LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram-521 230 :: Krishna Dist. :: A.P
Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

B.Tech. (IV Semester) (R17) Regular / Supplementary Examinations, August / September 2021

TIME TABLE

TIME :10.00 AM to 01.00 PM

A.Y. 2020-21

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
31-08-2021 (Tuesday)	17FE03 - Environmental Science	17FE03 - Environmental Science	17FE11 - Linear Algebra and Numerical Applications	17FE03 - Environmental Science	17FE03 - Environmental Science	17ME52 - Fundamentals of Fluid Mechanics	17CI14 - Web Technologies	17ME06 - Operations Research
02-09-2021 (Thursday)	17FE08 - Probability and Statistics	17FE08 - Probability and Statistics	17CI07 - OOPs Through Java	17FE09 - Functions of Complex Variables	17FE10 - Complex Variables and Statistical Methods	17FE09 - Functions of Complex Variables	17FE08 - Probability and Statistics	17FE08 - Probability and Statistics
04-09-2021 (Saturday)	17AE05 - Thermal Engineering	17CE08 - Strength of Materials – II	17CI08 - Design and Analysis of Algorithms	17EC09 - Electromagnetic Fields and Waves	17EE06 - Control Systems	17EI03 - Electrical and Electronics Measurements	17CI06 - Computer Architecture	17ME07 - Fluid Mechanics and Hydraulic Machinery
06-09-2021 (Monday)	17AE06 - Manufacturing Technology	17CE09 - Hydraulics and Hydraulic Machinery Systems	17CS01 - Linux Programming	17EC10 - Digital Signal Processing	17EE07 - Network Theory - II	17EI04 - Industrial Instrumentation	17CI03 - Discrete Mathematical Structures	17ME08 - Production Technology
08-09-2021 (Wednesday)	17AE07 - Aerodynamics-I	17CE10 - Structural Analysis – I	17CI09 - Data Base Management Systems	17EC11 - Digital System Design	17EE08 - Electronic Circuit Analysis	17EC05 - Signals and Systems	17CI04 - Python Programming	17ME09 - Applied Thermodynamics
11-09-2021 (Saturday)	17AE08 - Aircraft Structures-I	17CE11 - Geo Technical Engineering – I	17CI10 - Software Engineering	17EC12 - Analog Communications	17EE09 - Electrical Machines – I	17EC07 - Pulse and Switching Circuits	17IT02 - Object Oriented Analysis and Design	17ME10 - Kinematics of Machines
13-09-2021 (Monday)	---	---	17PD03 - Professional Ethics and Human Values	---	---	17PD03 - Professional Ethics and Human Values	17PD03 - Professional Ethics and Human Values	17PD03 - Professional Ethics and Human Values

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

Date: 10-08-2021

CONTROLLER OF EXAMINATIONS

10/8/2021
PRINCIPAL

Copy to: 1. Vice-Principal, Deans & HoDs 2. Transport in-charge & Librarian
3. Canteen, Security & Hostels 4. All Notice Boards

H.T.No										

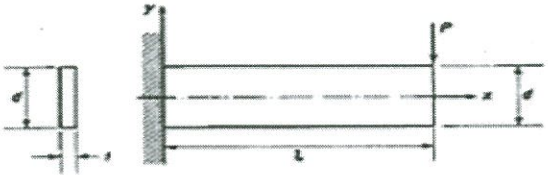
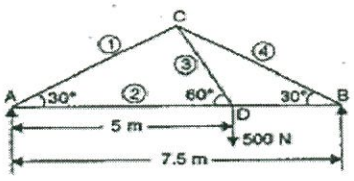
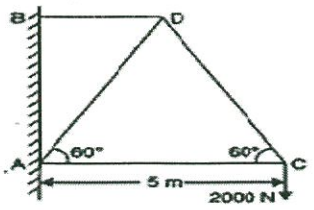
11 SEP 2021

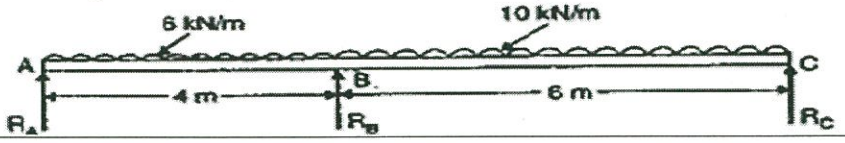
R17

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
17AE08-AIRCRAFT STRUCTURES-I
(ASE)

Time : 3 hours Max. Marks : 60

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

S.No.	Questions	Marks	CO	BL
1(a)	Illustrate a graphical method-Mohrs circle and derive the relations for principal stresses.	6M	CO1	L3
(b)	Direct stresses of 160 N/mm² (tension) and 120 N/mm² (compression) are applied at a particular point in an elastic material on two mutually perpendicular planes. The principal stress in the material is limited to 200 N/mm² (tension). Calculate the allowable value of shear stress at the point on the given planes. Determine also the value of the other principal stress and the maximum value of shear stress at the point.	6M	CO1	L3
	(OR)			
2(a)	Examine the equations of equilibrium to satisfy at all interior points in a deformable body under a three dimensional force system with the help of neat sketch.	6M	CO1	L3
(b)	What do you understand by an Airy stress function in two dimensions? A beam of length l, with a thin rectangular cross-section, is built-in at the end x =0 and loaded at the tip by a vertical force P. Test the stress distribution, as calculated by simple beam theory, can be represented by the expression $\varphi = Ay3 + By3x + Cyx$ as an Airy stress function and determine the coefficients A, B and C. 	6M	CO1	L3
3(a)	Differentiate between a beam, frame and a truss.	6M	CO2	L2
(b)	A truss of span 7.5m carries a load of 500N at joint D as shown in figure, Calculate the reactions and forces in all members of the truss. 	6M	CO2	L3
	(OR)			
4(a)	State and explain principle of super position theorem.	6M	CO2	L2
(b)	Determine the forces in all members of a cantilever truss as shown in figure below. 	6M	CO2	L3

5.	Evaluate the prop reaction of a cantilever of length 5 m carries a uniformly distributed load of 48 KN/m. The cantilever is propped rigidly at the free end.	12M	CO3	L3
	(OR)			
6(a)	A simply supported beam span 'L' is subjected to uniformly distributed load 'W' kN/m. Calculate the maximum slope and deflection at center. Use double integration method.	6M	CO3	L3
(b)	A continuous beam ABC covers two consecutive span AB and BC of lengths 4m and 6m, carrying uniformly distributed loads of 6KN/m and 10KN/m respectively. If the ends A and C are simply supported, Evaluate the support moments at A, B and C. Draw also Bending moment and shear force diagrams. 	6M	CO3	L3
7(a)	State and explain Castiglianos first theorem. Draw neat diagram.	6M	CO4	L
(b)	Calculate the central deflection of a simply supported beam of length L carrying a point load w N at the centre of span.	6M	CO4	L3
	(OR)			
8(a)	State and explain Maxwell's reciprocal theorem. Draw neat diagrams.	6M	CO4	L2
(b)	A Cantilever Beam 175 mm deep, 120 mm width and 3 m long. The moment 150 kN-m is applied at free End. Calculate the slope and deflection at free end. Take E = 200 KN / mm^2.	6M	CO4	L3
9(a)	A hollow cylinder of 150 mm external diameter 15 mm thick and 3 m long is hinged at one end and fixed at other. Calculate the ratio of Euler and Rankine load.	6M	CO5	L3
(b)	Two long columns having equal length and similar end conditions are of circular cross-section, one solid and the other hollow. Both the columns are of the same material and equal weight and the external radius of the hollow column is twice its internal radius. Evaluate the critical loads for both the columns and compare them.	6M	CO5	L3
	(OR)			
10(a)	A cast iron hollow cylinder 6 m long with hinged ends carries an axial load of 400kN. The ratio of external to internal diameter is 1.25. Use factor of safety of 4. Take σc= 560 N/mm^2 and Rankin's constant α=1/1600. Determine the section of cylinder.	6M	CO5	L3
(b)	Derive the expression for buckling load when one end of column is fixed and other is free.	6M	CO5	L3

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

17AE07-AERODYNAMICS-I

(ASE)

Time : 3 hours | Max. Marks : 60

Answer all questions with either or choice

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Consider a source of uniform strength and obtain the stream lines from it.	12M	CO1	L3
	(OR)			
2(a)	State and prove Kutta-Joukowski theorem.	6M	CO1	L3
(b)	A source of volume flow rate 2 m^2/s is located at origin and another source of volume flow rate 4 m^2/s is located at (5,0). Calculate the velocity components at (5, 3).	6M	CO1	L3
3.	With the aid of Kutta - Joukowski transformation. Explain how a circle can be transformed into a cambered airfoil.	12M	CO2	L3
	(OR)			
4(a)	A symmetrical airfoil is obtained by transforming a circle of unit radius, with Kutta-Joukowski transformation function. If the eccentricity is 0.1, find the maximum value of the thickness to chord ratio.	6M	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.	6M	CO2	L3
5(a)	State and explain Kutta condition.	6M	CO3	L2
(b)	Explain the flow characteristics of symmetrical and unsymmetrical airfoils with a neat schematic of lift–coefficient variation with angle of attack.	6M	CO3	L2
	(OR)			
6(a)	State and prove Kevin Circulation theorem for flow over airfoil.	6M	CO3	L3
(b)	Consider a thin symmetrical aerofoil at 5^0 degree of angle of attack. From the results of thin aerofoil theory, Calculate the (i) Lift coefficient (ii) moment coefficient about the leading edge.	6M	CO3	L3
7(a)	Explain the concept of downwash and induced drag.	6M	CO4	L2
(b)	Explain the principle of lifting line and obtain the expression for determining the downwash of lifting line.	6M	CO4	L3
	(OR)			
8.	Calculate the induced drag on a finite wing for a general lift distribution and the effect of Aspect Ratio on induced drag.	12M	CO4	L4
9.	Air moves over a flat plate with a uniform free stream velocity of 10 m/s. At a position 15 cm away from the front edge of the plate, calculate the boundary layer thickness. (Use a linear velocity profile in the boundary layer. For air, $\nu = 1.5 \times 10^{-5} m^2/s$ and $\rho = 1.23\ kg/m^3$.)	12M	C05	L3
	(OR)			
10(a)	Explain the effect of pressure gradient on boundary layer separation.	6M	CO5	L2
(b)	Distinguish between a favorable and adverse pressure gradient in a boundary layer. In which case, does the pressure increase downstream. Why?	6M	CO5	L2

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

17AE06-MANUFACTURING TECHNOLOGY

(ASE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No.	Questions	Marks	CO	BL
1(a)	Demonstrate the steps involved in making a Sand casting with neat sketch.	6M	CO1	L2
(b)	State the application of Semi-centrifugal and Centrifugal casting methods.	6M	CO1	L3
	(OR)			
2(a)	Illustrate the different types of patterns commonly used in manufacturing with suitable sketches.	6M	CO1	L2
(b)	Discuss the precision "Investment Casting" process with suitable diagram.	6M	CO1	L2
3(a)	Differentiate between Arc and Gas welding with respect to the principle, operation, application and limitations.	6M	CO2	L2
(b)	With the help of a neat-sketch explain the principle of spot-welding processes.	6M	CO2	L2
	(OR)			
4(a)	Describe with neat sketch the "Metal Inert Gas" (MIG) welding process and give its specific applications.	6M	CO2	L2
(b)	Classify different weld defects and explain with regard to their causes and effects.	6M	CO2	L2
5(a)	Differentiate between the hot working and cold working of metals. Bring out the advantage and disadvantages of each of these techniques.	6M	CO3	L2
(b)	What is "Hot Extrusion"? Discuss the Hydro static extrusion with the help of neat sketches.	6M	CO3	L2
	(OR)			
6(a)	With a neat sketch, explain the Impact extrusion. List out the advantages and disadvantages of extrusion process.	6M	CO3	L2
(b)	Differentiate between Smithy forging and Drop forging with suitable applications.	6M	CO3	L4
7(a)	Illustrate the various types of "Lathe Machines" and any one operation performed on Lathe with neat diagram.	6M	CO4	L2
(b)	Differentiate between Orthogonal and Oblique cutting processes with suitable diagrams.	6M	CO4	L2
	(OR)			
8(a)	How many types of Cutting fluids? What are the functions of a cutting fluid in machining operation?	6M	CO4	L2
(b)	Define "Tool Life". Discus the variables affecting tool life. With the help of sketch, show the tool crater wear and flank wear on a cutting tool.	6M	CO4	L1
9(a)	Discuss the principle of "Electrical Discharge Machining" (EDM)? Explain the function of dielectric fluid in EDM with neat sketch.	6M	CO5	L2
(b)	What is "Milling Operation"? With the help of a neat diagram, explain the principle element of milling machine its Advantages and Disadvantages.	6M	CO5	L2
	(OR)			
10(a)	Discuss the principle of "Abrasive Jet Machining" (AJM)? Explain the function of dielectric fluid in AJM.	6M	CO5	L2
(b)	What are the differences between the Shaper and Planning machine operation with suitable diagram?	6M	CO5	L1

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

17AE05-THERMAL ENGINEERING

(ASE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Draw the theoretical and actual valve timing diagram for a four stroke C.I. engine and discuss in brief the deviations between the two.	6M	CO1	L2
(b)	With a neat sketch explain the working of a simple carburetor.	6M	CO1	L2
	(OR)			
2(a)	Discuss the various assumptions that will be considered in analysis of Air Fuel Cycle.	6M	CO1	L1
(b)	How are the injection system classified? Discuss them briefly.	6M	CO1	L2
3(a)	Define (i) Ton of Refrigeration (ii) Refrigerating effect and (iii) COP of Refrigeration.	6M	CO2	L2
(b)	Explain the working of simple air evaporative cooling system used for aircrafts.	6M	CO2	L2
	(OR)			
4.	An air craft refrigeration plant has to handle a cabin load of 30 tonnes. The atmospheric temperature is 17^{0}C. The atmospheric air is compressed to a pressure of 0.95 bar and temperature of 30^{0}C due to ram action. This air is then further compressed in a compressor to 4.75 bar, cooled in a heat exchanger to 67^{0}C, expanded in a turbine to 1 bar pressure and supplied to the cabin. The air leaves the cabin at a temperature of 27^{0}C. The isentropic efficiencies of both compressor and turbine are 0.9. Calculate the mass of air circulated per minute and the C O P for air, C_p=1.004kJ/kg K and C_p /C_v = 1.4.	12M	CO2	L4
5(a)	Explain and represent i) sensible heating ii) sensible cooling iii) heating and humidification iv) heating and dehumidification on Psychrometric chart.	6M	CO3	L2
(b)	What are the advantages of year round air-conditioned system over Winter air- conditioned system?	6M	CO3	L2
	(OR)			
6(a)	Atmospheric air at 1.0132 bar has DBT of 32 °C and a WBT of 26 °C. Compute partial pressure of the water vapor, specific humidity, dew point temperature and relative humidity.	6M	CO3	L3
(b)	When do the DBT, WBT and DPT become equal? Discuss.	6M	CO3	L2

7.	The steam is supplied to a steam turbine at a pressure of 32 bar and a temperature 410°C. The steam then expands isentropically to a pressure of 0.08bar. Find the dryness fraction of steam at the end of expansion and thermal efficiency of the cycle. If the steam is reheated at 5.5 bar to a temperature of 395° C and then expands isentropically to 0.08 bar, what will be the dryness fraction at the end of final expansion and the thermal efficiency of the cycle?	12M	CO4	L3
	(OR)			
8(a)	Draw T-S diagram of Rankine cycle using dry-saturated steam and develop the equation for the Rankine cycle efficiency.	6M	CO4	L3
(b)	Steam at 50 bar and having an enthalpy of 3100 kJ/kg is supplied to a turbine and comes out at 0.10 bar and enthalpy of 2100 kJ/kg. A feed heating is done by extracting the steam at 3.2 bar with an enthalpy of 2500 kJ/kg. The condensate from condenser with an enthalpy of 125 kJ/kg is fed into the feed heater of direct mixing type. The quantity of bled steam is 11200 kg/hr. Find the power developed by the turbine. Neglect pump work.	6M	CO4	L4
9(a)	Distinguish between water-tube and fire-tube boilers and state under what circumstances each type would be desirable.	6M	CO5	L2
(b)	Describe the significance of draught in boiler practice.	6M	CO5	L2
	(OR)			
10(a)	Steam at a pressure of 10bar and 0.9 dry discharges through a nozzle having throat area of 450 mm^2. If the back pressure is 1bar. Find final velocity of the steam and cross sectional area of the nozzle at exit for maximum discharge.	6M	CO5	L3
(b)	Distinguish between impulse and reaction turbine.	6M	CO5	L2

