LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

A.Y. 2019-20

B.Tech. (IV Semester)(R17) Regular & Supplementary Examinations, October/November 2020

Regulations : R17

TIME TABLE

DATE	Time : 10.00 AM - 1.00 PM				Time : 10.45 AM - 01.45 PM			
	CSE	ECE	EEE	EIE	ASE	CE	IT	ME
27-10-2020 (Tuesday)	17FE11 - Linear Algebra and Numerical Applications	17FE03 - Environmental Science	17FE03 - Environmental Science	17ME52 - Fundamentals of Fluid Mechanics	17FE03 - Environmental Science	17FE03 - Environmental Science	17CI14 - Web Technologies	17ME06 - Operations Research
29-10-2020 (Thursday)	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	17FE08 - Probability and Statistics	17FE08 - Probability and Statistics
02-11-2020 (Monday)	17CI08 - Design and Analysis of Algorithms	17EC09 - Electromagnetic Fields and Waves	17EE06 - Control Systems	17EI03 - Electrical and Electronics Measurements	17AE05 - Thermal Engineering	17CE08 - Strength of Materials – II	17CI06 - Computer Architecture	17ME07 - Fluid Mechanics and Hydraulic Machinery
04-11-2020 (Wednesday)	17CS01 - Linux Programming	17EC10 - Digital Signal Processing	17EE07 - Network Theory - II	17EI04 - Industrial Instrumentation	17AE06 - Manufacturing Technology	17CE09 - Hydraulics and Hydraulic Machinery Systems	17CI03 - Discrete Mathematical Structures	17ME08 - Production Technology
06-11-2020 (Friday)	17CI09 - Data Base Management Systems	17EC11 - Digital System Design	17EE08 - Electronic Circuit Analysis	17EC05 - Signals and Systems	17AE07 - Aerodynamics-I	17CE10 - Structural Analysis – I	17CI04 - Python Programming	17ME09 - Applied Thermodynamics
10-11-2020 (Tuesday)	17CI10 - Software Engineering	17EC12 - Analog Communications	17EE09 - Electrical Machines – I	17EC07 - Pulse and Switching Circuits	17AE08 - Aircraft Structures-I	17CE11 - Geo Technical Engineering – I	17IT02 - Object Oriented Analysis and Design	17ME10 - Kinematics of Machines
12-11-2020 (Thursday)	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: (i) Any omissions or clashes in this time table may please be informed to the Controller of Examinations immediately.
(ii) Even if government/JNTUK/College declares holiday on any of the above dates, the examinations shall be conducted as notified only.
(iii) For any clarification in respect of the above examinations, please contact the Controller of Examinations.

Date: 08-10-2020

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to: 1. All H.o.Ds for N.A., 2. All Notice Boards

27 OCT 2020

H.T.No | | | | | | | | | | |

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

17FE03-ENVIRONMENTAL SCIENCE

(ASE&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)	Analyse the consequences of global population growth.	6M	CO1	L2
(b)	Explain the modes of transfer of HIV/AIDS, its effects and the control measures.	6M	CO1	L2
	(OR)			
2(a)	Explain the role of information and technology in protection of environment.	6M	CO1	L2
(b)	What is the impact of water quality on human health? Name any four water borne diseases.	6M	CO1	L1
3(a)	Differentiate between renewable and non-renewable resources with examples.	6M	CO2	L2
(b)	List out the environmental impacts of mining.	6M	CO2	L1
	(OR)			
4(a)	Summarize the causes and effects of deforestation.	6M	CO2	L2
(b)	What are the advantages and disadvantages of large dams and reservoirs?	6M	CO2	L1
5(a)	Describe the structure and functions of an ecosystem.	6M	CO3	L2
(b)	Explain the different types of ecological pyramids with a neat sketch.	6M	CO3	L2
	(OR)			
6(a)	Identify the present day major threats to the biodiversity.	6M	CO3	L1
(b)	Find out the efforts taken towards conservation of biodiversity.	6M	CO3	L1
7(a)	What are the sources, effects and control methods for noise pollution?	6M	CO4	L1
(b)	Identify the major causes of a flood. What are the measures to be taken to mitigate a flood disaster?	6M	CO4	L1
	(OR)			
8(a)	What is global warming and summarize its impacts?	6M	CO4	L1
(b)	Discuss various alternatives adapted in municipal solid waste (MSW) management.	6M	CO4	L2
9(a)	Summarize different strategies to support sustainable development in the country.	6M	CO5	L2
(b)	Define EIA. List the major objectives of EIA.	6M	CO5	L1
	(OR)			
10(a)	When was Air (Prevention and Control of Pollution) Act, framed in India? Outline the important features of this Act.	6M	CO5	L2
(b)	What are the major objectives of Stockholm conference?	6M	CO5	L1

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

17FE08-PROBABILITY AND STATISTICS
(ASE,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 Baye's theorem of probability.	6M	CO1	L2
(b)	Let X be a random variable with density function $f(x) = \frac{x^2}{3}, -1 < x < 2$, Compute (i) E(X) (ii) E(4X+3) (iii) V(X).	6M	CO1	L3
	(OR)			
2(a)	A bag contains 5 red and 3 black balls and a second bag contains 4 red and 5 black balls. One of the bags is selected at random and a draw of 2 balls is made from it. Determine the Probability that one of them is red and other is black.	6M	CO1	L3
(b)	A manufacturing firm employs three analytical plans for the design and development of a particular product. For cost reasons, all three are used at varying times. In fact, plans 1, 2 and 3 are used for 30%, 20% and 50% of the products respectively. The defect rate of these plans is known to be 0.01, 0.03 and 0.02 respectively. If a random product was observed and found to be defective, which plan was most likely used and thus responsible?	6M	CO1	L4
3(a)	In testing a certain kind of truck tire over a rugged terrain, it is found that 25% of the trucks fail to complete the test run without a blowout. Of the next 5 trucks tested, determine the probability that (i) less than 4 have blowouts (ii) more than 3 have blowouts.	6M	CO2	L3
(b)	5% of the tools produced by a certain process are defective. Determine the probability that in a sample of 80 tools chosen at random (i) exactly three will be defective (ii) more than 2 will be defective.	6M	CO2	L3
	(OR)			
4(a)	The distribution of the number of defective units produced in a single shift in a factory over 100 shifts is given below. Fit a Poisson distribution and estimate the number of shifts corresponding to the number of defective units.	6M	CO2	L3
(b)	An electrical firm manufactures light bulbs that have a life, before burn-out, that is normally distributed with mean equal to 800 hours and a standard deviation of 40 hours. Assess the probability that a bulb burns (i) between 778 and 834 hours (ii) more than 850 hours.	6M	CO2	L3
5(a)	Construct a sampling distribution of the sample mean from the population {22,24,26,28} with random samples of size 2 is taken from it without replacement, also measure the standard error of the sample mean.	6M	CO3	L3
(b)	Travelling between two campuses of a university in a city via shuttle bus takes, on average, 28 minutes with a standard deviation of 5 minutes. In a given week, a bus transported 40 times. Determine the probability that the average transport time was more than 30 minutes.	6M	CO3	L3
	(OR)			

No.of defective units	0	1	2	3	4	5	6
No.of shifts	4	14	23	23	18	9	9

6(a)	A random sample of 100 students in a college gave a mean weight of 58kg and standard deviation of 4kg. Construct 90% and 95% confidence limits of the mean weight of all the students in the college.	6M	CO3	L3
(b)	A new rocket-launching system is being considered for deployment of small, short-range rockets. A sample of 40 experimental launches is made with the new system, and 34 are successful. Construct 95% and 99% confidence interval for population proportion of success.	6M	CO3	L3
7(a)	Summarize the steps in the procedure for testing of hypothesis.	6M	CO4	L2
(b)	The mean height of 50 male students who showed above average participation in college athletics was 68.2 inches with a standard deviation of 2.5 inches, while 50 male students who showed no interest in such participation had a mean height of 67.5 inches with a standard deviation of 2.8 inches. Test the hypothesis at 5% level of significance that male students who participate in college athletics are taller than other male students.	6M	CO4	L4
	(OR)			
8(a)	An instructor has two classes A and B, in a particular subject. Class A has 16 students while class B has 25 Students. On the same examination, although there was no significant difference in mean marks, class A has a standard deviation of 9, while class B had a standard deviation of 12. Can we conclude at 0.01 level of significance that the variability of B is greater than that of A?	6M	CO4	L4
(b)	A random sample of 90 adults is classified according to gender and the number of hours of television watched during a week; Gender: Male / Female over 25 hours: 15 / 29 under 25 hours: 27 / 19 Use a 0.01 level of significance and test the hypothesis that the time spent watching television is independent of whether the viewer is male or female.	6M	CO4	L4
9.	Determine the coefficient of correlation and formulate two lines of regression from the following data. X: 2, 4, 6, 8, 10, 12, 14 Y: 4, 2, 5, 10, 4, 11, 12 Hence estimate i) The value of Y at X=13 ii) The value of X at Y=8.	12M	CO5	L3
	(OR)			
10(a)	A random sample of 7 college students is chosen and their marks in mathematics and statistics are given below. Calculate the rank correlation coefficient for the data. Roll no: 1, 2, 3, 4, 5, 6, 7 Statistics: 85, 60, 73, 40, 90, 94, 82 Mathematics: 93, 75, 65, 50, 80, 91, 84	6M	CO5	L3
(b)	Develop the two regression lines on the basis of following data, $\sum x = 50$, $\sum y = 60$, $\bar{x} = 5$, $\bar{y} = 6$, $\sum xy = 350$, Variance of x=4 and variance of y=9.	6M	CO5	L3

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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)	State the function of a carburettor in a petrol engine and describe a simple carburettor with a neat sketch and also its limitations.	6M	CO1	L2
(b)	Explain with suitable sketches the working of a four stroke Otto engine.	6M	CO1	L2
	(OR)			
2(a)	Explain with neat sketch the combustion phenomenon in C.I. engines.	6M	CO1	L2
(b)	A 4-cylinder four-stroke petrol engine develops 14.7 kW at 100 r.p.m. The mean effective pressure is 5.5 bar. Calculate the bore and stroke of the engine, if the length of stroke is 1.5 times the bore.	6M	CO1	L3
3.	A dense closed cycle air-refrigeration system working between 4 bar and 16 bar extracts 120 x10^3 kJ of heat per hour. The air enters the compressor at 5°C and into the expander at 20°C. Assuming the unit runs at 300 r.p.m. Find (i) kW required to run the unit (ii) bore of compressor (iii) Refrigerating capacity in tons of ice at 0°C per day. Take the following : Compressor and expander are double acting and stroke for compressor and expander = 30cm. Mechanical efficiency of compressor = 80%, Mechanical efficiency of expander = 85%. Latent heat of ice = 336 kJ/kg. Assume the compression and expansion are isentropic and C_p= 1 kJ/kg K.	12M	CO2	L3
	(OR)			
4 (a)	Boot-strap air refrigeration system is superior in producing more cooling effect than a simple sir refrigeration system? Justify your argument with help of Temperature (T) – entropy (s) plot.	6M	CO2	L2
(b)	How the secondary compression does effects the coefficient of performance of the Boot-strap air refrigeration system? Explain with help of temperature-entropy plot.	6M	CO2	L2

