	L1
(b)	List out the advantages and disadvantages of OTEC plants.	7M	CO3	L2
7(a)	What are the different types of biomass wastes?	7M	CO4	L2
(b)	Explain the working of continues type biogas plant.	7M	CO4	L1
	(OR)			
8(a)	Differentiate the updraft and downdraft gasification process.	7M	CO4	L2
(b)	Elaborate the cross-draft gasification process.	7M	CO4	L1
9(a)	State: (i) Seebeck effects (ii) Peltier effects (iii) Thomson effects	7M	CO5	L1
(b)	Describe the working and construction of basic thermoelectric power generation system.	7M	CO5	L2
	(OR)			
10(a)	List out the different direct energy conversion systems.	4M	CO5	L2
(b)	Illustrate the working of hybrid MHD closed cycle system.	10M	CO5	L1

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

20EC81-SATELLITE TECHNOLOGY

(ASE & IT)

29/12/25

Time : 3 hours Max. Marks :70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Identify different types of Spacecraft orbits based on altitude, inclination, and eccentricity.	7M	CO1	L1
(b)	Summarize various important missions of India.	7M	CO1	L2
	(OR)			
2(a)	Discuss various applications of satellite communication system.	7M	CO1	L2
(b)	Describe the general structure of satellite communication system.	7M	CO1	L2
3(a)	Evaluate the orbital parameters used to determine the satellite position.	7M	CO3	L2
(b)	The difference between the furthest and the closest points in a satellite's elliptical orbit from the surface of the Earth is 30000km and the sum of the distances is 50000 km. If the mean radius of the Earth is considered to be 6400 km, determine orbit eccentricity.	7M	CO4	L3
	(OR)			
4.	Summarize the following terms: (i) Apogee (ii) Perigee (iii) line of nodes (iv) Station keeping.	14M	CO3	L2
5(a)	Differentiate various types of Space batteries based on characteristics and efficiency parameters.	7M	CO2	L2
(b)	Describe the working principle of Solar cell with a neat sketch.	7M	CO2	L2
	(OR)			
6(a)	Discuss the functions of Onboard computer in satellites.	7M	CO3	L2
(b)	Describe TTC&M with the help of block diagram.	7M	CO3	L2
7(a)	Assess the importance of 3- axis stabilization in satellite control design.	7M	CO1	L2
(b)	Compose the salient features of a solar cell used in power control sub system.	7M	CO4	L2
	(OR)			
8(a)	Differentiate Mass expulsion and momentum exchange control system.	7M	CO4	L2
(b)	Paraphrase the following : (i) Inertial Sensors (ii) Star and Sun Sensors (iii) Earth sensors.	7M	CO4	L2
9(a)	Describe the types of applications that commonly use VSAT technology.	7M	CO2	L1
(b)	Discuss about MSAT and RADAR SAT.	7M	CO4	L2
	(OR)			
10(a)	What are the factors contributing to internal and external induced heat in a satellite?	7M	CO3	L1
(b)	Discuss the factors to be considered in the design of a satellite structure and the types of materials used.	7M	CO2	L2

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29 DEC 2025

H.T.No										

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.

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

20AD81-INTRODUCTION TO ARTIFICIAL INTELLIGENCE
(CE,EEE & ME)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain The Foundations of Artificial Intelligence.	7M	CO1	L2
(b)	Discuss history and state of the art of Artificial Intelligence.	7M	CO1	L2
	(OR)			
2(a)	What is Environment? Describe the features of environment.	7M	CO1	L2
(b)	Discuss any two types of agents based on behavior.	7M	CO1	L2
3.	Implement Best first search and A* algorithm with an example.	14M	CO2	L3
	(OR)			
4(a)	Explain Hill climbing algorithm with state space diagram.	7M	CO2	L2
(b)	Discuss the properties of search algorithms.	7M	CO2	L2
5(a)	Implement Breadth first Search with an example.	7M	CO3	L3
(b)	Illustrate Depth first Search algorithm to find solution to the problem with an example.	7M	CO3	L3
	(OR)			
6(a)	Implement Uniform Cost Search with an example.	7M	CO3	L3
(b)	Implement Bi-directional Search with an example.	7M	CO3	L3
7(a)	Implement Tic-tac-toe game with an example.	7M	CO4	L3
(b)	Discuss various levels and operations of Knowledge based agent.	7M	CO4	L2
	(OR)			
8(a)	Illustrate Min Max procedure with example.	7M	CO4	L3
(b)	Differentiate forward chaining and backward chaining.	7M	CO4	L2
9(a)	Discuss the Knowledge Representation Techniques.	7M	CO5	L2
(b)	Explain the Ontological engineering with example.	7M	CO5	L2
	(OR)			
10(a)	What is reasoning? Explain types of reasoning and reasoning system categories.	7M	CO5	L2
(b)	Discuss the Mental events and Mental Objects.	7M	CO5	L2

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29 DEC 2025

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar:: Mylavaram – 521 230:: NTR Dist.:: A.P.

