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. (IV Semester) (R20) Semester End Examinations (Supplementary) – November 2025

TIME TABLE

R20

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

Branch	17-11-2025 (Monday)	18-11-2025 (Tuesday)	19-11-2025 (Wednesday)	20-11-2025 (Thursday)	21-11-2025 (Friday)	22-11-2025 (Saturday)
AI & DS	--	20CS06-Design and Analysis of Algorithms	20CS10 -Data Warehousing and Data Mining	20CS11-Operating Systems	20AD03-Introduction to Artificial Intelligence and Data Science	20HS01-Universal Human Values 2: Understanding Harmony
ASE	--	20FE09-Probability and Statistics	20AE05-Aerospace Materials and Manufacturing	20AE06-Aerodynamics	20AE07-Aircraft Structures-I	20HS01-Universal Human Values 2: Understanding Harmony
CE	--	20FE09-Probability and Statistics	20CE09-Hydraulics and Hydraulic Machinery Systems	20CE10-Geo Technical Engineering	20CE11-Structural Analysis	20HS01-Universal Human Values 2: Understanding Harmony
CSE	20MC02-Environmental Science	20CS06-Design and Analysis of Algorithms	20CS10-Data Warehousing and Data Mining	20CS11-Operating Systems	20IT01-Software Engineering	20HS01-Universal Human Values 2: Understanding Harmony
CSE (AI & ML)	20MC02-Environmental Science	20CS06-Design and Analysis of Algorithms	20CS10-Data Warehousing and Data Mining	20CS11-Operating Systems	20AM01 - Introduction to Artificial Intelligence and Machine Learning	20HS01-Universal Human Values 2: Understanding Harmony
ECE	20MC02-Environmental Science	20EC08-Electromagnetic Waves and Transmission Lines	20EC06-Digital Signal Processing	20EE09-Control Systems	20EC07-Analog Communications	20HS01-Universal Human Values 2: Understanding Harmony
EEE	--	20EE11-Electrical Machines-I	20EE08-Power Systems-I	20EE09-Control Systems	20EE10-Analog Electronics	20HS01-Universal Human Values 2: Understanding Harmony
IT	20MC02-Environmental Science	20CS06-Design and Analysis of Algorithms	20CS10-Data Warehousing and Data Mining	20CS11-Operating Systems	20IT01-Software Engineering	20HS01-Universal Human Values 2: Understanding Harmony
ME	--	20FE09-Probability and Statistics	20ME07-Applied Thermodynamics	20ME08-Production Technology	20ME09-Theory of Machines	20HS01-Universal Human Values 2: Understanding Harmony

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

Date: 01-11-2025

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

17 NOV 2025

H.T.No										

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

19/11/25

20MC02-ENVIRONMENTAL SCIENCE

(CSE,CSE(AI&ML),ECE&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)	When did human population explosion occur? Summarize its consequences on natural resources.	7M	CO1	L2
(b)	What is meant by environmental health? Explain how pesticides and industrial chemicals have positive and negative impacts on society.	7M	CO1	L2
	(OR)			
2(a)	Explain the reasons for displacement of populations and its impacts.	7M	CO1	L2
(b)	Justify the significance of IT in the medical advances in terms of human health.	7M	CO1	L2
3(a)	Describe the efforts of any two individuals who have worked for the conservation of trees or forests.	7M	CO2	L1
(b)	What are the hurdles in moving towards a hydrogen economy? How can we improve energy efficiency?	7M	CO2	L1
	(OR)			
4(a)	Identify the impacts of Modern agriculture on environment and discuss the importance of organic farming.	7M	CO2	L1
(b)	Compare the advantages and disadvantages of oil, coal and natural gas as energy resources.	7M	CO2	L2
5(a)	What are biogeochemical cycles? Draw water and carbon cycles.	7M	CO3	L1
(b)	How many types of food chains exist in nature? Explain with examples.	7M	CO3	L1
	(OR)			
6(a)	Give the structural components (biotic and abiotic components) of a forest ecosystem.	7M	CO3	L2
(b)	Distinguish between the following (i) Background extinction and Mass extinction (ii) Threatened species and endangered species.	7M	CO3	L2
7(a)	How are Indian cities handling the increasing amounts of municipal wastes? Explain.	10M	CO4	L2
(b)	Which waste is considered as Hazardous? What practices should be adapted for management of hazardous waste?	4M	CO4	L2
	(OR)			
8(a)	How do fluoride and arsenic contamination of water affect people's health?	7M	CO4	L2
(b)	What do you understand by the term disaster? Give a brief account of tsunami that hit the India and Indonesian islands in the year 2004.	7M	CO4	L1
9(a)	Can you elaborate the major objectives of Green buildings by explaining its significance in environmental conservation.	7M	CO5	L2
(b)	What is ozone layer and why is it getting depleted?	7M	CO5	L2
	(OR)			
10(a)	Define EIA. Recall the major objectives of EIA in India.	7M	CO5	L1
(b)	Elaborate the main provisions of Water (Prevention and Control of Pollution) Act of 1974.	7M	CO5	L1

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B.Tech. (IV Semester) Supplementary Examinations

20CS06-DESIGN AND ANALYSIS OF ALGORITHMS
(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)	Apply Divide and Conquer and sort the following elements using Quick Sort algorithm 69, 75, 70, 89, 15, 60, 50, 30, 45, 20.	7M	CO2	L3
(b)	Analyze the worst-case and best-case time complexity of quick sort algorithm.	7M	CO2	L2
	(OR)			
2(a)	Find out the time complexity of the algorithm for sum of 'n' natural numbers using step count method.	7M	CO1	L2
(b)	Illustrate the characteristics of an algorithm. How it can be analyzed?	7M	CO1	L2
3(a)	Apply greedy algorithm to generate single-source shortest path with an example graph. Mention its time complexity.	7M	CO3	L2
(b)	Illustrate the general method of Greedy method technique with example.	7M	CO3	L2
	(OR)			
4(a)	What is Minimum cost spanning tree? Explain an algorithm for generating minimum cost spanning tree	7M	CO3	L1
(b)	Find optimal solution to the knapsack problem instance n=6, m=15, (p1...p6) = (10,5,15,7,6,18), (w1...w6) = (2,3,5,7,1,4).	7M	CO3	L3
5.	Explain knapsack problem with example.	14M	CO3	L3
	(OR)			
6(a)	Explain in detail job sequencing with deadlines problem with example.	7M	CO3	L3
(b)	Explain single source shortest path problem with example.	7M	CO3	L3
7(a)	Explain the method of reduction to solve travelling sales person problem using branch and bound.	7M	CO4	L3
(b)	Explain TSP using branch and bound method with example.	7M	CO4	L3
	(OR)			
8(a)	Describe control abstraction for LC Search.	7M	CO4	L3
(b)	Explain principle of LIFO branch and bound.	7M	CO4	L3
9.	Explain the Travelling salesmen problem using Branch and bound technique with example.	14M	CO5	L3
	(OR)			
10(a)	What are the differences between backtracking and branch and bound solutions?	4M	CO5	L2
(b)	Explain 0/1 Knapsack problem with example respect to branch and bound method.	10M	CO5	L3

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

20FE09-PROBABILITY AND STATISTICS
(ASE,CE & ME)

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)	The probability that a regularly scheduled flight departs on time is P(D)=0.83; the probability that it arrives on time is P(A)=0.82 and the probability that it departs and arrives on time is P(D ∩ A) = 0.78. Calculate the probability that a plane (i) arrives on time given that it departed on time, and (ii) departed on time given that it has arrived on time.	7M	CO1	L2
(b)	A random variable X has the following probability mass function. x: -2, -1, 0, 1, 2 P(x): 0.1, 2K, 0.2, 3k, 0.2 Calculate the value of k, hence determine (i) P(X ≥ 0) (ii) mean of X (iii) variance of X.	7M	CO1	L2
	(OR)			
2(a)	State and prove Baye's theorem of probability.	7M	CO1	L2
(b)	On a laboratory assignment, if the equipment is working, the density function of the observed outcomes X is $f(x) = 2(1-x)$, $0 < X < 1$, Then calculate (i) mean E(X) (i) variance V(X).	7M	CO1	L2
3(a)	Differentiate Binomial and Poisson distribution.	4M	CO2	L2
(b)	The distribution of typing mistakes committed by a typist is given below. Fit a Poisson distribution and calculate the expected frequencies from the data. (no.of mistakes) x: 0, 1, 2, 3, 4, 5 (no.of pages) f: 125, 95, 49, 20, 8, 3	10M	CO2	L3
	(OR)			
4(a)	If 20% of the bolts produced by a machine are defective, use binomial distribution to determine the probability that out of 4 bolts chosen at random (i) exactly one bolt (ii) none of the bolts, will be defective.	7M	CO2	L3
(b)	A certain type of storage battery lasts, on average 3.0 yrs. with a standard deviation of 0.5 yrs. Assume that battery life is normally distributed, determine the probability that a given battery will last (i) less than 2.3 yrs (ii) more than 2.5 yrs.	7M	CO2	L3
5.	A population consists of five numbers {2,4,8,12,24}. Consider all possible samples of size 2 which can be drawn without replacement from this population. Calculate the Population mean, Population Standard deviation, mean of the sampling distribution of means and Standard error of sample mean.	14M	CO2	L2
	(OR)			
6(a)	A random sample of 100 students gave a mean weight of 58 kg and standard deviation of 4kg. Estimate 95% and 99% confidence limits of mean of the population.	7M	CO3	L3