5(a)	Illustrate the working of year-round air conditioning system with help of a neat sketch.	6M	CO3	L2
(b)	The moist air at 1 atm has 34°C DBT and 27°C WBT. Calculate Partial pressure of water vapor, specific humidity, dew point temperature and relative humidity.	6M	CO3	L3
	(OR)			
6(a)	Write short notes on (i) Cooling with adiabatic humidification of air (ii) Sensible cooling.	6M	CO3	L1
(b)	200m³ of air is passed through an adiabatic humidifier per minute. The condition of air at inlet is 40°C DBT and 15% R.H. and outlet condition is 25°C DBT and 20°C WBT. Find the following. (i) DPT (ii) Relative humidity of the exit air (iii) Amount of water vapour, added to the air per minute. Take p_t = 1.033 bar.	6M	CO3	L3
7.	In a single heater regenerative cycle the steam enters the turbine at 30 bar, 400°C and the exhaust pressure is 0.10 bar. The feed water heater is a direct contact type which operates at 5 bar. Find: (i) The efficiency and the steam rate of the cycle (ii) The increase in mean temperature of heat addition, efficiency and steam rate as compared to Rankine cycle without regeneration. Pump work can be neglected.	12M	CO4	L3
	(OR)			
8(a)	Describe the different operations of Rankine cycle. Derive also the expression for its efficiency.	6M	CO4	L3
(b)	A simple Rankine cycle works between pressures 28 bar and 0.06 bar, the initial condition of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption.	6M	CO4	L3
9(a)	Explain with the neat diagram Cochran boiler.	6M	CO5	L2
(b)	The velocity of steam exiting the nozzle of the impulse stage of a turbine is 400 m/s. The blades operate close to the maximum blading efficiency. The nozzle angle is 20°. Considering equiangular blades and neglecting blade friction, calculate for a steam flow of 0.6 kg/s, the diagram power and the diagram efficiency.	6M	CO5	L3
	(OR)			
10(a)	Obtain the expression for the maximum discharge through the nozzle.	6M	CO5	L3
(b)	Explain the pressure compounded impulse turbine showing pressure and velocity variations along the axis of the turbine.	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)	Explain the steps involved in making a Sand casting with neat sketch.	6M	CO1	L2
(b)	What are the functions of riser? Explain the difference between open riser & blind riser.	6M	CO1	L2
	(OR)			
2 (a)	What is a "Gating ratio"? How do you classify thegating ratios system with suitable diagram?	6M	CO1	L2
(b)	Explain"Continuous casting" process with suitable diagram with the applications?	6M	CO1	L2
3(a)	What do you know about the "Brazing" and different methods used in Brazing operation.	6M	CO2	L1
(b)	With the help of a neat- sketch explain the principle of spot-welding processes.	6M	CO2	L2
	(OR)			
4(a)	Discuss with neat sketch the "TungstenInert Gas" (TIG)welding process and give its specific applications.	6M	CO2	L3
(b)	What are the various steps involved in "Friction Welding" process?	6M	CO2	L2
5(a)	Discuss the following with the help of neat sketches. i) Hydro static extrusion ii) Impact extrusion.	6M	CO3	L4
(b)	Differentiate between the hot working and cold working of metals. Bring out the advantage and disadvantages of each of these techniques.	6M	CO3	L2
	(OR)			
6(a)	How do you classify the different kinds of rolling mills with the help of a neat sketch and its characteristics?	6M	CO3	L2
(b)	Differentiate between Smithy forging and Drop forging with neat diagrams.	6M	CO3	L4
7(a)	Explain the various types of "Lathe Machines" and any one operation performed on Lathe with neat diagram.	6M	CO4	L2
(b)	What is meant by Single point cutting tool and Multi point cutting tool? What are the requirements for cutting tool materials?	6M	CO4	L2
	(OR)			
8(a)	Differentiate between Orthogonal and Oblique cutting processes with suitable diagrams.	6M	CO4	L2
(b)	How many types of Cutting fluids? What are the functions of a cutting fluid in machining operation?	6M	CO4	L2
9(a)	Write the applications and different types of abrasives used in Abrasive jet machining (AJM).Also comment on accuracy of machining AJM.	6M	CO5	L2
(b)	What is "Milling Operation"? With the help of a neat diagram, explain the principle of milling machine and its Advantages and Disadvantages.	6M	CO5	L2
	(OR)			
10(a)	Explain the working process of "Laser Beam Machining" (LBM)? Explain the function of dielectric fluid in LBM with advantages.	6M	CO5	L2
(b)	Enumerate the limitations of conventional manufacturing processes particularly in the context of present-day manufacturing environment.	6M	CO5	L1

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

17AE07-AERODYNAMICS-I
(AE)

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 superposition of a uniform flow and a doublet results in non-lifting flow over a circular cylinder. (i) Find out the coordinates for location of stagnation point. (ii) What is the equation of streamline passing though the stagnation point?	12M	CO1	L4
	(OR)			
2(a)	Consider the non-lifting flow over circular cylinder. Derive an expression for the pressure coefficient at an arbitrary point (r, θ) in this flow. Derive the surface pressure coefficient over a circular cylinder.	6M	CO1	L4
(b)	The lift on spinning circular cylinder in a free stream with a velocity of 30 m/s and at standard sea level conditions is 6 N/m of span. Calculate the circulation around the cylinder.	6M	CO1	L3
3(a)	Find the transformation of the uniform flow parallel to the y-axis of the physical plane, with the transformation function $\zeta = z^2$.	6M	CO2	L3
(b)	A symmetrical airfoil is obtained by transforming a circle with Kutta- Joukowski transformation function. Show that the maximum thickness is at the quarter chord point from the leading edge of the aerofoil. The coordinates of the transformed profile are $\xi = 2b\cos\theta$ $\eta = 2be(1+\cos\theta)\sin\theta$	6M	CO2	L3
	(OR)			
4.	A cambered airfoil is obtained by transforming a circle with Kutta- Joukowski transformation function. Express the ratio of maximum thickness to chord as a function of eccentricity.	12M	CO2	L3
5(a)	State and explain Kutta condition.	6M	CO3	L2
(b)	For the NACA 2412 airfoil, the lift coefficient and moment coefficient about the quarter chord at -6° angle of attack are -0.39 and -0.045, respectively. At 4° angle of attack, these coefficients are 0.65 and-0.037, respectively. Calculate the location of aerodynamic center.	6M	CO3	L3
	(OR)			
6(a)	A flat plate of length 1.2 m and width 1 m in a uniform airstream of pressure 1 atm, the temperature 30° C and velocity 30 m/s, experiences a lift of 1500 N. Determine the lift coefficient, and the location of center of pressure.	6M	CO3	L3

(b)	Explain in detail the numbering system of NACA 4 digit, 5 digit and 6 digit airfoil series.	6M	CO3	L2
7(a)	Write short notes on (i) Trailing vortices (ii) Horse shoe vortex (iii) Bound vortex.	6M	CO4	L2
(b)	Consider the flow of air with density 1.23 kg/m^3 over a wing of chord length 0.5 m and span 3 m. Let the free stream velocity be 100 m/s and the average circulation around the wing be 10 m^2/s per unit span. Estimate the lift force acting on the wing.	6M	CO4	L3
	(OR)			
8(a)	Consider a potential flow over a finite wing with elliptic circulation distribution. The circulation at the origin is 100 m^2/s. The wing span is 4 m. The free stream velocity is 100 m/s. Determine the induced angle of attack. Use the standard notations in the solution.	6M	CO4	L3
(b)	An elliptic wing of aspect ratio 8 and span 20 m is in steady level flight, at sea level at a speed of 300 km/h. If the induced drag on the wing is 400 N, determine the lift acting on the wing.	6M	CO4	L3
9	Consider an incompressible boundary layer with free stream velocity U = constant. Assuming the velocity distribution $u/U=2(y/\delta)-(y/\delta)^2$, where 'u' is the velocity at y and $u \rightarrow U$ (free stream velocity) as $y \rightarrow \delta$ (boundary layer thickness). Determine the expression for wall shear stress.	12M	CO5	L4
	(OR)			
10	Consider linear velocity profile for the boundary layer over the plate, Develop the expressions for boundary layer thickness and the variation of wall shear stress with distance along the flat plate.	12M	CO5	L4

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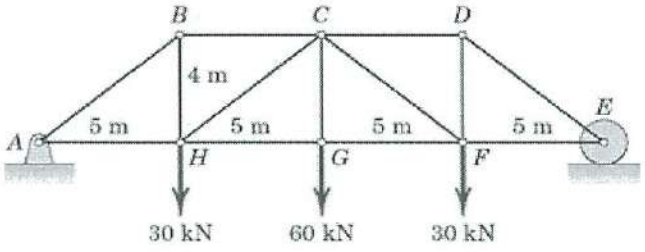
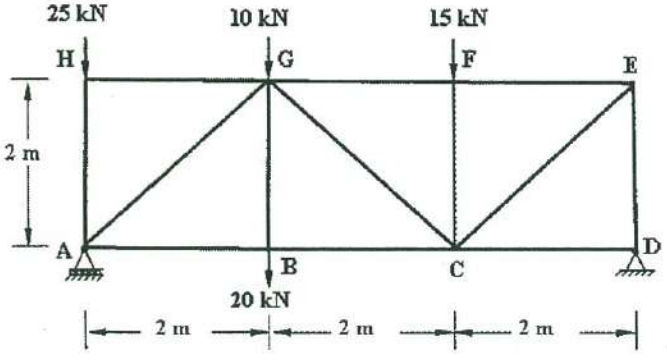
B.Tech. (IV Semester) Regular/Supplementary Examinations

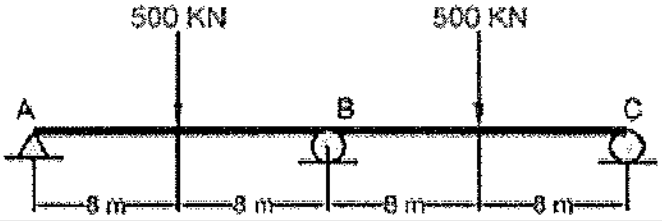
17AE08-AIRCRAFT STRUCTURES-I

(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 rectangular element in a linearly elastic isotropic material is subjected to tensile stresses of 83 and 65 N/mm^2 on mutually perpendicular planes and a shear stress of 35 N/mm^2 acting each plane. Determine the strain in the direction of each stress and in the direction perpendicular to both stresses. Find also the principal stresses, the principal strains, the maximum shear stress, the maximum shear strain and their directions at the point. Take E =200000 N/mm^2 and υ = 0.3.	12M	CO1	L3
	(OR)			
2.	A strained element has tensile stress of 500 N/mm^2 and a compressive stress of 300 N/mm^2 acting on two mutually perpendicular planes X and Y and two equal shear stresses of 75 N/mm^2 on these planes. Find The stresses on a inclined plane at 35^0 and check the results by using graphical methods.	12M	CO1	L3
3.	Analyze the given truss Figure and find the forces in all the members. 	12M	CO2	L4
	(OR)			
4.	Analyze the given frame Figure and find the support reactions. 	12M	CO2	L4