B.Tech. (V Semester) Supplementary Examinations

20CE82-DISASTER MANAGEMENT
(CSE)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Examiner the role and responsibilities of National Disaster Management Authority.	7 M	CO1	L2
(b)	Discuss various types of natural disasters in India and highlight their effects.	7 M	CO1	L2
	(OR)			
2(a)	Summarize landslides at wayanad in the year of 2024.	7 M	CO1	L2
(b)	Discuss the elements of disaster management.	7M	CO1	L2
3(a)	Discuss the disastrous impact of earthquake on agriculture and human life loss.	7 M	CO1	L2
(b)	Discuss in detail the causes and consequences of agriculture in India.	7M	CO1	L2
	(OR)			
4(a)	Explain the environmental causes and effects of volcanic eruptions.	7M	CO1	L2
(b)	Describe the measures taken during a land slide due to impact of disasters.	7M	CO1	L2
5(a)	Discuss the application of remote sensing and GIS for the disaster management.	7M	CO2	L2
(b)	Describe the role National Building Code for the disaster management.	7M	CO2	L2
	(OR)			
6(a)	Briefly discuss the advantages of multimedia technology in disaster management.	7M	CO2	L2
(b)	Explain the types of drought and drought preparedness with Mitigation.	7M	CO2	L2
7(a)	Explain about the early warning network in India for Tsunami.	7M	CO3	L2
(b)	Explain the factors to be considered for preparation of effective disaster planning.	7M	CO3	L2
	(OR)			
8(a)	Explain the various causes that can lead to unsafe drinking water after the response phase in disaster or emergency situation	7M	CO3	L2
(b)	Discuss about response and rehabilitation after cyclone.	7M	CO3	L2
9(a)	Explain on the public awareness and public education for disaster risk reduction.	7M	CO4	L2
(b)	Explain the necessity of community participation in disaster.	7M	CO4	L2
	(OR)			
10.	Discuss the earthquake that occurred in Mulugu, Telangana in December 2024. If you were a disaster management authority, what risk prevention and mitigation measures would you has implemented. Use this incident as a case study.	14M	CO4	L2

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29/12/25

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

20IT81-OOP THROUGH JAVA
(ECE,EEE&ME)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Explain the fundamental concepts of Object-Oriented Programming (OOP).	7M	CO1	L2
(b)	Write a java program to check whether a given number is a Armstrong number or not. (Armstrong number is equal to the sum of its own digits each raised to the power of the number of digits).	7M	CO1	L3
	(OR)			
2(a)	Discuss about recursive control statements in java.	7M	CO1	L1
(b)	Write a java program that finds the maximum number in a given set of numbers separated by comma through StringTokenizer class.	7M	CO1	L2
3(a)	Explain the concept of method overriding in the context of abstract classes with the help of an example.	7M	CO2	L2
(b)	Discuss how dynamic method dispatchment support polymorphism in java.	7M	CO2	L2
	(OR)			
4(a)	Explain the concept of inheritance in Java and discuss the various types of inheritances supported by the language.	7M	CO2	L3
(b)	Discuss about "final" keyword in java with the help of examples.	7M	CO2	L2
5(a)	Write a Java program that uses classes from a user-defined package.	7M	CO3	L1
(b)	Write a Java program that shows how to use methods from all the wrapper classes, for parsing and converting the primitive values.	7M	CO3	L2
	(OR)			
6(a)	Write a Java program to define a BankAccount interface with deposit() and withdraw() methods. Implement it in SavingAccount and CurrentAccount classes, with Current Account supporting higher transaction limits for both operations compared to Savings Account.	7M	CO3	L2
(b)	Explain the concept of "access control" in Java using different access modifiers with examples.	7M	CO3	L2
7(a)	Explain the difference between checked exception and Run Time exceptions with an example.	7M	CO4	L1
(b)	"There is a significant difference between the usage of the `throws` and `throw` keywords in Java, both in their functionality and the situations in which they are applied." Clarify this distinction with an example.	7M	CO4	L1
	(OR)			
8(a)	Discuss the concept of exception propagation in Java.	7M	CO4	L1
(b)	Explain in detail the concept of user defined exception in java with an example.	7M	CO4	L2
9(a)	Explain the role of the synchronized keyword in Java, to prevent race conditions.	7M	CO5	L2
(b)	Explain the thread life cycle in Java, including all possible thread states and transitions.	7M	CO5	L2
	(OR)			
10(a)	Explain the usage of wait(), notify(), notifyAll() methods in critical sections of a muti threaded program.	4M	CO5	L2
(b)	Discuss about how threads communicate each other in java.	10M	CO5	L1

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

20EE84-ELECTRIC VEHICLES

(ME)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Discuss the terms Rolling resistance, Aerodynamic drag and Gravitational force in vehicles with neat sketch and indicate directions of each force.	4M	CO1	L2
(b)	Illustrate about propulsion system design in Electric Vehicles with neat sketch.	10M	CO1	L3
	(OR)			
2(a)	Illustrate the general Electric Vehicle working procedure with a neat sketch.	7M	CO1	L2
(b)	Classify various dynamics of vehicle motion.	7M	CO1	L2
3(a)	Interpret battery SOC (state of charge) with suitable expression.	7M	CO2	L2
(b)	A 12V battery with capacity of 500Ah is at 25% DOD. Determine the following parameters of the battery (i) Charge to be delivered to the load (ii) Energy to be delivered to the load from battery.	7M	CO2	L3
	(OR)			
4(a)	Classify different types of batteries and discuss them briefly with suitable examples.	7M	CO2	L2
(b)	Demonstrate about battery capacity with one suitable example.	7M	CO2	L2
5(a)	Classify and discuss the various electric motor drives used for EV and HEV applications.	7M	CO3	L2
(b)	Plot the various detailed characteristics of PMBLDC motor for EV application.	7M	CO3	L2
	(OR)			
6(a)	Enumerate various parameters that are required to match Electric motor with Internal combustion engine in an Electric Vehicle.	7M	CO3	L2
(b)	Illustrate the construction and principle of operation of a switched reluctance motor used in Electric Vehicles.	7M	CO3	L2
7(a)	Interpret transmission Configuration of Modern EV drive train subsystems with the help of block diagrams.	7M	CO4	L2
(b)	Describe about general working procedure of EV Differential with neat sketch.	7M	CO4	L2
	(OR)			
8.	Analyze Power source and Drive train alternatives of EV Drive train with neat diagrams.	14M	CO4	L2
9(a)	Classify and Demonstrate various Hybrid Electric Vehicles based on their Power Flow.	7M	CO5	L2
(b)	List the advantages and disadvantages of series drive train design of Hybrid Electric vehicles.	7M	CO5	L2
	(OR)			
10(a)	Interpret the concept of Hybridness in Electric Vehicles and compare with conventional, basic battery vehicles.	4M	CO5	L2
(b)	Illustrate vehicle modelling methodology of hybrid electric vehicle components sizing for maximum optimization with the help of a schematic power train.	7M	CO5	L3