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2 SEP 2021

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

17FE08-PROBABILITY AND STATISTICS
(AE,CE,IT&ME)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1 (a)	State and prove Bayee's theorem.	6M	CO1	L1
(b)	The diameter of an electric cable, say X is assumed to be continuous random variable with *p.d.f.* $f(x) = 6x(1-x); 0 \le x \le 1$. (i)Check that $f(x)$ is *p.d.f.* (ii)Determine a number 'b' such that $P(X < b) = P(X > b)$.	6M	CO1	L3
	(OR)			
2 (a)	The probabilities of X, Y and Z becoming managers are 4/9,2/9 and 1/3 respectively. The probabilities that the bonus scheme will be introduced if X,Y and Z becomes managers are 3/10,1/2,and 4/5 respectively. (i) What is the probability that the bonus scheme will be introduced. (ii) if the bonus scheme has been introduced. What is the probability that the manager appointed was X?	6M	CO1	L3
(b)	The probability density function of a random variable X is X: 0, 1, 2, 3, 4, 5, 6 P(X): k, 3k, 5k, 7k, 9k, 11k, 13k (i) Find $P(X < 4)$ *and* $P(3 < X \le 6)$. (ii)What will be the minimum value of k so that $P(X \le 2) > 0.3$?	6M	CO1	L3
3(a)	A and B play a game in which their chances of winning are in the ratio 3:2. Find A's chance of winning at least three games out of five games played.	6M	CO2	L3
(b)	If X is a normal variate with mean 30 and S.D 5. Find the probability that (i)$26 \le x \le 40$ $(ii)\ x \ge 45$ $(iii)|x-30| > 5$.	6M	CO2	L3
	(OR)			
4(a)	Prove that Poisson distribution is limiting case of Binomial distribution.	6M	CO2	L2
(b)	In a Distribution exactly normal 10.03% of the items are under 24kilograms weight and 89.97% of the items are under 70kilograms weight. What are the mean and standard deviation of the distribution?	6M	CO2	L1
5(a)	A population consists of the five numbers 3,6,9,15 and 27. Consider all possible samples of size 2 that can be drawn without replacement from this population. Find i) The mean of the population ii) The standard deviation the population iii) The mean of the sampling distribution of means. iv) The standard deviation of the sampling distribution of means.	6M	CO3	L3

(b)	Discus the following (i) unbiased estimation (ii)point estimation (iii)interval estimation.	6M	CO3	L2
	(OR)			
6(a)	The mean of certain normal population is equal to the standard error of the mean of the samples of 64 from that distribution. find the probability that the mean of the sample size 36 will be negative.	6M	CO3	L3
(b)	A random sample of 10 ball bearings produced by a company have a mean diameter of 0.5060cm with S.D of 0.004cm. find the maximum error of estimate E and Develop 95% confidence interval for the actual mean diameter of ball bearings produced by the company assuming sampling from normal population.	6M	CO3	L3
7(a)	Before an increase in excise duty on tea, 800 persons out of a sample of 1000 persons were found to be tea drinkers. After an increase in duty, 800 people were tea drinkers in a sample of 1200 people. using standard error of proportion, state whether there is a significant decrease in the consumption of tea after the increase in excise duty.	6M	CO4	L4
(b)	The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70,64,64,66 inches. Is it reasonable to believe that the average height is greater than 64 inches?(Test at 5%LOS).	6M	CO4	L4
	(OR)			
8(a)	To test the claim that the resistanceof an electric wire can be reduced by at least 0.05 ohm.by alloying, 25 values obtained for each alloyed wire and standard wire produced the following results: Type of wire | Mean (ohm) | S.D (ohm) Alloyed wire | 0.083 | 0.003 Standard wire | 0.136 | 0.002 Test at 5% level whether the claim is substantiated or not.	6M	CO4	L4
(b)	A group of boys and girls were given an intelligence test. The mean score, S.D are numbers in each group are as follows: | | Boys | Girls mean | 124 | 121 S.D | 12 | 10 size | 18 | 14 Is the mean score of boys significantly different from that girls?	6M	CO4	L4
9(a)	Obtain the equations of two lines of regression for the following data. also obtain the estimate of X for Y = 70 x: 65 66 67 67 68 69 70 72 y: 67 68 65 68 72 72 69 71	6M	CO5	L3
(b)	An investigator collected the following data with respect to the socio-economic status and severity of respiratory illness of 8 patients. Calculate the rank correlation coefficient and comment on its value. Patient: 1 2 3 4 5 6 7 8 Socio-economic status (rank): 6 7 2 3 5 4 1 8 Severity of illness (rank): 5 8 4 3 7 1 2 6	6M	CO5	L3
	(OR)			
10(a)	In a partially destroyed laboratory record, only the lines of regression of Y on X and X on Y are available as $4x - 3y + 33 = 0$ *and* $29x - 9y = 107$ respectively. Calculate $\bar{x}, \bar{y}$ and coefficient of correlation between x and y.	6M	CO5	L3
(b)	Calculate coefficient of rank correlation. x: 65 63 67 64 68 62 70 66 68 67 69 71 y: 68 66 68 65 69 66 68 65 71 67 68 70	6M	CO5	L3

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31 AUG 2021

R17

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

17FE03-ENVIRONMENTAL SCIENCE
(ASE,CE,ECE&EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit.
All questions carry equal marks
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Q.No	Questions	Marks	CO	BL
1(a)	What is meant by 'Population Explosion'? Discuss the Indian Scenario.	6M	CO1	L1
(b)	Describe the scope of environmental studies.	6M	CO1	L1
	(OR)			
2.	Illustrate the major issues and problems related to rehabilitation of the displaced tribals. Discuss in the light of some case study.	12M	CO1	L2
3(a)	List out the major causes and consequences of deforestation.	6M	CO2	L1
(b)	Discuss the major environmental impacts of mineral extraction.	6M	CO2	L2
	(OR)			
4(a)	How can you as an individual conserve different natural resources?	6M	CO2	L1
(b)	Mention the major causes for conflicts over water. Discuss one international and one inter-state water conflict.	6M	CO2	L1
5(a)	Discuss about the biotic and abiotic components of an ecosystem.	6M	CO3	L2
(b)	Comment up on Indian biodiversity with special reference as a mega diversity nation.	6M	CO3	L2
	(OR)			
6(a)	Identify the major causes for man-wildlife conflicts. Discuss the remedial steps that can curb the conflict.	6M	CO3	L1
(b)	Discuss the process of Ecological succession.	6M	CO3	L2
7(a)	Describe the sources, effects and control measures for noise pollution.	6M	CO4	L2
(b)	Classify solid waste. What are the sources for urban and industrial solid wastes?	6M	CO4	L2
	(OR)			
8.	Write short notes on (i) Bhopal gas Tragedy (ii) Love canal Tragedy (iii) Chernobyl nuclear disaster.	12M	CO4	L1
9(a)	Why do we refer to environmental protection act, 1986 as an umbrella act? Discuss the major environmental protection rules, 1986.	6M	CO5	L1
(b)	Discuss about the problems and causes of consumerism and waste product.	6M	CO5	L1
	(OR)			
10(a)	Discuss any 15 principles of Stockholm conference.	6M	CO5	L2
(b)	Define is EIA. Draw the flow chart of EIA methodology.	6M	CO5	L1

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

17CE11-GEO TECHNICAL ENGINEEING-I

(CE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	The moist unit weight of a soil is 16.50kN/m^3. Given that the water content = 15% and specific gravity of soil solids =2.70, find the dry unit weight, porosity, degree of saturation and the mass of water that must be added to reach full saturation.	6M	CO1	L3
(b)	What is the use of classification of soils? Discuss Indian standard classification system.	6M	CO1	L2
	(OR)			
2(a)	A soil sample has a porosity of 30% the specific gravity of solids is 2.60.Calculate (i) void ratio, (ii) dry density (iii) unit weight if the soil is 50% saturated and (iv) unit weight if the soil is completely saturated.	6M	CO1	L3
(b)	Write a short note on the corrections to be applied to hydrometer test readings and mention limitations of test.	6M	CO1	L1
3(a)	A cohesive soil yields a maximum dry density of 1.8gm/cc at an OMC of 16% during a standard proctor test. If the value of G is 2.65, what is the degree of saturation? What is the maximum dry density it can further compacted to?	6M	CO2	L3
(b)	What are the different Atterberg limits? Explain them.	6M	CO2	L2
	(OR)			
4(a)	Write about the factors affecting the compaction properties of a soil.	6M	CO2	L2
(b)	What is the different soil indices used in identification of soil? Describe each one. Give their uses.	6M	CO2	L2
5(a)	Derive expression for calculating average permeability of layered soil systems.	6M	CO3	L3
(b)	A falling head permeability test is to be performed on a soil sample whose coefficient of permeability is 3x10^{-5} cm/s. What diameter of the standpipe should be used if the head is to drop from 27.5cm to 20.0cm in 5 minutes and if the cross sectional area and length of the sample are respectively 15cm^2 and 8.5cm?	6M	CO3	L3
	(OR)			
6(a)	Derive an equation for quicksand condition.	6M	CO3	L3

(b)	Compute the total, effective and pore pressure at a depth of 20m below the bottom of a lake 6 m deep. The bottom of the lake consists of soft clay with thickness of more than 20m. The average water content of the clay is 35% and the specific gravity of the soil may be assumed to be 2.65.	6M	CO3	L3
7(a)	When do you use the following shear tests and give reasons: (i) Shear box; (ii) Tri axial test; (iii) Unconfined compression test.	6M	CO4	L2
(b)	In an unconfined compression test, a sample of sandy clay 8cm long and 4cm in diameter fails under a load of 120N at 10% strain. Compute the shearing resistance taking into account the effect of change in cross-section of the sample.	6M	CO4	L3
	(OR)			
8(a)	Explain three drainage conditions for conducting shear testing of soils.	6M	CO4	L2
(b)	In a consolidated drained tri-axial test, a specimen of clay fails at a cell pressure of $60kN/m^2$. The effective shear strength parameters are $c' = 15kN/m^2$ and $\Phi' = 20^0$. Determine the principle stresses.	6M	CO4	L3
9(a)	Illustrate New mark's influence chart preparation and usage.	6M	CO5	L2
(b)	Define pre consolidation pressure. Describe a suitable procedure for determining the pre consolidation pressure.	6M	CO5	L2
	(OR)			
10(a)	Illustrate 2:1 stress distribution method.	6M	CO5	L2
(b)	There is a layer of soft clay 4 m thick under a newly constructed building. The overburden pressure over the centre of the clay layer is $300kN/m^2$. Compute the settlement, if there is an increase in pressure due to construction of $100kN/m^2$. Take Cc = 0.50, G =2.70 The water content of the deposit was found to be 50 %.	6M	CO5	L3

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

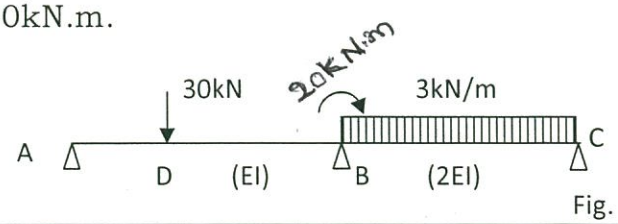
B.Tech. (IV Semester) Regular/Supplementary Examinations

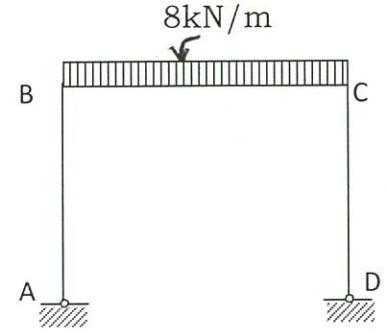
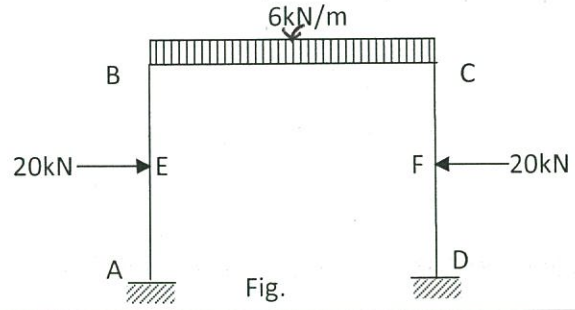
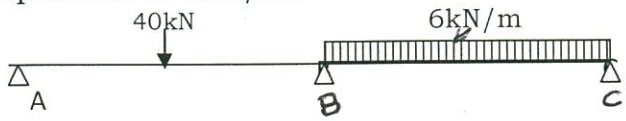
17CE10-STRUCTURAL ANALYSIS-I

(CE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	A fixed beam of span 8m is subjected to a concentrated load of 20kN.The end moments developed are 20kN.m. hogging in nature. Sketch the corresponding conjugate beam and the load on it.	6M	CO1	L3
(b)	The conjugate beam of a cantilever beam of length 5m carries a uniformly varying load of 5kN/m at fixed end and 25kN/m at free end. Determine the slope and deflection at the free end of the real cantilever beam.	6M	CO2	L3
	(OR)			
2(a)	Determine the end slopes of a simply supported beam subjected to concentrated load of 80kN at its mid span. Flexural rigidity of the mid half is $8x10^5kN.m^2$ and the same for the remaining portion of the beam is $4x10^5kN.m^2$. Apply Conjugate beam technique. Span of the beam is 12m.	6M	CO1	L3
(b)	Determine the fixed end moments of a propped cantilever beam subjected to concentrated load its mid span. Use conjugate beam method.	6M	CO2	L2
3(a)	Prove that a cable hanging on its own weight takes the shape of a catenary.	6M	CO1	L3
(b)	List the assumption made in the analysis of three hinged suspension cable with stiffening girder. Mention their importance.	6M	CO2	L1
	(OR)			
4(a)	A suspension cable hangs between two points A and B, separated horizontally by a span of 100m. The position of B is 16m above A. The lowest point in the cable is 3m below A. The stiffening girder weighs 2.5KN/m and is hinged vertically below the points A, B and the lowest point of the cable. Calculate the maximum tension which occurs in the cable when a 200kN load is acting on the girder 4m from left support.	12M	CO1	L3
5.	Sketch the BMD and SFD of the continuous beam shown in Fig., apply principles of moment distribution method. AB=5m; BC=8m. AD=2m and DB=3m. clockwise moment at B is 20kN.m.  Fig.	12M	CO3	L3
	(OR)			

6.	Determine the joint displacements of the portal frame shown in Fig. Apply Principles of slope deflection method. AB=CD=8m and BC=6m. EI is constant. UDL is 8kN/m.  Fig.	12M	CO4	L3
7.	Using Kani's method determine the end moments of the symmetrical frame shown in Fig. Draw BMD. AE=BE=CF=FD=3m;BC=8m;$EI_{AB}=EI_{CD}=2xEI_{BC}$  Fig.	12M	CO4	L3
	(OR)			
8.	Sketch the BMD the continuous beam shown in Fig., use Kani's method. AB=6m; BC=4m. The support B sinks down by 5mm. EI=20000kN.m^2. EI is same for AB and BC. Mid span concentrated load for AB span is 40kN and UDL on span BC is 6kN/m.  Fig.	12M	CO3	L3
9(a)	State and Prove Castigliano's Theorem – II.	6M	CO5	L3
(b)	Using Castigliano's Theorem – II, end moments in a fixed beam subjected to concentrated at mid span.	6M	CO5	L2
	(OR)			
10.	Using Castigliano's Theorem –I, determine slope and deflection at the mid span of a simply supported beam subjected to concentrated load located at quarter span.	12M	CO5	L3

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

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

17CE09- HYDRAULICS AND HYDRAULIC MACHINERY SYSTEMS

(CE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Determine the economical cross-section for an open channel of trapezoidal section with side slopes of 1 vertical to 2 horizontal, to carry 10 m^3/s, the bed slope being 1/2000. Assume Manning coefficient as 0.022.	6M	CO1	L3
(b)	Derive the condition for the best side slope of most economical trapezoidal section.	6M	CO1	L3
	(OR)			
2(a)	Derive an expression for discharge through a channel by Chezy's formula.	6M	CO1	L3
(b)	Find the discharge through a trapezoidal channel of width 8m and side slope of 1 horizontal to 3 vertical. The depth of flow of water is 2.4m and value of Chezy's constant, C= 50. The slope of the bed channel is given 1 in 4000.	6M	CO1	L3
3(a)	Derive the dynamic equation for gradually varied flow in open channel and list all assumptions.	6M	CO2	L3
(b)	Define the terms mild, critical, steep, horizontal and adverse slopes.	6M	CO2	L1
	(OR)			
4.	Prove that the loss of energy head in a hydraulic jump is equal to $\frac{(d_2-d_1)^3}{4d_1d_2}$ Where d_1 and d_2 are the conjugate depths.	12M	CO2	L3
5(a)	Show that the force exerted by a jet of water on a inclined fixed plate in the direction of the jet is given by $F_x = \rho a V^2 \sin^2\theta$ Where a = area of jet, V= Velocity of the jet.	6M	CO3	L3
(b)	A jet of water of diameter 75mm moving with a velocity of 25m/s strikes a fixed plate in such a way that the angle between the jet and the plate is 60^0. Find the force exerted by the jet on the plate (i) in the direction normal to the plate and (ii) in the direction of the jet.	6M	CO3	L3
	(OR)			
6(a)	Derive an expression for force exerted by a jet on moving flat vertical plate in the direction of the jet.	6M	CO3	L3