5.	Evaluate the support reactions and moments for the given continuous beam as shown in the figure. 	12M	CO3	L3
	(OR)			
6.	Analyze and draw Shear force and bending moment diagrams for the fixed beam of length l subjected to uniformly distributed load w/l thought out the span.	12M	CO3	L4
7(a)	Derive the strain energy stored in a member due to bending load.	6M	CO4	L2
(b)	State Maxwell's law of reciprocal deflection and explain with an example.	6M	CO4	L2
	(OR)			
8.	Using Castigliano's theorem, obtain the deflection at the centre of a beam (SSB) carrying uniformly distributed load of 20kN/m over the whole span, length of beam is 3 m take EI=2.5 MN-m^2.	12M	CO4	L4
9.	A mild steel tube 4m long, 3cm internal diameter and 4mm thick is used as a column with both ends hinged. What will be the crippling load if (i) Both ends are built in? (ii) One end is built –in and one end is free? Take E=2 x 10^5 N/mm^2.	12M	CO5	L3
	(OR)			
10(a)	Obtain the expression for crippling load by Euler's formula for a column having one end fixed other hinged.	6M	CO5	L2
(b)	Design the column and find the shortest length L for a pin ended steel column having a cross section of 60mmX100mm. For which Euler's formula applied. Take Es=2x10^5 N/mm^2 and critical proportional limit is 250 N/mm^2.	6M	CO5	L3

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12 NOV 2020

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING **R17**

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

17CE08-STRENGTH OF MATERIALS-II

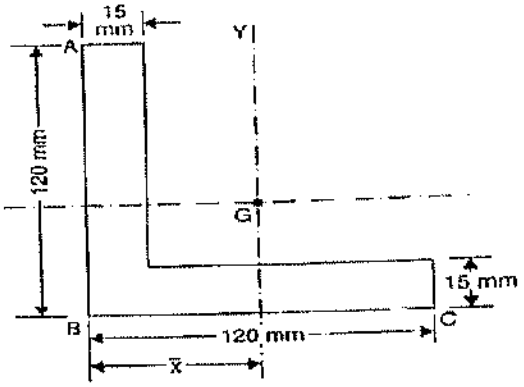
(CE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit.

All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	A rectangular block of material is subjected to a tensile stress of 100 N/mm² on one plane and a tensile stress of 50 N/mm² on a plane at right angles, together with shear stresses of 60 N/mm² on the faces. Determine the direction of principal planes, the magnitude of principal stresses and magnitude of the greatest shear stress. Using Mohr's circle method.	6M	CO1	L3
(b)	Derive the formulae for the normal and tangential stresses on an inclined plane in case of bi-axial stress system.	6M	CO1	L2
	(OR)			
2(a)	At a point in an elastic material under strain, there are normal stresses of 50N/mm² and 30N/mm² (both tensile) respectively at right angles to each other with a shearing stress of 25N/mm². Determine the principal stresses and the position of the principal planes.	6M	CO1	L3
(b)	A bolt is under an axial thrust of 7.2 kN together with a transverse shear force of 3.6 kN. Evaluate the diameter of the bolt according to (i) Maximum principal stress theory and (ii) Maximum strain energy theory. Take elastic limit in simple tension = 202 N/mm², factor of safety = 3 and Poisson's ratio = 0.3.	6M	CO1	L3
3(a)	Determine the crippling stress, using Euler's formula for a pin-ended strut 1800 mm long consisting of a tube of 60 cm outside diameter and wall thickness 5 mm.	6M	CO2	L3
(b)	A short column of external diameter 30 cm and internal diameter 15 cm carries an eccentric load of 60 kN. Calculate the maximum eccentricity which the load can have without producing tension on the cross-section.	6M	CO2	L3
	(OR)			
4(a)	Derive the equation for the Euler's crippling load for a column with both ends hinged.	6M	CO2	L2
(b)	Compare the crippling loads given by Euler's and Rankine's formula for a tubular steel strut 3 m long having outer and inner diameters 35 mm and 30 mm respectively, loaded through pin joints at each end. Take the yield stress as 335 N/mm², the Rankine's constant = 1/7500 and E = 2.05 x 10^5 N/mm².	6M	CO2	L3
5(a)	Derive the expression for the maximum deflection of a cantilever beam of length L carrying a point load W at the free end using area moment method.	6M	CO3	L2
(b)	A beam of uniform rectangular section 200 mm wide and 300 mm deep is simply supported at its ends. It carries a uniformly distributed load of 9 kN/m run over the entire span of 5 m. If the value of E for the beam material is 1 x 10^4 N/mm², determine: (i) The slope at the supports and (ii) Maximum deflection.	6M	CO3	L3
	(OR)			

6(a)	A cantilever beam of length 30 m carries a uniformly distributed load of 24 kN/m length over the entire length. If moment of inertia I = 10^8 mm^4 and value of E = 2 x 10^5 N/mm^2, calculate the slope and deflection at the free end.	6M	CO3	L3
(b)	A beam of length 20 m is simply supported at its ends and carries two point loads of 4 kN and 10 kN at a distance of 8 m and 12 m from left end respectively. Evaluate : (i) deflection under each load (ii) maximum deflection using Macaulay's method. Take E = 2 x 10^5 N/mm^2 and I = 1 x 10^8 mm^4.	6M	CO3	L3
7(a)	Derive an expression for the fixing moments, when one of the supports of a fixed beam sinks down by δ from its original position.	6M	CO4	L2
(b)	A fixed beam AB of length 5 m carries a point load of 20 kN at a distance of 2 m from A. Determine the fixed end moments and support reactions, if the flexural rigidity of the beam is 1 x 10^4 kNm^2.	6M	CO4	L3
	(OR)			
8(a)	Determine the fixing couples of a fixed beam subjected to uniformly distributed load w/m run over the entire length using Clapeyron's theorem of three moments.	6M	CO4	
(b)	Calculate the fixing moments and support reactions of a fixed beam AB of length 8 m, carrying a uniformly distributed load of 6 kN/m over the left half of the span.	6M	CO4	L3
9(a)	An equal angle of dimensions 120 mm X 120 mm and 15 mm thick. Determine : (i) position of the principal axes and (ii) magnitude of the principal moments of inertia for the given angle section.	6M	CO5	L3
(b)	Derive the expression for shear centre of a channel section of flange width' b', total web height 'h' and thickness t.	6M	CO5	L2
	(OR)			
10.	A simply supported beam of span 3.6 m carries a load of 600 N at its centre. The section of the beam is an equal angle of size 120 mm by 120 mm by 15 mm as shown in fig. The load line passes through the centroid of the section and is along line YG. Determine: (i) stresses at points A,B and C of mid section of the beam (ii) deflection of beam at mid-section of the beam (iii) position of neutral axis. Take E = 2 x 10^5 N/mm^2. 	12M	CO5	L3

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H.T.No | | | | | | | | | | |

4 NOV 2020

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

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)	Differentiate between : (i) steady and unsteady flow (ii) Uniform and non-uniform flow (iii) subcritical and supercritical flow.	6M	CO1	L2
(b)	Determine the velocity of flow and rate of flow of water through a rectangular channel of 6m wide and 3m deep, when it is running full. The channel is having bed slope as 1in 2000. Take Chezy's C=55.	6M	CO1	L3
	(OR)			
2(a)	Show that, for a trapezoidal channel of given area of flow, the condition of maximum flow requires that hydraulic mean depth is equal to one half the depth of flow.	6M	CO1	L3
(b)	A concrete lined circular channel of 3.6m diameter has a bed slope of 1 in 600. Determine the velocity and flow rate for the conditions of i) maximum velocity and ii) maximum discharge. Take C=50.	6M	CO1	L3
3(a)	Explain the terms: specific energy of a flowing liquid, minimum specific energy, critical depth, critical velocity and alternate depths as applied to non- uniform flow.	6M	CO2	L2
(b)	If y_1 and y_2 are the alternate depth in a rectangular channel, show that $yc^3 = \frac{2y1^2 y2^2}{y1 + y2}$ Also show that the specific energy can be expressed as $E=(y_1^2 + y_1y_2 + y_2^2)/(y_1+y_2)$.	6M	CO2	L3
	(OR)			
4(a)	Define hydraulic jump. Derive the expression for the depth of hydraulic jump in terms of the upstream Froude numbers.	6M	CO2	L2
(b)	In a rectangular channel 10 m wide and 3 m deep water is flowing with a velocity of 1m/s The bed slope of the channel is 1 in 4000.If flow of water through the channel is regulated in such a way that energy line is having a slope of 0.00004, determine the rate of change of depth of water in the channel.	6M	CO2	L3
5(a)	Show that the efficiency of a free jet striking normally as series of flat plates mounted on the periphery of a wheel never exceeds 50%.	6M	CO3	L3

(b)	A 75mm diameter jet of water having a velocity of 30m/s strikes a flat plate, normal of which is inclined at an angle of 30^0 with the axis of the stream. If the plate moves in the same direction as that of the jet with a velocity of 6m/s, determine i) The force normal to the plate ii) the rate of work done and iii) The efficiency of the jet.	6M	CO3	L3
	(OR)			
6(a)	A two dimensional jet of water carrying a discharge Q with a velocity v strikes a stationary plate at an angle θ with normal to the plate. Show that the ratio of the discharge divides in the two directions as $Q_1/Q_2= (1-\sin\theta)/(1+\sin\theta)$.	6M	CO3	L3
(b)	A jet of water 80mm diameter and having a velocity of 20m/s impinges at the center of a hemispherical vane. The linear velocity of vane is 10m/s in the direction of jet. Determine the force exerted on the vane .How this force would change, if the jet impinges on a series of vanes attached to the circumference of a wheel.	6M	CO3	L3
7(a)	Define the various types of efficiencies of a turbine.	6M	CO4	L1
(b)	A Pelton wheel operates under a head of 350m with a speed ratio of 0.45 and flow ratio 0.97.The buckets deflect the jet through an angle 165^0. Determine the power developed per unit weight of water flow.	6M	CO4	L3
	(OR)			
8(a)	Define and derive an expression for unit speed, unit discharge and unit power for a turbine.	6M	CO4	L3
(b)	A turbine with an overall efficiency of 90% is to be installed in a hydroelectric plant. The head and discharge available at the plant are 30m and 15 m^3 /sec respectively. If the turbine has to run at 150 rpm. Determine the power developed, the specific speed and the type of the turbine.	6M	CO4	L3
9(a)	Discuss about the working of a single-state centrifugal pump with a neat sketch.	6M	CO5	L2
(b)	A Centrifugal pump is to discharge 0.118cumecs at a speed of 1450rpm against a head of 25m.The impeller diameter is 250mm, its width at outlet is 50mm and manometric efficiency is 75%. Determine the vane angle at the periphery of the impeller.	6M	CO5	L3
	(OR)			
10(a)	Define and derive the specific speed of a centrifugal pump.	6M	CO5	L3
(b)	A single acting reciprocating pump having a bore of 20cm and stroke of 30cm runs at 50rpm.The pump is raising water to a height of 20m above the pump level at a rate of 0.0078cumecs.The efficiency of the pump is 75%. Determine i) the theoretical discharge ii) the % slip iii) The coefficient of discharge iv) the actual power required to run the pump.	6M	CO5	L3