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

20CS24-CLOUD COMPUTING
(AI&DS)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define High-Throughput Computing with example.	7M	CO1	L2
(b)	Explain about High-Performance Computing.	7M	CO1	L2
	(OR)			
2(a)	Write the difference between cluster and Grid Computing.	7M	CO1	L1
(b)	Explain Amdahl's law with an example.	7M	CO1	L2
3(a)	With a diagram explain the architecture of a computer system before and after virtualization.	7M	CO2	L2
(b)	List relative Merits of Virtualization at Various Levels.	7M	CO2	L1
	(OR)			
4(a)	Explain the differences between hypervisor and para-virtualization and give one example VMM (virtual machine monitor), that was built in each of the two categories.	7M	CO2	L2
(b)	Explain Virtual cluster and resource management.	7M	CO2	L2
5(a)	Discuss the role of Windows Microsoft Azure in detail.	7M	CO3	L1
(b)	Explain Layered architectural development of the cloud platform for IaaS, PaaS, and SaaS applications over the Internet.	7M	CO3	L2
	(OR)			
6(a)	Explain the properties of Service Oriented Architecture.	7M	CO3	L1
(b)	Explain about a security-aware cloud platform built with a virtual cluster of VMs, storage, and networking resources over the data-center servers operated by providers.	7M	CO3	L2
7(a)	How to Coordinating power and performance management?	7M	CO4	L2
(b)	Explain A utility-based model for cloud-based Web services.	7M	CO4	L2
	(OR)			
8(a)	Discuss on Resource bundling and combinatorial auctions.	7M	CO4	L2
(b)	List out Scheduling algorithms in Clouds. Explain in brief.	7M	CO4	L1
9(a)	Write the differences between File Systems and DBMS.	7M	CO5	L2
(b)	Explain General Parallel File System with a neat diagram.	7M	CO5	L2
	(OR)			
10(a)	Write on Distributed File System	7M	CO5	L2
(b)	Draw a neat diagram and explain on Google File System.	7M	CO5	L2

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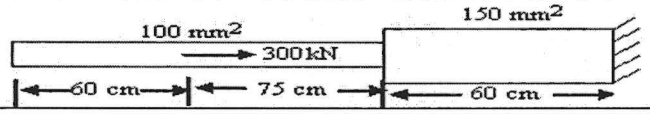
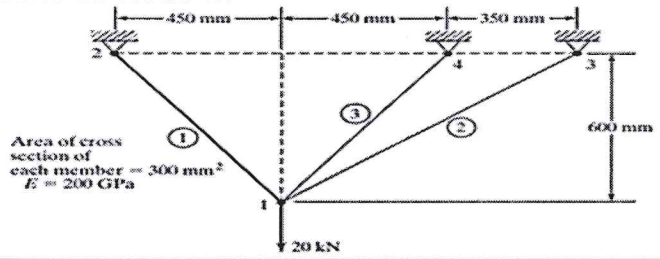
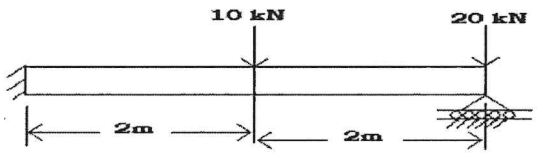
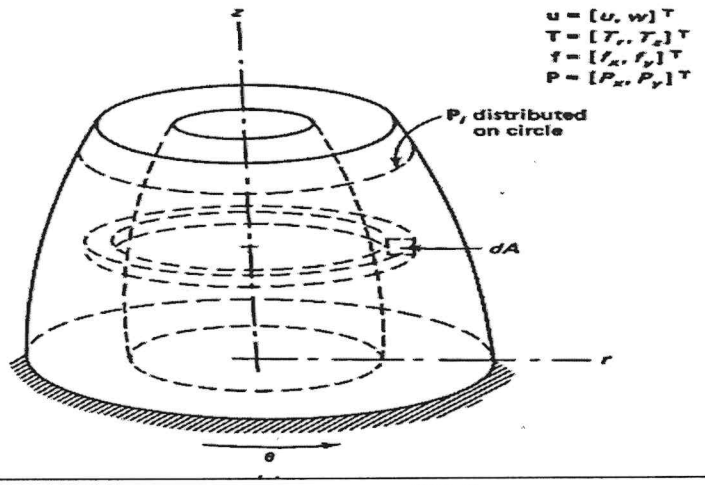
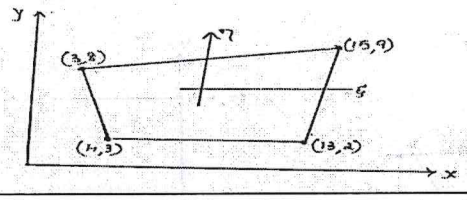
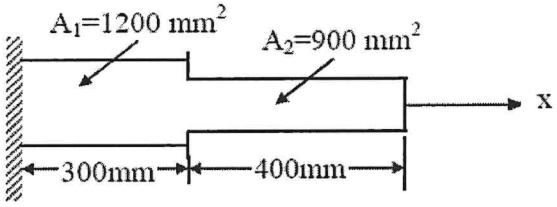
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations
20AE12-FINITE ELEMENT METHODS IN ENGINEERING
(ASE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	What are the steps involved in Rayleigh Ritz Method?	4M	CO1	L1
(b)	Compute the relationship between stress and strain components, strain components and displacements (u,v,w); equilibrium equations for three dimensional elasticity problem.	10M	CO1	L2
2(a)	Derive the strain Displacement Matrix for a 1-D bar element.	4M	CO1	L3
(b)	A stepped bar is subjected to an axial load of 300 KN as shown in Figure. Determine the global stiffness matrix and nodal displacements by considering E = 2 X 10^5 N/mm^2. The cross-sectional areas are 100 mm^2 and 150 mm^2. 	10M	CO1	L2
3.	For the three-bar truss shown in the figure find the displacements in node 1. 	14M	CO2	L3
	(OR)			
4(a)	Explain the principle of minimum potential energy. How it applies to truss analysis in finite element methods?	7M	CO2	L2
(b)	What are the key considerations when modeling a complex aerospace truss structure with FEA?	7M	CO2	L1
5(a)	How do you derive the load vector for a beam element under uniform distributed load?	4M	CO3	L1
(b)	A beam of 4 m length is subjected to point loads at the distances of 2 m & 4m from the fixed end of 10 kN and 20kN respectively. How can you estimate the deflection at the centre of the beam, if modulus of elasticity of beam material E = 2 x 10^5 MPa and A = 400 mm^2. 	10M	CO3	L2
	(OR)			