(b)	A jet of water diameter 10cm strikes a flat plate normally with a velocity of 16m/s, the plate is moving with a velocity of 7m/s in the direction of the jet and away from the jet. Find the force exerted by the jet on the plate.	6M	CO3	L3
7.	The following data is given for a Francis turbine Net head = 68 m, Speed = 750 rpm, Output power = 330 kW, Hydraulic efficiency = 94%, Over all efficiency = 85%, Flow ratio = 0.15, Breadth ratio = 0.1, Inner diameter of runner is 0.5 outer diameter. Also assume 6% of circumferential area of the runner to be occupied by the thickness of the vanes. Velocity of flow remains constant throughout and flow is radial at exit. Determine: (i) Guide blade angle (ii) Runner vane angles at outlet and inlet (iii) Diameters of runner at inlet and outlet.	12M	CO4	L3
	(OR)			
8(a)	Define the specific speed of the turbine. Derive an expression for the specific speed. What is the significance of specific speed of the turbine?	6M	CO4	L3
(b)	A Pelton wheel is having a mean bucket diameter of 0.8 m and is running at 1000 r.p.m. The net head on the Pelton wheel is 400 m. If the side clearance angle is 15° and discharge through nozzle is 150 liters/s, find (i) Power available at the nozzle, and (ii) Hydraulic efficiency of the turbine.	6M	CO4	L3
9(a)	Explain the components of centrifugal pump with neat sketch.	6M	CO5	L2
(b)	A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40m. The velocity of flow through the impeller is constant and equal to 2.5m/s. The vanes are set back at an angle of 40^0 at outlet. If the outer diameter of the impeller is 500mm and width at outlet is 50mm, determine: (i) Vane angle at inlet (ii) Workdone by the impeller on water per second, and (iii) Manomteric efficiency.	6M	CO5	L
	(OR)			
10(a)	What do you mean by manometric efficiency, mechanical efficiency and overall efficiency of centrifugal pump?	6M	CO5	L2
(b)	A three stage centrifugal pump has impellers of 40 cm in diameter and 2cm wide at outlet. The vanes are curved back at the outlet at 45^0 and reduce the circumferential area by 10%. The manometric efficiency is 90% and overall efficiency is 80%. Determine the head generated by the pump when running at 1000 r.p.m. delivering 50 liters per second. What should be the shaft power?	6M	CO5	L3

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

17CE08-STRENGTH OF MATERIALS-II

(CE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1.	The stress system on two orthogonal planes is observed as 60 MPa compressive and 40 MPa tensile along with 30 MPa shear stress. Find the principal stresses and their planes. Also find the maximum shear stress and its planes. What is the normal stress on these maximum shear planes? Show the above results on elements with neat sketches.	12M	CO1	L3
	(OR)			
2.	A solid circular shaft is subjected to a maximum bending moment of 2500 Nm and twisting moment of 4200 Nm. Find the required minimum diameter for the shaft to avoid any failure, if the yield stress and Poisson's ratio of shaft material are 380 MPa and 0.3 respectively. What is the parameter governing the value of diameter?	12M	CO1	L3
3.	A 5 m long cast iron column with fixed ends has to carry an axial load of 800 kN. Rankine's constant and the allowable compressive stress are 1/1600 and 80 MPa respectively. Determine the required diameter for solid circular cross section by adopting a factor of safety 2. If this solid circular column is replaced with a hollow circular column having inner diameter as 70% of its outer diameter and of same material, determine the required diameter with same factor of safety. Also find percentage saving in material.	12M	CO2	L3
	(OR)			
4.	A flat bar of 200 mm wide and 16 mm thickness carries an axial tensile load of 200 kN. A hole of 30 mm diameter was drilled at a distance of 60 mm from the longitudinal axis. Find the extreme stresses in the flat at critical section.	12M	CO2	L3
5.	A prismatic beam of 10m long is supported by hinge at right end and by a roller at 2m from the left end and subjected to 20 kN/m uniformly distributed load over the entire length. Determine the slope at hinged support and deflection at the free end by using Macaulay's method. The Young's modulus of elasticity and moment of inertia of the beam cross section are 200 GPa and $4x10^4$ cm^4 respectively.	12M	CO3	L3
	(OR)			

6.	A simply supported steel beam of 8m span is subjected to uniformly distributed load 60 kN/m over the entire span. Determine the maximum slope and deflection in the beam by using moment-area method. The Young's modulus of elasticity and moment of inertia of the beam cross section are 200 GPa and $5x10^4$ cm^4 respectively.	12M	CO3	L3
7.	Determine the support moments in a fixed beam of span L carrying eccentric point load, by using moment area method. Also draw the shear force and bending moment diagrams by indicating all salient values.	12M	CO4	L3
	(OR)			
8.	A fixed beam of 5 m span carries 20 kN/m uniformly distributed load over the entire span. The right support sinks by 5 mm. Analyse the beam by using Clapeyron's theorem. Draw the shear force and bending moment diagrams by indicating all salient values. The Young's modulus of elasticity and moment of inertia of the beam cross section are 210 GPa and 9000 cm^4 respectively.	12M	CO4	L3
9.	A beam of rectangular cross section 90 mm wide and 120 mm deep is simply supported over 2m span and subjected to a central concentrated load of 20 kN. But the trace of the plane of load is orthogonal to one of its diagonals. Locate the neutral axis and compute the stresses at all corners of the cross section.	12M	CO5	L3
	(OR)			
10	A steel channel section of 250 mm deep, 125 mm wide and 20 mm thick is carrying a vertical shear of 3 kN. Compute the shear stress and locate the shear center.	12M	CO5	L3

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

17PD03-PROFESSIONAL ETHICS AND HUMAN VALUES
(CSE,EIE,IT&ME)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Describe the professional role played by an engineer.	6M	CO1	L2
(b)	List out various principles of Duty Ethics.	6M	CO1	L1
	(OR)			
2(a)	Discuss various professional roles that attract engineers.	6M	CO1	L2
(b)	Determine various types of inquiries in solving ethical problems.	6M	CO1	L2
3(a)	"Character is considered as a challenge in the work place". Illustrate your views with an example.	6M	CO2	L2
(b)	"Service learning refers to learning the service policies" Tell your views on the statement and justify.	6M	CO2	L1
	(OR)			
4(a)	Explain various spiritual traits to be developed for corporate excellence in corporate activities.	6M	CO2	L2
(b)	Define the term values and also give a detailed outline on various types of values.	6M	CO2	L2
5(a)	Compare the engineering experiments with standard experiments.	6M	CO3	L2
(b)	Discuss the role of law and its importance in engineering.	6M	CO3	L2
	(OR)			
6(a)	Explain the concept of engineers as responsible experimenters.	6M	CO3	L2
(b)	Determine the essential roles played by code of ethics.	6M	CO3	L2
7(a)	"Assessing the personal risk is not an easy task", Discuss.	6M	CO4	L2
(b)	Explain the concept "Public risk" with a suitable example.	6M	CO4	L2
	(OR)			
8.	Discuss on "Intellectual Property Rights".	12M	CO4	L2
9(a)	Explain the role of engineers as managers.	6M	CO5	L2
(b)	State the duties of engineers being an expert-witness.	6M	CO5	L1
	(OR)			
10(a)	Discuss on the engineer's role in Weapons Development.	6M	CO5	L2
(b)	Write a brief note on "Consulting Engineers".	6M	CO5	L1

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

17CI10-SOFTWARE ENGINEERING

(CSE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Outline various software myths.	6M	CO1	L2
(b)	Illustrate the concept of Software Engineering – a layered technology.	6M	CO1	L2
	(OR)			
2(a)	Demonstrate about Personal Software Process model and Team Software Process model.	6M	CO1	L2
(b)	Discuss about Capability Maturity Model Integration (CMMI).	6M	CO1	L2
3(a)	Summarize Unified Process model with neat sketch.	6M	CO2	L2
(b)	The Rapid Application Development model is a high-speed adaption of the waterfall model. Explain.	6M	CO2	L2
	(OR)			
4(a)	Write about the nature of practice.	6M	CO2	L1
(b)	Illustrate communication practices.	6M	CO2	L2
5(a)	Discuss the requirements management planning in detail.	6M	CO3	L2
(b)	Outline the need and explain the concept of requirement elicitation.	6M	CO3	L2
	(OR)			
6(a)	Why behavioral models are used? Explain different behavioral modeling diagrams.	6M	CO3	L1
(b)	Define Objects and Object classes. Explain the concept of design evolution.	6M	CO3	L2
7(a)	List the golden rules for user interface design.	6M	CO4	L1
(b)	Discuss about any Four Design Concepts.	6M	CO4	L1
	(OR)			
8(a)	What is architecture? Discuss about the importance of architecture.	6M	CO4	L1
(b)	Illustrate Architectural styles and patterns.	6M	CO4	L2
9(a)	Summarize the strategic approach for software testing.	6M	CO5	L2
(b)	Demonstrate software reliability in detail.	6M	CO5	L2
	(OR)			
10(a)	What is risk management? Explain the difference between Reactive and Proactive risk strategies.	6M	CO5	L2
(b)	Demonstrate about white box testing.	6M	CO5	L2

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

17CI09-DATA BASE MANAGEMENT SYSTEMS
(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1.	Illustrate about Database Structure in detail with Neat Diagram.	12M	CO1	L2
	(OR)			
2(a)	Discuss about Super key, Candidate key and Primary Key with Examples.	6M	CO1	L2
(b)	Model a Company ER Diagram.	6M	CO1	L3
3(a)	Illustrate about Integrity Constraints in Detail.	6M	CO2	L2
(b)	Describe any 3 relational algebra operators with examples.	6M	CO2	L2
	(OR)			
4(a)	Demonstrate any 3 types of Joins with Examples.	6M	CO2	L2
(b)	List and describe aggregate functions with Examples.	6M	CO2	L2
5(a)	Outline functional dependencies and inclusion dependencies.	6M	CO3	L2
(b)	Determine all the candidate keys for the Relation R, which has eight attributes ABCDEFGH. F={CH→G, A→BC, B→CFH, E→A, F→EG} is a set of functional dependencies (FDs).	6M	CO3	L3
	(OR)			
6(a)	Explain about 3rd Normal Form with an Example.	6M	CO3	L2
(b)	Discuss about Join dependencies and 5NF.	6M	CO3	L2
7.	Illustrate about conflict and view Serializability with examples.	12M	CO4	L2
	(OR)			
8(a)	Explain about 2 phase locking protocol, strict 2 phase locking protocol and conservative 2 phase locking protocol.	6M	CO4	L2
(b)	Discuss about ARIES algorithm in detail for crash recovery.	6M	CO4	L2
9(a)	Describe any 3 RAID levels.	6M	CO5	L2
(b)	Differentiate B Tree and B+ Tree indexing.	6M	CO5	L2
	(OR)			
10(a)	Outline Static and Linear Hashing techniques.	6M	CO5	L2
(b)	Describe any 2 page formats and record formats.	6M	CO5	L2

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

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

17CS01- LINUX PROGRAMMING
(CSE)

Time : 3 hours Max.Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate about Multiprogramming and Multitasking operating systems.	6M	CO1	L2
(b)	List out the features of LINUX operating System.	6M	CO1	L1
	(OR)			
2.	Outline about the following LINUX commands with example. Cat, date, echo, printf, cd, who, tty, sty, rm, wc, more, pwd.	12M	CO1	L2
3(a)	What are pipes? Explain how pipes are created and used in IPC with an example.	6M	CO2	L2
(b)	Write a shell script to count the number of lines in a text file without using wc command.	6M	CO2	L3
	(OR)			
4(a)	Differentiate between shell variables and environment variables.	6M	CO2	L2
(b)	Write a shell script to find the length of a given string.	6M	CO2	L3
5(a)	Illustrate the following commands with syntax, options and examples (i) head (ii) tail.	6M	CO3	L2
(b)	Define grep and egrep. Write a grep command to display the lines which does not matches all the given pattern.	6M	CO3	L3
	(OR)			
6(a)	Write a sed command that deletes the first character in each line in a file.	6M	CO3	L3
(b)	Write an awk program to count the number of vowels in a given file.	6M	CO3	L3
7.	Define Process. Explain the concept of Process creation mechanism and process attributes.	12M	CO4	L2
	(OR)			
8(a)	Demonstrate Briefly about the following socket APIs with syntax (i) connect (ii) listen.	6M	CO4	L2
(b)	Write a C Socket program for LINUX with a Server and client Example code.	6M	CO4	L3
9(a)	Describe about the INTEL multiprocessor specification.	6M	CO5	L2
(b)	Discuss the process of compiling LINUX SMP.	6M	CO5	L2
	(OR)			
10(a)	Explain with a program how to copy file data from server to client using multi processing.	6M	CO5	L3
(b)	Differentiate loosely coupled multi processing architecture and tightly coupled multi processing architecture.	6M	CO5	L2

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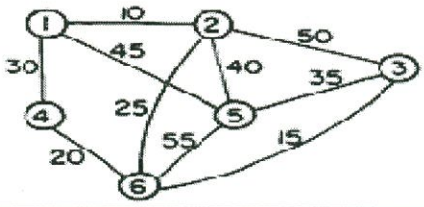
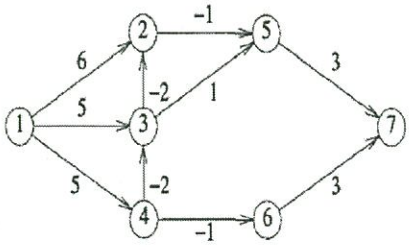
B.Tech. (IV Semester) Regular/Supplementary Examinations

17CI08-DESIGN AND ANALYSIS OF ALGORITHMS

(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define the following asymptotic notations (i) Big-Oh(O) (ii) Omega(Ω) (iii) Theta(Θ)	6M	CO1	L1
(b)	Solve the following recurrence relation using substitution method $T(n) = c, \quad n = 1$ $= 2\,T(n/2) + n, \quad n > 1$	6M	CO1	L3
	(OR)			
2(a)	Present an algorithm for finding maximum and minimum using divide and conquer method.	6M	CO1	L1
(b)	Analyze the time complexity of MaxMin algorithm using divide and conquer method.	6M	CO1	L4
3(a)	You are given a set of n jobs .Associated with each job i is a processing time t_i and a deadline d_i by which it must be completed. Write a greedy algorithm to generate a maximum profit by finding the sequence of jobs to be completed within their deadlines.	6M	CO2	L2
(b)	What is the solution generated by the Job Sequecing algorithm when n=7, $(p_1,p_2,p_3,p_4,p_5,p_6,p_7) = (3,5,20,18,1,6,30)$ and $(d_1, d_2, d_3, d_4, d_5, d_6, d_7) = (1,3,4,3,2,1,2)$.	6M	CO2	L3
	(OR)			
4.	Present the Kruskal's algorithm to find out the minimum cost spanning tree. Apply the kruskal's algorithm to compute a minimum cost spanning tree for the following graph.  	12M	CO2	L3
5	Use Bellman and Ford algorithm to compute shortest paths from node 1 to every other node in the following graph.  	12M	CO3	L3
	(OR)			

6	Apply the dynamic programming approach, Construct the Optimal Binary Search Tree(OBST) for the instance with n=4 and identifiers (a1,a2,a3,a4) = (do,if,int,while) with successful searches p(1:4) = (3,3,1,1) and unsuccessful searches q(0:4)=(2,3,1,1,1).	12M	CO3	L3
7(a)	Present a general method of backtracking algorithm. List out the applications of backtracking.	6M	CO4	L1
(b)	Illustrate the N-Queen's problem when N=8 and place 8-Queens in a 8*8 chess board.	6M	CO4	L3
	(OR)			
8(a)	Illustrate the graph coloring problem with one example.	6M	CO4	L2
(b)	Draw the portion of the state space tree for m-coloring, when n=4 and m=3.	6M	CO4	L3
9.	Consider the following traveling salesperson instance defined by the cost matrix .Obtain the portion of the state space tree that will be generated by LC Branch and Bound technique. $\begin{bmatrix} \infty & 7 & 3 & 12 & 8 \\ 3 & \infty & 6 & 14 & 9 \\ 5 & 8 & \infty & 6 & 18 \\ 9 & 3 & 5 & \infty & 11 \\ 18 & 14 & 9 & 8 & \infty \end{bmatrix}$	12M	CO5	L3
	(OR)			
10.	Construct the portion of the state space tree generated by FIFO Branch and Bound technique for the knapsack instance of n = 4; (p1, p2, p3, p4) = (10, 10,12, 18); (w1, w2, w 3, w4) = (2, 4, 6,9) and m = 15.	12M	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