(b)	A geneticist is interested in the proportion of African males that have a certain minor blood disorder. In a random sample of 100 African males, 24 are found to be afflicted. Construct a 90% and 95% confidence interval for the proportion of African males that have this blood disorder.	7M	CO3	L3
7(a)	A sales clerk in the departmental store claims that 60% of the shoppers entering the store leave without making a purchase. A random sample of 50 shoppers showed that 35 of them left without buying anything. Are these sample results consistent with the claim of the sales clerk? Use 0.05 level of significance.	7M	CO4	L4
(b)	A sample of heights of 6,400 Englishmen has a mean of 67.85 inches and S.D. 2.56 inches, while another sample of heights of 1,600 Australians has a mean of 68.55 inches and S.D. of 2.52 inches. Do the data indicate that Australians are, on the average, taller than English men? (at α=0.01).	7M	CO4	L4
	(OR)			
8(a)	A sample of 25 bulbs gives a mean life of 990 hours with a S.D of 20 hrs. The manufacturer claims that the mean life of bulbs is 1000 hrs. Is the sample not up to the standard? (Test at 0.05 level of significance)	7M	CO4	L4
(b)	200 digits were chosen at random from a set of tables. The frequencies of the digits are shown below Digit: 0 1 2 3 4 5 6 7 8 9 Frequency: 18 19 23 21 16 25 22 20 21 15 Assess the correctness of the hypothesis that the digits were distributed in equal number in the tables from which these were chosen at 5% level of significance.	7M	CO4	L4
9(a)	Determine the coefficient of correlation between X and Y from the following data related to aptitude scores(X) and productivity index(Y). X: 15 18 18 20 20 23 Y: 33 23 33 42 29 32	7M	CO5	L3
(b)	Calculate (i) means of X and Y variables (ii) the regression coefficients (iii) coefficient of correlation between X and Y, from the following two regression equations: 2Y–X–50=0, 3Y–2X-10=0.	7M	CO5	L3
	(OR)			
10(a)	The following data is obtained from10 observations. $\sum x = 250, \sum x^2 = 6500, \sum y = 300, \sum y^2 = 10000$ and $\sum xy = 7900$. Determine (i) Coefficient of correlation between the variables X and Y (ii) Regression line of Y on X.	7M	CO5	L3
(b)	A panel of men and women were asked by a consumer testing organization to rank 8 brands of tea according to taste. A rank of 1 was given to the best tasting tea and rank 8 to the worst. **Brand**: **A B C D E F G H** Rank by Women: 5 4 3 6 7 8 1 2 Rank by men: 4 5 6 3 8 7 2 1 Examine how closely men's and women's tastes in tea are related by the rank correlation coefficient.	7M	CO5	L3

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H.T.No.										

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R20

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

9.12.25

20EC08-ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

(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 about Electric flux and Electric flux density by using a pair of concentric metallic spheres arrangement. Hence obtain the relation between E and D.	7M	CO1	L2
(b)	Evaluate the Electric flux density (D) at a point P(2, $\pi/2$, 0) in the region having potential, $V = \frac{10}{r^2} Sin\theta Cos\varphi$. Also calculate the work done in moving a 10 μC charge from point A (1, 30⁰, 120⁰) to B (4, 90⁰, 60⁰).	7M	CO2	L3
	(OR)			
2(a)	What is the Capacitance of a Capacitor? Discuss the computational process of Capacitance of Spherical Capacitor.	7M	CO1	L2
(b)	Evaluate the capacitance of a spherical capacitor with a = 1.5 cm and b = 4 cm has an inhomogeneous dielectric of $\epsilon = \frac{10\varepsilon_o}{r}$.	7M	CO2	L3
3(a)	State Ampere's Circuit Law. List out various applications. Discuss in detail.	7M	CO1	L2
(b)	Determine the magnetic field intensity H at a center of square conducting loop of side '2a' lies in the z=0 plane and carries a current of 'I' Amps in the counterclockwise direction.	7M	CO2	L3
	(OR)			
4(a)	What are the Electric and Magnetic boundary conditions? Discuss in detail.	7M	CO1	L2
(b)	Apply Maxwell's equations and obtain the Electric field intensity E and the frequency of the wave ω in a medium characterized by σ = 0, μ = $2\mu_o$, ε = $5\varepsilon_0$,the magnetic field intensity, H= 2 Cos(ωt-3y)a_z Amp/m.	7M	CO2	L4
5(a)	Discuss the various parameters involved in the EM wave propagation through free space.	7M	CO4	L2
(b)	Evaluate the ratio conduction current to displacement current, attenuation, Phase and propagation constants, Intrinsic Impedance, wavelength, and Phase velocity, when a wave is propagation through a large copper conductor (σ=5.8x10^7 S/m, ε_r=1=μ_r=1) at a frequency 60Hz.	7M	CO3	L4
	(OR)			
6(a)	What is skin depth? Discuss in detail.	7M	CO4	L2
(b)	Evaluate the loss tangent, dielectric constant, and attenuation constant at 1MHz, when a wave is propagating through a nonmagnetic medium has an intrinsic impedance of 240∠30⁰Ω.	7M	CO3	L4
7(a)	State and prove the Poynting theorem.	7M	CO4	L2
(b)	Evaluate the Poynting vector, and the time average power associated with an electromagnetic wave under lossy media. Given, $E(z,t) = E_0 e^{-\alpha z} Cos(\omega t - \beta z) a_x V/m$.	7M	CO3	L4
	(OR)			
8(a)	Discuss about (i) Incident wave (ii) Reflected wave (iii) Transmitted wave (iv) Standing wave, and (v) Standing wave ratio, by assuming the EM wave is incident normally on the boundary between dielectric-conductor interface.	7M	CO4	L2
(b)	Show that the power loss in a plane conductor, $P_{loss} = \frac{1}{4}\sigma\delta E_0^2 e^{-\frac{2}{\delta}z} a_z$.	7M	CO3	L2
9(a)	Discuss about primary and secondary constants of a transmission line. Represent primary constants in terms of secondary constants.	7M	CO4	L2
(b)	A distortion line has Z_0 = 60 Ω, α = 0.02 Np/m, u = 0.6c, where c is the speed of light. Find R, L, G, C and λ at 100 MHz.	7M	CO3	L3
	(OR)			
10(a)	Compare input impedance, reflection coefficient and VSWR for (i) Short circuit, (ii) Open circuit, and (iii) Matched transmission lines.	7M	CO4	L2
(b)	A lossless transmission line with Z_0 = 50 Ω is 30 m long and operating at 2 MHz. This line terminated with a load Z_L = 60 + j40 Ω. If u = 0.6c on the line, find (i) Reflection coefficient, (ii) Voltage standing wave ratio, and (iii) Input impedance.	7M	CO3	L3

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B.Tech. (IV Semester) ~~Regular~~/Supplementary Examinations
20EE11-ELECTRICAL MACHINES-I
(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)	Illustrate the complete classification of D.C Generators and discuss any two types.	10M	CO1	L2
(b)	Distinguish between Lap and Wave windings.	4M	CO1	L2
	(OR)			
2(a)	Illustrate the power stages of DC Generator and derive the condition for maximum efficiency.	7M	CO1	L2
(b)	A 4-pole machine has 60 slots and 8 conductors per slot. The total flux per pole is 20 mwb. For relative speed of 1500 rpm, between field flux and armature winding, Calculate the generated emf if the machine is a DC machine with lap winding.	7M	CO1	L3
3.	The O.C.C of a given shunt generator driven at 1000 rpm is as follows: I_f (A): 0, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.2 V_{OC} (V): 5, 40, 75, 100, 124, 145, 162, 178, 188, 195, 205 The terminal volatge is 150V, total field resitance of 200Ω and armature resistance to be 0.8 Ω. Find the critical filed resistance and critical speed.	14M	CO1	L3
	(OR)			
4(a)	Illustrate the concept of EMF build-up of self-excited DC generator.	7M	CO1	L2
(b)	How the critical speed and critical field resistance can be obtained from the OCC discuss with the procedure?	7M	CO1	L2
5(a)	Interpret the 3-point starter in detail with a neat sketch.	7M	CO2	L2
(b)	Illustrate Hopkinson's test for DC machine and state the merits and demerits.	7M	CO2	L2
	(OR)			
6(a)	Illustrate the brake test of a DC machine.	7M	CO2	L2
(b)	Explain the characteristics of compound motor in detail.	7M	CO2	L2
7(a)	Describe the parallel operation of the transformers with a neat sketch.	7M	CO3	L2
(b)	Discuss All-day efficiency and explain how All-day efficiency differs from power efficiency.	7M	CO3	L2
	(OR)			
8(a)	Derive the e. m. f. equation of a transformer.	7M	CO3	L2
(b)	The primary winding of a 500 kVA, 3300/400 V transformer has 800 turns. Determine (i) the number of secondary turns, (ii) secondary full load current, (iii) the emf/turn on primary and secondary side.	7M	CO3	L3
9(a)	Explain with the help of connections and phasor diagrams, how Scott connections are used to obtain two phase supply from three phase.	10M	CO4	L2
(b)	List the advantages, disadvantages of auto transformer.	4M	CO4	L2
	(OR)			
10(a)	Discuss the benefits of converting two-winding transformer to Auto transformer.	7M	CO4	L2
(b)	Illustrate the Delta-Delta and Delta-star connection with their merits and demerits.	7M	CO4	L2

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H.T.No										

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

20CS10-DATA WAREHOUSING AND DATA MINING
((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)	Explain OLAP operations in the Multidimensional Data Model.	7M	CO1	L2
(b)	Define Data Warehouse. Explain about Data Warehouse implementation.	7M	CO1	L1
	(OR)			
2(a)	Describe a starnet query model for querying multidimensional database.	7M	CO1	L1
(b)	Illustrate indexing methods used for OLAP data.	7M	CO1	L4
3(a)	What do you mean by Data Mining and write major challenges of Data Mining in connection with present day applications.	7M	CO2	L1
(b)	"Data pre-processing is emerged as an essential phase in knowledge discovery " - Justify this statement.	7M	CO2	L4
	(OR)			
4(a)	Describe various methods to handle missing data.	7M	CO2	L2
(b)	What is the primary objective of dimensionality reduction? List and explain any two dimensionality reduction strategies.	7M	CO2	L2
5(a)	Discuss about measures for selecting an attribute test condition in detail.	7M	CO3	L2
(b)	Define decision tree. Explain the process of building a decision tree.	7M	CO3	L1
	(OR)			
6(a)	Differentiate between holdout method and cross-validation.	7M	CO3	L2
(b)	Make a decision tree for the following database using Gini Index. Indicate all intermediate steps. Example Colour Shape Size Class 1 Red Square Big + 2 Blue Square Big + 3 Red Circle Big + 4 Red Circle Small – 5 Green Square Small – 6 Green Square Big –	7M	CO3	L3