6(a)	Write the expression for Traction Force vector in CST element.	4M	CO3	L1
(b)	For a triangular element shown obtain strain displacement matrix B and Determine ϵ_x, ϵ_y, γ_{xy}. Nodal coordinates are (1,1), (8,4), (2,7) and the displacements vector Q= [0.001,0.004,0.003,0.002, -0.002,0.005].	10M	CO3	L3
7(a)	Describe how boundary conditions are applied in axisymmetric analysis, including both essential (displacement) and natural (force) boundary conditions.	7M	CO4	L2
(b)	Determine the stress and strain of the axisymmetric solids shown in Figure subjected to axisymmetric loading. 	7M	CO4	L3
	(OR)			
8(a)	Compute the cartesian coordinates of point P which has local coordinates ξ=0.8 and η=0.6 as shown in figure. 	7M	CO4	L3
(b)	What is Gauss Quadrature in the context of Finite Element Analysis (FEA).	7M	CO4	L1
9(a)	List out the properties of Eigen vectors.	7M	CO5	L1
(b)	Elucidate the following (i) Lumped mass matrix (ii) Consistent mass matrix	7M	CO5	L2
	(OR)			
10.	Determine the natural frequencies and mode shapes. Take E=210GPa. 	14M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20CE15-REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEMS
(CE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Differentiate a map and an aerial photograph in remote sensing.	7M	CO1	L2
(b)	Illustrate the basic geometric characteristics of an aerial photograph.	7M	CO1	L2
	(OR)			
2(a)	Given an aerial image with a focal length of 150 mm, flying heights of 2000 m, and an object at a distance of 100 mm from the principal point with a height of 30 m, calculate the relief displacement of the object.	4M	CO1	L2
(b)	Derive the formula for calculating relief displacement in vertical aerial photography.	10M	CO1	L3
3.	Draw and explain the spectral reflectance curves for soil, vegetation and water.	14M	CO2	L2
	(OR)			
4(a)	Differentiate active and passive remote sensing systems.	4M	CO2	L2
(b)	Define Remote sensing. Explain the components of ideal remote sensing system with a neat sketch.	10M	CO2	L2
5(a)	Define GIS. Describe various components of GIS.	7M	CO3	L1
(b)	List and explain the characteristics of maps.	7M	CO3	L1
	(OR)			
6(a)	Distinguish between spatial and non-spatial data.	4M	CO3	L2
(b)	Explain in detail about map projection, its various types and uses.	10M	CO3	L2
7(a)	Discuss the advantages of the vector data model in representing spatial data.	7M	CO4	L2
(b)	Explain the basic elements of raster data models.	7M	CO4	L2
	(OR)			
8(a)	Discuss the advantages of using the raster data model in spatial data representation.	7M	CO4	L2
(b)	Define network allocation and its role in spatial data analysis.	7M	CO4	L1
9(a)	Discuss the applications of GIS in mapping groundwater availability and quality.	7M	CO5	L2
(b)	What is geomorphology? Discuss the role of RS and GIS in geomorphological applications.	7M	CO5	L2
	(OR)			
10.	Elaborate the applications of remote sensing in civil engineering.	14M	CO5	L2

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L.B.Reddy Nagar :: Mylavaram – 521 230 :: N.T.R Dist.:: A.P.