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6 NOV 2020 **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

17CE10-STRUCTURAL ANALYSIS-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)	A cantilever beam of length 3m carries a point load of 15kN at a distance 2m from fixed end. If the material Young's modulus is $E=2x10^5$ N/mm^2 and $I=10^8$ mm^4 find the slope and deflection below the load .Use conjugate beam method.	6M	CO1	L2
(b)	A cantilever beam of length 4m carries UDL of 2kN/m over the span and the beam is rigidly supported at free end. If $E=2.1x10^5$ N/mm^2 and Moment of Inertia $I = 1.2x10^8$ mm^4, find the maximum deflection and its location.	6M	CO1	L3
	(OR)			
2(a)	A cantilever beam of length 4 carries a point load of 10kN at a distance 1m from fixed end. If $E=2.1x10^5$ N/mm^2 and $I=10^6$ mm^4 find the slope and deflection at free end by using conjugate beam method.	6M	CO1	L4
(b)	A cantilever of length 6m carries a point load 30kN at centre. The cantilever is propped rigidly at free end. Determine the reaction at rigid prop.	6M	CO1	L3
3(a)	A suspension Bridge of 140m span has a 2 numbers of 3 hinged stiffening girders supported by 2 cables with a central dip of 12m. The width of the roadway supported by the girder is 5m. The dead load is 7KN/m^2 of floor area. A live load of 12.5 KN/m^2 covers the left hand half of the bridge. Determine the bending moment at 35m from left support. Also, determine the maximum tension of the cable.	6M	CO2	L4
(b)	Write the difference between three hinged and two hinged cable stayed suspension bridge of stiffened girder.	6M	CO2	L2
	(OR)			
4(a)	A Suspension cable of 75m horizontal span and central dip of 6m has a stiffening girder hinged at both ends. The dead load transmitted to the cable including its own weight is 1500KN. The girder carries a live load of 30KN/m UDL over the left half of the span. Assuming the girder to be rigid, determine the Bending Moment in the girder at 20m from the left support. Also calculate maximum tension in the cable.	6M	CO2	L3
(b)	Write a short notes on (i) General cable theorem (ii) Effect of temperature on suspension cable bridge.	6M	CO2	L2
5(a)	Analyze two span continuous beam ABC of span AB=4m and BC=6m carrying point load of 10kN at mid span of AB and 15kN at mid span of BC. Assume the support B is sunken by 3mm and size of rectangular beam AB=200X300MM depth and BC=200x400mm depth. $E=2.1x10^5$ MPa. Use slope deflection method.	6M	CO3	L3
(b)	Analyze the continuous beam ABC of span AB=6m and BC=4m, supported by UDL load 12kN/m over ABC and both ends of beam is fixed. Assume moment of Inertia of AB=I and BC=2I. Draw bending moment diagrams. Use moment distribution method.	6M	CO3	L3
	(OR)			

6(a)	Analyze two span continuous beam ABC of span AB=3m and BC=4m carrying UDL 3kN/m at mid span of AB and 15kN at mid span of ABC over the entire span. Assume uniform flexural rigidity of beam AB and BC=I. Use slope deflection method.	6M	CO3	L4
(b)	Analyze a symmetric portal frame of beam span 6m and column height 4m. Assume the columns are fixed at supports and UDL lateral wind load applied on column at 3kN/m and point load 20kN at mid span of beam. Assume uniform flexural rigidity of column and beam and the frame is under sway condition. Use moment distribution method.	6M	CO3	L4
7(a)	Analyze three span continuous beam ABCD of span AB=3m, BC=4m ,CD=4m carrying point load of 20kN at mid span of AB , and UDL of 5kN/m over the span of BC and CD. Assume A and D are fixed and C and D are simply supported. The moment of Inertia of AB=**I,** BC=1.5**I** and CD=**I**. Use Kani's method.	6M	CO4	L3
(b)	Analyze a symmetric portal frame of beam span 8m and column height 6m. Assume the columns are fixed at supports and UDL lateral wind load applied on column at 5kN/m and Two point loads of 10kN, and 20kN acting at 3m and 5m from left end of beam. Assume flexural rigidity of columns=I and beam=2I and the frame is non-sway condition. Use Kani's method.	6M	CO4	L4
	(OR)			
8(a)	Analyze two span continuous beam ABC of span AB=6m, BC=4m which carrying point load of 10kN at mid span of AB , and UDL of 3kN/m over the span of BC. Assume A and C are fixed and B is simply supported. The moment of Inertia of AB=2**I,** BC=1.5**I**. Use Kani's method.	6M	CO4	L3
(b)	Analyze a symmetric portal frame of beam span 6m and column height 4m. Assume the columns are fixed at supports and UDL lateral wind load applied on column at 6kN/m . The beam is supported by UDL of 15kN/m. Assume flexural rigidity of columns=1.5 I and beam=2I and the frame is under non-sway condition. Use Kani's method.	6M	CO4	L4
9(a)	State Castiglione First theorem and Second theorem with suitable examples.	6M	CO5	L1
(b)	Find out mid span deflection of beam AB of length 6m UDL 10kN/m fixed at both ends. Use strain energy method. Assume the size of beam 150x250mm and young's modulus E=0.15x10^5 MPa. Use energy method.	6M	CO5	L2
	(OR)			
10(a)	Find out the lateral deflection of portal frame of height 6m and span 8m. Assume the size of beam 450x600mm and column size 300x300mm. A UDL lateral load of 8kN/m applied on the left column face over its span. Both the columns are fixed at ends. Use strain energy theorem and E=0.17x10^5 MPa.	6M	CO5	L3
(b)	Find out mid span deflection of beam AB of length 4m UDL 6kN/m ,One end of beam fixed at other end is simply supported. Use strain energy method. Assume the size of beam 200x250 mm depth and young's modulus E=0.15x10^5 MPa. Use energy method.	6M	CO5	L3

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10 NOV 2020

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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

17CE11-GEOTECHNICAL ENGINEERING-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)	Derive the relation between bulk unit weight, unit weight of water, degree of saturation, void ratio and specific gravity of soil.	6M	CO1	L3
(b)	A sample of wet soil has a volume of 0.0192m^3 and a mass of 32Kg. When the sample is dried out in an oven, its mass reduces to 28.5Kg. Determine (i) Bulk density (ii) Water content and (iii) Dry density.	6M	CO1	L3
	(OR)			
2(a)	Discuss the types of soils based on formation of origin.	6M	CO1	L2
(b)	A sample of dry soil weighs 68gm. Determine the volume of voids if the total volume of the sample is 40ml and specific gravity is 2.65. Also determine the void ratio and porosity.	6M	CO1	L3
3(a)	The results of a standard liquid limit test are as given below. No. of blows: 12, 21, 29, 38, 47 Water content of the sample (%): 78, 62, 53, 41, 32 Determine : (i) Liquid limit (ii)Plasticity Index, if the plastic limit is found to be 28%. (iii)Flow index (iv)Toughness index.	6M	CO2	L3
(b)	Define plasticity index, consistency index and liquidity index of soil.	6M	CO2	L1
	(OR)			
4(a)	State and explain the factors affecting the compaction of soil.	6M	CO2	L2
(b)	Draw a typical curve showing the relation between MDD-OMC and explain the terms MDD, OMC and Air voids line.	6M	CO2	L2
5(a)	Describe variable head permeability test for determination of coefficient of permeability.	6M	CO3	L2
(b)	In a falling head permeability test on a silty clay sample, the following results were obtained : sample length 120 mm; sample diameter 80 mm; initial head 1200 mm; final head 400 mm, time for fall in head 6 minutes; stand pipe diameter is 4 mm. Find the coefficient of permeability of soil in mm/sec.	6M	CO3	L3
	(OR)			

<table>
<tr><td>6.</td><td>The water table in a deposit of uniform sand located at 2m below the ground surface. Assuming the soil above the water table is dry; determine the effective stress at a depth of 5m below the surface. Take e=0.75; G=2.65 in dry and saturated soil mass. If Water table rises to ground surface, then determine the percentage of reduction in effective stress at 5m below the ground surface.</td><td>12M</td><td>CO3</td><td>L3</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>7(a)</td><td>State the advantages of Triaxial Compression Test over a Direct Shear Test.</td><td>6M</td><td>CO4</td><td>L1</td></tr>
<tr><td>(b)</td><td>A direct shear test was carried out on a sample and the following results were obtained :
Normal Stress (kN/m^2) — Shear Stress at Failure (kN/m^2)
100 — 80
150 — 110
250 — 120
Plot the failure envelop and Compute the shear strength parameters of given sample.</td><td>6M</td><td>CO4</td><td>L3</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>8.</td><td>The following results were obtained from a CU test on a normally consolidated clay. Plot the strength envelope in terms of total stresses and effective stresses and determine the shear strength parameters.
<table>
<tr><th>S. No</th><th>Cell pressure (kN/m^2)</th><th>Deviator stress (kN/m^2)</th><th>Pore water pressure (kN/m^2)</th></tr>
<tr><td>1.</td><td>100</td><td>600</td><td>20</td></tr>
<tr><td>2.</td><td>200</td><td>750</td><td>30</td></tr>
<tr><td>3.</td><td>300</td><td>870</td><td>50</td></tr>
</table></td><td>12M</td><td>CO4</td><td>L3</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>9(a)</td><td>State the various assumptions and their validity of Terzaghi's theory of consolidation.</td><td>6M</td><td>CO5</td><td>L1</td></tr>
<tr><td>(b)</td><td>Discuss the following terms
(i) Coefficient of compressibility
(ii) Coefficient of volume change</td><td>6M</td><td>CO5</td><td>L2</td></tr>
<tr><td colspan="5">(OR)</td></tr>
<tr><td>10(a)</td><td>Derive Boussinesq's equation for estimation of vertical stress below the soil mass.</td><td>6M</td><td>CO5</td><td>L2</td></tr>
<tr><td>(b)</td><td>Define pressure bulb. Draw the vertical stress distribution on a horizontal plane.</td><td>6M</td><td>CO5</td><td>L2</td></tr>
</table>