<table>
<tr><td>7(a)</td><td>Discuss the following terms with example
(i) Rule-Generation (ii) Frequent Item set Generation</td><td>4M</td><td>CO4</td><td>L2</td></tr>
<tr><td>(b)</td><td>Apply Apriori Principle to generate frequent item sets and strong association rules for the given data set with support = 50% and Confidence = 60%.
<table>
<tr><th>TID</th><th>ITEMS</th></tr>
<tr><td>100</td><td>{1,3,4}</td></tr>
<tr><td>200</td><td>{2,3,5}</td></tr>
<tr><td>300</td><td>{1,2,3,5}</td></tr>
<tr><td>400</td><td>{2,5}</td></tr>
<tr><td>500</td><td>{2,3}</td></tr>
</table></td><td>10M</td><td>CO4</td><td>L3</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>8(a)</td><td>What do you mean by frequent item set, Closed item set? Explain with example.</td><td>7M</td><td>CO4</td><td>L3</td></tr>
<tr><td>(b)</td><td>Compare and contrast FP-Growth algorithm with Apriori algorithm.</td><td>7M</td><td>CO4</td><td>L4</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>9(a)</td><td>What do you mean by hierarchical clustering? How is it represented? What are differences between single link and complete link algorithms?</td><td>7M</td><td>CO5</td><td>L2</td></tr>
<tr><td>(b)</td><td>Apply K-means algorithm for the following example to find the cluster where k =3and initial points are assigned to clusters as C1 = {A1, A2, A3}, C2={A4, A5, A6},C3={A7, A8}.
<table>
<tr><th></th><th>X</th><th>Y</th></tr>
<tr><td>A_1</td><td>2</td><td>10</td></tr>
<tr><td>A_2</td><td>2</td><td>5</td></tr>
<tr><td>A_3</td><td>8</td><td>4</td></tr>
<tr><td>A_4</td><td>5</td><td>8</td></tr>
<tr><td>A_5</td><td>7</td><td>5</td></tr>
<tr><td>A_6</td><td>6</td><td>4</td></tr>
<tr><td>A_7</td><td>1</td><td>2</td></tr>
<tr><td>A_8</td><td>4</td><td>9</td></tr>
</table></td><td>7M</td><td>CO5</td><td>L3</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>10(a)</td><td>Define Cluster Analysis and Discuss various applications of cluster analysis.</td><td>7M</td><td>CO5</td><td>L2</td></tr>
<tr><td>(b)</td><td>What are density based clustering methods? How DBSCAN algorithm works?</td><td>7M</td><td>CO5</td><td>L3</td></tr>
</table>

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

19/11/25

20AE05-AEROSPACE MATERIALS AND MANUFACTURING

(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)	Differentiate between interstitial and substitutional solid solutions.	7M	CO1	L2
(b)	Calculate the atomic packing factor for a Face Centered Cubic (FCC) structure.	7M	CO1	L3
	(OR)			
2(a)	Describe the process of recrystallization and its effect on grain structure.	7M	CO1	L2
(b)	What is the significance of the valency factor in Hume-Rothery's rules for the formation of solutions?	7M	CO1	L2
3.	Recall the main phases and zones in the Iron-Iron Carbide equilibrium diagram.	14M	CO2	L2
	(OR)			
4(a)	Illustrate the main phases in a partial eutectic equilibrium diagram.	7M	CO2	L2
(b)	Summarize the crystal structure of pure copper and its mechanical and electrical properties.	7M	CO2	L2
5.	Outline the main steps involved in making sand casting.	14M	CO3	L2
	(OR)			
6(a)	Compare between true centrifugal casting, semi-centrifugal casting, and centrifuge casting.	7M	CO3	L2
(b)	Explain the step-by-step process involved in Smith forging a simple component.	7M	CO3	L2
7(a)	Differentiate open and blind risers.	7M	CO4	L2
(b)	Describe the working process of Arc Welding operation and its applications.	7M	CO4	L2
	(OR)			
8(a)	Classify the rolling mills and specific applications.	7M	CO4	L2
(b)	Distinguish the equipment setup required for hydrostatic extrusion.	7M	CO4	L2
9(a)	Define tool wear and demonstrate single-point and multipoint cutting tools.	7M	CO5	L2
(b)	Difference between shaping and planner operations.	7M	CO5	L2
	(OR)			
10(a)	Demonstrate the Abrasive Jet Machining system and their respective functions.	10M	CO5	L2
(b)	List out the cutting fluids used in machining operations.	4M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

B.Tech. (IV Semester) Supplementary Examinations

20CE09-HYDRAULICS AND HYDRAULIC MACHINERY 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 between rapidly varied flow and gradually varied flow.	7M	CO1	L2
(b)	A power canal of trapezoidal section has to be excavated through hard clay at the least cost. Determine the dimensions of the channel given, discharge equal to 14 m^3/s, bed slope 1: 2500 and Manning's N = 0.020. (Take best side slope).	7M	CO2	L3
	(OR)			
2(a)	Prove that for the rectangular channel of most section (i) Width of the Channel = Two times the depth of the channel (ii) Hydraulic mean depth= Half the depth of flow.	7M	CO1	L2
(b)	A concrete lined circular channel of diameter 3 m has a bed slope of 1 in 500. Work out the velocity and flow rate for the conditions of maximum velocity. Assume Chezy's C = 50.	7M	CO2	L3
3(a)	Derive the differential equation for steady gradually varied flow in Open Channels and list all assumptions.	7M	CO2	L2
(b)	A Sluice gate discharges water into a horizontal rectangular channel with a velocity of 6 m/sec, and depth of flow is 0.4 m. The width of the channel is 8m. Determine whether a Hydraulic Jump will occur, and if so, find its height and loss of energy due to Hydraulic Jump. Also, determine the Power lost in the Hydraulic Jump.	7M	CO2	L4
	(OR)			
4(a)	Derive the condition for maximum discharge for a given specific energy in a rectangular channel.	7M	CO2	L2
(b)	A rectangular channel 10 m wide carries a discharge of $30m^3/sec$. it is laid at a slope of 0.0001. If at a section in this channel the depth is 1.6 m, how far from the section will the depth be 2.0 m? Also, find whether the 2 m depth section is U/S or D/S from that of 1.6 m depth section. Take n = 0.015.	7M	CO2	L4
5(a)	A jet of water having a diameter of 65 mm and the head of water at the center of the nozzle is 100 meters strikes a flat plate, the normal of which is inclined at 55^0 to the axis of the jet. Find the normal force on the plate, when (i) the plate is stationary, (ii) the plate is moving with a velocity of 16 m/sec in the direction of the jet. Also determine the power and efficiency of the jet, when the plate is moving. Take C_v as 0.96.	7M	CO3	L3

(b)	State the Angular Momentum Principle. Derive an equation for the work done by the jet of water on a series of radial curved vanes.	7M	CO3	L2
	(OR)			
6(a)	Define Impact of Jet. Derive an expression for force exerted by the jet of water on an inclined stationary plate.	7M	CO3	L2
(b)	A jet having a velocity 'V' strikes a single curved vane moving in the jet direction with a velocity 'u' so the velocity of jet relative to the vane is (V-u). The vane causes the jet to be reversed in direction. Show that maximum efficiency is obtained when V=3u and determine resultant efficiency.	7M	CO3	L3
7(a)	Distinguish between an Impulse turbine and a Reaction turbine.	4 M	CO1	L2
(b)	A Francis is turbine with an overall efficiency of 75 present is required to produce 149.26 kW it is working under a head of 7.62 m the speed ratio = 0.26 and flow ratio = 0.96. The wheel runs at 150 r.p.m and the Hydraulic losses in the turbine are 22 present of the available energy. Assuming radial discharge determine: (i) The guide blade angle (ii) The wheel vane angle at inlet (iii) Diameter of the wheel at inlet and (iv) Width of the wheel at inlet.	10 M	CO4	L3
	(OR)			
8(a)	Describe briefly the function of various main components of Kaplan turbine with neat sketches.	7M	CO1	L2
(b)	A Peloton wheel having a mean bucket diameter of 1.2 m is running at 1000r.p.m .The net head on the Peloton wheel is 840 m, if the side clearance angle is 150 and discharge through the nozzle is 0.12 m^3/s, Calculate the power available at the nozzle and hydraulic efficiency of the turbine.	7M	CO4	L3
9(a)	Explain the different efficiencies of a centrifugal pump.	7M	CO1	L2
(b)	The diameter of an impeller of a centrifugal pump at inlet and outlet are 30 cm and 60 cm respectively. Determine the minimum starting speed of the pump if its works against a head of 30 m.	7M	CO4	L3
	(OR)			
10(a)	Describe the principle and working of a reciprocating pump with a neat sketch.	7M	CO1	L2
(b)	A centrifugal pump is to discharge 0.118 m^3/s at a speed of 1450 r.p.m. against a head of 25 m. The impeller diameter is 250 mm, its width at outlet is 50 mm and manometric efficiency is 75 %. Determine the vane angle at the outer periphery of the impeller.	7M	CO4	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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