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

20CS16-PRINCIPLES OF ARTIFICIAL INTELLIGENCE

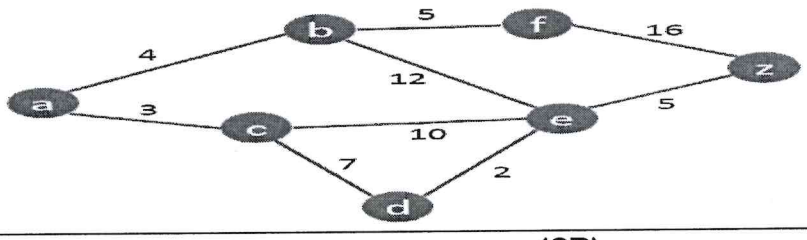
(CSE & IT)

30/12/25

Time : 3 hours | Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define artificial intelligence. What goals are such systems design to achieve?	7M	CO1	L2
(b)	Define the state space. explain with 8-Puzzle Problem.	7M	CO1	L2
	(OR)			
2(a)	Define Application of AI. Write advantages and disadvantages.	7M	CO1	L2
(b)	Summarize the Historical milestone of Artificial Intelligence. And list out the types of artificial intelligence.	7M	CO1	L2
3(a)	Discuss the following toy problems with example. (i) 8- puzzle (ii) Missionaries cannibals	7M	CO2	L2
(b)	Make use of A* algorithm for the following graph. With the following heuristic value. Node: A b c d e f z h(n): 12 10 9 6 4 8 0  	7M	CO2	L2
	(OR)			
4(a)	Discuss the following real-world problems with example. (i) Healthcare Diagnostics (ii) Robot Navigation.	7M	CO2	L2
(b)	Describe the terminologies and properties of search algorithms in detail.	7M	CO2	L2
5(a)	Examine the properties and effectiveness of Alpha-Beta pruning. with example.	7M	CO3	L3
(b)	Illustrate the procedure of Minimax with help of an algorithm.	7M	CO3	L3
	(OR)			
6(a)	Dramatize the representations and mappings with example.	7M	CO3	L3
(b)	Examine the following issues related to knowledge representation with example. (i) Representing Sets of Objects (ii) Important attributes.	7M	CO3	L3
7(a)	Describe the different quantifiers in first order logic with example.	7M	CO4	L2
(b)	Consider the following sentences: Marcus was a man Marcus was a Pompeian Marcus was born in 40 AD All men are mortal All Pompeiians died the Volcano erupted in 79 AD No Mortal lives for more than 150 years (i) Convert them into clause form. (ii) Answer the question "is Marcus dead now "in two different ways. Clearly state the assumptions made.	7M	CO4	L2
	(OR)			
8(a)	Describe the forward versus backward reasoning in detail.	7M	CO4	L2
(b)	Describe the Natural Deduction Using Rules.	7M	CO4	L2
9(a)	Describe about Certainty factors and rule-based Systems.	7M	CO5	L2
(b)	Discuss the Baye's theorem with example.	7M	CO5	L2
	(OR)			
10(a)	Discuss the fuzzy logic in detail with example.	7M	CO5	L2
(b)	Define architecture of an artificial neural network. Discuss the advantages and disadvantages.	7M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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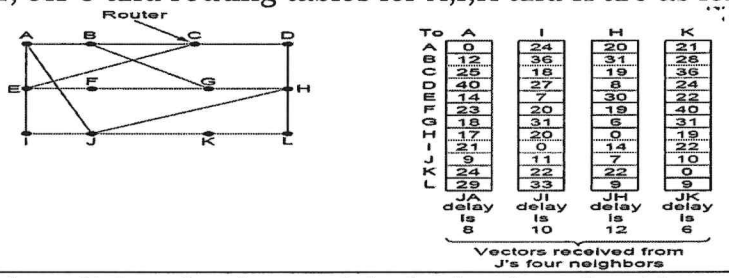
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20EC14-DATA COMMUNICATION AND COMPUTER NETWORKS