17CI07-OOPS THROUGH JAVA
(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	List and Explain Java Buzz words.	6M	CO1	L2
(b)	Explain Byte Code and its advantages.	6M	CO1	L2
	(OR)			
2(a)	Define Class and Object. Explain with suitable example program.	6M	CO1	L1
(b)	Illustrate the use of Constructor and different types of Constructors with suitable program.	6M	CO1	L2
3(a)	Illustrate the concept of Inheritance. List out different types of Inheritance.	6M	CO2	L2
(b)	Differentiate between Method Overloading and Method Overriding.	6M	CO2	L2
	(OR)			
4(a)	Demonstrate Dynamic Method Dispatch concept with suitable example program.	6M	CO2	L3
(b)	Define Interface. List interface uses and advantages.	6M	CO2	L2
5(a)	Describe Exception. List different types of Exceptions.	6M	CO3	L2
(b)	Demonstrate the mechanism used to handle exceptions with suitable program.	6M	CO3	L3
	(OR)			
6(a)	Differentiate Multi-Threading and Multi-Tasking.	6M	CO3	L2
(b)	Illustrate creation of multiple threads with suitable program.	6M	CO3	L3
7.	Illustrate that how to pass the parameters to an Applet. Explain with an example.	12M	CO4	L3
	(OR)			
8(a)	Outline the delegation event model.	6M	CO4	L2
(b)	Discuss procedure to handle mouse events with an example program.	6M	CO4	L3
9(a)	Discuss different Layout Managers in AWT.	6M	CO5	L2
(b)	Discuss the limitations of AWT.	6M	CO5	L2
	(OR)			
10.	Develop an application with different Components that are available in Swings.	12M	CO5	L3

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

17FE11-LINEAR ALGEBRA AND NUMERICAL APPLICATIONS
(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Reduce the non-singular matrices P and Q such that PAQ is in the normal form for A. Hence find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & -2 \\ 2 & -2 & 1 & 3 \\ 3 & 0 & 4 & 1 \end{bmatrix}$	6M	CO1	L3
(b)	Test whether the following system of equations are consistent or not. If so, solve them completely $3x+3y+2z=1, x+2y=4, 10y+3z=-2, 2x-3y-z=5$	6M	CO1	L3
	(OR)			
2(a)	Find the rank of the matrix A = $\begin{bmatrix} 2 & -2 & 0 & 6 \\ 4 & 2 & 0 & 2 \\ 1 & -1 & 0 & 3 \\ 1 & -2 & 1 & 2 \end{bmatrix}$ by reducing it to canonical form.	6M	CO1	L3
(b)	Investigate the values of λ and μ so that the simultaneous equations $2x + 3y + 5z = 9$, $7x + 3y - 2z = 8$, $2x + 3y + \lambda z = \mu$ have (i) no solution (ii) a unique solution iii) an infinite number of solutions.	6M	CO1	L4
3(a)	Determine the Eigen values and the corresponding Eigen vectors of $\begin{bmatrix} 6 & 3 & 0 \\ 0 & 3 & 0 \\ 0 & -1 & 3 \end{bmatrix}$.	6M	CO2	L3
(b)	If λ is an Eigen value of a non singular matrix A, then $\frac{1}{\lambda}$ is an Eigen value of the matrix A.	6M	CO2	L2
	(OR)			
4(a)	Apply Caley -Hamilton theorem to evaluate the matrix represented by $A^8-5A^7+7A^6-3A^5+A^4-5A^3+8A^2-2A+I$, where $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ and also find its inverse and A^4.	6M	CO2	L4

(b)	Prove that the sum of the Eigen values of a square matrix is equal to its trace and product of the Eigen values is equal to its determinant.	6M	CO2	L3
5.	Reduce the quadratic form $3x^2+5y^2+3z^2-2yz-2xy+2zx$ to canonical form and specify the matrix of transformation.	12M	CO3	L3
	(OR)			
6.	Find the orthogonal transformation which transforms the quadratic form $x_1^2+3x_2^2+3x_3^2-2x_2x_3$ to canonical form.	12M	CO3	L3
7(a)	Apply Regula-falsi method to find a positive root of the equation $x^3-5x-7=0$.	6M	CO4	L3
(b)	Apply Newton's backward interpolation formula estimate the population of the city in the year 1995	6M	CO4	L3
	(OR)			
8(a)	Apply Newton -Raphson method to find a real root of the equation $e^x \sin x = 1$ correct to four decimal places.	6M	CO4	L3
(b)	Apply Lagrange's interpolation formula to find a unique polynomial p(x) of degree two or less such that $p(1)=1, p(3)=27, p(4)=64$.	6M	CO4	L3
9.	Apply Jacobi's iteration method to find the solutions of the following equations $10x+y-z=11.9, x+10y+z=28.08, -x+y+10z=35.61$, correct to two decimal places.	12M	CO5	L3
	(OR)			
10(a)	Fit a straight line by the method of least squares to the following data	6M	CO5	L3
(b)	Determine a parabola by the method of least squares to the following data .	6M	CO5	L3

Year (x)	1961	1971	1981	1991	2001
Population in lakhs (y)	46	66	81	93	101

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

x	1	2	3	4	5
y	5	12	26	60	100

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.
B.Tech. (IV Semester) Regular/Supplementary Examinations
17EC12-ANALOG COMMUNICATIONS
(ECE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	If μ_1, μ_2, μ_3,...denote the individual modulation indices in a multi tone signal,interpret the expression for total power as well as net modulation index.	6M	CO1	L2
(b)	An AM signal is given as $s(t)=5\cos 2\pi x10^6t(1+\cos 2\pi x10^3t+ 2\cos 4\pi x10^3t)$. Estimate the (i) Message signal and Carrier frequencies (ii)Individual modulation indices (iii)Net modulation Index.	6M	CO2	L4
	(OR)			
2(a)	Contrast the role of Ring Modulator in the generation of Double side band suppressed Carrier Amplitude Modulated (DSBSC-AM) signal.	6M	CO1	L2
(b)	Evaluate the total power required for given DSBSC – AM signal $s(t)=3\cos 4\pi x10^6t(2\cos 6\pi x10^3t+ 2\cos 8\pi x10^3t)$.	6M	CO2	L4
3(a)	Illustrate about demodulation of Single Sideband suppressed carrier Amplitude Modulated signal (SSBSC –AM) using coherent detector.	6M	CO1	L2
(b)	Summarize the differences between the SSBSC –AM and vestigial sideband suppressed carrier amplitude modulated signal (VSB SC-AM).	6M	CO1	L2
	(OR)			
4(a)	Outline the process of envelope detection for demodulating the VSBSC AM signal.	6M	CO1	L2
(b)	Show the reason behind Donald Duck effect with the help of necessary mathematical expression.	6M	CO1	L3
5(a)	With a neat block diagram, elaborate the generation of FM using indirect method.	6M	CO2	L2
(b)	Calculate the (i)Message frequency (ii)Carrier frequency (iii) frequency deviation (iv) Band width for given FM signal $S(t)=10\cos(8\pi x10^6t + 10\sin 5000\pi t)$.	6M	CO2	L3
	(OR)			
6(a)	Describe the balanced slope detector method for FM demodulation.	6M	CO1	L2
(b)	Show that the expression for NBFM is $s(t)= A_c\cos\omega_c t - \beta A_c\sin\omega_c t\sin\omega_m t$.	6M	CO1	L2
7(a)	Elaborate the steps involved in demodulation of PWM with required waveforms.	6M	CO3	L2
(b)	Discriminate between Ideal, Natural and Flat top sampling.	6M	CO3	L2
	(OR)			
8(a)	With a neat block schematic, demonstrate the role of Frequency Division Multiplexing in communication.	6M	CO2	L2
(b)	Determine the sampling rate as well sampling interval required for the given message signal $m(t)= \sin(1000\,\pi\, t)\cos(6000\,\pi\, t)+ \sin(8000\pi t)\cos(2000\pi t)$.	6M	CO2	L3
9(a)	Outline working of the AM low level transmitter with necessary block diagram.	6M	CO1	L2
(b)	Obtain the loaded Q of an FM receiver if incoming signal frequency is 90MHz and image frequency rejection ratio is 12.	6M	CO2	L3
	(OR)			
10.	Examine the statement that Figure of merit for SSBSC AM is unity	12M	CO4	L2

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

17EC11-DIGITAL SYSTEM DESIGN

(ECE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Draw the VHDL program structure and discuss the objects such as variables, constants and signals.	6M	CO1	L2
(b)	Draw the two input CMOS NAND and CMOS NOR gates and explain the operation with functional tables.	6M	CO1	L2
	(OR)			
2(a)	Explain the different abstraction levels of digital system design with proper examples.	6M	CO1	L2
(b)	Draw the CMOS AOI and OAI gates and explain the operation with functional tables.	6M	CO1	L2
3(a)	Develop VHDL model for an 8-input priority encoder (74x148) and 3 to 8 decoder (74x138).	6M	CO2	L2
(b)	Develop structural VHDL model for a4-bit binary counter using JK Flip flop as a component.	6M	CO2	L2
	(OR)			
4(a)	Develop structural VHDL model for a 8-bit barrel shifter.	6M	CO2	L2
(b)	Develop VHDL model for a MOD-12 counter.	6M	CO2	L2
5(a)	Draw the basic Verilog module structure and explain the language constructs and conventions.	6M	CO3	L2
(b)	Discuss the logic gate primitives available in the Verilog language.	6M	CO3	L2
	(OR)			
6(a)	Write the Verilog code for clocked RS flip-flop and D latch modules using primitive gates.	6M	CO3	L2
(b)	List and explain the logic values and its strength levels and different data types supported in Verilog.	6M	CO3	L2
7(a)	Explain the conditional assignment constructs available in the Verilog.	6M	CO4	L2
(b)	Write the Verilog code for CMOS NAND gate using switch primitives with delays.	6M	CO4	L2
	(OR)			
8(a)	Draw the procedural block structure and write the syntax for initial, multiple initial and always constructs in Verilog.	6M	CO4	L1
(b)	Write the Verilog code for Bi-directional gate using CMOS switch primitives and delays available in the Verilog.	6M	CO4	L1
9(a)	Explain the continuous assignments with delays and continuous assignment to vectors with Verilog syntax examples.	6M	CO5	L2
(b)	Write the Verilog code for 4-bit ripple carry adder with arithmetic and logical operators.	6M	CO5	L1
	(OR)			
10(a)	Draw the Verilog simulation flow diagram discuss the different possible events in the execution process.	6M	CO5	L2
(b)	Write the Verilog code for 4-bit universal shift register using conditional and logical operators.	6M	CO5	L1

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B.Tech. (IV Semester) Regular/Supplementary Examinations
17EC10-DIGITAL SIGNAL PROCESSING
(ECE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1.	Determine the response y(n);n≥0 of the system described by the second order difference equation y(n)-3y(n-1)-4y(n-2)=x(n)+2x(n-1) for the input $x(n)=(4)^n u(n)$.	12M	CO1	L2
	(OR)			
2(a)	State and prove the properties of time shifting, time reversal and differentiation properties of DTFT.	6M	CO2	L3
(b)	Determine X(ω) for the following signals $x_1(n) = \delta(n)$ $x_2(n) = a^{\lvert n\rvert}$ $-1<a<1$ $x_3(n) = u(n)$.	6M	CO2	L3
3(a)	Apply the Z-Transform for the following signals $x(n) = (-1)^n(2)^{-n}u(n)$ $x(n) = (-1)(\cos\frac{\pi}{3}n)u(n)$.	6M	CO3	L3
(b)	State and prove the following properties of Z-Transform. (i) Differentiation (ii) Amplitude scaling.	6M	CO3	L3
	(OR)			
4(a)	Determine the causal signal x(n) if it's Z-transform X(Z) is given by (i) $X(Z) = \frac{Z^{-6}+Z^{-7}}{1+Z^{-1}}$ (ii) $X(Z) = \frac{1-\frac{1}{2}Z^{-1}}{1+\frac{1}{2}Z^{-1}}$	6M	CO3	L3
(b)	Evaluate 4-point DFT of a sequence x(n)={1,2,3,4}.	6M	CO3	L3
5(a)	Compute 8-point DFTof the discrete time sequence $x(n) = \cos\frac{\pi}{2}n$; 0≤n≤7	6M	CO4	L4
(b)	Compute circular convolution using time domain formula. $x_1(n)$={-1,1,2,-2} and $x_2(n)$ = {0.5,1,-1,2}	6M	CO4	L4
	(OR)			
6(a)	Develop the algorithm to compute 8-Point DFT of a sequence x(n) using radix-2 DIT FFT.	6M	CO4	L4
(b)	Analyze 8-Point DFT, using radix-2 DIF FFT Algorithm for the sequence x(n)={1,1,1,1,1,1,0,0}.	6M	CO4	L4
7(a)	Derive the normalized transfer function H(S) of Butterworth lowpass filter for N=4 order.	6M	CO5	L3
(b)	Extract digital transfer function using Impulse Invariance method $H(S) = \frac{10}{S^2+7S+10}$ for T=0.2sec.	6M	CO5	L3
	(OR)			
8.	The specifications of desired lowpass digital filter is $0.9 \le \lvert H(\omega)\rvert \le 1.0$; $0 \le \omega \le 0.25\pi$ $\lvert H(\omega)\rvert \le 1.0$; $0.5\pi \le \omega \le \pi$ Design a Chebyshev digital filter using impulse invariant transformation.	12M	CO5	L3
9.	Design a lowpass filter using hanning window by taking 6 samples of w(n) and with cutoff frequency of 1.2radians/sec.	12M	CO5	L4
	(OR)			
10.	Design a highpass filter using hamming window with cutoff frequency 1.2 rad/sec and N=9 samples.	12M	CO5	L4

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4 SEP 2021

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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

17EC09-ELECTROMAGNETIC FIELDS AND WAVES

(ECE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Derive Poisson's and Laplace equations from fundamentals.	6M	CO1	L2
(b)	List the applications of Gauss law and Derive any two of them.	6M	CO1	L2
	(OR)			
2(a)	State and explain Maxwell's equations of electrostatics.	6M	CO2	L1
(b)	Obtain the expressions of capacitance of co-axial cable. Assume suitable length, charge density, inner and outer radii.	6M	CO1	L2
3(a)	State Biot-savort's law and Derive the 'H' field at an observation point due to infinite long current element.	6M	CO2	L2
(b)	Discuss the magnetic scalar and vector potentials derive an expressions for it.	6M	CO2	L2
	(OR)			
4(a)	State Maxwell's equations for magneto static fields.	6M	CO2	L1
(b)	The magnetic field intensity, H, due to current source is given by $H= y\cos(ax)a_x +(ye^z)\,a_z$. Describe current density in Y-Z plane.	6M	CO4	L2
5(a)	Explain Maxwell's equations of time varying fields using differential and integral forms their basics.	6M	CO2	L2
(b)	A copper wire carries a conduction current of 1A. Determine the displacement current in the wire at 1MHz. For copper **ε=εo** and conductivity is 5.8 x 107 S/m.	6M	CO3	L3
	(OR)			
6(a)	State and explain the differential and integral form of four Maxwells equations.	6M	CO3	L2
(b)	If x < 0 defines region 1 and x>0 defines region 2. Region 1 is characterized by μ_{r1} =3.0 and region 2 characterized by $\mu_{r\,2}$= 5.0. If the magnetic field in region 1 is given by $H_1 = 4.0\,a_x +1.5\,a_y + 3.0\,a_z$, A/m , find H_2 and B_2.	6M	CO3	L3
7(a)	Discuss about the scalar form of wave equations used for both conducting and dielectric media.	6M	CO1	L2
(b)	Evaluate Electric Field Component E, Attenuation constant α, Skin Depth, Wave polarization, when a wave is propagating through a lossy dielectric has an intrinsic impedance of $200\angle 30^0\ \Omega$ at a particular radian frequency ω has the magnetic field component $H = 10e^{-\alpha x}Cos\left(\omega t - \frac{1}{2}x\right)a_y A/m$.	6M	CO4	L3
	(OR)			
8(a)	Define conducting medium and obtain the expression for intrinsic impedance.	6M	CO4	L2
(b)	Discuss different types of polarizations with neat sketches.	6M	CO1	L2
9(a)	State and Prove pointing theorem.	6M	CO3	L1
(b)	Illustrate the reflection of uniform plane wave by a perfect dielectric on oblique incidence.	6M	CO1	L2
	(OR)			
10(a)	Analyze the reflection of a plane wave at normal incidence.	6M	CO3	L3
(b)	Solve incident, reflected and transmitted wave equations under the parallel polarization of oblique incidence to obtain reflection coefficient (Γ) and transmission coefficient(τ).	6M	CO2	L3