B.Tech. (IV Semester) Supplementary Examinations

19/11/25

20EC06-DIGITAL SIGNAL PROCESSING

(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 classification of discrete time systems with relevant examples.	7M	CO1	L2
(b)	Compute the frequency, magnitude and phase response of the DT system described by difference equation y(n) = 0.5x(n) + 0.5 x(n-2).	7M	CO3	L3
	(OR)			
2(a)	Describe the block diagram of DSP system along with its merits and demerits.	7M	CO1	L2
(b)	Determine the linear convolution response of the DT system if input x(n) = {3, 2, 1, 2} and system impulse response h(n) = {1, 2, 1, 2}.	7M	CO2	L3
3(a)	Determine the system function, impulse response, pole-zero plot and frequency response of the system described by difference equation y(n) – 3y(n-1) – 4y(n-2) = x(n) +2x(n-1) using Z-transforms.	7M	CO3	L3
(b)	Obtain the Direct Form-I and Direct Form-II of the system described by LCCDE is $y(n)=-\frac{13}{12}y(n-1)-\frac{9}{24}y(n-2)-\frac{1}{24}y(n-3)+x(n)+4x(n-1)+3x(n-2)$	7M	CO3	L3
	(OR)			
4(a)	List the Properties of Z-transform and prove any two properties.	7M	CO2	L3
(b)	Apply partial fractions method to compute the impulse response of the system having $H(z)=\frac{1+3z^{-1}}{1+3z^{-1}+2z^{-2}}$ *for ROC* $\lvert z\rvert>2$	7M	CO3	L3
5(a)	Give the steps involved in implementing Radix –2, DIT FFT algorithm.	7M	CO3	L2
(b)	Find the DFT of a sequence x[n]={1,2,6,3,4,6,3,1} using: a) DIT algorithm b) DIF algorithm	7M	CO3	L3
	(OR)			
6(a)	Find the DFT of a sequence x(n)={1, 1, 0, 0} and find the IDFT of Y(k)={1, 0, 1, 0}	7M	CO3	L3
(b)	Compute the DFT of the given sequence $x(n)$ using DIT FFT algorithm. $[n]$ = {1, −1, 1, − 1, 1, − 1, 1, − 1} Show the intermediate result on the flow graph.	7M	CO3	L3
7(a)	Illustrate the bilinear transformation method of deriving IIR digital filter corresponding analog filter.	7M	CO4	L3
(b)	Determine the transfer function of the digital filter H(z) using impulse invariant method for given analog transfer function H(s) = $\frac{2}{s^2+2s}$ (Assume T = 0.25 sec).	7M	CO4	L3
	(OR)			
8.	Design a Butterworth low pass digital filter satisfying the following specifications using bilinear transformation. Sampling time = 1sec Pass band frequency = 0.06π rad/sec, Stop band frequency = 0.75π rad/sec, Pass band attenuation = 6Db, Pass band attenuation = 20dB.	14M	CO4	L3
9(a)	Given a 3-stage lattice FIR filter with coefficients, $k_1=(1/4)$; $k_2=(1/2)$; $k_3=(1/3)$; Determine the FIR filter coefficients for the direct form structure.	7M	CO4	L3
(b)	Explain the design of FIR filters using windows.	7M	CO4	L3
	(OR)			
10(a)	List out the characteristics of FIR digital filters.	7M	CO4	L2
(b)	Explain the frequency-sampling method of FIR filter design with an example.	7M	CO4	L3

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

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

20EE08-POWER SYSTEMS-I

(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 in detail about various components and its functions in Thermal Power Station with a neat line diagram.	7M	CO1	L2
(b)	With neat sketch, enumerate & explain about the essential components of hydroelectric plant.	7M	CO1	L2
	(OR)			
2(a)	Discuss the principle of operation about Gas turbine power plant with neat diagram.	7M	CO1	L2
(b)	Explain the function of following components of Hydroelectric Power Plant. (i) Dam (ii) Reservoir (iii) Trash Rack (iv) Forebay (v) Surge Tank (vi) Spillway (vii) Penstock.	7M	CO1	L2
3(a)	Explain the following terms (i) Connected load (ii) maximum demand (iii) demand factor (iv) load factor	7M	C02	L3
(b)	Explain base load and peak load plants.	7M	C02	L2
	(OR)			
4(a)	Define i) fixed-cost ii) running cost iii) Tariff.	7M	C02	L3
(b)	A generating station has the following daily load cycle : Time (Hours):0—6 6—10 10—12 12—16 16—20 20—24 Load (MW) : 40 50 60 50 70 40 Draw the load curve and find (i) maximum demand (ii) units generated per day (iii) average load and (iv) load factor.	7M	C02	L3
5(a)	Why is electrical energy preferred over other forms of energy ?	7M	CO3	L2
(b)	A single phase A.C. distributor AB 300 metres long is fed from end A and is loaded as under : (i) 100 A at 0·707 p.f lagging 200 m from point A (ii) 200 A at 0·8 p.f lagging 300 m from point A The load resistance and reactance of the distributor is 0·2Ω and 0·1Ω per kilometre. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.	7M	CO3	L3
	(OR)			
6(a)	Derive the Insulation resistance of a cable.	7M	C03	L2
(b)	Comparison between overhead lines versus underground cables.	7M	C03	L2
7(a)	What is a sag in overhead lines? Discuss the disadvantages of providing too small or too large sag on a line.	7M	C04	L3
(b)	The towers of height 30 m and 90 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500 m. If the tension in the conductor is 1600 kg, find the minimum clearance of the conductor and water and clearance mid-way between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be at water level.	7M	C04	L3
	(OR)			
8(a)	Derive the inductance of single phase transmission line conductors.	7M	C04	L3
(b)	Deduce an approximate expression for sag in overhead lines when (i) supports are at equal levels (ii) supports are at unequal levels.	7M	C04	L3
9(a)	What are the methods of reducing corona loss?	7M	C05	L2
(b)	In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find (i) the distribution of voltage over 3 insulators and (ii) string efficiency.	7M	C05	L3
	(OR)			
10(a)	Discuss the advantages and disadvantages of pin-type insulators.	7M	C05	L2
(b)	Explain in detail about suspension insulators.	7M	C05	L2

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B.Tech. (IV Semester) Supplementary Examinations

20ME07-APPLIED THERMODYNAMICS

(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 the working of steam power plant and state their merits and demerits.	7M	CO1	L2
(b)	In a Rankine cycle, the steam at inlet to a turbine is dry saturated at a pressure of 35 bar and the exhaust pressure is 0.2 bar. Calculate (i) pump work (ii) turbine work.	7M	CO1	L3
	(OR)			
2(a)	Explain the working of Rankine cycle with Reheating and list out its merits and demerits.	7M	CO1	L2
(b)	State the various fuels used in thermal power plant.	7M	CO1	L1
3(a)	Illustrate the working principle of Cochran boiler.	7M	CO2	L2
(b)	Differentiate fire tube and water tube boilers.	7M	CO2	L2
	(OR)			
4(a)	Develop an expression for the maximum discharge condition of flue gases through the chimney.	7M	CO2	L2
(b)	Calculate the height of chimney required to produce a draught equivalent to 1.7cm of water if the flue gas temperature is 270 ^{0}C and ambient temperature is 22 ^{0}C and minimum amount of air per kg of fuel is 17kg.	7M	CO2	L3
5(a)	List the different types of nozzles and develop an expression for exit velocity of steam from a nozzle.	7M	CO3	L1
(b)	Dry saturated steam at a pressure of 10bar enters a convergent-divergent nozzle and leaves at a pressure of 2 bar. If the flow is adiabatic and frictionless, Determine, (i) The exit velocity of steam (ii)Ratio of cross-section at exit and that at throat. Assume the index of adiabatic expansion to be 1.135.	7M	CO3	L3
	(OR)			
6(a)	State the detailed classification of condensers.	7M	CO3	L1
(b)	Illustrate the working principle of shell and tube condenser.	7M	CO3	L2
7(a)	Prove that the maximum efficiency of De-Laval turbine is $\cos^2\alpha$.	7M	CO4	L2
(b)	Steam is issued from the nozzle of an impulse turbine at 400m/s. The nozzle angle is 25^0 and blade speed is 240m/s. Assuming blade velocity coefficient as 0.75 for a mass flow rate of 960 kg/min, find (i) power developed (ii) diagram efficiency.	7M	CO4	L3
	(OR)			
8(a)	Illustrate the working principle of Parson Reaction turbine and state its merits and demerits.	7M	CO4	L2
(b)	Discuss the various characteristics of the simple impulse turbine.	7M	CO4	L2
9(a)	Illustrate the working principle of single stage reciprocating compressor.	7M	CO5	L2
(b)	A single- stage reciprocating compressor takes 2.5 m^3 of air per minute at 1.013 bar and 22 ^{0}C and delivers it at 7bar. Assuming that the law of compression is $pv^{1.3}$=constant, and the clearance is negligible, calculate the indicated power.	7M	CO5	L3
	(OR)			
10(a)	Explain the working principle of centrifugal compressor.	7M	CO5	L2
(b)	Differentiate reciprocating and rotary compressors.	7M	CO5	L2

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

20CS11-OPERATING SYSTEMS
(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)	Compare the Layered and Kernel approaches.	7M	CO1	L2
(b)	Discuss various categories of system calls supported in Windows and Unix OS.	7M	CO1	L2
	(OR)			
2(a)	Describe the services of operating system with neat sketch.	7M	CO1	L2
(b)	Illustrate the concept of virtual machines with neat diagram.	7M	CO1	L2
3.	Consider the following processes with an arrival time and cpu burst times. P1: 10, P2: 1, P3: 5, P4: 3, P5: 2 Draw the gantt chart and calculate Turnaround time, waiting time, average waiting time, average turnaround time of above processes using Shortest Job First(SJF) Scheduling and Round robin algorithm.	14M	CO2	L3
	(OR)			
4(a)	Describe various operations on processes.	7M	CO2	L2
(b)	Describe various Inter Process Communication models.	7M	CO2	L2
5(a)	Describe the condition required for the dead lock prevention.	7M	CO3	L2
(b)	Discuss about classical problems of synchronization.	7M	CO3	L2
	(OR)			
6.	Consider the system with the 10 instances of resource type A,5 instances of resource type B and 7 instances of resource type C and snapshot of information related to resources allocation, max and available indicated below Apply the Banker's algorithm to find the (i) Need matrix of each process. (ii) Safe state sequence.	14M	CO3	L3

Process Name	*Allocation*	*Max*	*Available*
	A B C	***A B C***	***A B C***
P0	***0 1 0***	***7 5 3***	***3 3 2***
P1	*2 0 0*	*3 2 2*	
P2	*3 0 2*	*9 0 2*	
P3	*2 1 1*	*2 2 2*	
P4	*0 0 2*	*4 3 3*	

7(a)	Describe the concept of Thrashing.	7M	CO4	L2
(b)	Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. Calculate the number of page faults occurred for the above page reference string using Optimal page replacement algorithm. Assume that three frames are available in physical memory and initially all frames are free.	7M	CO4	L3
	(OR)			
8(a)	Describe the role of demand paging in virtual memory.	7M	CO4	L2
(b)	Discuss segmentation with architecture.	7M	CO4	L2
9(a)	Consider, for example, a disk queue with requests for I/O to blocks on cylinders98, 183, 37, 122, 14, 124, 65, 67, in that order. If the disk head is initially at cylinder 53. Starting from the current head position. Compute the total distance travelled (in cylinders) by the disk arm to satisfy the requests using algorithms FCFS, SSTF. Illustrate with figures in each case.	7M	CO5	L3
(b)	Describe the overview of magnetic disks and magnetic tapes.	7 M	CO5	L2
	(OR)			
10(a)	Summarize directory implementation with advantages and limitations.	7M	CO5	L2
(b)	Describe about directory system implementation.	7M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