(ECE)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Differentiate between OSI and TCP/IP models.	7M	CO1	L2
(b)	Classify various guided and unguided transmission media.	7M	CO1	L2
	(OR)			
2(a)	Describe the networks PAN, LAN, MAN and WAN.	7M	CO1	L2
(b)	Distinguish between connection oriented and connectionless services.	7M	CO1	L2
3(a)	Consider the Data: 1110101 for Hamming code, and answer the following: (i) Calculate the number of redundancy bits required (ii) Determine the positions of various data bits and redundancy bits (iii) Determine the values of redundant bits.	7M	CO2	L3
(b)	Examine the Stop and wait protocol with ARQ.	7M	CO2	L2
	(OR)			
4(a)	Outline the sliding window protocol, Selective ARQ with neat diagram.	7M	CO2	L2
(b)	With neat sketch explain about wireless LAN frame format.	7M	CO2	L2
5(a)	Interpret the importance of distance vector routing with diagram. Consider the following subnet and construct the new routing table for node J using Distance Vector Routing Algorithm. Delay: JA-8, JI-10, JH-12, JK-6 and routing tables for A,I,H and K are as follows: 	7M	CO3	L3
(b)	Illustrate how Token bucket and leaky bucket algorithms helps in congestion control.	7M	CO3	L3
	(OR)			
6(a)	Outline the concept of Flooding and its usage.	7M	CO3	L2
(b)	Discuss the importance of Optimality principle.	7M	CO4	L2
7(a)	Examine the classful and classless addressing schemes.	7M	CO3	L2
(b)	Identify the transport layer services provided to upper layers.	7M	CO2	L2
	(OR)			
8(a)	Compare between IPV4 and IPV6.	7M	CO2	L2
(b)	Describe the Three-way Handshake Connection release mechanism.	7M	CO3	L2
9(a)	Discuss the Email Architecture and Services in detail.	7M	CO4	L2
(b)	Identify UDP and RTP headers and important fields.	7M	CO4	L2
	(OR)			
10(a)	Discuss Simple Network Management Protocol (SNMP).	7M	CO4	L2
(b)	Interpret FTP protocol and different commands used for file transfer.	7M	CO4	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations
20EE16-LINEAR AND DIGITAL IC APPLICATIONS
(EEE)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Formulate the output relations for a circuit design of integrator and differentiator using OP-AMP.	7M	CO1	L3
(b)	How the DIP construction is developed for IC package?	7M	CO1	L2
	(OR)			
2(a)	Design Astable multivibrator using an op-amp. Apply the designed op-amp circuit to generate two unstable states.	7M	CO1	L4
(b)	Derive the output voltage equation of (i) log amplifier and (ii) anti-log amplifier. Also design each op-amp circuit for obtaining derived output.	7M	CO1	L4
3(a)	Draw the schematic diagram of the Wein bridge oscillator using op-amp and derive expression for the oscillation frequency.	7M	CO2	L3
(b)	Analyze triangular wave generator using proper circuit design.	7M	CO2	L3
	(OR)			
4(a)	Develop a op-amp IC for square waveform generation. Analyze the circuit operation in detail.	10M	CO2	L4
(b)	Use suitable op-amp to obtain the saw tooth waveform and discuss the operation.	4M	CO2	L3
5(a)	Design the IC 555 timer circuit and analyze the circuit as a pulse width modulation generator.	7M	CO1	L4
(b)	Design a IC 566 for voltage controlled oscillator.	7M	CO1	L4
	(OR)			
6(a)	Develop Successive approximation type converter circuit. Analyze the function of circuit design.	7M	CO1	L4
(b)	Implement Inverted R-2R ladder DAC circuit and illustrate its operation in detail.	7M	CO1	L4
7(a)	Implement a CMOS transmission gate circuit and analyze its operation by expressing tristate logic.	7M	CO3	L4
(b)	Develop a Magnitude comparator 74X85 IC and list out applications of circuit.	7M	CO3	L4
	(OR)			
8.	How the 4-bit binary adder 74X283 IC works? Develop a detailed circuit and express the procedure for addition and subtraction of two inputs A, B.	14M	CO3	L3
9(a)	Design a Synchronous counter integrated circuit for mod 10 operation.	7M	CO3	L4
(b)	Analyze the programmable ROM configuration with suitable example.	7M	CO3	L3
	(OR)			
10.	Design the synchronous DRAM and mention detailed operation for data transfer rate.	14M	CO4	L4

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

20IT02-INTERNET OF EVERYTHING
(IT)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe some common protocols used at the application layer in IoT and explain their specific uses.	10M	CO1	L2
(b)	Explain the roles of "things" and the internet in the Internet of Things (IoT).	4M	CO1	L2
	(OR)			
2(a)	Describe IoT levels 1 to 3 and their deployment templates and explain the significance of each level in the IoT system structure.	7M	CO1	L2
(b)	Explain an example of an IoT service that utilizes WebSocket-based communication.	7M	CO1	L2
3(a)	Discuss the role of IoT in developing smart cities. How does it contribute to efficient urban management?	7M	CO2	L2
(b)	Describe how IoT is used in monitoring and managing renewable energy sources. Provide examples of specific devices and systems.	7M	CO2	L2
	(OR)			
4(a)	Discuss the impact of IoT on logistics and supply chain management. How does it improve efficiency?	7M	CO2	L2
(b)	Explain the concept of Industry 4.0. What role does IoT play in enhancing Machine Diagnosis and Prognosis processes?	7M	CO2	L2
5(a)	Compare conventional network architecture with SDN (Software Defined Networking) architecture.	7M	CO3	L3
(b)	An IoT service provider wants to offer a new value-added service to its customers. Explain how (Network Function Virtualization) NFV can be used to accelerate the deployment of this new service, reducing time-to-market and improving customer experience.	7M	CO3	L3
	(OR)			
6.	A network administrator is experiencing performance issues on a network device. Describe how (Simple Network Management Protocol) SNMP can be used to identify and troubleshoot the problem, explaining the role of each SNMP component in the process.	14M	CO3	L3
7(a)	Write about following Commands in Linux: wc, ls, rmdir, rm, chown, grep, mv, cat, tar, cd, mkdir,cp.	7M	CO4	L2
(b)	Describe the role of sensors in IoT devices. Why are they essential?	7M	CO4	L2
	(OR)			
8(a)	Explain various data types used in Python.	7M	CO4	L2
(b)	Write a Python script to read temperature data from a sensor connected to a Raspberry Pi. What libraries would you use?	7M	CO4	L3
9(a)	Describe the role of communication APIs in cloud storage.	7M	CO5	L2
(b)	Explain the concept of HTTP methods (GET, POST, PUT, DELETE) in RESTful APIs.	7M	CO5	L2
	(OR)			
10.	Explain the MVC (Model-View-Controller) architecture in Django.	14M	CO5	L2