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2 SEP 2021

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.
B.Tech. (IV Semester) Regular/Supplementary Examinations
17FE09-FUNCTIONS OF COMPLEX VARIABLES
(ECE & EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Show that the function f(z) = $\sqrt{\lvert xy \rvert}$ is not analytic at the origin even though C-R equations are satisfied thereof.	6M	CO1	L3
(b)	State and Prove C-R Equations in Polar form.	6M	CO1	L3
	(OR)			
2(a)	Find the analytic function whose real part is $\frac{\sin 2x}{\cosh 2y - \cos 2x}$	6M	CO1	L3
(b)	If $f(z)$ is a regular function of z, prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)\lvert f(z)\rvert^2 = 4\lvert f'(z)\rvert^2$	6M	CO1	L3
3(a)	If cosh(u+iv) = x+iy, prove that $\frac{x^2}{\cosh^2 u}+\frac{y^2}{\sinh^2 u}=1$	6M	CO2	L3
(b)	Find the real and imaginary parts of exp(iz²).	6M	CO2	L2
	(OR)			
4(a)	Prove that (i) $\overline{\sin z} = \sin \bar{z}$ (ii) $\overline{\tan z} = \tan \bar{z}$	6M	CO2	L3
(b)	Find the general and principal value of log(1+i)+ log(1-i).	6M	CO2	L2
5(a)	Prove that $\int_C \frac{dz}{z-a} = 2\pi i$ *where C is the circle* $\lvert z-a\rvert = r$	6M	CO3	L3
(b)	Evaluate $\int_C f(z)dz$, if $f(z) = x^2 + ixy$ from A(1,1) to B(2,8) along the Straight line AB.	6M	CO3	L3
	(OR)			
6(a)	Evaluate $\int_c \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$ where C is the circle $\lvert z\rvert = 3$	6M	CO3	L3
(b)	Determine $\int_c \frac{\sin^2 z}{\left(z-\frac{\pi}{6}\right)^3} dz$, where C is $\lvert z\rvert = 1$	6M	CO3	L3
7.	Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the region i) $\lvert z\rvert < 1$, *ii)* $1 < \lvert z\rvert < 2$,*iii)* $\lvert z\rvert > 2$	12M	CO4	L3
	(OR)			
8.	Write Taylor's expansion of $f(z) = \frac{2z^3+1}{z^2+z}$ about the point z=i.	12M	CO4	L1
9(a)	Calculate the residues at the poles of $f(z) = \frac{ze^z}{(z-1)^3}$	6M	CO5	L3
(b)	Evaluate $\oint_C \tan z \, dz$ where C is the circle $\lvert z\rvert = 2$.	6M	CO5	L3
	(OR)			
10(a)	Show that $\int_{-\infty}^{+\infty} \frac{1}{x^4+1} dx = \frac{\pi}{\sqrt{2}}$	6M	CO5	L3
(b)	Prove that $\int_0^{2\pi} \frac{\cos 3\theta}{5-4\cos\theta} d\theta = \frac{\pi}{12}$	6M	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

17EE09-ELECTRIAL MACHINES-I

(EEE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the classification of DC generators with respective to type of excitation.	6M	CO1	L2
(b)	A compound generator delivers a load current of 50A at 500V. The resistances are R_a=0.05Ω, R_{se}= 0.064Ω and R_{sh}= 250Ω. The brush contact drop is 1 volt/brush. Find the induced EMF and Armature current when the machine connected as (i) long shunt ii) short shunt.	6M	CO1	L3
	(OR)			
2(a)	Derive the EMF equation of a DC generator.	6M	CO1	L2
(b)	A shunt generator delivers 195 A at terminal p.d of 250V. The armature resistance and shunt field resistance are 0.02Ω and 50Ω respectively. The iron and friction losses equal to 950W. Find (i) E.M.F generated (ii) Cu losses (iii) Output of the prime mover.	6M	CO1	L3
3(a)	Draw and discuss the O.C.C of self -excited D.C generator.	6M	CO2	L2
(b)	What are the conditions for voltage buildup of a dc shunt generator?	6M	CO2	L1
	(OR)			
4(a)	Illustrate the internal characteristics of D.C shunt generator.	6M	CO2	L2
(b)	What are the different types of characteristics of D.C generators?	6M	CO2	L2
5(a)	Derive the torque equation of D.C motor.	6M	CO2	L3
(b)	A 230V DC shunt motor takes and armature current of 20A on a certain load. Resistance of armature is 0.5Ω. Find the resistance required in series with the armature to half the speed if i) the load torque is constant ii) the load torque is proportional to the square of the speed.	6M	CO2	L3
	(OR)			
6(a)	Describe the Speed-Current, Torque-Current and Speed-Torque characteristics of a D.C shunt motors and mention their applications.	6M	CO2	L3
(b)	A 500V shunt motor runs at its normal speed of 250 r.p.m when the armature current is 200A. The resistance of armature is 0.12Ω. Calculate the speed when a resistance is inserted in the field reducing the shunt field to 80% of normal value and the armature current is 100A.	6M	CO2	L3

7(a)	Derive the e.m.f equation of a 1-ph transformer.	6M	CO2	L3
(b)	A 15KVA, 2200/220V, 50Hz transformer gave the following results. O.C test (L.V side): V =220V, I=2.742A, P=185W. S.C test (H.V side): V =112V, I=6.3A, P=197W. Compute the voltage regulation at full load 0.8p.f leading.	6M	CO2	L3
	(OR)			
8(a)	Demonstrate the Sumpner's test with neat sketch.	6M	CO2	L2
(b)	A 15KVA, 2200/220V, 50Hz transformer gave the following results. O.C test (L.V side): V =220V, I=2.742A, P=185W. S.C test (H.V side): V =112V, I=6.3A, P=197W. Compute the efficiency at full load 0.8p.f lag.	6M	CO2	L3
9(a)	Distinguish between the 2-winding transformer and an autotransformer.	6M	CO2	L2
(b)	Illustrate the various types of three phase transformers connections.	6M	CO3	L1
	(OR)			
10(a)	Give the merits and demerits of star delta connected three phase transformers. Explain.	6M	CO3	L2
(b)	Outline about the open delta connection with neat sketch.	6M	CO3	L2

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B.Tech. IV Semester Regular/Supplementary Examinations

17EE08-ELECTRONIC CIRCUIT ANALYSIS

(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Demonstrate the transistor at high frequencies.	6M	CO1	L2
(b)	A BJT has h_{ie}=6kΩ and h_{fe}=224 at I_C=1 mA, with f_T=80 MHz and $C_{b'c}$=12pF. Find (a) g_m (b) $r_{b'e}$ (c) $r_{bb'}$ at room temperature.	6M	CO1	L3
	(OR)			
2(a)	Translate hybrid- π parameters into h-parameters.	6M	CO1	L2
(b)	Derive f_T from f_β of hybrid – π model of transistor.	6M	CO1	L3
3(a)	Derive the equation for efficiency of direct coupled Class–A power amplifier.	6M	CO2	L3
(b)	Analyze the cross over distortion problem of Class-B power amplifier with neat circuit and wave forms.	6M	CO2	L4
	(OR)			
4.	For class-B power amplifier compile the peak value of input voltage signal (Vm) at which power dissipation ($P_{D)}$ and output power ($P_{out)}$ is maximum.	12M	CO2	L3
5(a)	Model the concept of current series feedback with neat block diagram.	6M	CO2	L3
(b)	An amplifier requires an input signal of 60mV to produce a certain output. With a negative feedback to get the same output, the required input signal is 0.5V. The voltage gain with feedback is 90. Determine open loop gain and feedback factor.	6M	CO2	L3
	(OR)			
6(a)	Build the feedback concept with neat block diagram.	6M	CO2	L3
(b)	Divide the frequency response of an amplifier with and without feedback.	6M	CO2	L2
7(a)	Classify the oscillators with respect to frequency of operation and method of generation.	6M	CO3	L2
(b)	Determine the frequency of oscillations when a RC phase-shift oscillator has R=10 kΩ, C=0.01 μF and R_C= 2.2 kΩ. Also, compute the minimum current again needed for this purpose.	6M	CO3	L3
	(OR)			
8(a)	In a transistorized Colpitts oscillator, the two capacitances are 10 μF and 20 μF while the frequency is to be changed from 1000 kHz to 2000 kHz. Design the range over which the inductor need to be varied.	6M	CO3	L3
(b)	Formulate the equation for frequency of oscillations in RC phase shift oscillator by using BJT.	6M	CO3	L3
9(a)	Construct the High pass RC circuit which is excited by an Ideal 1 μsec pulse and plot RC High Pass response under the fallowing conditions. The upper cut of frequency is i) 10 MHZ (ii) 0.1 MHZ.	6M	CO4	L3
(b)	Diagram the response of a low pass RC circuit with small, medium and large time constants when input is square wave and also prove that V_1= (V/2)Tan(hx).	6M	CO4	L3
	(OR)			
10(a)	Classify the different types of Clippers circuits. And explain any one of Clipper circuit operation with the aid of transfer characteristics.	6M	CO4	L2
(b)	Design a circuit to transmit that part of a sine wave which lies between +4V and +8V. (peak value of sinusoidal signal is 10V)	6M	CO4	L3

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

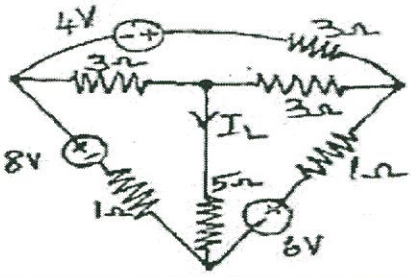
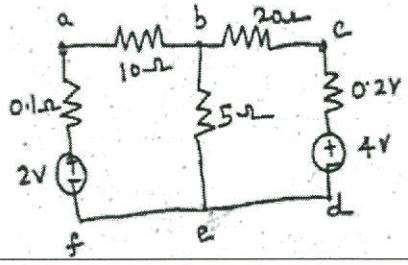
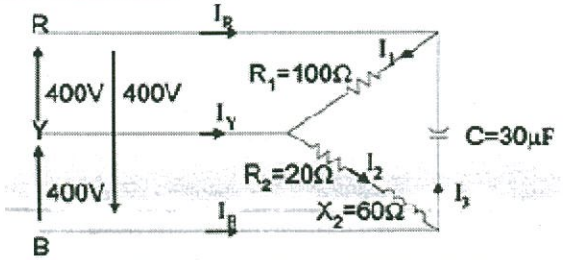
17EE07-NETWORK THEORY-II

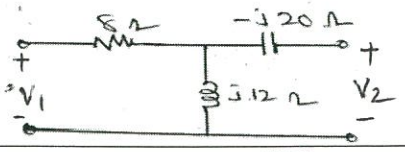
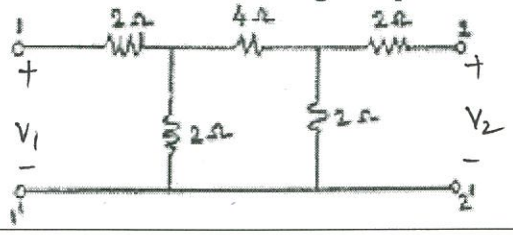
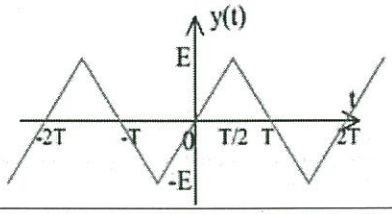
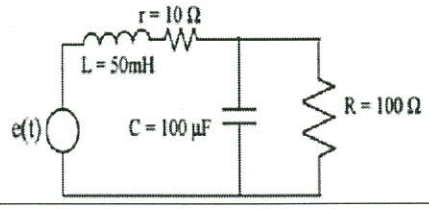
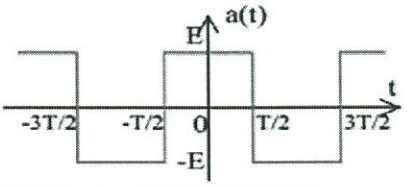
(EEE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

S.No	Questions	Marks	CO	BL
1(a)	State and explain Millman's and Tellegen's theorem.	6M	CO1	L1
(b)	Determine the current I_L in the circuit shown below by super position theorem. 	6M	CO1	L3
	(OR)			
2(a)	State and explain maximum power transfer theorem. What are the limitations of maximum power transfer theorem?	6M	CO1	L2
(b)	Determine the current through branch b-e using Norton's theorem. 	6M	CO1	L3
3(a)	Deduce the relation between line and phase quantities in a three phase delta connected system.	6M	CO1	L1
(b)	A 3 phase, 4-wire system containing impedances of (7 + j4) Ω, (3 + *j*2) Ω, and (9 + *j*2) Ω on three phases, when a supply of 440 V is applied to the system. Find line currents and neutral current.	6M	CO1	L3
	(OR)			
4(a)	A delta- connected load is arranged as in Figure below. The supply voltage is 400V at 50Hz.Calculate (i) The phase currents and (ii) The line currents. 	6M	CO1	L3
(b)	Three identical coils, each having a resistance of 20 Ω and an inductance of 0.5H connected in (i) star and (ii) delta to three phase supply of 400V; 50 Hz. Calculate the current and the total powers absorbed by both method of connections and compare the results.	6M	CO1	L3

5(a)	Convert Z – parameter to ABCD and H parameters.	6M	CO2	L3
(b)	Compute the Z parameters of the circuit in Fig. 	6M	CO2	L3
	(OR)			
6(a)	Explain the connections of (i) parallel and (ii) cascade two port networks.	6M	CO2	L2
(b)	Obtain the h-parameters of the following two port network. 	6M	CO2	L3
7(a)	Determine the effective values of the voltage and the current, the total power consumed, the overall power factor and the fundamental displacement factor, if the Fourier series of the voltage and current are given as follows. $v(t) = 5 + 8\sin(\omega t + \pi/6) + 2\sin 3\omega t$ volt $i(t) = 3 + 5\sin(\omega t + \pi/2) + 1\sin(2\omega t - \pi/3) + 1.414\cos(3\omega t + \pi/4)$ ampere	6M	CO3	L3
(b)	Find the Fourier Series of the triangular waveform shown in fig. 	6M	CO3	L3
	(OR)			
8(a)	Determine the voltage across the load R for the supply voltage e(t) applied to the circuit shown in figure $e(t) = 100 + 30\sin(300t + \pi/6) + 20\sin 900t + 15\sin(1500t - \pi/6) + 10\sin 2100t$. 	6M	CO3	L3
(b)	Find the Fourier Series of the piecewise continuous rectangular waveform. 	6M	CO3	L3
9(a)	Test the polynomial P(S) of Hurwitz property. $P(S) = S^6+3S^5+8S^4+15S^3+17S^2+12S+4$.	6M	CO4	L3
(b)	Obtain the Foster 1 and Cauer 1 forms of the RL impedance function. $\mathbf{Z(S)} = \frac{S(S+4)(S+8)}{(S+1)(S+6)}$	6M	CO4	L3
	(OR)			
10(a)	Synthesise the L-C driving point impedance $\mathbf{Z(S)} = \frac{6S^4+42S^2+48}{S^5+18S^3+48S}$	6M	CO4	L4
(b)	Synthesise in Foster 1 cauer 1 admittance $\mathbf{Y(S)} = \frac{S(S+4)(S+8)}{(S+1)(S+6)}$	6M	CO4	L4

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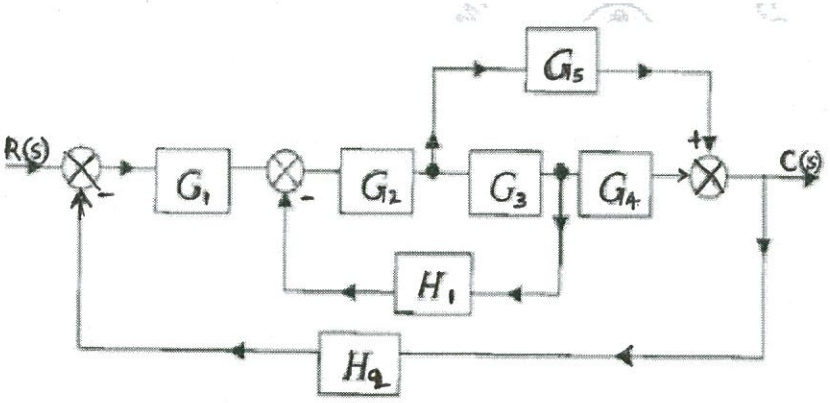
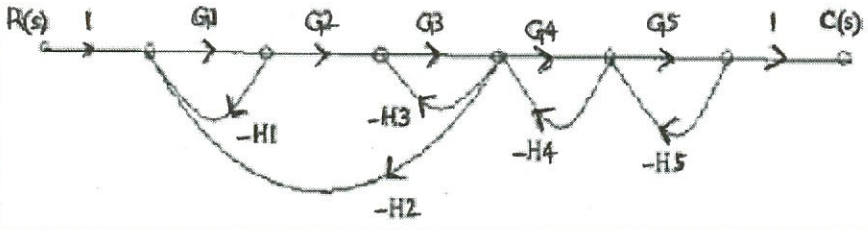
B.Tech. (IV Semester) Regular/Supplementary Examinations

17EE06-CONTROL SYSTEMS
(EEE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	List out the rules of block diagram reduction technique.	6M	CO1	L1
(b)	Determine the overall transfer function of the system given below: 	6M	CO1	L3
	(OR)			
2(a)	State Mason's gain formula and describe the steps to determine transfer function using signal flow graph technique.	6M	CO1	L2
(b)	Obtain $\frac{C}{R}$ for the following system. 	6M	CO1	L3
3(a)	Determine the time response of first order system for unit step input.	6M	CO2	L3
(b)	The open loop transfer function of a unity feedback control system is given by $G(S) = \frac{K}{S(1+ST)}$ (i) By what factor the amplifier gain K should be multiplied so that the damping ratio is increased from 0.2 to 0.8. (ii) By what factor the time constant T should be multiplied so that damping ratio is reduced from 0.9 to 0.3.	6M	CO2	L3
	(OR)			
4(a)	Illustrate the standard test signals with mathematical representation.	6M	CO2	L2