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

20AE06-AERODYNAMICS

(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)	A source flow of strength 5 m^2/s is superimposed on a uniform flow of velocity 2 m/s. Determine (i) location of the stagnation point (ii) Maximum width of the half body and (iii) width of the body at source.	7M	CO1	L3
(b)	Derive the expression for Velocity potential and Stream function of source flow.	7M	CO1	L3
	(OR)			
2.	Derive expression for velocity potential and stream function of simple vortex.	14M	CO1	L3
3(a)	Transform circle of radius 'a' to straight line using the Kutta-Joukowski transformation function.	7M	CO2	L3
(b)	A cambered airfoil is obtained by transforming a circle of unit radius, with Kutta- Joukowski transformation function. If the percentage of camber is 3.2, determine the location of the circle center in the physical plane.	7M	CO2	L3
	(OR)			
4(a)	A symmetrical aerofoil is obtained by transforming a circle of radius 'a' with Kutta-Joukowski transformation function. Derive the expressions for coordinates of symmetrical airfoil profile in the transformed plane.	7M	CO2	L3
(b)	A symmetrical airfoil is obtained by transforming a circle with Kutta- Joukowski transformation function. Show that the is maximum thickness is at the quarter chord point from the leading edge of the aerofoil.	7M	CO2	L3
5(a)	Explain in detail the numbering system of NACA 4 digit, 5 digit airfoil series	7M	CO3	L2
(b)	Derive the relation between center of pressure and aerodynamics center of an airfoil.	7M	CO3	L3
	(OR)			
6(a)	Explain the flow characteristics of symmetrical and unsymmetrical airfoils with a neat schematic of lift–coefficient variation with angle of attack.	7M	CO3	L2
(b)	Consider a thin flat plate at 5 deg. angle of attack. Calculate the (i) lift coefficient (ii) moment coefficient about the leading edge (iii) moment coefficient about the trailing edge.	7M	CO3	L3

7.	Derive the Equation for induced drag coefficient $C_{Di} = C_L^2/\pi AR$, for elliptical lift distribution over finite wing. C_L is lift coefficient, AR is aspect ratio.	14M	CO4	L3
	(OR)			
8(a)	Differentiate between flow field over airfoil and finite wing.	4M	CO4	L2
(b)	A wing of aspect ratio 7.5 and span 15 m has a wing loading of 1100 N/m^2 while flying at 210 km/h at sea level. Determine the induced drag acting on the wing. Assume both the wing plan form and lift distribution to be elliptical.	10M	CO4	L3
9(a)	Air moves over a flat plate with a uniform freestream velocity of 10 m/s. At a position 15 cm away from the leading edge of the plate, determine the boundary layer thickness. Use the parabolic velocity profile in the boundary layer $u/U = 2(y/\delta)-(y/\delta)^2$, where 'u' is the velocity at y and $u \rightarrow U$ (freestream velocity) as $y \rightarrow \delta$ (boundary layer thickness). For air kinematic viscosity is 1.5×10^{-5} m^2/s and density is 1.23 kg/m^3	7M	CO5	L3
(b)	If the velocity profile in boundary layer is given by $\mathbf{u/U = y/\delta}$. Where u is the velocity at y and $u \rightarrow U$ (freestream velocity) as $y \rightarrow \delta$ (boundary layer thickness). Derive the expression for boundary layer thickness.	7M	CO5	L3
	(OR)			
10(a)	A flat plate of length 0.8 m and width 1.9 m is kept in a sea level air stream flowing at a velocity of 5.3 m/s. Assume a linear velocity profile for the boundary layer over the plate. Evaluate the boundary layer thickness at the end of the plate.	7M	CO5	L3
(b)	The velocity distribution in a laminar boundary layer over flat plate is given by the following expression. Where u is the velocity at y and $u \rightarrow U$ (freestream velocity) as $y \rightarrow \delta$. Calculate the Momentum thickness. $$\frac{u}{U} = \left(\frac{3}{2}\left(\frac{y}{\delta}\right) - \frac{1}{2}\left(\frac{y}{\delta}\right)^3\right)$$	7M	CO5	L3

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

20CE10-GEO TECHNICAL 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)	Describe the classification of soils according to Indian Standard Classification System.	7M	CO2	L2
(b)	The grading curve of a soil gives the effective size as 0.16mm, D_{30} = 0.4mm and D_{60} = 1.3 mm. Find Cu and Cc. Classify the soil.	7M	CO2	L3
	(OR)			
2(a)	Define void ratio and porosity. Derive an expression between them.	7M	CO1	L2
(b)	A sample of wet soil has a volume of 0.0192m^3 and a mass of 32Kg. When the sample is dried out in an oven, its mass reduces to 28.5Kg. Determine (i) Void ratio (ii) Degree of saturation and (iii) Saturated density.	7M	CO1	L3
3(a)	Explain in detail about Plasticity chart.	7M	CO2	L2
(b)	Describe the process of determination of plastic limit in the laboratory.	7M	CO1	L2
	(OR)			
4(a)	Compare light compaction test and heavy compaction test in a tabular form.	7M	CO1	L2
(b)	In a standard compaction test, on a soil sample having specific gravity 2.7, the following test results were obtained: Bulk Density (gm/cc): 1.89, 2.13, 2.2, 2.21, 2.16, 2.08 Water Content (%): 5, 8, 10, 12, 15, 20 Plot the moisture density curve and find MDD and OMC.	7M	CO1	L3
5(a)	State Darcy's law. Explain its limitations.	7M	CO3	L1
(b)	A cylindrical mould of diameter 7.5 cm contains a 15 cm long sample of fire sand. When water flows through the soil under constant head at a rate of 58cc/min, the loss of head between two points 8 cm apart is. Found to be 12.1 cm. Determine the coefficient of permeability of the soil.	7M	CO3	L3
	(OR)			

6(a)	A saturated sand layer over a clay stratum is 5m in depth. The water table 1.5m below ground level. If the bulk density of sand is 17.66kN/m^3 and saturated density is 19.24kN/m^3, calculate the total, effective and neutral stresses on top of the clay layer. Also draw the pressure variation diagrams. Assume G=2.68.	14M	CO3	L3
7(a)	The stresses on a failure plane in a direct shear test on a cohesionless soil are as under normal stress of 100 kN/m^2 and shear stress of 40 kN/m^2. (i) Determine angle of shearing resistance (ii) Also fine the major and minor principal stresses.	7M	CO3	L3
(b)	State the advantages of Unconfined Compression Test.	7M	CO3	L1
	(OR)			
8(a)	Illustrate Vane Shear Test with neat sketch. Derive an expression for determination of the undrained shear strength of soil.	10M	CO3	L3
(b)	An in-situ vane shear was conducted in clay at the bottom of a bore hole. A torque of 153 N-m was required to shear the soil. Determine the undrained shear strength of clay. The vane was 100 mm in diameter and 150 mm long	4M	CO3	L3
9(a)	Discuss the spring analogy method for primary consolidation.	7M	CO3	L2
(b)	Differentiate between primary consolidation and secondary consolidation.	7M	CO3	L2
	(OR)			
10(a)	State the formula for stress in a soil mass, due to a point load, at a point below ground level as given by Boussiness and give the meaning of all the terms in it.	7M	CO4	L2
(b)	A concentrated load of 30kN acts on the surface of a homogenous soil mass of large extent. Find the stress intensity at a depth of 8m and: (i) Directly under the load (ii) at a horizontal distance of 6 m.	7M	CO4	L3

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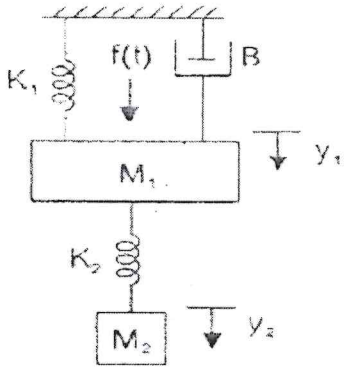
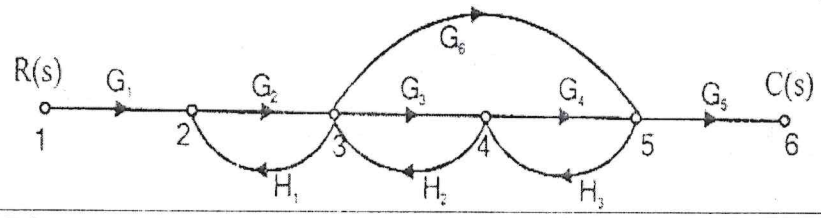
LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B. Reddy Nagar :: Mylavaram – 521 230 :: NTR Dist.:: A.P.

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

20EE09-CONTROL SYSTEMS
(ECE & 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)	Illustrate the effect of feedback on (i) Sensitivity of system to parameter variations (ii) Disturbance signals.	7M	CO1	L2
(b)	Obtain the transfer function $\frac{Y_2(S)}{F(S)}$ for the following mechanical system 	7M	CO1	L3
	(OR)			
2(a)	Solve the closed loop transfer function for the given signal flow graph using Mason's gain formula 	7M	CO1	L3
(b)	Discuss about open loop and closed loop system.	7M	CO1	L2
3(a)	Derive the expression for peak time when unit step input is applied for second order underdamped system.	7M	CO2	L2
(b)	The unit feedback system is characterized by an open loop transfer function $G(s)=\frac{K}{s(s+10)}$. Determine the gain K, so that the system will have a damping ratio of 0.5 for this value of K. Determine peak overshoot and time at peak overshoot for a unit step input.	7M	CO2	L3
	(OR)			
4(a)	Derive the steady state error for unit step, ramp and parabolic signals.	7M	CO2	L3

(b)	For unity feedback system the open loop transfer function $G(s)=\frac{10(s+2)}{s^2(s+1)}$. Find position, velocity and acceleration error constants.	7M	CO2	L3
5(a)	Discuss procedure for stability analysis using Routh Hurwitz Criteria.	7M	CO2	L2
(b)	The open-loop transfer function of a unity feedback system is $G(S)=\frac{K}{(S+2)(S+4)(S^2+6S+25)}$. By applying Routh criteria, discuss the stability of the closed loop system as a function of K.	7M	CO2	L3
	(OR)			
6.	Sketch the root locus for the unity feedback system whose open loop transfer function is $G(S)=\frac{K}{S(S+1)(S+4)}$. Also obtain the limiting value of K for system stability.	14M	CO2	L3
7.	Sketch the Bode plot for the following transfer function and determine gain cross over frequency, phase cross over frequency, Gain Margin, Phase Margine. $G(S)=\frac{100}{S(1+0.1S)(1+0.001S)}$	14M	CO2	L3
	(OR)			
8.	Sketch the Nyquist plot for the following transfer function and determine gain cross over frequency, phase cross over frequency, Gain Margin, Phase Margine. $G(S)=\frac{10}{S(1+S)(2+S)}$	14M	CO4	L2
9(a)	Derive the transfer function of a LTIV state space model.	7M	CO1	L3
(b)	Obtain the transfer function for the system having state model $\dot{X}(t)=AX(t)+BU(t)$, $Y(t)=CX(t)+DU(t)$ $A=\begin{bmatrix}0 & 1\\ -1 & -3\end{bmatrix}$ $B=\begin{bmatrix}3\\5\end{bmatrix}$ $C=[1\quad 1]$ D=[0]Q	7M	CO1	L3
	(OR)			
10(a)	Find the controllability and observability of the system with $\dot{X}=AX+BU$ with $A=\begin{bmatrix}0 & 1\\ -2 & -3\end{bmatrix}$ $B=\begin{bmatrix}0\\1\end{bmatrix}$ $C=[1\quad 0]$	7M	CO1	L3
(b)	Develop the observable canonical state space model of a system described by the differential equation $\dddot{Y}+8\ddot{Y}+11\dot{Y}+6Y=U$	7M	CO1	L3

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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.