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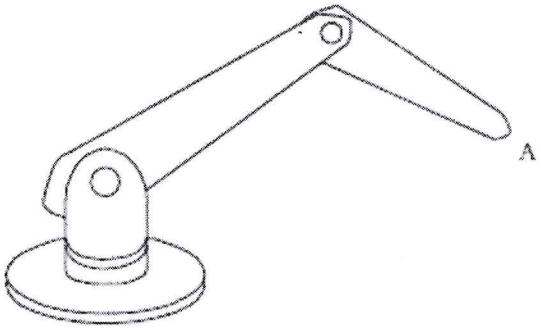
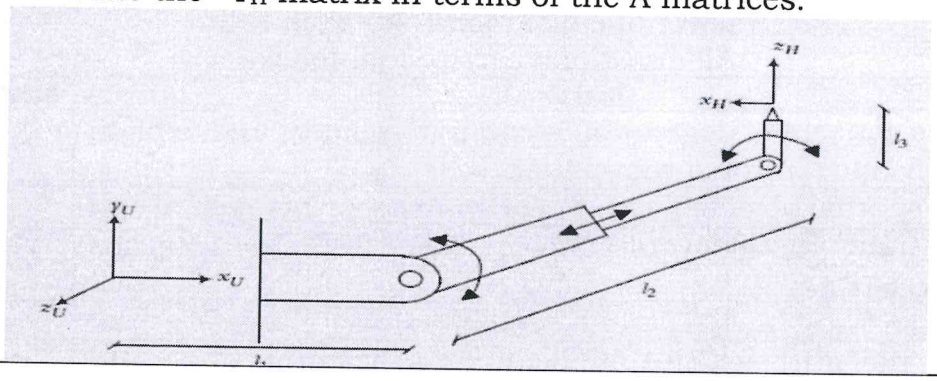
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

20ME14-ROBOTICS
(ME)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	State the concept of degrees of freedom in robotics and explain its significance in robot movement.	7M	CO1	L2
(b)	Given a specific object shape, select an appropriate type of end effector and justify your choice based on the object's characteristics.	7M	CO1	L3
	(OR)			
2(a)	Discuss the purpose and applications of vacuum cups and magnetic grippers in robotics.	7M	CO1	L2
(b)	Draw the approximate workspace for the following robot. Assume the dimensions of the base and other parts of the structure of the robot are as shown. 	7M	CO1	L3
3(a)	Define an actuator and list the three main types of actuators used in robotics.	7M	CO2	L2
(b)	For a robotic application requiring accurate position tracking, recommend an appropriate sensor type and justify your choice.	7M	CO2	L3
	(OR)			
4(a)	Discuss the key characteristics of electric actuators and describe their impact on robotic precision.	7M	CO2	L2
(b)	Compare the applications and limitations of potentiometers, LVDTs, and encoders in position measurement.	7M	CO3	L3
5(a)	For frame F, find the values of the missing elements and complete the matrix representation of the frame. $F = \begin{bmatrix} ? & 0 & -1 & 5 \\ ? & 0 & 0 & 3 \\ ? & -1 & 0 & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	7M	CO3	L2
(b)	Derive the matrix that represents a pure rotation about the y-axis of the reference frame.	7M	CO3	L3
	(OR)			

6.	A special 3-DOF spraying robot has been designed as shown: • Assign the coordinate frames based on the D-H representation. • Fill out the parameters table. • Write all the A matrices. • Write the ${}^{U}T_{H}$ matrix in terms of the A matrices.  	14M	CO3	L4
7(a)	Define differential transformation and explain its purpose in robot motion analysis.	7M	CO4	L2
(b)	Suppose the location and orientation of a hand frame is expressed by the following matrix. What is the effect of a differential rotation of 0.15 radians about the z-axis, followed by a differential translation of [0.1, 0.1, 0.3]? Find the new location of the hand. $${}^{T}_{H}R = \begin{bmatrix} 0 & 0 & 1 & 2 \\ 1 & 0 & 0 & 7 \\ 0 & 1 & 0 & 5 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$	7M	CO4	L3
	(OR)			
8.	Using the Lagrange-Euler method, derive the dynamic equation for torque for a single-link robotic arm with a known mass 'm', Moment of Inertia 'I' and length 'l' at a given angular displacement 'θ' with respect to the universal reference system.	14M	CO4	L4
9(a)	A robot joint moves from an initial position of 10^0 to 50^0 over 4 seconds. Using cubic polynomial interpolation, find the joint angle as a function of time, assuming initial and final velocities are zero. Find joint angles at 1, 2, 3 sec and mention concluding remarks.	7M	CO5	L2
(b)	Propose a robotic assembly solution for a product requiring precise positioning and parts' orientation.	7M	CO5	L3
	(OR)			
10(a)	A robot's end effector needs to move in a straight line from point $(x_1,y_1)=(1,2)$ m to $(x_2,y_2)=(5,8)$ m over 10 seconds. Determine the position of the end effector at every second along the linear path.	7M	CO5	L2
(b)	Compare the benefits and limitations of robotic versus manual material transfer regarding cost, efficiency, and safety.	7M	CO5	L3

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31 DEC 2025

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.
B.Tech. (V Semester) ~~Regular~~/Supplementary Examinations

Proof 31/12/25

20ME10-IC ENGINES AND GAS TURBINES
(ME)