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27 OCT 2020

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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

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 following matrix into its echelon form and hence find its rank $A=\begin{bmatrix}6&1&3&8\\4&2&6&-1\\10&3&9&7\\16&4&12&15\end{bmatrix}$.	6M	CO1	L1
(b)	Applying Gauss-Elimination method, solve the system of equations $2x_1+x_2+2x_3+x_4=6$, $x_1-x_2+x_3+2x_4=6$, $4x_1+3x_2+3x_3-3x_4=-1$, $2x_1+2x_2-x_3+x_4=10$	6M	CO1	L3
	(OR)			
2(a)	Reduce the following matrix into its canonical form and hence find its rank $A=\begin{bmatrix}2&3&-1&-1\\1&-1&-2&-4\\3&1&3&-2\\6&3&0&-7\end{bmatrix}$	6M	CO1	L1
(b)	For what values of λ and μ do the system of equations $x+y+z=6$, $x+2y+3z=10$, $x+2y+\lambda z=\mu$ have (i) no solution (ii) unique solution (iii) more than one solution.	6M	CO1	L4
3(a)	Find the eigen values and eigen vectors of the matrix $A=\begin{bmatrix}8&-6&2\\-6&7&-4\\2&-4&3\end{bmatrix}$.	6M	CO2	L1
(b)	Find the characteristic equation of $A=\begin{bmatrix}2&1&1\\0&1&0\\1&1&2\end{bmatrix}$ and hence, find the matrix represented by $A^8-5A^7+7A^6-3A^5+A^4-5A^3+8A^2-2A+I$.	6M	CO2	L3
	(OR)			
4(a)	Find the eigen values and eigen vectors of the A $A=\begin{bmatrix}3&1&4\\0&2&6\\0&0&5\end{bmatrix}$	6M	CO2	L1

(b)	Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix}2 & -1 & 1\\ -1 & 2 & -1\\ 1 & -1 & 2\end{bmatrix}$ and hence compute A^{-1}	6M	CO2	L5
5.	Reduce the quadratic form $8x^2+7y^2+3z^2-12xy+4xz-8yz$ into canonical form by orthogonal transformation and also specify the matrix of transformation and hence identify its nature, rank, index and signature.	12M	CO3	L4
	(OR)			
6(a)	Classify the quadratic form nad find the rank, index and signature of $-3x_1^2-3x_2^2-3x_3^2-2x_1x_2-2x_1x_3+2x_2x_3$	6M	CO3	L2
(b)	Show that the transformation $y_1 = x_1 - x_2 + x_3$, $y_2=3x_1-x_2+2x_3+y_3=2x_1+3x_3$ is non-singular, Find the inverse transformation.	6M	CO3	L2
7(a)	Find one real root x + tanx−1=0 in the interval (0,0.5) by applying Bisection Method.	6M	CO4	L3
(b)	Using suitable interpolating formula, estimate the number of persons earning weekly wages between 60 and 70 rupees, from the following data Wages (in Rs.): Below 40 | 40-60 | 60-80 | 80-100 | 100-120 No. of persons (in thousands): 250 | 120 | 100 | 70 | 50	6M	CO4	L3
	(OR)			
8(a)	By using RegulaFalsi method find one real root of the equation $2x-\log_{10}x-7=0$.	6M	CO4	L3
(b)	Interpolate the value of y at x = 5, using Lagrange's interpolation method, from the following data: x: 1 | 2 | 3 | 4 | 7 y: 2 | 4 | 8 | 16 | 128	6M	CO4	L3
9(a)	Applying Gauss-Seidel iteration method to solve the equations 20x+y – 2z = 17, 2x – 3y+20z = 25 3x + 20y –z=-18	6M	CO5	L3
(b)	Find the equation of the line of best fit to the following data x: 0 | 5 | 10 | 15 | 20 | 25 y: 12 | 15 | 17 | 22 | 24 | 30	6M	CO5	L1
	(OR)			
10(a)	Applying Gauss-Jacobi's iteration method to solve the equations $8x-y+z=18, 1x+5y-2z=3x+y-3z=-6$	6M	CO5	L3
(b)	The pressure and volume of a gas satisfy the relation $PV^{\gamma} = C$. Fit the same equation taking P to be the independent variable, to the following data: P: (kg/sq.cm): 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 V: 9Litres: 1.62 | 1.00 | 0.75 | 0.62 | 0.52 | 0.46	6M	CO5	L2

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29 OCT 2020

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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

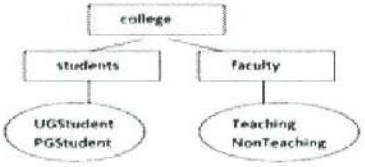
(CSE)

JCY

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 the Buzzwords of Java.	6M	CO1	L1
(b)	Illustrate "Constructor Overloading" with an example program.	6M	CO1	L3
	(OR)			
2(a)	How an object Array is created in Java ? Explain.	6M	CO1	L2
(b)	A set of 5 words are given. Write a program to reverse each word and arrange the resulting words in alphabetical order.	6M	CO1	L3
3(a)	Explain different types of inheritance and also write a program to implement multiple inheritance using interfaces.	6M	CO2	L3
(b)	Discuss various access modifiers available in Java. How access modifiers effect the visibility of a member in different access locations?	6M	CO2	L2
	(OR)			
4(a)	What is an abstract class? Can an abstract class have constructor? Explain.	6M	CO2	L3
(b)	Create a following package hierarchy including the classes inside the packages. 	6M	CO2	L3
5(a)	Create a try block that is likely to generate two types of exceptions and then incorporate necessary catch blocks and finally block to handle them appropriately.	6M	CO3	L3
(b)	Using Thread.sleep() method , Develop a Java program that prints numbers from 1 to 10 line by line after every 5 seconds.	6M	CO3	L3
	(OR)			
6(a)	Write a Java program to read 10 integers and store them in an array and try to access the 12th element in the same array, if there is any error; handle it using exception handling technique of java.	6M	CO3	L3
(b)	"Threads can be given priorities" - Support this statement with suitable example.	6M	CO3	L3
7(a)	Differentiate between init() and start() methods of applet with an example.	6M	CO4	L2
(b)	Describe the Delegation Event Model. What are the Event Sources and Event Listeners? Explain with an example Java code. How various mouse events are handled?	6M	CO4	L2
	(OR)			
8(a)	Define an Applet. How is an Applet different from an stand alone application? Describe the lifecycle of an applet.	6M	CO4	L2
(b)	Write a Java program to handle mouse events using Adapter classes.	6M	CO4	L3
9(a)	Develop a java program that has 6 text fields, one submit button. When you press the button, first 5 text field's values average has to be displayed in the 6th text field?	6M	CO5	L3
(b)	Explain about any two Layout Managers with example programs.	6M	CO5	L2
	(OR)			
10.	Design a JApplet which will display 5 buttons with color names. When the user clicks on specific button, it changes the background color of screen?	12M	CO5	L3

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2 NOV 2020

R17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

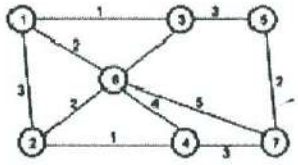
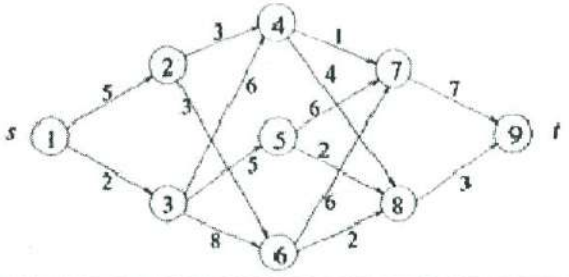
B.Tech. (IV Semester) Regular/Supplementary Examinations

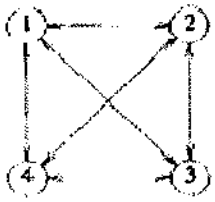
17CI08-DESIGN AND ANALYSIS OF ALGORITHMS

(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)	Write a recursive algorithm to compute factorial of a given number and analyze its time complexity.	6M	CO1	L2
(b)	What is asymptotic notation? Explain various asymptotic notations with examples.	6M	CO1	L1
	(OR)			
2(a)	Solve the following recurrence equation: $T(n) = T(n-1)+n$.	6M	CO1	L3
(b)	Write an algorithm for Merge Sort and trace the following sequence of keys using Merge Sort: 23, 72, 45, 66, 16, 34, 47, and 58.	6M	CO1	L3
3(a)	Find an optimal solution for the following instance of job sequencing with deadlines: n=7, (p1,p2,p3,p4,p5,p6,p7) = (3,5,20,18,1,6,30) and (d1,d2,d3,d4,d5,d6,d7) = (1,3,4,3,2,1,2).	6M	CO2	L3
(b)	Build minimum cost spanning tree for the following graph by using Kruskal's algorithm. 	6M	CO2	L3
	(OR)			
4(a)	Solve the following knapsack problem using greedy strategy: (p1,p2,p3,p4) = (11,21,31,33), (w1,w2,w3,w4)= (2,11,22,15), M = 40, n = 4.	6M	CO2	L2
(b)	Write an algorithm of finding minimum cost spanning tree using PRIM'S algorithm and explain with suitable example.	6M	CO2	L2
5(a)	Find a minimum-cost path from s to t in the given multistage graph. Do this first using the forward approach. 	6M	CO3	L3
(b)	Write a Bellman ford algorithm for single source shortest path and analysis its time complexity.	6M	CO3	L2
	(OR)			
6(a)	Consider the knapsack instance n = 3, (w1,W2,w3)= (2,3,4), (P1,P2,P3)= (1,2,5), and m = 6 find the solution using Dynamic Programming and analyze it's the time complexity.	6M	CO3	L3