R20

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

20ME08 - PRODUCTION TECHNOLOGY

(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 briefly the steps involved in sand casting with suitable diagrams.	7M	CO1	L2
(b)	Explain the types of gating systems.	7M	CO1	L2
	(OR)			
2(a)	Identify the various allowances that are given on a pattern. Describe shrinkage allowance with help of a suitable diagram.	7M	CO1	L2
(b)	Explain the process of Die casting with neat sketch.	7M	CO1	L2
3(a)	Explain the process of arc welding with neat sketch.	7M	CO2	L2
(b)	With neat sketch explain TIG welding process with suitable sketch.	7M	CO2	L2
	(OR)			
4(a)	With neat sketch, explain the principle of operation in MIG welding.	7M	CO2	L2
(b)	Explain the characteristics of different types of flames used in gas welding.	7M	CO2	L2
5(a)	With neat sketch, explain the principle of operation of soldering and brazing.	7M	CO3	L3
(b)	Describe the working principle of induction welding with neat sketch.	7M	CO3	L2
	(OR)			
6(a)	With neat sketch, explain the principle of operation of Resistance welding.	7M	CO3	L2
(b)	Explain various defects in welding and their remedies.	7M	CO3	L2
7(a)	Explain the two high and three high rolling mill arrangements with neat sketches.	7M	CO4	L2
(b)	Compare hot working and cold working processes.	7M	CO4	L3
	(OR)			
8(a)	Explain the process of press forging with sketches.	7M	CO4	L2
(b)	Explain tube drawing process with neat sketch.	7M	CO4	L2
9(a)	Describe forward and backward extrusion processes with neat sketch.	7M	CO5	L2
(b)	Explain Hydrostatic extrusion process with suitable sketch.	7M	CO5	L2
	(OR)			
10(a)	Explain the basic principle of bending with suitable sketch. List its types.	7M	CO5	L3
(b)	Explain Embossing and coining operation with neat sketches.	7M	CO5	L2

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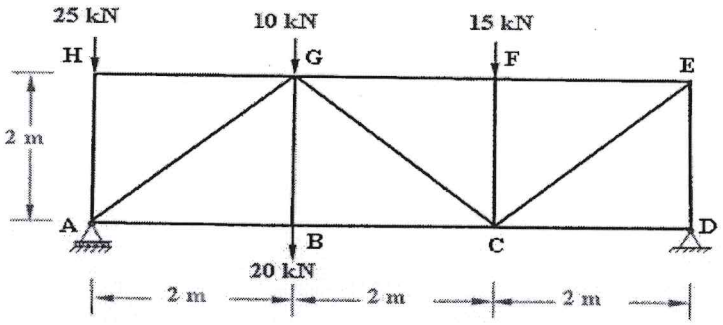
B.Tech. (IV Semester) Regular/Supplementary Examinations

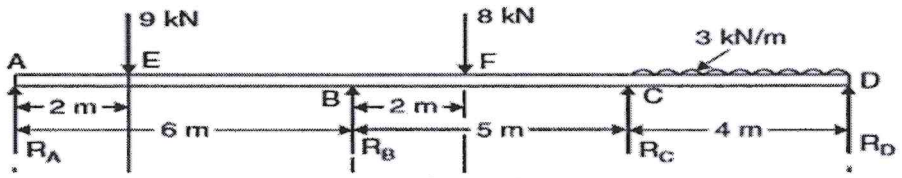
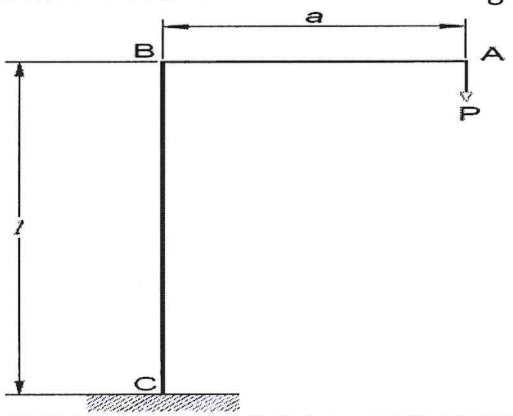
20AE07-AIRCRAFT STRUCTURES-I

(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)	A rectangular block of material is subjected to a tensile stress of 110 N/mm² on one plane and a tensile stress of 47 N/mm² on a plane at right angles, together with shear stress of 63N/mm² with an inclination angle 30⁰ determine normal, tangential and resultant stresses by using analytically method.	7M	CO1	L3
(b)	A rectangular element in a linearly elastic isotropic material is subjected to tensile stresses of 60 and 54N/mm² on mutually perpendicular planes. Determine the strain in the direction of each stress and in the direction perpendicular to both stresses. Find also the principal strains, maximum shear strain. Take E =200 000 N/mm² and υ=0.3	7M	CO1	L3
	(OR)			
2(a)	The tensile stresses at a point across two mutually perpendicular planes are 100N/mm² and 120N/mm². Determine the normal, tangential and resultant stresses on a plane inclined at 30⁰ to the axis.	7M	CO1	L3
(b)	At a particular point in a structural member a two-dimensional stress system exists where σ_x =80 N/mm², σ_y=−60 N/mm² and τ_{xy} =50 N/mm². If Young's modulus E =200 000 N/mm² and Poisson's ratio ν=0.3 calculate the direct strain in the x and y directions and the shear strain at the point. Also calculate the principal strains at the point.	7M	CO1	L3
3.	Calculate the truss in each member of truss as shown Figure 1  Figure 1	14M	CO2	L3
	(OR)			
4(a)	Explain the method of sections and its applications.	4M	CO2	L2
(b)	Calculate the force in member GF, GC and by using method of sections from figure1.	10M	CO2	L3
5(a)	Evaluate the prop reaction of a cantilever of length 6 m carries a point load of 48 KN at its centre. The cantilever is propped rigidly at the free end.	7M	CO3	L3

(b)	A continuous beam ABCD, simply supported at A, B, C and D is loaded as shown in Figure 2. evaluate the moments over the beam and load at supports.  Figure 2	7M	CO3	L3
	(OR)			
6(a)	Analyze and draw Shear force and bending moment diagrams for the fixed-fixed beam of length l subjected to uniformly distributed load w/l thought out the span.	7M	CO3	L3
(b)	A continuous beam ABCD of length 15 m rests on four supports covering 3 equal spans and carries a uniformly distributed load of 1.5 kN/m length. Calculate the moments and reactions at the supports.	7M	CO3	L3
7(a)	Derive the expression of strain energy due to axial and pure torsion.	7M	CO4	L3
(b)	Solve the expression of strain energy when load is applied with impact.	7M	CO4	L3
	(OR)			
8(a)	Derive the expression of strain energy due to shear, bending loads.	7M	CO4	L3
(b)	The bend ABC shown in figure carries a vertical load at A. Find the vertical deflection at A. Assume uniform flexural rigidity  	7M	CO4	L3
9(a)	Derive the expression for crippling load by Euler's formula for a column having one end fixed other hinged.	7M	CO5	L3
(b)	Design the column and find the shortest length L for a pin ended steel column having a cross section of 60mmX100mm. For which Euler's formula applied. Take E_s=2x10^5 N/mm^2 and critical proportional limit is 250 N/mm^2 (i) Both ends hinged (ii) One end is fixed and other is hinged.	7M	CO5	L3
	(OR)			
10(a)	Derive the expression for crippling load by Euler's formula for a column having both ends fixed.	7M	CO5	L3
(b)	A steel column is of length 6 m and diameter 400 mm Determine the crippling load by Euler's formula. Take E =2.1 x 10^5 N/mm^2 (i) Both ends hinged (ii) One end is fixed and other is hinged.	7M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

B.Tech. (IV Semester) Supplementary Examinations

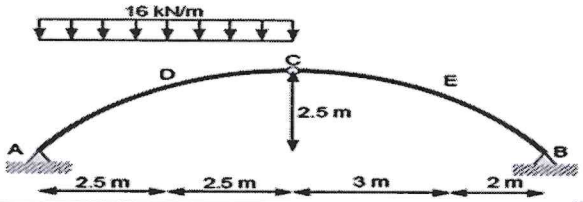
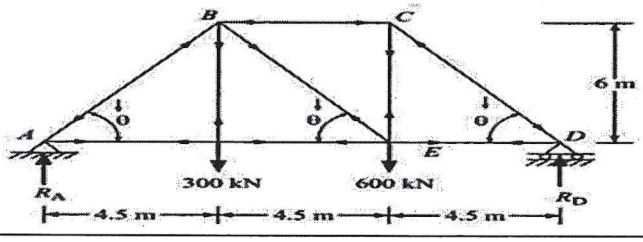
20CE11-STRUCTURAL ANALYSIS