(b)	The open loop transfer function of a unity feedback system is $G(S) = \frac{4}{S(S+1)}$. Determine the nature of response of closed loop system for a unit step input. Also determine the rise time, peak time, peak over shoot and settling time.	6M	CO2	L3
5.	Sketch the root locus plot for the system given below. Show that root locus is a circle. $$G(S)H(S) = \frac{K(S+1)}{S(S-1)}$$	12M	CO2	L3
	(OR)			
6 (a)	Discuss the significance of R-H criterion and mention its limitations.	6M	CO2	L2
(b)	By means of Routh criterion, determine the stability of system represented by following characteristic equation $S^4 + 2S^3 + 10S^2 + 20S + 5 = 0$	6M	CO2	L3
7 (a)	Describe the procedure for construction of Bode plot.	6M	CO2	L2
(b)	Sketch the asymptotic Bode plot for the transfer function given below $$G(S)H(S) = \frac{4}{S(1+0.5S)(1+0.08S)}$$	6M	CO2	L3
	(OR)			
8.	Construct the complete Nyquist plot for a unity feedback control system whose open loop transfer function is $G(S)H(S) = \frac{K}{S(S^2+2S+2)}$. Find maximum value of K for which system is stable.	12M	CO2	L4
9(a)	Discuss the advantages of state variable approach over transfer function approach.	6M	CO2	L2
(b)	Obtain the STM for the state model whose A matrix is given by $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$.	6M	CO1	L3
	(OR)			
10(a)	Describe the procedure for design of a Lag-Lead compensator.	6M	CO3	L4
(b)	Discuss the significance of P, PI, PID controllers.	6M	CO3	L2

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

17FE10-COMPLEX VARIABLES AND STATISTICAL METHODS

(EEE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Find the imaginary part of the analytic function whose real part is $u = y + e^x \cos y$	6M	CO1	L3
(b)	Using Cauchy's integral formula evaluate $\int_C \frac{z^3+3z^2+2z-4}{(z-2)^3}dz$ where C is the $\|z\|=3$	6M	CO1	L3
	(OR)			
2(a)	Show that $u(x,y)=e^x \cos y$ is harmonic and hence find its harmonic conjugate.	6M	CO1	L3
(b)	Apply Cauchy's Integral formula to evaluate $\oint_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)}dz$ where C is the circle $\|z\|=3$.	6M	CO1	L3
3(a)	Find the Taylor's series expansion of $\frac{z}{z+2}$ about $z=1$	6M	CO2	L3
(b)	Evaluate using residue theorem $\int_C \frac{3z}{z(z-1)(z-3)}dz$ where C is the circle $\|z\|=\frac{3}{2}$	6M	CO2	L3
	(OR)			
4(a)	Expand e^{2+z} as Taylor's series about $\|z\|=1$	6M	CO2	L3
(b)	Applying the method of residues show that $\int_0^{2\pi} \frac{d\theta}{2+\cos\theta} = \frac{2\pi}{\sqrt{3}}$	6M	CO2	L3
5(a)	In a factory, machine A produce 40% of the output and machine B produce 60%. On the average, 9 items in 1000 produced by A are defective and 1 item in 250 produced by B is defective. An item drawn at random from a day's output is defective. What is the probability that it was produced by A or B?	6M	CO3	L3
(b)	If a random variable has a Poisson distribution such that P(X=1)=P(X=2). Find (i) mean of the distribution (ii) P(X=4) (iii) P(1<X<4).	6M	CO3	L3
	(OR)			

6(a)	In a certain college, 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. What is the probability that mathematics is being studied? If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl.	6M	CO3	L3
(b)	Ten coins are thrown simultaneously. Find the probability of getting (i)at least seven heads (ii) at least six heads.	6M	CO3	L3
7(a)	A sample of 64 students has a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56kgs and standard deviation 25kgs.	6M	CO4	L3
(b)	In 16 one hour test runs, the gasoline consumption of an engine averaged 16.4 gallons with a standard deviation of 2.1 gallons. Test the claim that the average gasoline consumption of the engine is 12.0 gallons per hour.	6M	CO4	L3
	(OR)			
8(a)	A manufacturer claimed that atleast 95% of the equipment which he supplied to a factory confirmed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty, Test his claim at 5% level of significance.	6M	CO4	L3
(b)	A random sample of 16 values from a normal population showed a mean of 41.5 inches and the sum of the squares of deviation from this mean equal to 135 square inches. Show that the assumption of a mean of 43.5 inches for the population is not acceptable.	6M	CO4	L3
9(a)	From 10 observations on price x and supply y the following data was obtained $\sum x = 130$, $\sum x^2 = 2288$, $\sum y = 220$, $\sum y^2 = 5506$ and $\sum xy = 3407$. Find i) Coefficient of correlation ii) regression line y on x iii) regression line x on y.	6M	CO5	L3
(b)	In a partially destroyed laboratory, record of an analysis of correlation data, the following results only are available: variance of X=9, Regression equations: 8X-10Y+66=0, 40X-18Y=214, then find (i) The mean values of X and Y (ii) The correlation coefficient between X and Y. (iii) Standard deviation of Y.	6M	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 $\sum xy = 7900$. Find i) Coefficient of correlation ii) regression lines of y on x and x on y.	6M	CO5	L3
(b)	A random sample of 7 college students is chosen and their marks in Mathematics and Statistics are given below. Find the rank correlation coefficient for the data.	6M	CO5	L3

Statistics	85	60	73	40	90	94	82
Mathematics	93	75	65	50	80	91	84

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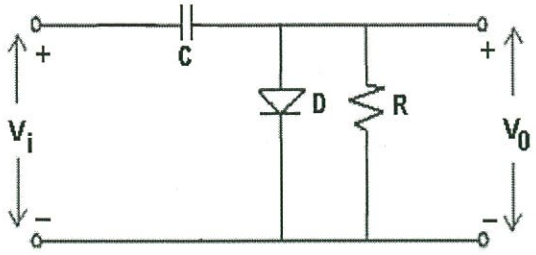
B.Tech. (IV Semester) Regular/Supplementary Examinations

17EC07-PULSE AND SWITCHING CIRCUITS

(EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Examine the response of RC low pass circuit applied with a ramp signal as input and obtain the expression for transmission error.	6M	CO1	L3
(b)	A 1 KHZ square wave output from an amplifier has a rise time t_r =350 ns and tilt=50%. Determine the upper and lower 3-dB frequencies.	6M	CO1	L3
	(OR)			
2(a)	A symmetrical square wave of amplitude ±0.5V and frequency 2 kHz is impressed on an RC low-pass circuit. If R=5KΩ, c=0.1μf, Illustrate and plot the steady-state output with respect to time.	6M	CO1	L3
(b)	Obtain the output equation of a high pass RC circuit when the pulse input is applied and also sketch the all input and output waveforms.	6M	CO1	L3
3(a)	Develop a circuit to transmit that part of a sine wave which lies between +4V and +8V and explain its working.	6M	CO2	L5
(b)	Model the steady state output voltage for the clamper circuit shown in figure when a square wave input signal with a peak value of 15Vis applied to a negative clamping circuit. The input base level is zero level. The frequency of input signal is 5KHz, R_f = 1KΩ, R_r = 500 KΩ, V_γ =0. C = 0.1μF and R = 20 KΩ. Assume T_1=T_2 	6M	CO2	L3
	(OR)			
4(a)	A square wave has to be generated by passing a sine wave through a clipper. The square wave has to have an upper level of 40V and lower level of -20V. Construct the necessary clipper circuit and output wave form.	6M	CO2	L3
(b)	Utilize the statement of Clamping circuit theorem with proof.	6M	CO2	L3

5(a)	Generalize the terms pertaining to transistor switching characteristics. (i) Rise time (ii) Delay time (iii) Turn-ON time (iv) Storage time (v) Fall time (vi) Turn-OFF time	6M	CO3	L2
(b)	Interpret a fixed biased bistable multivibrator with the specifications: $V_{CC} = V_{BB} = 18V$, $I_{C(sat)} = 5m$ Amps, $I_{B(actual)} = 1.5I_{B(min)}$, hfe=20 and zero base-to-emitter voltage at cut-off.	6M	CO4	L3
	(OR)			
6(a)	Illustrate the circuit of fixed bias binary using commutating capacitors.	6M	CO4	L2
(b)	A fixed biased binary uses npn silicon transistors with worst case (maximum) values of $V_{CE\ (sat)} = 0.3V$, $V_{BE\ (sat)} = 0.7V$, $V_{BE(cutoff)} = 0V$ and circuit parameters are: $V_{CC} = V_{BB} = 10V$, $R_C = 2K$, $R_1 = 5K$, $R_2 = 20K$. Find $h_{FE\ min}$ and verify that one transistor is OFF and other is ON. Find the stable currents and stable voltages.	6M	CO4	L3
7(a)	Identify the Mono stable multi vibrator can be used as a voltage to time converter.	6M	CO4	L3
(b)	Build an astable multivibrator to generate a symmetrical square wave of 1KHz with hfe = 25, $I_C = 2m$ Amps, $V_{CC} = 12V$, $R_1 = R_2$, $I_{B(actual)} = 1.5I_{B(min)}$.	6M	CO4	L3
	(OR)			
8(a)	Make use of the circuit of Schmitt trigger and derive the expression for Lower Trigger point (LTP) voltage.	6M	CO4	L3
(b)	Analyze the pulse width, period and frequency of output of an astable multivibrator given $R_1 = R_2 = 100\ K\Omega$, $C_1 = C_2 = 0.1\mu F$.	6M	CO4	L3
9(a)	Discuss the miller circuit with neat waveforms.	6M	CO5	L2
(b)	Contrast how the sampling gates are differing from the general logic gates and explain the basic principle of sampling gate.	6M	CO5	L2
	(OR)			
10(a)	With the help of a neat diagram, explain the working of a bidirectional four-diode sampling gate.	6M	CO5	L2
(b)	With neat circuit and waveforms inference the operational performance of UJT sweep generator.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

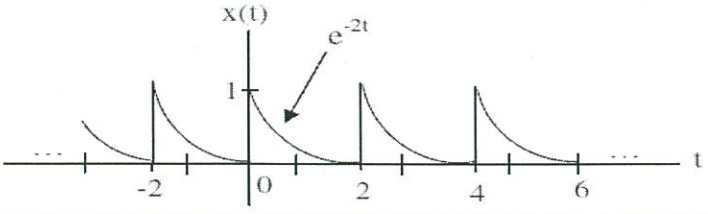
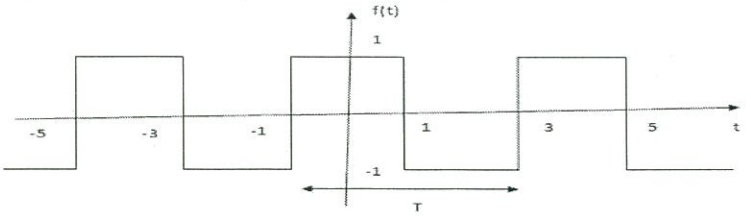
B.Tech. (IV Semester) Regular/Supplementary Examinations

17EC05-SIGNALS AND SYSTEMS

(EIE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Apply time-shifting and time reversal concepts to plot the following signals i) $u(-t+5)$ ii) $u(t+3)-u(t-2)$ iii) $u(t+3)u(t)$ iv) $r(t+1)-r(t-1)$	6M	CO1	L3
(b)	Compute the convolution of two signals using graphical method $x(t)=u(t-1)-u(t-4)$, $h(t)=e^{-2t}u(t)$	6M	CO1	L3
	(OR)			
2(a)	Identify the fundamental time period (T) of the following signals i) $2cos(100\pi t)$ ii) $5sin(2t)$ iii) $e^{-j20\pi t}$	6M	CO1	L3
(b)	Illustrate the step by step procedure to find convolution of two signals with an example.	6M	CO1	L3
3(a)	A rectangular function $f(t)$ is defined by $f(t)=\begin{cases} A & 0<t<\pi \\ -A & \pi<t<2\pi \end{cases}$ Apply the concept of approximation to represent the function $f(t)$ with a waveform $Asin(t)$ over the interval 0 to 2π.	6M	CO2	L3
(b)	Compute the Trigonometric Fourier series coefficients for the signal x(t) shown in below figure. 	6M	CO2	L3
	(OR)			
4(a)	Show the set of exponentials $\{e^{\pm jw_0t}, e^{\pm j2w_0t}, e^{\pm j3w_0t}, \ldots\}$ are orthogonal over any interval T_0	6M	CO2	L3
(b)	Compute the Trigonometric Fourier series coefficients for the signal f(t) shown in below figure. 	6M	CO2	L3

5(a)	Analyze the following properties of Fourier transform with mathematical proofs i) Time Reversal ii) Differentiation in time	6M	CO3	L2
(b)	Define the terms i) Sampling Rate ii) Sampling Time iii) Nyquist Rate iv) Nyquist Interval	6M	CO3	L1
	(OR)			
6.	Illustrate the sampling theorem for Band limited signals with neat sketches.	12M	CO3	L2
7(a)	List out the conditions for distortion less transmission through a system.	6M	CO4	L2
(b)	Compare auto correlation and cross correlation along with their properties	6M	CO4	L2
	(OR)			
8(a)	Identify whether the following systems are causal/non-causal and static/ dynamic. i) $y(n) = x(n) + x(n-1)$ ii) $y(t) = x(2t)$	6M	CO4	L2
(b)	Classify filters based on their filtering characteristics and draw the characteristics of an ideal LPF, HPF, BPF and BSF.	6M	CO4	L2
9(a)	Make use of Laplace transform to analyze the ROC of the signals i) $x(t) = e^{-5t}u(t)$ ii) $x(t) = t\,u(t)$	6M	CO5	L3
(b)	Compute the inverse Laplace transform of the following function $X(S) = e^{-2s}\left(\frac{2s+5}{s^2+5s+6}\right)$	6M	CO5	L3
	(OR)			
10(a)	Explain Initial value and final value theorems of Laplace Transform.	6M	CO5	L3
(b)	Solve the following differential equation using Laplace transform $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = u(t)$ with the initial conditions y(0) = 0 and y'(0) = 1	6M	CO5	L3

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6 SEP 2021

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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

17EI04-INDUSTRIAL INSTRUMENTATION
(EIE)

Time : 3 hours Max.Marks :60

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

Q.No	Questions	Marks	CO	BL
1(a)	Describe the principle and operation of LVDT accelerometer.	6M	CO2	L2
(b)	Illustrate the construction and working of revolution counter and timer.	6M	CO1	L2
	(OR)			
2(a)	Write short notes on stroboscope.	6M	CO2	L1
(b)	Seismic instrument as an accelerometer and vibrometer. Justify.	6M	CO1	L2
3(a)	Illustrate proving ring type load cell with its advantages.	6M	CO2	L2
(b)	Discuss any two types of torque measurement with a neat sketch.	6M	CO1	L2
	(OR)			
4(a)	Define the term Force, list out different types of electrical force sensors. Explain any one.	6M	CO1	L2
(b)	Summarize the working principle of Dynamometer with neat sketch.	6M	CO2	L2
5(a)	Describe the operation of thermal conductivity gages and mention its merits and demerits.	6M	CO3	L2
(b)	Demonstrate with neat sketch, how McLeod pressure gauge measures vacuum pressure?	6M	CO2	L2
	(OR)			
6(a)	Illustrate construction and working of Knudsen gauge.	6M	CO2	L2
(b)	List different types of manometers. Explain any one in detail.	6M	CO1	L1
7(a)	Derive an expression for quantity of flow through variable head flow meter.	6M	CO1	L3
(b)	What is the principle used in turbine flow meter? With a neat sketch, Illustrate the construction and working of Turbine flow meter.	6M	CO1	L2
	(OR)			
8(a)	Summarize the installation procedure of Rota meter.	6M	CO1	L2
(b)	Discuss in detail about the calibration of flow meters by using dynamic weighing method.	6M	CO2	L2
9(a)	Write short note on thermister as a temperature sensor. Write its advantages.	6M	CO3	L1
(b)	Discuss the sources of errors in filled – in system thermometers and explain its compensation.	6M	CO1	L2
	(OR)			
10(a)	With the neat sketch explain the operation of optical pyrometer.	6M	CO1	L2
(b)	Describe the electrical method of measuring temperature using RTD.	6M	CO2	L2