(b)	Find the solution of the travelling sales person problem Considering the directed graph in figure a and The edge lengths are given by matrix in figure b.  (a) $\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$ (b)	6M	CO3	L3
7(a)	Write a note on the general method of backtracking using suitable diagram.	6M	CO4	L1
(b)	Write an algorithm of 8-queen problem and analysis its time complexity.	6M	CO4	L3
	(OR)			
8(a)	Let w = {5, 7, 10, 12, 15, 18, 20} and m=35. Find all possible subsets of w that sum to m. Do this using Sum Of Subset using backtracking. Draw the portion of the state space tree that is generated.	6M	CO4	L3
(b)	Determine the order of magnitude of the worst-case computing time for the backtracking procedure that finds all Hamiltonian cycle with example.	6M	CO4	L2
9(a)	State the difference between backtracking and branch and bound methodology with the suitable example.	6M	CO5	L2
(b)	Draw the portion of the state space tree generated by LC-Branch and bound for the following knapsack instances. n = 5, {p1,p2,...,p5) = (10,15,6, 8, 4), (w1, w2, ..., w5) = (4, 6, 3, 4, 2), and m = 12	6M	CO5	L3
	(OR)			
10(a)	Consider the traveling sales person instance defined by the cost matrix given below and find the solution using LC branch and bound. $\begin{bmatrix} \infty & 7 & 3 & 12 & 8 \\ 3 & \infty & 6 & 14 & 9 \\ 5 & 8 & \infty & 6 & 18 \\ 9 & 3 & 5 & \infty & 11 \\ 18 & 14 & 9 & 8 & \infty \end{bmatrix}$	6M	CO5	L3
(b)	What is the difference between LC branch and bound and FIFO branch and bound with the suitable example?	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

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)	Summarize the purpose and implementation of date and cat commands.	6M	CO1	L2
(b)	LINUX is multi-user operating system. Justify your answer.	6M	CO1	L2
	(OR)			
2.	Discuss the FILE SYSTEM in detail.	12M	CO1	L1
3(a)	Demonstrate the use of pipes and redirection using appropriate examples.	6M	CO2	L2
(b)	Design a shell script that list out the files which is having *.txt files from given directory as a argument.	6M	CO2	L3
	(OR)			
4(a)	Illustrate Positional Parameters using suitable examples.	6M	CO2	L2
(b)	Design a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.	6M	CO2	L3
5(a)	List out the looping structures in awk and distinguish those using suitable examples.	6M	CO3	L2
(b)	Distinguish the purpose and implementation of cmp, comm and diff filters.	6M	CO3	L2
	(OR)			
6(a)	Demonstrate string functions of awk with suitable examples.	6M	CO3	L2
(b)	Compare and Contrast "print" and "printf" statements of awk.	6M	CO3	L2
7(a)	Define a process in the context of Linux OS. Discuss the process basics.	6M	CO4	L2
(b)	What is a PID and PPID? How the PID of a Login Shell can be identified? Discuss with suitable examples.	6M	CO4	L2
	(OR)			
8.	Define Signal. What a Process does when a Signal comes? Explain different Signal with examples.	12M	CO4	L2
9(a)	Describe about Architecture of in SMP systems.	6M	CO5	L1
(b)	Describe about the problems with multiprocessing systems.	6M	CO5	L2
	(OR)			
10(a)	Explain compiling process of Linux SMP with example.	6M	CO5	L2
(b)	Compare and contrast between uni-processors and multiprocessor systems.	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

17CI09-DATABASE 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(a)	Discuss about three schema architecture with neat diagram.	6M	CO1	L2
(b)	Define the following terms with suitable example i) Candidate key ii) Primary key iii)Foreign key	6M	CO1	L1
	(OR)			
2.	Construct an ER-Diagram for Bank Database System with suitable constraints and relationships among the entities.	12M	CO1	L2
3(a)	Give the syntax for basic SQL query and explain with suitable example.	6M	CO2	L2
(b)	Illustrate different types of joins in SQL.	6M	CO2	L2
	(OR)			
4.	Consider the following schema to write queries in SQL. Sailor (sid, same, age, rating) Boats (bid, bname, bcolor) Reserves (sid, bid, day) (i) Create the tables for above schemas with suitable constraints . (ii) Find the sailors who reserved at least one boat. (iii)Find the names of the sailors who have reserved red boat but not a green boat. (iv) Find the names of sailors who are older than the oldest sailor with a rating of 10. (v) Find the names of sailors who are older than the oldest sailor with a rating of 10.	12M	CO2	L3
5(a)	What is minimal set of functional dependencies? Consider following set F of functional dependencies on schema R1 (A, B, C,D,E) A -> BC, CD -> E, B -> D, E -> A Calculate minimal set of functional dependencies for relation R1.	6M	CO3	L3
(b)	Given a relation with attributes R2= (A, B, C, D, E) and following functional dependencies. A→B, BC→D, E→C, D→A Find out all possible Candidate keys for relation R2.	6M	CO3	L3
	(OR)			
6(a)	Illustrate the concept of BCNF with suitable example.	6M	CO3	L2

(b)	Given a relation with attributes R= (A, B, C, D, E) and following functional dependencies. BC->D, AC->BE, B->E Determine the highest normal form for R.	6M	CO3	L3
7(a)	Draw a state diagram and discuss the typical states that a transaction goes through during execution.	6M	CO4	L2
(b)	Demonstrate the concept of Conflict Serializability with suitable example.	6M	CO4	L2
	(OR)			
8(a)	What is Log? How is it maintained? Discuss the features of deferred database modification and immediate database modification in brief.	6M	CO4	L2
(b)	Why concurrency control is needed? Explain the problems that would arise when concurrency control is not provided by the database system.	6M	CO4	L2
9.	Construct a B+ tree for the following set of keys (order 3) 1,3,6,11,15,21,32,25,18,20,26,28.	12M	CO5	L3
	(OR)			
10(a)	Compare and contrast between heap files and sorted files.	6M	CO5	L2
(b)	What is dynamic hashing? Give the implementation details of it.	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.

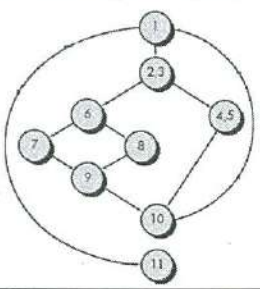
B.Tech. (IV Semester) Regular/Supplementary Examinations

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)	Write about umbrella activities.	6M	CO1	L1
(b)	Why "Software Engineering" is called as "Layered Technology"? Justify your answer with a neat figure.	6M	CO1	L2
	(OR)			
2(a)	Discuss about CMMI levels in Software Engineering.	6M	CO1	L2
(b)	What is the purpose of PSP? What framework activities are used during it?	6M	CO1	L1
3(a)	Describe incremental model with diagram.	6M	CO2	L3
(b)	List out the advantages and disadvantages of spiral model.	6M	CO2	L1
	(OR)			
4(a)	Explain the Concurrent Development Model with a diagram.	6M	CO2	L2
(b)	Describe different principles involved in the Construction Practices.	6M	CO2	L2
5.	Scenario-based modeling comprises of writing use-cases, developing an activity diagram and drawing swim lane diagrams. Elaborate on these to show the importance of each of these steps.	12M	CO3	L3
	(OR)			
6(a)	Why the requirements have to be validated? Write the steps briefly.	6M	CO3	L2
(b)	How you develop Use Cases? Draw a use case diagram for ATM software system.	6M	CO3	L3
7(a)	What is the need for dividing software into several modules?	6M	CO4	L2
(b)	Write short notes on: (i) Abstraction (ii) Refinement (iii) Pattern.	6M	CO4	L2
	(OR)			
8(a)	What is Architecture? Why architecture is important?	6M	CO4	L2
(b)	With neat diagram describe any two architectural styles.	6M	CO4	L2
9(a)	What are the strategic approaches to Software Testing?	6M	CO5	L2
(b)	Differentiate Black Box Testing and White Box Testing.	6M	CO5	L2
	(OR)			
10(a)	Define independent path. Consider a flow graph given in below Fig. Calculate cyclomatic complexity by all three methods.  	6M	CO5	L3
(b)	Describe unit testing. What errors are commonly found during unit testing?	6M	CO5	L2

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12 NOV 2020

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

B.Tech. (IVSemester) Regular/Supplementary Examinations

17PD03-PROFESSIONAL ETHICS AND HUMAN VALUES
(CSE&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)	Describe the role of ethics in engineering with one suitable example.	6M	CO1	L2
(b)	Outline any four moral issues related to engineering.	6M	CO1	L2
	(OR)			
2.	Using Kohlberg's theory, summarizes the stages of moral development in human life.	12M	CO1	L2
3(a)	Distinguish between Values and Ethics.	6M	CO2	L2
(b)	Write the any four ways, that a person can exhibit Civic Virtue in a society.	6M	CO2	L2
	(OR)			
4(a)	Interpret the word "Integrity" to your own engineering practice, use the examples if necessary.	6M	CO2	L2
(b)	Justify the use of "spirituality" in professional engineering practice.	6M	CO2	L2
5(a)	Distinguish between engineering projects and standard experiment.	6M	CO3	L2
(b)	Identify any three common general outlines provided by the companies under companies "code of ethics".	6M	CO3	L2
	(OR)			
6.	Describe need for the industrial standards towards the safety of workers and quality of the products.	12M	CO3	L2
7.	Discuss the chain of events during the "Three Mile Island accident" and also emphasis on public concern & confusion.	12M	CO4	L1
	(OR)			
8(a)	Differentiate between "professional rights and employee rights".	6M	CO4	L1
(b)	Explain the importance of "Collegiality" in the employees of present multinational IT companies.	6M	CO4	L1
9(a)	List any four global issues and prepare necessary solution for their consequences.	6M	CO5	L1
(b)	Summarize the "code of ethics" of any professional body related to your branch of engineering (Ex. IE, IETE, CSI).	6M	CO5	L1
	(OR)			
10.	Analysis the role of an engineer as expert witness and advisor.	12M	CO5	L1

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27 OCT 2020

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

17FE03-ENVIRONMENTAL SCIENCE

(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	BL
1(a)	Analyze the consequences of global population growth.	6M	L2
(b)	Discuss HIV/AIDS, mode of its spread and its effects. Also discuss the control measures.	6M	L2
	(OR)		
2(a)	Justify the need for public awareness of Environmental Studies.	6M	L3
(b)	What is the role of environment on human health?	6M	L1
3(a)	Can you suggest some measures needed to be taken for conserving forest resources?	6M	L2
(b)	Discuss the major causes of wastage and degradation of water resources. What can be done to conserve them?	6M	L2
	(OR)		
4(a)	Discuss in detail about world food problems.	6M	L2
(b)	Elaborately discuss the impacts of fertilizers and pesticides.	6M	L2
5(a)	Define ecosystem. Discuss in detail the structure and functions of an ecosystem.	6M	L2
(b)	Suggest some of the in-situ methods for conservation of biodiversity with examples.	6M	L1
	(OR)		
6(a)	What are biogeochemical cycles? With a neat sketch explain the cycling of carbon and oxygen in environment.	6M	L2
(b)	"Man made activities, to a large extent, are responsible for the loss of biodiversity". Explain.	6M	L2
7(a)	Define radiation. Explain in detail the sources, effects and control for radioactive pollution.	6M	L2
(b)	Explain the natural disasters like landslides and earth quakes with the possible mitigation measures to be taken.	6M	L2
	(OR)		
8(a)	Define greenhouse effect. Explain about greenhouse gases.	6M	L1
(b)	Write a case study of nuclear holocaust.	6M	L1
9(a)	Discuss the salient features of Air Prevention and Control of Pollution Act, 1981.	6M	L2
(b)	What is EIA? And what are the major objectives of EIA?	6M	L1
	(OR)		
10(a)	Discuss the salient features of Environmental Protection Act.	6M	L2
(b)	Define consumerism. What are the ill effects of consumerism on environment? Explain.	6M	L2