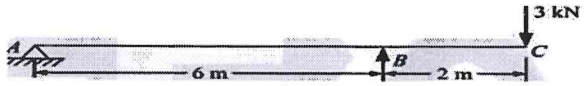
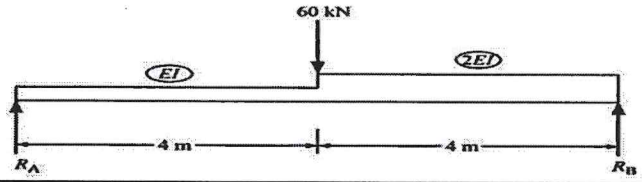
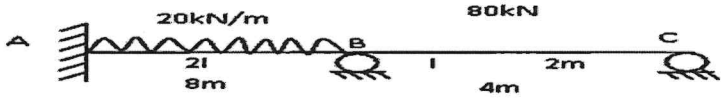
(CE)

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)	For the three hinged parabolic arch shown in figure what is the value of horizontal thrust? 	7M	CO1	L1
(b)	Explain about anchor cables with neat sketches and expressions for different reactions.	7M	CO1	L2
	(OR)			
2(a)	A three hinged semi-circular arch of radius R carries a uniformly distributed load W per unit run over the whole span. What will be the horizontal thrust?	7M	CO1	L1
(b)	Explain general cable theorem and derive the expression for horizontal reaction.	7M	CO1	L2
3(a)	Derive the expression for deflection of a cantilever beam AB of length 'L' subjected to gradually varying load having w/m at fixed end and zero at free end.	10M	CO2	L3
(b)	Determine the slope and deflection of the free end of a cantilever of length 3m which is carrying a UDL of 10kN/m over a length of 2m from the fixed end.	4M	CO2	L3
	(OR)			
4(a)	A beam of length 6m is simply supported at its ends and carries two point loads of 48kN and 40kN at a distance of 1m and 3m respectively from the left support. Find: (i) deflection under each load (ii) Position and quantity of maximum deflection. Take $E=2X10^5N/mm^2$ and $I=85X10^6$ mm^4.	10M	CO2	L3
(b)	A beam of length 5m and of uniform rectangular section is supported at its ends and carries UDL over the entire length. Calculate the depth of the section is the maximum permissible bending stress is $8N/mm^2$ and central deflection is not to exceed 10mm.	4M	CO2	L3
5(a)	Determine the horizontal displacement of roller support of the truss shown in figure. The cross-sectional areas of all top chord members 6000 mm^2 and the other members are 3000 mm^2, take E=200GPa. 	7M	CO3	L2

(b)	Using unit load method determine the deflection of the free end of a cantilever of length L subjected to a concentrated load P is 100kN at the free end. Given E = 200GPa and I = $20X10^6$ mm^4. 	7M	CO3	L2
	(OR)			
6(a)	State and prove Castigliano's Second Theorem.	7M	CO3	L1
(b)	Determine the deflection at the 60kN of the given beam shown in figure using strain energy. 	7M	CO3	L2
7(a)	A cantilever of length 4m carries a UDL of 20 kN/m run over the whole length. The cantilever is propped rigidly at the free end. If the value of $E=2X10^5$ N/mm^2 and $I=10^8mm^4$, determine (i) Reaction at the prop end (ii) Deflection at the center of cantilever (iii) Magnitude and position of maximum deflection.	7M	CO4	L3
(b)	A simply supported beam of length 8m carries a UDL of 10kN/m run over the entire length. The beam is rigidly propped at center. Determine (i) Reaction at the prop (ii) Reactions at the supports (iii) net BM at the center and (iv) position of point of contra flexure.	7M	CO4	L3
	(OR)			
8(a)	Derive the expression for slope and deflection for a fixed beam AB of length 'L' carrying a point load of 'W' at the center.	7M	CO4	L3
(b)	A fixed beam AB of length 3m carries a point load of 45kN at a distance of 2m from A. If $EI=1X10^4$ kNm^2, determine (i) Fixed end moments (ii) Deflection under the load (iii) Maximum deflection (iv) Position of Max. deflection.	7M	CO4	L3
9.	Analyse the continuous beam as shown in Fig. by slope deflection method, if joint B sinks by 10mm. Given $EI=4000kNm^2$. Draw bending moment and shear force diagrams. 	14M	CO5	L3
	(OR)			
10(a)	Derive the Clapeyron's equation of three moments by considering a continuous beam of ABC.	7M	CO5	L2
(b)	A continuous beam ABC covers two consecutive span AB and BC of lengths 4m and 6m, carrying UDL of 6kN/m and 10kN/m respectively. If the ends A and B are simply supported, find the support moments at A, B and C. Draw also BM and SF diagrams.	7M	CO5	L3

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

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

20IT01-SOFTWARE ENGINEERING
(CSE&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 the importance of software engineering, and levels in Software engineering layered Approach.	7M	CO1	L3
(b)	Discuss the characteristics of a good software.	7M	CO1	L2
	(OR)			
2(a)	Illustrate Generic process framework activities present in Software engineering.	7M	CO1	L2
(b)	Discuss Incremental model in the context of software process.	7M	CO1	L2
3(a)	Illustrate different phases of Unified process model.	7M	CO2	L2
(b)	Describe different architectural styles in Software Design.	7M	CO2	L2
	(OR)			
4(a)	Distinguish between functional and non-functional requirements.	7M	CO2	L2
(b)	Elaborate the features of a good SRS document.	7M	CO2	L2
5(a)	Elaborate the basic building blocks of UML.	7M	CO3	L2
(b)	Illustrate the different types of Relationships in UML.	7M	CO3	L2
	(OR)			
6(a)	Describe the Object diagram for Point of sales system.	7M	CO3	L2
(b)	Interpret the common mechanisms in UML.	7M	CO3	L2
7(a)	Develop a Use case diagram for Hospital management system.	7M	CO4	L3
(b)	Construct a Sequence diagram for Online ticket booking.	7M	CO4	L2
	(OR)			
8(a)	Draw an Activity diagram for ATM.	7M	CO4	L3
(b)	Construct the Collaboration diagram for Railway reservation system.	7M	CO4	L3
9(a)	Distinguish boundary value analysis and basis path testing.	7M	CO5	L2
(b)	Discuss System testing with an example.	7M	CO5	L2
	(OR)			
10(a)	Describe Black box testing with merits and demerits.	7M	CO5	L2
(b)	Illustrate Basis path testing with an example.	7M	CO5	L2

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

20AM01-INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

(CSE (AI&ML))

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 the history of Artificial Intelligence.	7M	CO1	L2
(b)	Explain nature of environments in AI.	7M	CO1	L2
	(OR)			
2(a)	Describe four main approaches of Artificial Intelligence.	7M	CO1	L2
(b)	Illustrate the Utility based agent with neat sketch.	7M	CO1	L2
3(a)	Explain Best first search algorithm with an example.	7M	CO2	L2
(b)	Compare informed search and uninformed search strategies.	7M	CO2	L2
	(OR)			
4(a)	Explain Depth Limited Search algorithm with an example.	7M	CO2	L2
(b)	Explain four-phase problem-solving process followed by an agent.	7M	CO2	L2
5(a)	Explain Reasoning system for categories.	7M	CO3	L2
(b)	Make use of Propositional logic to develop a Wumpus world agent.	7M	CO3	L3
	(OR)			
6(a)	Develop knowledge based agent with the required operations for any real-world problem.	7M	CO3	L3
(b)	Summarize the need of Ontological Engineering in AI.	7M	CO3	L2
7(a)	Describe well-posed learning algorithm with suitable applications.	7M	CO4	L2
(b)	Demonstrate version spaces and the candidate-elimination algorithm.	7M	CO4	L2
	(OR)			
8(a)	Summarize choices in designing the checkers learning problem with neat sketch.	7M	CO4	L2
(b)	Explain concept learning task with suitable notations.	7M	CO4	L2
9(a)	Explain decision tree representation with suitable example.	7M	CO5	L2
(b)	Suppose S is a collection of 20 examples of some boolean concept, including 13 positive and 7 negative samples. Find the entropy of S relative to this boolean classification.	7M	CO5	L3
	(OR)			
10(a)	Describe inductive bias in decision tree learning.	7M	CO5	L2
(b)	Explain Issues in Decision tree learning.	7M	CO5	L2

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

20EC07-ANALOG COMMUNICATIONS

(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 elements of a basic communication system with the help of block diagram.	7M	CO1	L2
(b)	Determine the (i) Total power as well as power of sidebands (ii) Frequency domain representation for the given amplitude modulated (AM) signal $s(t)=20 \cos 2\pi 10^6 t(1+ 2 \cos 2\pi 10^3 t)$.	7M	CO3	L3
	(OR)			
2(a)	Prove that a coherent detector can reconstruct the original signal in the demodulation of double sideband suppressed carrier amplitude modulation (DSBSC -AM) signal.	7M	CO2	L3
(b)	Calculate power saved by DSB-SC than AM for modulating index (i) 100% (ii) 50%.	7M	CO3	L3
3(a)	Derive the time domain expression of SSBSC and draw the waveforms.	7M	CO1	L3
(b)	A single tone message signal is given as $m(t)= 2\cos 4\pi x 10^3 t$. Denote the expression for single sideband suppressed carrier amplitude modulation for given carrier $c(t)=10 \cos 2\pi x 10^6 t$ and estimate the power required.	7M	CO3	L3
	(OR)			
4(a)	Provide a time domain description of VSB modulation. How does VSB achieve a balance between bandwidth efficiency and signal fidelity?	7M	CO1	L3
(b)	Give the applications of different AM systems.	7M	CO1	L2
5(a)	Compare Narrow Band FM and Wide Band FM.	7M	CO1	L2
(b)	Calculate the (i) Message frequency (ii) Carrier frequency (iii) frequency deviation (iv) Band width for given FM signal $S(t)=10 \cos(8\pi x 10^6 t + 10 \sin 5000\pi t)$.	7M	CO3	L3
	(OR)			
6(a)	Discuss the fundamental principle behind the Foster Seeley Discrimination method in FM demodulation.	7M	CO2	L2
(b)	An FM wave is given by $S(t) =10 \cos(2\pi x 10^6 t + 0.2 \sin 4\pi x 10^3 t)$ it is passed through cascaded frequency multiplier having multiplying constants of 4 and 5. Find the parameters such as (i) Carrier amplitude (ii) Modulation Index (iii) Carrier frequency (iv) Frequency deviation (Δf) (v) Band width (f) Power of FM signal at the output of each of the multiplier.	7M	CO3	L3
7(a)	How does a Tuned Radio Frequency (TRF) receiver amplify and select desired radio signals?	7M	CO1	L2
(b)	Explain the concept of frequency multiplication and its role in the Indirect method of FM modulation.	7M	CO1	L2
	(OR)			
8(a)	Discuss the characteristics or features of Super heterodyne receiver.	7M	CO1	L2
(b)	For supper heterodyne receiver, the intermediate frequency is 15 MHz and local oscillator frequency is 3.5 GHz. If frequency of received signal is greater than the local oscillator frequency. Find the Image frequency.	7M	CO3	L3
9(a)	Define pulse amplitude modulation, draw the waveform, and explain the generation of PAM.	7M	CO1	L2
(b)	How does the input signal-to-noise ratio (SNR) in an FM receiver impact its performance and ability to faithfully demodulate the received signal?	7M	CO4	L4
	(OR)			
10(a)	Justify the statement that a pulse position modulated (PPM) signal can be generated from a pulse width modulated (PWM) signal.	7M	CO2	L2
(b)	Analyze the Threshold Effect and Capture Effect in FM receivers.	7M	CO4	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. (IV Semester) Supplementary Examinations