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4 SEP 2021

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.
B.Tech. (IV Semester) Regular/Supplementary Examinations
17EI03-ELECTRICAL AND ELECTRONICS MEASURMENTS
(EIE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Define the following terms (i) Accuracy (ii) Dynamic error (iii) Repeatability (iv) Reproducibility (v) Sensitivity.	6M	CO1	L1
(b)	Explain about static calibration and list out the static characteristics with necessary description.	6M	CO1	L2
	(OR)			
2(a)	What are the different types of instruments that are used as ammeters and voltmeters? What are the errors that occur in ammeters and voltmeters?	6M	CO1	L2
(b)	Illustrate how Random errors are heated statistically.	6M	CO1	L2
3(a)	Describe with neat sketch, the working of a PMMC instrument.	6M	CO2	L1
(b)	Write the short notes on (i) Resonance type frequency meter and (ii) Synchroscope.	6M	CO2	L2
	(OR)			
4(a)	Illustrate how the following adjustments are made in induction type single-phase energy meter: (i) lag adjustment (ii) overload compensation (iii) creep.	6M	CO2	L2
(b)	A 50 A, 230V meter on full load test makes 61 revolutions in 37 seconds. If the normal disc speed is 520 revolutions per KWH, find the percentage error.	6M	CO2	L3
5(a)	What is the principle of using loss of charge technique for measurement of high resistance? Derive necessary relation.	6M	CO3	L2
(b)	The four arms of a Wheatstone bridge are as follows: AB=100 Ω ; BC=1000 Ω; CD=4000 Ω; and DA=400 Ω. The galvanometer has a resistance of 100 Ω, a sensitivity of 100 mm/μA and is connected across AC. A source of 4 V D.C. is connected across BD. Calculate the current through the galvanometer and its deflection if the resistance of arm DA is changed from 400.	6M	CO3	L3
	(OR)			
6(a)	Why is Hay's bridge suited for measurement of inductance of high Q-coils? Derive the equation for balance condition.	6M	CO3	L2
(b)	In an Anderson bridge for measurement of inductance Lx and resistance Rx in the arm AB, the arms CD and DA have resistance of 600 Ω each and the arm CE has a capacitor of 1 μF capacitance. With ac supply at 100 Hz supplied across A and C balance is obtained with a resistance of 400 Ω in arm DE and 800 Ω in the arm BC. Calculate the value of Lx and Rx.	6M	CO3	L3
7(a)	Describe the working of electronic multimeter with necessary diagrams.	6M	CO4	L2
(b)	What are the types of Rectifier based AC Voltmeters? Explain.	6M	CO4	L2
	(OR)			
8(a)	What are the different types of digital voltmeters? With block diagram explain the operation of "Dual slope" digital voltmeter.	6M	CO4	L2
(b)	Illustrate True RMS Reading Voltmeter.	6M	CO4	L2
9(a)	With a neat diagram explain electro static focusing in CRO.	6M	CO5	L2
(b)	Compare the spectrum, Wave analyzer and harmonic distortion analyzers.	6M	CO5	L2
	(OR)			
10(a)	What are the different Types of Wave Analyzers and explain the working of Superheterodyne Wave Analyzer?	6M	CO5	L2
(b)	Explain the operation of X-Y recorder with block diagram.	6M	CO5	L2

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

17ME52-FUNDAMENTALS OF FLUID MECHANICS
(EIE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	If the velocity distribution over a plate is given by $u = (2/3)\ y - y^2$ in which u is the velocity in meter per second at a distance y meter above the plate, determine the shear stress at y=0 and y=0.15m. Take dynamic viscosity of fluids as 8.63 poises.	6M	CO1	L3
(b)	Characterize the following properties of fluids. (i) Surface tension (ii) Capillarity (iii) Density.	6M	CO1	L1
	(OR)			
2(a)	Deduce the expression for capillary Fall.	6M	CO1	L2
(b)	Explain the following Pressures (i) Atmospheric pressure (ii) Absolute pressure (iii) Gauge pressure (iv) Vacuum pressure.	6M	CO1	L1
3(a)	Deduce the expression for Euler's equation of motion.	6M	CO2	L3
(b)	Water is flowing through a pipe of 5cm diameter under a pressure of $29.43 N/cm^2$ (gauge) and with mean velocity of 2 m/s. Calculate the total head or total energy per unit weight of the water at a cross-section, which is 5m above the datum line.	6M	CO3	L3
	(OR)			
4(a)	Evaluate the velocity of the flow of oil through a pipe, when the difference of mercury level in a differential U-tube manometer connected to the two tapings of the pitot-tube is 100mm. Take the co-efficient of pitot-tube 0.98 and sp.gr. of oil = 0.8.	6M	CO3	L4
(b)	Distinguish between venturimeter with respect to orifice-meter.	6M	CO2	L1
5(a)	The time period 'T ' of a pendulum depends upon the length(L) of the pendulum and acceleration due to gravity (g). Determine an expression for time period.	6M	CO4	L2
(b)	Demonstrate the (i) Inertia force(F_i) (ii) Viscous force(F_v) (iii) Gravitational force(F_g).	6M	CO1	L1
	(OR)			
6(a)	In geometric similarity model of spillway the discharge per meter is 1/6 m^3/s. If the scale of the model is 1/36. Find the discharge per meter length of the prototype.	6M	CO3	L3
(b)	Demonstrate the below Dimensionless numbers (i) Mach's number (ii) Froude's number (iii) Reynolds's number	6M	CO4	L1

7(a)	A Kaplan turbine working under a head of 20m develops 11772 KW shaft power. The outer diameter of the runner is 3.5m and hub diameter is 1.75m. The guide blade angle at the extreme edge of the runner is 35^0. The hydraulic and overall efficiencies of the turbines are 88% and 84% respectively. If the velocity of whirl is zero at outlet, determine runner vane angles at inlet and outlet at the extreme edge of the runner.	6M	CO5	L4
(b)	Explain the essential parts of pelton wheel turbine?	6M	CO2	L1
	(OR)			
8(a)	A pelton wheel has a mean bucket speed of 10 meters per second with a jet of water flowing at the rate of 700 liters/s under a head of 30 meters. The buckets deflect the jet through an angle of 160^0. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume co-efficiency of velocity as 0.98.	6M	CO5	L4
(b)	Explain the Classification the hydraulic turbines.	6M	CO2	L1
9(a)	A centrifugal pump is to discharge 0.118 m^3/sec at a speed of 1450 rpm against a head of 25 m. the impellor 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 impellor.	6M	CO5	L4
(b)	Explain the efficiencies of centrifugal pump.	6M	CO2	L2
	(OR)			
10(a)	Demonstrate the Classification of centrifugal pumps.	6M	CO2	L1
(b)	Illustrate the working of reciprocating pump.	6M	CO2	L2

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

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

17IT02-OBJECT ORIENTED ANALYSIS AND DESIGN

(IT)

Time : 3 hours Max.Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Summarize how use case modeling is useful in analysis.	6M	CO1	L1
(b)	Describe object oriented systems development Life cycle.	6M	CO1	L2
	(OR)			
2(a)	What are the basic features of object orientation? Explain briefly.	6M	CO1	L2
(b)	Describe the object oriented Business process modeling.	6M	CO1	L2
3(a)	Illustrate with an example, how use case modeling is used to describe functional requirements.	6M	CO2	L2
(b)	Draw an use case diagram to model the behavior of ATM system. Explain briefly.	6M	CO2	L2
	(OR)			
4(a)	Explain briefly the classification of grouping and annotational things in UML.	6M	CO2	L2
(b)	What are the categories of building blocks in the UML? Explain any one category building block.	6M	CO2	L2
5(a)	Draw a class diagram for course management system.	6M	CO3	L2
(b)	List and explain any Four constraints applied to association relationships.	6M	CO3	L2
	(OR)			
6(a)	Illustrate the use of process and threads in modeling an application.	6M	CO3	L3
(b)	What are the four kinds of relations events of the UML? Explain them in brief.	6M	CO3	L2
7(a)	Draw a state chart diagram for library management system.	6M	CO4	L2
(b)	What is semantic equivalence between sequence and collaboration diagrams.	6M	CO4	L2
	(OR)			
8(a)	Demonstrate how collaboration is used to model the realization of use cases.	6M	CO4	L2
(b)	Draw the activity diagram for ticket reservation of Railway Reservation System.	6M	CO4	L2
9(a)	Illustrate about deployment diagram with an example.	6M	CO5	L2
(b)	How to model an application programming interface? Explain with an example.	6M	CO5	L2
	(OR)			
10(a)	Enumerate the steps to model (i)Physical database (ii) Source code.	6M	CO5	L2
(b)	Demonstrate the steps to model executables and source code using component diagrams.	6M	CO5	L3

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

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

17CI04-PYTHON PROGRAMMING

(IT)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate different built-in types in python with examples.	6M	CO1	L2
(b)	Write a python program to solve sum of positive integers that are entered by a user, excluding all numbers that are greater than 100.	6M	CO2	L3
	(OR)			
2(a)	A seven-digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not. Further, the program counts the number of prime digits in the given number.	6M	CO2	L4
(b)	Outline the usages of end and format in python.	6M	CO1	L2
3(a)	Write a python program to create a list of elements and display elements in reverse order through indexing. The program also identifies the integer elements and display the number of integers in the given list.	6M	CO2	L3
(b)	Explain any six built-in methods on list in python with examples.	6M	CO2	L2
	(OR)			
4(a)	Distinguish updating and deleting elements both in array and list with examples.	6M	CO2	L2
(b)	Write a python program to perform matrix operations with the help of array. Further, display the array in a sorted order.	6M	CO2	L3
5(a)	Compare string and raw string with the help of a program.	6M	CO3	L3
(b)	Write a function to perform multiplication of two complex numbers.	6M	CO3	L3
	(OR)			
6(a)	Define a function and call a function using function arguments along with an example.	6M	CO3	L1
(b)	Demonstrate any four escape sequencing character in python along with examples.	6M	CO3	L2
7(a)	Write a program to implement slicing operation in python with examples.	6M	CO4	L3

(b)	Write a python program to generate 20 random numbers. Store the random numbers into a file and determine the largest number stored in the file.	6M	CO4	L3
	(OR)			
8(a)	Distinguish the process of creating and accessing data values in a tuple with suitable examples. Consider the following tuple: tup2=(1,2,3,4,5,6,7,8). Give the outputs of the following commands: (i) tup2[0:3] (ii) tup2[1:6:2].	6M	CO2	L3
(b)	Write a python program to count the number of lines, words and characters in the input text file. Further, print last 10 lines from the file.	6M	CO4	L3
9(a)	Illustrate the process of creating user-defined exceptions in python along with a program.	6M	CO5	L3
(b)	Write a program to insert values into a table in a database using python.	6M	CO5	L3
	(OR)			
10(a)	Explain the process of heap sort. Write a python program to apply heap sort approach to sort a list of "n" numbers.	6M	CO5	L3
(b)	Illustrate the process of binary search. Write a python program to apply binary search approach to search an element from a list.	6M	CO5	L3

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6 SEP 2021

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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
17CI03-DISCRETE MATHEMATICAL STRUCTURES
(IT)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define conditional proposition and logical equivalence with suitable examples.	6M	CO1	L1
(b)	Find the disjunctive normal form of the formula: $P \rightarrow ((P \rightarrow Q) \wedge \sim (\sim Q \vee \sim P))$.	6M	CO1	L3
	(OR)			
2(a)	Show each of the following in symbolic form (i) all monkeys have tails (ii) no monkey has tail (iii) some monkey has tails (iv) some monkey has no tails.	6M	CO2	L2
(b)	Determine the negations of the following statements (i) Jan will take a job in industry or go to graduate school (ii) James will bicycle or run tomorrow (iii) If the processor is fast then the printer is slow.	6M	CO2	L2
3(a)	Define a relation. Explain the properties of relations and the operations on relations.	6M	CO2	L1
(b)	Let A={1,2,3,4,6} and R be a relation on A defined by a R b if and only if a is multiple of b represent the relation R as a matrix and construct its diagraph.	6M	CO2	L3
	(OR)			
4(a)	Draw the Hasse diagram for the divisibility relation on {2,4,5,10,12,20,25}.	6M	CO2	L3
(b)	Consider the set A={ball,bed,dog,let,egg} and define the relation R on A by R={(x,y) | x,y € A and x R y if x and y contain some letter}. Show R is a compatibility relation which is not transitive.	6M	CO2	L3
5(a)	Explain the matrix representation of graph.	6M	CO4	L1
(b)	Define In-degree and Out-degree of a graph. Explain self loop edges and multiple edges.	6M	CO4	L1
	(OR)			
6(a)	Show that the maximum number of edges in a simple disconnected graph G with n vertices and k components (n-k)(n-k+1)/2.	6M	CO4	L2
(b)	What is meant by Minimum spanning tree algorithm? Explain with suitable examples.	6M	CO4	L1
7(a)	Find the number of permutations of the letters of the following words (i) MATHEMATICS (ii) CALCULUS.	6M	CO5	L3
(b)	Let G be the set of all non-zero real numbers and let a*b= ½ ab. Show that <G,*> is an abelian Group.	6M	CO5	L3
	(OR)			
8(a)	Show that in a group (G,*) for every a,b € G$(a*b)^2 = a^2*b^2$ if (G,*) is an abelian.	6M	CO5	L3
(b)	Let G be the set of real numbers not equal to -1 and * be defined by a*b = a+b+ab. Show that <G,*> is an abelian Group.	6M	CO5	L3
9(a)	Write the generating functions for the following sequences (i)1,2,3,4 (ii)1,-2,3,-4 (iii) 0,1,2,3 (iv) 0,1,-2,3,-4.	6M	CO5	L3
(b)	Solve the recurrence relation an=an-1-6an-2+9an-3, n>=1 where a0 = 5 by using substitution method.	6M	CO5	L3
	(OR)			
10(a)	Write the generating function for the following sequence1,2,3,4.....	6M	CO5	L2
(b)	Identify the co-efficient of x^{27} of $(x^4+x^5+x^6.....)^5$	6M	CO5	L2

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4 SEP 2021

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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

17CI06-COMPUTER ARCHITECTURE

(IT)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Identify the basic functional units of the system. Illustrate the schema structure with respect to storage classes.	6M	CO1	L1
(b)	Outline Von Neumann Architecture.	6M	CO1	L1
	(OR)			
2(a)	Identify and briefly tabulate the 5 memory reference instructions that provide control functions and micro operations required for their execution.	6M	CO1	L2
(b)	Discuss the various phases of Instruction cycle and summarize its functionality with flow chart.	6M	CO1	L2
3(a)	Draw a flow chart for multiplication of two signed numbers using Boots algorithm.	6M	CO2	L2
(b)	Using above procedure perform Multiplication 10101 and 10111.	6M	CO2	L2
	(OR)			
4(a)	Illustrate different types of addressing modes with examples.	6M	CO2	L1
(b)	Describe the steps involved in addition/subtraction of two floating-point numbers? Explain the operation through a flow chart.	6M	CO2	L2
5(a)	Outline the Hardwired control and Micro programmed control.	6M	CO3	L2
(b)	Define microinstruction. Compare horizontal and vertical microinstructions.	6M	CO3	L1
	(OR)			
6.	Describe the concept of address sequencing.	12M	CO3	L2
7(a)	Define Locality of Reference. Explain.	6M	CO4	L1
(b)	Demonstrate the hardware organization of Associative Memory.	6M	CO4	L3
	(OR)			
8(a)	Differentiate DRAM and SDRAM.	6M	CO4	L2
(b)	Illustrate memory hierarchy in detail.	6M	CO4	L2
9(a)	Describe about the functionality of DMA controller.	6M	CO5	L1
(b)	Illustrate CPU-IOP communication.	6M	CO5	L3
	(OR)			
10(a)	Explain input output interface.	6M	CO5	L2
(b)	Explain the different modes of data transfer techniques between two units.	6M	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

17CI14-WEB TECHNOLOGIES

(IT)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Design a "feedback form" with text box, text area, radio buttons, checkboxes, dropdown list controls.	6M	CO1	L3
(b)	Explain different types of CSS styles with suitable examples.	6M	CO1	L2
	(OR)			
2(a)	Design the static web page that display a marks table with three rows and three columns .	6M	CO1	L3
(b)	Demonstrate with example, how form validation is performed in JavaScript.	6M	CO1	L3
3(a)	Define an XML schema. Show how an XML schema can be created.	6M	CO2	L1
(b)	Differentiate between DOM and SAX parsers.	6M	CO2	L2
	(OR)			
4(a)	List and briefly explain in Java Beans API.	6M	CO2	L3
(b)	Create a DTD for your daily schedule.	6M	CO2	L3
5(a)	Assume that a database has a table Employee with two columns Employee ID and Name. Write a JDBC program that can query and print all the entries in the table Student.	6M	CO3	L3
(b)	Write the differences between Statement and Prepared Statement object.	6M	CO3	L2
	(OR)			
6(a)	List and explain the steps involved in a basic JDBC program.	6M	CO3	L2
(b)	Discuss the Cons & Pros of JDBC Drivers.	6M	CO3	L2
7(a)	Demonstrate the use of Request Dispatcher interface with an example.	6M	CO4	L3
(b)	Illustrate the lifecycle of a servlet with neat diagram.	6M	CO4	L3
	(OR)			
8(a)	Develop a servlet to accept username and password from the user and validate it with the values retrieved from the database.	6M	CO4	L3
(b)	How is session management done in servlet and describe the techniques involved in maintaining state information?	6M	CO4	L1
9(a)	Write JSP implicit objects and explain them.	6M	CO5	L2
(b)	Explain about JSP Error handling mechanism.	6M	CO5	L2
	(OR)			
10(a)	Discuss the struts of application for login page.	6M	CO5	L2
(b)	How JSP action elements are used in web application?	6M	CO5	L1