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29 OCT 2020

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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

17FE09-FUNCTIONS OF COMPLEX VARIABLES

(ECE&EIE)

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Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Construct an analytic function $f(z)$ if it's real part is $u=\frac{\sin 2x}{\cosh 2y-\cos 2x}$	6M	CO1	L3
(b)	Investigate if $u(x,y)=3x^2y+2x^2-y^3-2y^2$ is harmonic. If harmonic find its harmonic conjugate and the analytic function.	6M	CO1	L3
	(OR)			
2(a)	Derive the analytic function whose imaginary part is $v=(r-\frac{1}{r})\sin\theta$	6M	CO1	L3
(b)	If $f(z)=u+iv$ is analytic function, find $f(z)$ where $u-v=e^x(\cos y-\sin y)$	6M	CO1	L3
3(a)	If $\operatorname{cosec}(\frac{\pi}{4}+i\alpha)=u+iv$, *showthat* $(u^2+v^2)^2=2(u^2-v^2)$	6M	CO2	L3
(b)	Separate the real and imaginary parts of $\tan z$	6M	CO2	L2
	(OR)			
4(a)	Calculate the values of z which satisfy $e^z=1+i$	6M	CO2	L3
(b)	Find all the values of $(\frac{\sqrt{3}}{2}+\frac{i}{2})^{(1+i\sqrt{3})}$	6M	CO2	L3
5(a)	Evaluate $\int_{(0,0)}^{(1,1)}(3x^2+4xy+ix^2)dz$ *along* $y=x^2$	6M	CO3	L3
(b)	Apply Cauchy's generalized integral formula to evaluate $\int_C \frac{\log z}{(z-1)^3}dz$, *where* $C:\lvert z-1\rvert=\frac{1}{2}$	6M	CO3	L3
	(OR)			
6(a)	If C denotes the boundary of a square whose sides lie along the lines $x=\pm 2, y=\pm 2$, where C is described in positive sense, then evaluate $\int_C \frac{e^{-z}}{z-\frac{\pi}{2}i}dz$	6M	CO3	L3

(b)	If $F(a)=\int_C \frac{3z^2+7z+1}{z-a}dz$, where C is the circle $\|z\|=2$, find the values of $F(1),F(3),F'(1-i),F''(1-i)$	6M	CO3	L3
7(a)	Develop $f(z)=\frac{1}{z^2-z-6}$ as a power series about z = -1	6M	CO4	L3
(b)	Utilize the Laurent series to obtain the power series of $f(z)=\frac{e^z}{((z-1)^2}$ about $z=1$	6M	CO4	L3
	(OR)			
8.	If $f(z)=\frac{1}{(1-z)(z-2)}$ then obtain (i) The Maclaurin's series (ii) The Laurent series in $1<\|z+1\|<2$ (iii) $\|z\|>2$	12M	CO4	L3
9.	Apply Residue Theorem to evaluate $\oint_C \frac{z-3}{z^2+2z+5}dz$ (i) $C:\|z+1-i\|=2$ (ii) $C:\|z+1+i\|=2$	12M	CO5	L3
	(OR)			
10(a)	Evaluate the real definite integral $\int_0^{\pi} \frac{1}{\pi+\cos\theta}d\theta$ around the unit circle.	6M	CO5	L3
(b)	Calculate the residues at the poles of $f(z)=\frac{ze^z}{(z-1)^3}$	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

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)	Three equal point charges of 4μc are in free space at (0, 0, 0), (2, 0, 0) and (0, 2, 0), respectively. Find net force on Q4 = 6 μc at (2, 2, 0).	6M	CO1	L3
(b)	Compare convection and conduction current density with relevent expressions.	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 and explain ampere's circuit law.	6M	CO2	L2
(b)	Derive the two Maxwells equation for magnetic field.	6M	CO2	L2
5(a)	Prove that the Curl of H is equal to the sum of conduction and Displacement current density.	6M	CO3	L2
(b)	State and Derive the equation of continuity.	6M	CO3	L2
	(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)	Derive Helmholtz Wave equations.	6M	CO4	L2
(b)	A uniform plane wave in air has $E=10\cos(2\pi \times 10^6 t - \beta z)\ a_y$ V/m. Calculate β, λ and H.	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	CO4	L2
9(a)	A perpendicularly polarized wave is incident at an angle of $\theta_1=15^0$ It's Propagating from medium 1 to medium 2 . Medium 1 is defined by ε_{r1} =8.5 , μ_{r1} =1 , σ_1 =0 and medium 2 is free space. If E_I =1.0 mV/m , Determine E_r, H_i and H_r.	6M	CO5	L3
(b)	Define and derive the reflection coefficient of a wave incidence is normal on dielectric.	6M	CO5	L2
	(OR)			
10(a)	Define and Derive the expression for Brewster angle.	6M	CO5	L2
(b)	Define Poynting theorem and obtain the time averaged power.	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

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(a)	Define discrete time system, impulse response, and frequency response.	6M	CO1	L1
(b)	Analyze the following discrete time signals for energy and power(i)$x(n)=(1/2)^n u(n)$ (ii)$y(n)=u(n)$.	6M	CO1	L3
	(OR)			
2(a)	Discuss the following with suitable examples (i) Periodic and aperiodic discrete signals (ii) Even and odd discrete signals.	6M	CO1	L2
(b)	Evaluate DTFT of a signal $x(n)=\{-1,0,1,\underset{\uparrow}{2},1,0,1,2,1,0,-1\}$, hence obtain its magnitude and phase spectrum.	6M	CO1	L3
3(a)	What is ROC? List out the various properties of ROC with suitable examples.	6M	CO2	L1
(b)	Determine the z-transform of the following sequences (i) $x(n)=u(n)*nu(n)*n^2u(n)$ (ii) $y(n)=a^{n-1}u(n-1)*a^{n-1}u(n+1)$	6M	CO2	L3
	(OR)			
4(a)	Define the z-transform of a right sided, left sided and both sided sequences.	6M	CO2	L1
(b)	Calculate the initial and final values of a causal sequence x(n) from the z-domain $X(z)=\frac{z(z+1)(z+2)}{(z-1)(z-1/2)(z-1/4)(z-1/8)}$	6M	CO2	L3
5(a)	How to compute the N-point IDFT of a sequence X(k) through the inverse FFT? Explain in detail.	6M	CO3	L2
(b)	Compute the 4-point DFT of a sequence x(n)={1,2,3,4}, hence obtain its magnitude and phase response.	6M	CO3	L3
	(OR)			
6(a)	State and derive the Parsevalls theorem of DFT, if the N-point DFT[x(n)]=X(k).	6M	CO3	L2
(b)	Apply DIF radix-2 FFT algorithm to compute the 8-Point DFT of a sequence x(n)={1,0,0,0,1,0,0,0}.	6M	CO3	L3

7(a)	Compare Impulse Invariant and Bilinear transformations.	6M	CO4	L2
(b)	Design a digital filter by converting the transfer function of analog filter H(s) into digital filter H(z) by using impulse invariant transformation method. Given $H(s)=\frac{3}{s^2+0.2s+9.01}$	6M	CO4	L4
	(OR)			
8.	Design a digital low pass filter by using IIR Butterworth approximation and Bilinear transformation method by taking the sampling period of T=0.5sec to satisfy the following specifications $0.707 \le \lvert H(jw)\rvert \le 1.0; 0 \le w \le 0.45\pi$, $\lvert H(jw)\rvert \le 0.2; 0.65\pi \le w \le \pi$	12M	CO4	L4
9(a)	List out the various applications of Digital Signal Processing system and explain.	6M	CO5	L2
(b)	Draw the ideal and practical frequency response characteristics of band pass filter and obtain the expression for the impulse response $h_d(n)$ from the frequency response of desired filter $H_d(e^{jw})$.	6M	CO5	L3
	(OR)			
10.	Design a digital band stop filter through FIR method by considering 7 samples of impulse response to reject frequencies in the range 1.5kHz to 3kHz and a sampling frequency of 8kHz by using Fourier series method.	12M	CO5	L4

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

17EC11-DIGITAL SYSTEM DESIGN

(ECE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Discuss in detail about Program Structure of VHDL.	6M	CO2	L2
(b)	Explain the operation CMOS NAND with functional tables, switch model and circuit diagrams.	6M	CO1	L2
	(OR)			
2(a)	Discuss in detail about CMOS Inverter using switch Model and write its functional table.	6M	CO1	L2
(b)	Write structural program for Prime Number detector in VHDL.	6M	CO2	L3
3(a)	With neat logic diagram and truth table explain operation of 74x138 3to8 decoder.	6M	CO3	L2
(b)	Discuss in detail about 74X163 working as Mod 11 and Mod 193 counters.	6M	CO3	L2
	(OR)			
4(a)	Write Behavioral VHDL Program for specialized four input, 3 bit Multiplexer.	6M	CO3	L3
(b)	Analyse the operation of 74x194 Universal shift Register with neat diagrams.	6M	CO3	L4
5(a)	Illustrate the different levels of design description in Verilog.	6M	CO4	L2
(b)	List the four types of tri state buffer primitives with typical instantiation functional description and representation.	6M	CO4	L1
	(OR)			
6(a)	Explain about the different ways of number representations and Data types in Verilog.	6M	CO4	L2
(b)	Write a Module to instantiate AND gate primitive and to test it. Also represent the output that is obtained by running the module.	6M	CO4	L3
7(a)	Analyze in detail about different transistor switch primitives.	6M	CO4	L2
(b)	Illustrate in detail about the initial construct.	6M	CO4	L2
	(OR)			
8(a)	Explain about types of Bidirectional gates with their instantiation.	6M	CO4	L2
(b)	Write a Module to illustrate the delayed assignment.	6M	CO4	L2
9.	Discuss in detail about the unary, binary, ternary operators with examples.	12M	CO4	L2
	(OR)			
10(a)	Illustrate with an example how to combine delays with assignments.	6M	CO4	L2
(b)	Explain in detail about Continuous Assignment structures.	6M	CO4	L2