Time : 3 hours Max. Marks : 70

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Classify the IC engines based on various grounds.	7M	CO1	L1
(b)	Illustrate the working principle of two stroke SI engine.	7M	CO1	L2
	(OR)			
2(a)	Elaborate the key requirements of an injection system.	7M	CO1	L2
(b)	Explicate the working of of simple carburetor with neat sketch.	7M	CO1	L2
3(a)	Enumerate the factors that influence the delay period in CI engines.	7M	CO2	L1
(b)	Elucidate the knocking phenomenon in CI engines with suitable sketch.	7M	CO2	L2
	(OR)			
4(a)	Discuss the methods of controlling diesel knock.	7M	CO2	L2
(b)	Describe the construction and functioning of pre-combustion chamber with neat sketch.	7M	CO2	L2
5(a)	List the methods to improve the performance of CI engines.	4M	CO3	L1
(b)	A four-cylinder 4-stroke petrol engine with 6 cm bore and 9 cm stroke was tested at constant speed, the fuel supply is 0.13 kg/min. The spark plugs of 4 cylinders are successively short circuited without change of speed. The power measurements are as follows. (i) With all cylinders working = 16.25 kW (ii) With first cylinder cutoff = 11.55 kW (iii) With second cylinder cutoff = 11.65 kW (iv) With Third cylinder cutoff = 11.7 kW (iv) With fourth cylinder cutoff = 11.5 kW Find (i) Frictional power and Indicated power of the engine (ii) Mechanical efficiency of the engine (iii) Brake thermal efficiency Take clearance volume = 65 cm^3 and CV = 42000 kJ/kg.	10M	CO3	L3
	(OR)			
6(a)	Enlist the merits and demerits of electric vehicles.	7M	CO3	L1
(b)	Explicate the working principle of DTSi technology.	7M	CO3	L2
7(a)	Deduce an expression for efficiency of a simple open cycle gas turbine in terms of pressure ratio.	7M	CO4	L3
(b)	In a gas turbine plant working on the Brayton cycle the air at inlet is 27°C and 0.1Mpa. The pressure ratio of 6.25 and maximum cycle temperature of 800 °C. The isentropic efficiencies of the compressor and turbine are 80% each. Evaluate (i) heat supplied per kg of air (ii) turbine exhaust temperature (iii) cycle efficiency.	7M	CO4	L3
	(OR)			
8(a)	Illustrate the working of a simple constant pressure open cycle gas turbines.	7M	CO4	L2
(b)	Enumerate the advantages and applications of gas turbines.	7M	CO4	L1
9(a)	Discuss the criteria of performance considered in aircraft propulsion analysis.	7M	CO5	L2
(b)	Illustrate the working of turboprop engine.	7M	CO5	L2
	(OR)			
10(a)	Discuss in brief the importance of gas turbine combustion system and its components.	7M	CO5	L2
(b)	Enumerate the merits and demerits of turbojet engine.	7M	CO5	L1

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02 JAN 2026

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

Revised 2/1/26

20ME11-MACHINE TOOLS AND METROLOGY

(ME)

Time : 3 hours | Max. Marks : 70

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate basic elements of machining with a neat sketch.	7M	CO1	L2
(b)	Dissimilarity between orthogonal and oblique cutting in machining.	7M	CO1	L2
	(OR)			
2(a)	Elucidate merchant's force diagram with a neat sketch.	7M	CO1	L2
(b)	What are the various types chips formed in machining process? Explain.	7M	CO1	L2
3.	List parts of lathe machine and in detail discuss parts in lathe machine with neat sketch.	14M	CO2	L2
	(OR)			
4(a)	Draw a neat sketch of a shaper machine and label all parts, clearly.	7M	CO2	L1
(b)	Illustrate various work holding devices used in lathe.	7M	CO2	L2
5(a)	Describe with the help of a line diagram demonstrate and working principle of a horizontal milling machine.	7M	CO3	L1
(b)	Outline the working process of a radial drilling machine with a neat diagram.	7M	CO3	L2
	(OR)			
6(a)	Elucidate the following operation in drilling machine (i) Drilling (ii) Reaming (iii) Boring (iv) Counter sinking	7M	CO3	L2
(b)	What do you understand by grit, grade, bond and structure of a grinding wheel? Explain.	7M	CO3	L2
7(a)	Recognize various factors affecting on surface roughness and what is the necessity for controlling the surface texture?	7M	CO4	L2
(b)	In the measurement of surface roughness, heights of 20 successive peaks and valleys measured from a datum as follows: 25,25,40,25,35,16,40,22,25,34,25,40,20,36,28,18,20,25,30,38, microns. If these measurements were obtained over a length of 20 mm. Determine the CLA and RMS value of the rough surface.	7M	CO4	L3
	(OR)			
8(a)	Define Metrology. Discuss various types of Metrologies.	7M	CO4	L1
(b)	The measurement of surface roughness the height of 10 successive peaks and valleys over datum line over a specified sampling length were found to be; Peaks: 55, 52, 50, 45, 45 Valleys: 40, 35, 35, 34, 28 Calculate the Rz value of the surface.	7M	CO4	L3
9(a)	Short notes on Limits, Fits, and Tolerance.	7M	CO5	L1
(b)	Differentiate between Hole basis system and Shaft basis System of limits and fits.	7M	CO5	L2
	(OR)			
10.	With neat sketches illustrate the following tests on the lathe. ➢ Test for level of machine bed ➢ Axil slip of main spindle ➢ True Running of Headstock Centre ➢ True Running of taper socket in main spindle ➢ Alignment of both the centers in the vertical plain	14M	CO5	L3

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