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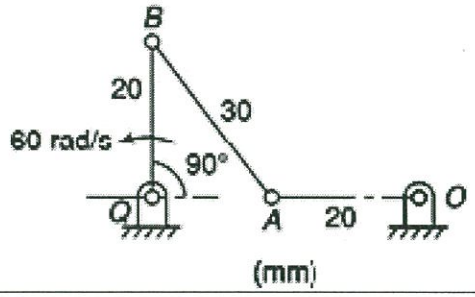
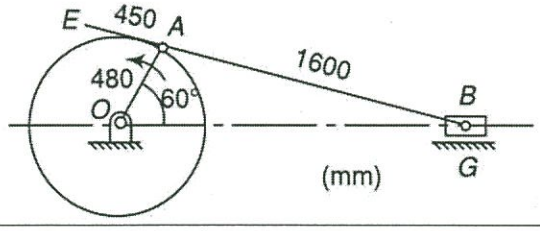
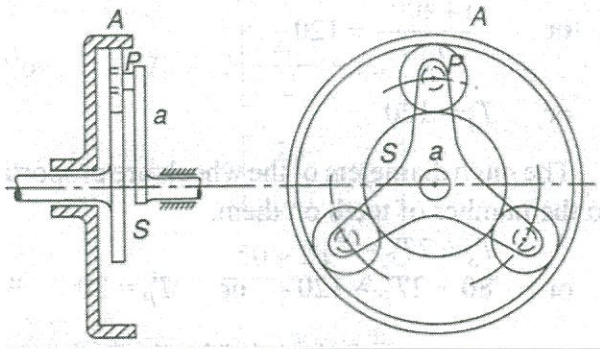
L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.::A.P.
B.Tech. (IV Semester) Regular/Supplementary Examinations

17ME10-KINEMATICS OF MACHINES
(ME)

Time : 3 hours Max. Marks : 60

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

Q.No.	Questions	Marks	CO	BL
1.	Illustrate the double slider crank chain mechanism and its inversions.	12M	CO1	L2
	(OR)			
2.	Sketch and describe the working of two different types of quick return mechanisms. Give examples of their applications.	12M	CO1	L2
3(a)	Describe the condition for correct steering. Sketch and show the two main types of Steering gears.	6M	CO2	L2
(b)	For the mechanism shown in Fig., determine the angular velocity of link AB. 	6M	CO2	L3
	(OR)			
4(a)	Differentiate the Davis and Ackermann's steering gear.	6M	CO2	L2
(b)	For the configuration of a slider-crank mechanism shown in below Figure, calculate the (i) acceleration of the slider at B (ii) acceleration ofthe point E (iii) angular acceleration ofthe link AB. OA rotates at 20 rad/s counterclockwise. 	6M	CO2	L3
5(a)	Deduce expressions for the velocity and acceleration of the follower when it moves with simple harmonic motion.	6M	CO3	L2
(b)	Classify the followers based on their surface in contact with neat sketches.	6M	CO3	L1
	(OR)			

6.	The following data is related to a symmetrical cam operating a flat faced follower. Least radius of the cam=40 mm, total lift= 24 mm, angle of lift=75^0, nose radius=8mm speed of cam=420 rpm. Determine the main dimensions of the cam and the acceleration of the follower at the (i) beginning of the lift (ii) end of contact with the flank (iii) beginning of contact with the nose.	12M	CO3	L3
7.	2.5 kW of power is transmitted by an open-belt drive. The linear velocity of the belt is 2.5 m/s. The angle of lap on the smaller pulley is 165^0.The coefficient of friction is 0.3.Determine the effect on power transmission in the following cases: (i) Initial tension in the belt is increased by 8%. (ii) Initial tension in the belt is decreased by 8%. (iii) The coefficient of friction is increased by 8%.	12M	CO4	L4
	(OR)			
8.	Determine the maximum Power is transmitted using a V-belt drive from a pulley of 200mm diameter running at 300rpm. The included angle of V-groove is35°.The belt is 20 mm deep and maximum width is 20 mm. If the mass of the belt is 0.35 kg per metre length and maximum allowable stress is 1.4 MPa, the angle of lap is 140°. μ =0.15.	12M	CO4	L3
9(a)	State and prove the law of gearing.	6M	CO5	L1
(b)	Two 20^0 in volute spur gears have a module of 10 mm. The addendum is one module. The larger gear has 50 teeth and the pinion has 13 teeth. Does interference occur. If it occurs, to what valve should the pressure angle be changed to eliminate interference.	6M	CO5	L3
	(OR)			
10	Annulus A in the gear shown in fig. rotates at 300rpm about the axis of the fixed wheel S which has 80 teeth. The armed spider is driven at 180rpm. Determine the number of teeth required on the wheel P.  	12M	CO5	L4

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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

17ME09-APPLIED THERMODYNAMICS

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the working of steam power plant and state their merits and demerits.	6M	CO1	L2
(b)	Enlist the requirements of a good fuel.	6M	CO1	L1
	(OR)			
2(a)	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.	6M	CO1	L3
(b)	Explicate the working of Reheating cycle and list out its merits and demerits.	6M	CO1	L2
3(a)	Illustrate the functions of Super heater, Economizer and Air pre heater in thermal power plant.	6M	CO2	L2
(b)	Differentiate fire tube and water tube boilers.	6M	CO2	L2
	(OR)			
4(a)	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 is22^{0}C and minimum amount of air per kg of fuel is 17kg.	6M	CO2	L3
(b)	Derive an expression for the height of chimney with suitable sketch.	6M	CO2	L2
5(a)	Comment on the necessity of the nozzles and their configurations in a vapour power cycle.	6M	CO3	L3
(b)	Inlet pressure and temperature of steam nozzles are 10 bar and 200^0 C respectively. The exit pressure of steam nozzle is 0.5 bar. Evaluate the mass flow rate of steam, if throat diameter is 12 mm.	6M	CO3	L3
	(OR)			
6(a)	Draw the line diagram of steam condensing plant and locate all the key components.	6M	CO3	L1
(b)	Differentiate jet and surface condensers.	6M	CO3	L2
7(a)	Prove that the maximum efficiency of De-Laval turbine is $\cos^2\alpha$.	6M	CO4	L3
(b)	What do you mean by compounding of a turbine? Illustrate the velocity compounding of an impulse turbine.	6M	CO4	L2
	(OR)			
8(a)	Differentiate between impulse and reaction turbine.	6M	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.	6M	CO4	L3
9(a)	Derive an expression for work done for a single-stage single-acting reciprocating air compressor without clearance volume.	6M	CO5	L2
(b)	An air compressor takes in air at 1bar and 15 ^{0}C and compresses it according to law $pv^{1.2}$=constant. It is then delivered to a receiver at a constant pressure of 9bar, R=0.287 kJ/kgK. Determine (i) temperature at the end of compression (ii) work done per kg of air.	6M	CO5	L3
	(OR)			
10(a)	Classify the compressors and illustrate the working of vane blower compressor.	6M	CO5	L2
(b)	Elucidate the working of a centrifugal compressor with a suitable diagram.	6M	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. (IV Semester) Regular/Supplementary Examinations

17ME08-PRODUCTION TECHNOLOGY

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Define manufacturing and explicate the importance of manufacturing.	6M	CO1	L1
(b)	Sketch the cross-section of a sand mould which is ready for pouring the liquid material, enumerate and explain the important parts.	6M	CO1	L2
	(OR)			
2(a)	Enumerate and explain the pattern allowances.	6M	CO1	L2
(b)	Describe centrifugal casting with a neat sketch.	6M	CO1	L2
3(a)	Discuss the Classification of welding processes.	6M	CO2	L2
(b)	Describe Tungsten Inert Gas Welding.	6M	CO2	L2
	(OR)			
4(a)	Illustrate Submerged Arc welding process.	6M	CO2	L2
(b)	List the types of flames obtained in oxy acetylene welding process and mention their advantages and applications.	6M	CO2	L1
5(a)	For welding heavy rail sections, thermit welding is often used. Explain how the heat necessary for the joining processes is obtained.	6M	CO3	L2
(b)	With the help of sketch, explain friction welding process.	6M	CO3	L2
	(OR)			
6(a)	Elaborate various defects that occur after welding.	6M	CO3	L2
(b)	Differentiate welding and brazing processes.	6M	CO3	L2
7(a)	With neat sketches explicate the rolling mill processes.	6M	CO4	L2
(b)	Sketch and explain the metal spinning process	6M	CO4	L2
	(OR)			
8(a)	Describe wire drawing process with its applications.	6M	CO4	L2
(b)	Distinguish between open die forging and closed die forging processes.	6M	CO4	L2
9(a)	Elucidate the hot extrusion and cold extrusion.	6M	CO5	L2
(b)	State important characteristics and applications of extrusion process.	6M	CO5	L1
	(OR)			
10(a)	Discuss the embossing and coining operations.	6M	CO5	L1
(b)	Sketch and explain the Injection moulding process with a neat sketch.	6M	CO5	L2

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

17ME07-FLUID MECHANICS AND HYDRAULIC MACHINERY

(ME)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Enlighten the Newton's law of viscosity.	6M	CO1	L2
(b)	If the velocity distribution over a plate is given by $u= (2/3)\ y-y^2$ in which u is the velocity in meter per second at a distance y meter above the plate, estimate the shear stress at y=0 and y=0.15m. Take dynamic viscosity of fluid as 8.63 poises.	6M	CO1	L3
	(OR)			
2(a)	Explain the single column manometers with suitable sketches.	6M	CO1	L2
(b)	A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of specific gravity is 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of mercury level in the two limbs is 40cm and the height of fluid in the left from the centre of pipe is 15cm below.	6M	CO1	L4
3(a)	Define the following terms (i) stream line (ii) path line (iii) streak line.	6M	CO2	L1
(b)	A 30 cm diameter pipe, conveying water, branches into two pipes of diameters 20 cm and 15 cm respectively. If the average velocity in the 30 cm diameter pipe is 2.5 m/s, find the discharge in this pipe. Also find the velocity in 15 cm pipe if the average velocity in 20 cm diameter pipe is 2 m/s.	6M	CO2	L3
	(OR)			
4(a)	Derive an expression for the discharge through a venturimeter.	6M	CO3	L3
(b)	A 30cm*15cm venturimeter is inserted in vertical pipe carrying water, flowing in the upward direction. A differential mercury manometer connected to the inlet and throat gives a reading of 20 cm. Find the discharge. Take C_d=0.98	6M	CO3	L3
5(a)	Elucidate about the boundary layer separation phenomenon.	6M	CO4	L2
(b)	Develop an expression for the displacement thickness of boundary layer.	6M	CO4	L2
	(OR)			
6(a)	Deduce an expression for the force exerted by the jet on the inclined plate moving in the direction of the jet.	6M	CO3	L3

(b)	A jet of water of diameter 10cm strikes a flat plate normally with a velocity of 15m/s. The plate is moving with a velocity of 6m/s in the direction of the jet and away from the jet. Estimate (i) the force exerted by the jet on the plate (ii) work done by the jet on the plate per second.	6M	CO3	L3
7 (a)	Illustrate the Kaplan turbine and state its merits and demerits.	6M	CO5	L2
(b)	A pelton wheel is to be designed for the following specifications: shaft power= 11,772 KW; head= 380 meters; speed = 750 rpm; overall efficiency= 86%; jet diameter is not to exceed one-sixth of the wheel diameter. Evaluate (i) the wheel diameter (ii) the number of jets required (iii) diameter of jet. Take K_{v1} = 0.985 and K_{u1} = 0.45.	6M	CO5	L3
	(OR)			
8 (a)	What is a draft tube? List the main functions of draft tube in Kaplan turbine.	6M	CO5	L1
(b)	Explicate the impulse turbine with neat sketch.	6M	CO5	L2
9 (a)	Demonstrate the working principle of centrifugal pump.	6M	CO5	L2
(b)	The internal and external diameters of the impeller of a centrifugal pump are 200 mm and 400 mm and the pump is running at 1200 rpm.The vane angles of the impeller at inlet and outlet are 20^0 and 30^0 .The water enters the impeller radially and velocity of flow is constant. Evaluate the work done by the impeller per unit weight of water.	6M	CO5	L3
	(OR)			
10(a)	Formulate an expression for work done by reciprocating pump.	6M	CO5	L2
(b)	A single acting reciprocating pump has a stroke length of 15 cm. The suction pipe is 7 m long and the ratio of the suction diameter to the plunger diameter is 3/4.the water level in the sump is 2.5 m below the axis of the pump cylinder, and the pipe connecting the sump and pump cylinder is 7.5 cm diameter. If the crank is running at 75 rpm. Estimate the pressure head on the piston :(i)in the beginning of the suction stroke (ii)in the end of the suction stroke (iii)in the middle of the suction stroke .Take f=0.01	6M	CO5	L3

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

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

17ME06 OPERATIONS RESEARCH

(ME)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Describe the applications of Operations Research.	6M	CO1	L1
(b)	Use the graphical method to Maximize $Z = 6x_1+8x_2$ subjected to $5x_1+10x_2 \le 60$, $4x_1+4x_2 \le 40$, and $x_1,x_2 \ge 0$.	6M	CO1	L3
	(OR)			
2.	Use Big-M method, maximize $Z = 3x_1-x_2$ subjected to $2x_1+x_2 \ge 2$, $x_1+3x_2 \ge 3$, $x_2 \le 4$ and $x_1, x_2 \ge 0$.	12M	CO1	L3
3(a)	A salesman has to visit five cities A, B, C, D and E. The distances (in hundreds of km) between five cities are as follows. If the salesman starts from city A and has to come back to city A, which route should he select so that total distance traveled by him is minimized?	6M	CO2	L3

	To city	A	B	C	D	E
From city	A	-	17	16	18	14
	B	17	-	18	15	16
	C	16	18	-	19	17
	D	18	15	19	-	18
	E	14	16	17	18	-

(b)	Brief out the various types of an assignment problem.	6M	CO2	L1
	(OR)			
4(a)	Determine an initial basic feasible solution to the following transportation problem by using Vogel's approximation Method.	6M	CO2	L3

	D_1	D_2	D_3	D_4	Supply
S_1	21	16	15	3	11
S_2	17	18	14	23	13
S_3	32	27	18	41	19
Demand	6	10	12	15	

(b)	Discuss applications of a transportation problem.	6M	CO2	L1
5(a)	Explicate the dominance principle for reducing payoff matrix with suitable example.	6M	CO3	L2
(b)	Obtain the optimal strategies for both persons and the value of the game for two-person zero-sum game whose payoff matrix is as follows:	6M	CO3	L3

	Player B	
Player A	B_1	B_2
A_1	1	-3
A_2	3	5
A_3	-1	6
A_4	4	1
A_5	2	2
A_6	-5	0

(OR)

6.	The purchase price of a machine is Rs 50,000. The installation charges amount to Rs.15,400 and its scrap value is only Rs 6,500. The maintenance cost in various years is given below table. After how many years should the machine be replaced? Assume that the machine replacement can be done only at the year ends.	12M	CO3	L3

Years	1	2	3	4	5	6	7	8
Maintenance Cost(Rs.)	1,000	3,000	4,000	6,000	8,400	11,600	16,000	19,200

7.	An item is produced at the rate of 50 items per day. The demand occurs at rate of 25 items per day. If the setup cost is Rs 100 per setup and holding cost is Rs 0.01 per unit of item per day. Find the economic lot size for one run, assuming that shortages are not permitted. Also find the time of cycle and minimum total cost for one run.	12M	CO4	L3
	(OR)			
8.	A branch of SBI has only one typist. Since the typing work varies in length (number of pages to be typed) the typing rate is randomly distributed approximating a Poisson distribution with mean service rate of 6 letters per hour. The letters arrives at a rate of 7 per hour during the entire 8-hour workday. Determine, (i)Utilization factor, (ii) Average number of customers in the system, (iii) Average waiting time in a system.	12M	CO4	L3
9(a)	Discuss applications of dynamic programming in an industrial scenario.	6M	CO5	L2
(b)	Discuss the engineering applications of optimization.	6M	CO5	L2
	(OR)			
10.	A firm has divided its marking area into three zones. The amount of sales depends upon the number of salesman in each zone. The firm has been collecting the data regarding sales salesman in each area over a number of past year. The information is summarized in table. For the next year firm has only 9 salesmen and the problem is to allocate these salesman to 3 different zones so that the total sales are maximum.	12M	CO5	L3

Profits in thousands of rupees			
No. of salesman	Zone 1	Zone 2	Zone 3
0	30	35	42
1	45	45	54
2	60	52	60
3	70	64	70
4	79	72	82
5	90	82	95
6	98	93	102
7	105	98	110
8	100	100	110
9	90	100	110

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