20EE10-ANALOG 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)	Derive the following expression, when the transistor works at High Frequency: (i) Feedback Conductance (ii) Output Conductance.	4M	CO1	L2
(b)	Determine the current gain of a hybrid - π model of Common EmitterAmplifier with Short Circuit.	10M	CO1	L2
	(OR)			
2(a)	Draw and describe each parameter of a Hybrid- π model representation of transistor in CE configuration in terms of the Hybrid Model.	7M	CO1	L2
(b)	A BJT has following low frequency h-parameter **as I_c = 5 mA, h_{ie} = 1k, h_{re} = 10^{-4}, h_{fe} = 100, h_{oe} = 4 10^{-5} mho**. Calculate the resistive parameters of the hybrid- π equivalent model.	7M	CO1	L3
3(a)	Show that the efficiency of series fed class A power amplifier is 25% with the necessary diagram.	7M	CO2	L3
(b)	Draw the circuit of Class AB Power Amplifier and list its applications.	7M	CO2	L1
	(OR)			
4(a)	Show that the efficiency of the push-pull class B power amplifier is 78.5% with necessary diagrams.	10M	CO2	L3
(b)	Explain cross-over distortion with a diagram.	4M	CO2	L2
5(a)	How do you classify amplifiers based on input and output? Discuss any two with a neat diagram.	7M	CO1	L2
(b)	Elaborate on the following parameters with neat diagrams. How these are effected by Feedback? (i) Gain (ii) Noise.	7M	CO1	L2
	(OR)			
6(a)	How do you classify negative feedback amplifiers? Discuss any two with a neat diagram.	7M	CO1	L2
(b)	An amplifier requires an input signal of 60mV to produce a certain output. With negative feedback to get the same output, the required input signal is 0.5V. The voltage gain with feedback is 90. Find the open loop gain and feedback factor.	7M	CO1	L3
7(a)	Explain the wein bridge oscillator and how it is related to bridge circuit.	7M	CO3	L2
(b)	A Hartley oscillator is designed with L = 20μH and a variable capacitance. Find the Range of capacitance values if the frequency of oscillation is varied between 950 KHz to 2050 KHz.	7M	CO4	L3
	(OR)			
8(a)	Extend the frequency and amplitude stability of oscillators with diagram.	7M	CO2	L2
(b)	Calculate the frequency of oscillation for the Colpitts oscillator with C_1=0.1μf, C_2=1μf, C_3=100pF and L=470μH.	7M	CO3	L3
9(a)	Discuss various diode-clipping circuits that operate with two independent clipping levels.	10M	CO5	L2
(b)	Differentiate between series and shunt clippers.	4M	CO5	L2
	(OR)			
10(a)	Explain the working of the RC low pass circuit for square wave input with necessary equations and diagrams.	7M	CO5	L2
(b)	Draw the basic circuit diagram of the positive peak clamper and explain its operation with neat sketches.	7M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

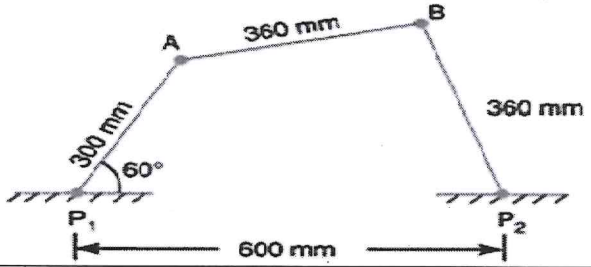
B.Tech. (IV Semester) ~~Regular~~/Supplementary Examinations

20ME09-THEORY OF MACHINES

(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 how the Old ham coupling is an inversion of double slider crank mechanism.	7M	CO1	L2
(b)	Discuss about degrees of freedom of a mechanism clearly.	7M	CO1	L2
	(OR)			
2.	Illustrate all the inversions of 4-bar chain.	14M	CO1	L2
3(a)	State and explain Kennedy's theorem as applicable to instantaneous center of rotation of three bodies.	7M	CO2	L2
(b)	The dimensions and configuration of the four bar mechanism, shown in Fig, are as follows: P_1A = 300 mm; P_2B = 360 mm; AB = 360 mm, and P_1P_2 = 600mm. The angle AP_1P_2 = 60°. The crank P_1A has an angular velocity of 10 rad/s clockwise. Determine the angular velocities of P_2B, and AB and the velocity of the joint B. 	7M	CO2	L3
	(OR)			
4(a)	Derive the expression for radial and tangential components of acceleration of a rotating link.	7M	CO2	L3
(b)	The crank and connecting rod of a theoretical steam engine are 0.5 m and 2 m long respectively. The crank makes 180 rpm. in the clockwise direction. When it has turned 45° from the inner dead center position, determine (i) velocity of piston, (ii) angular velocity of connecting rod.	7M	CO2	L3
5(a)	Name the two forms of teeth profiles generally used. Compare them.	7M	CO3	L2
(b)	Two 20^0 involute spur gears mesh externally and give a velocity ratio of 3. Module is 3 mm and the addendum is equal to 1.1 module. If the pinion rotates at 120 rpm, determine (i) the minimum number of teeth on each wheel to avoid interference.(ii) The number of pairs of teeth in contact.	7M	CO3	L3
	(OR)			
6(a)	Describe the following terms related to governors: (i) maximum fluctuation of energy (ii) maximum fluctuation of speed (iii) co-efficient of fluctuation of speed.	7M	CO3	L2

(b)	The turning moment diagram for a multi cylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows: + 52, – 124, + 92, – 140, + 85, – 72 and + 107 mm^2, when the engine is running at a speed of 600 rpm. If the total fluctuation of speed is not to exceed ±1.5% of the mean, find the necessary mass of the flywheel of radius 0.5 m.	7M	CO3	L3
7(a)	Discuss the construction and working of Hartnell governor. Deduce the expression for stiffness of the spring in terms of centrifugal forces of governor.	7M	CO4	L3
(b)	Calculate the vertical height of a Watt governor when it rotates at 60 rpm. Also find the change in vertical height when its speed increases to 61 rpm.	7M	CO4	L3
	(OR)			
8(a)	Describe the construction and working of centrifugal governor.	4M	CO4	L2
(b)	In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of the governor.	10M	CO4	L3
9(a)	Explain how to balance a mass with a counter mass which is revolving in same plane.	4M	CO5	L2
(b)	A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine(i) The magnitude of the masses at A and D; (ii) the distance between planes A and D ; and (iii) the angular position of the mass at D.	10M	CO5	L3
	(OR)			
10(a)	Define damping factor.State the values of damping factor for critical damping, under damping and over damping vibrations.	4M	CO5	L1
(b)	The measurements on a mechanical vibrating system show that it has a mass of 8 kg and that the springs can be combined to give an equivalent spring of stiffness 5.4 KN/m. If the damping co-efficient of the vibrating system is 40 N/(m/s) when the mass has a velocity of 1 m/s, find(i) critical damping coefficient, (ii) damping factor, (iii) logarithmic decrement, and (iv) ratio of two consecutive amplitudes.	10M	CO5	L3

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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. (IV Semester) ~~Regular~~/Supplementary Examinations

20HS01-UNIVERSAL HUMAN VALUES-2 UNDERSTANDING HARMONY
(Common to All)

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 the guidelines and the importance of value education in achieving one's own goal.	7M	CO1	L2
(b)	Mention the basic human aspirations including subsequent requirements to fulfil them and justify your understanding with one example.	7M	CO1	L2
	(OR)			
2(a)	Illustrate the 'content' and 'process' of self-exploration with an appropriate diagram and example.	7M	CO1	L2
(b)	What happens when there is 'no right understanding' in case of sustaining 'relationship' and identifying adequate 'physical facilities'? Discuss.	7M	CO1	L2
3(a)	When one has the feeling of self-regulation, what would be the programs for nurturing, protecting and right utilization of the body?	7M	CO2	L2
(b)	List the various sources of imagination in the Self. Elaborate with few examples.	7M	CO2	L2
	(OR)			
4(a)	Elaborate the 'prevailing notions' of happiness and prosperity in the society.	7M	CO2	L2
(b)	Illustrate the Circadian Rhythm with a neat sketch.	7M	CO2	L2
5(a)	How the relationship can be established within a human being and family? What are the essential aspects to be considered in developing a relationship?	7M	CO3	L2
(b)	Compare the following attributes in maintaining relationship: Care and Guidance.	7M	CO3	L2
	(OR)			
6(a)	Compare the following attributes in maintaining relationship: Affection and Love.	7M	CO3	L2
(b)	Illustrate the different features and significance of Cognitive domain of understanding.	7M	CO3	L2
7(a)	Compare the following terms with examples: Generosity and Brevity.	7M	CO4	L2
(b)	Illustrate how the space and units are linked together mentioning their activities and roles in nature.	7M	CO4	L2
	(OR)			
8(a)	Elaborate how the four orders of the nature are co-existing in nature.	7M	CO4	L2
(b)	Define and explain happiness and unhappiness. Discuss he notions felt by the humans during these states of feeling.	7M	CO4	L2
9(a)	List out and discuss some of the unethical practices being employed in today's world. Identify the remedial measures.	7M	CO5	L2
(b)	Describe briefly the criteria for evaluation of holistic technology. Support your answer with an example.	7M	CO5	L2
	(OR)			
10(a)	Give a critical review of the current management models in profession.	7M	CO5	L2
(b)	Describe the steps involved in developing human education in an Institution.	7M	CO5	L2

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