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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)	Explain the basic communication system with the help of block diagram.	6M	CO1	L2
(b)	Obtain the (i)Total Power as well as Power of sidebands (ii)Frequency domain Representation of given AM signal $s(t)=10\cos 2\pi x10^6t(1+3\cos 2\pi x10^3t)$.	6M	CO2	L3
	(OR)			
2(a)	Discuss the role of Square law demodulator in the demodulation of an Amplitude Modulated (AM) signal.	6M	CO1	L2
(b)	Show that coherent detector can reconstruct the original signal in the demodulation of Double side band suppressed carrier (DSBSC) signal.	6M	CO1	L2
3(a)	Compare Single Sideband Suppressed carrier Amplitude modulation and Vestigial Side band Suppressed carrier Amplitude modulation.	6M	CO1	L2
(b)	A single tone message signal is given as $m(t)=4\cos 4\pi x10^3t$. Denote the expression for Single Sideband Suppressed carrier Amplitude modulation for given carrier $c(t)=10\cos(2\pi x10^6t)$ and estimate the power required, when LSB is retained.	6M	CO2	L3
	(OR)			
4(a)	Summarize the generation of Single Sideband Suppressed carrier Amplitude modulation using two stage modulator.	6M	CO1	L2
(b)	Discuss the role of phase error in the demodulation of Single Sideband Suppressed carrier (SSBSC) Amplitude modulation using coherent detection.	6M	CO1	L2
5(a)	Describe the role of Armstrong method for generation of Frequency Modulated (FM) signal.	6M	CO1	L2
(b)	Obtain the (i)Carrier Amplitude (ii)Message signal Amplitude (iii)Carrier Frequency (iv)Message frequency For the given FM signal $s(t)=5\cos(2\pi X10^6t+0.5\sin 6000\pi t)$. Assume frequency sensitivity as 10KHz/V	6M	CO2	L3
	(OR)			
6(a)	Explain the working of Foster Seeley discriminator for FM demodulation.	6M	CO1	L2

(b)	A high frequency carrier signal $c(t)= 2\cos(2\pi x10^6 t)$ is Frequency modulated by a message signal $m(t)= 4\cos(8\pi x10^3 t) + 8\cos(6\pi x10^3 t)$. Obtain the time domain representation of FM signal. Also calculate the individual modulation indices and maximum frequency deviation. Frequency sensitivity is 1KHz/Volt.	6M	CO2	L3
7(a)	Use necessary expressions to represent Pulse Amplitude Modulated signal using Flat top sampling.	6M	CO3	L3
(b)	Determine the value of sampling rate to satisfy sampling theorem for the given signal $m(t)= \cos 8000\pi t + 7 \sin 6000\pi t - 6 \sin 4000\pi t \sin 3000\pi t$.	6M	CO2	L3
	(OR)			
8(a)	Apply the concepts of sampling to obtain the time domain representation of Natural sampling.	6M	CO3	L3
(b)	Illustrate the role of commutator in time division multiplexing with relevant block diagram.	6M	CO3	L3
9(a)	Summarize the underlying concepts of Reactance Tube FM transmitter.	6M	CO1	L2
(b)	In a broadcast super heterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 100. If the IF frequency is 455 kHz Determine (i)The image frequency and its rejection ratio for tuning at 1.1 kHz (ii)The image frequency and its rejection ratio for tuning at 25 MHz.	6M	CO2	L3
	(OR)			
10.	Analyze the statement that the Figure of Merit for DSBSC AM is unity.	12M	CO4	L4

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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)	Derive the imaginary part of the analytic function whose real part is $u=y+e^x\cos y$	6M	CO1	L2
(b)	Show that $u(x,y)=4xy-3x+2$ is harmonic and hence construct corresponding analytic function in terms of 'z'.	6M	CO1	L3
	(OR)			
2(a)	Apply Cauchy's Integral formula to evaluate $\oint_C \frac{\cos \pi z}{z(z^2+1)}dz$ where C is the circle $\|z\|=2$.	6M	CO1	L3
(b)	Apply generalized Cauchy's Integral formula to evaluate $\int_C \frac{z^3e^{-z}}{(z-1)^3}dz$ where C is $\|z-1\|=\frac{1}{2}$	6M	CO1	L3
3(a)	Find the poles and corresponding residues of the function $\frac{e^{iz}}{z^2+1}$.	6M	CO2	L3
(b)	Apply Residue theorem to evaluate $\oint_C \frac{z}{(z-1)(z-2)^2}dz$ where C is the circle $\|z-2\|=\frac{1}{2}$.	6M	CO2	L3
	(OR)			
4(a)	Apply Laurent's series to expand $f(z)=\frac{7z-2}{(z+1)z(z-2)}$ in the ring shaped region $3<\|z+2\|<5$.	6M	CO2	L3
(b)	Find Taylor's series expansion of $f(z)=\frac{1}{z^2}$ about the point $z=1$	6M	CO2	L2
5(a)	A certain firm has three plants A, B and C producing respectively 35%, 15% and 50% of the total output. The probabilities of a non-defective product are 0.75, 0.95 and 0.85 respectively. A customer receives a defective product. What is the probability that it is from plant C?	6M	CO3	L2
(b)	A discrete random variable has the following probability distribution, then find mean and variance of it.	6M	CO3	L3

X	-3	-2	-1	0	1	2	3
P(X)	0.05	0.10	0.30	0	0.30	0.15	0.10

(OR)

6(a)	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	L2
(b)	For a normally distributed variate with mean 70 and standard deviation 16, find the probabilities that (i) $38 \le x \le 46$ (ii) $82 \le x \le 94$.	6M	CO3	L2
7(a)	Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same, at 1% level.	6M	CO4	L3
(b)	A sample of 400 items is taken from a population whose S.D. is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population mean.	6M	CO4	L3
	(OR)			
8(a)	In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters, can we assume that both rice and wheat are equally popular in this state at 5% level of significance.	6M	CO4	L3
(b)	The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as draw from the same population of S.D 2.5 inches.	6M	CO4	L3
9.	Find the Karl Pearson's coefficient of correlation and two regression lines from the following data. Age of Husband: 25, 22, 28, 26, 35, 20, 22, 40, 20, 18 Age of wife: 18, 15, 20, 17, 22, 14, 16, 21, 15, 14 (i) Estimate the age of husband when the age of wife is 19. (ii)Estimate the age of wife when the age of husband is 30.	12M	CO5	L3
	(OR)			
10(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 $\sum xy = 3407$. Estimate 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

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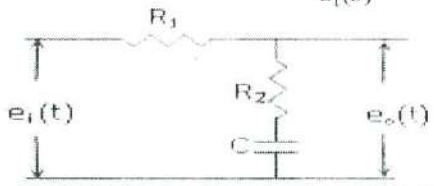
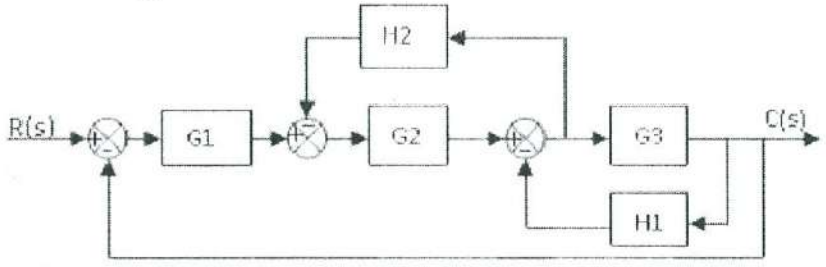
B.Tech. (IV Semester) Regular/Supplementary Examinations

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)	Discuss the characteristics of feedback control system.	6M	CO1	L2
(b)	Develop the dynamical equations describing the electrical system and obtain transfer function $\frac{E_0(S)}{E_i(S)}$ 	6M	CO1	L3
	(OR)			
2.	Compute the transfer function of the given system using block diagram reduction technique. Draw the signal flow graph of the same system and verify the result by using Mason's gain formula. 	12M	CO1	L3
3(a)	Derive the expressions for Peak time and Settling time of a second order under damped system with unit step input.	6M	CO2	L2
(b)	A unity feedback system is characterized by an open loop transfer function $(S) = \frac{K}{S(S+10)}$. Determine the gain K so that the system will have a damping ratio of 0.5. For this value of K determine the settling time and peak overshoot for a unit-step input.	6M	CO2	L3
	(OR)			
4(a)	Define the following terms: (i) Rise time (ii)steady state error (iii) Rise time.	6M	CO2	L1
(b)	A unity feedback system is characterized by the open loop transfer function $G(S) = \frac{1}{S(0.5S+1)(0.2S+1)}$ Determine the steady state errors for unit-step, unit-ramp and unit – acceleration input.	6M	CO2	L3

5(a)	What is necessary and sufficient condition for stability using the RH criterion method?	6M	CO2	L2
(b)	The characteristic equation of a feedback control system is given by $S^4 + 20S^3 + 15S^2 + 2S + K = 0$. Determine the range of value of K for the system to be stable.	6M	CO2	L3
	(OR)			
6(a)	Illustrate the effect of adding poles and zeros to G(S)H(S).	6M	CO2	L2
(b)	Sketch the root locus of a system with $G(S)H(S) = \frac{K(S+3)}{S(S+2)}$	6M	CO2	L3
7(a)	Discuss the advantages of frequency response analysis.	6M	CO2	L2
(b)	Sketch the polar plot of transfer function given below $G(S) = \frac{1}{(1+S)(1+2S)}$	6M	CO2	L3
	(OR)			
8.	Sketch the asymptotic Bode Plot for the transfer function given below $G(S)H(S) = \frac{2(S+0.25)}{S^2(S+1)(S+0.5)}$ From the Bode plot determine: (i)Phase Margin (ii)Gain Margin	12M	CO2	L3
9(a)	Find the State Transition Matrix for the state model whose A matrix is given by $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$	6M	CO1	L3
(b)	List out the properties of state transition matrix.	6M	CO2	L1
	(OR)			
10(a)	Discuss the procedure for design of Lead compensator.	6M	CO3	L2
(b)	Given the system $\dot{X}(t) = AX(t) + Bu(t), y(t) = CX(t)$ Where $A = \begin{bmatrix} 0 & 1 \\ -1 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$, $C = [1 \quad 1]$ Determine state and output controllability.	6M	CO2	L3

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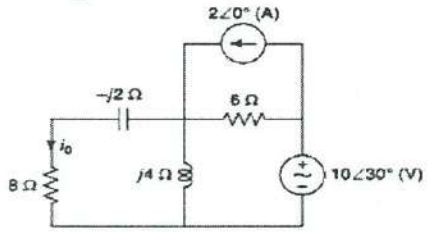
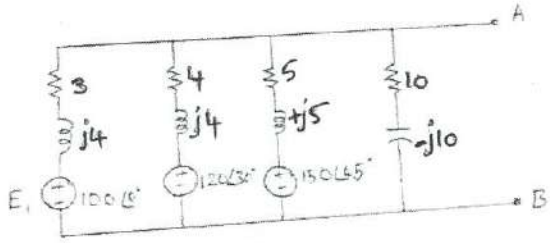
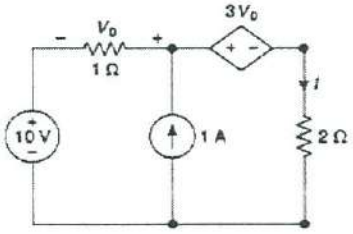
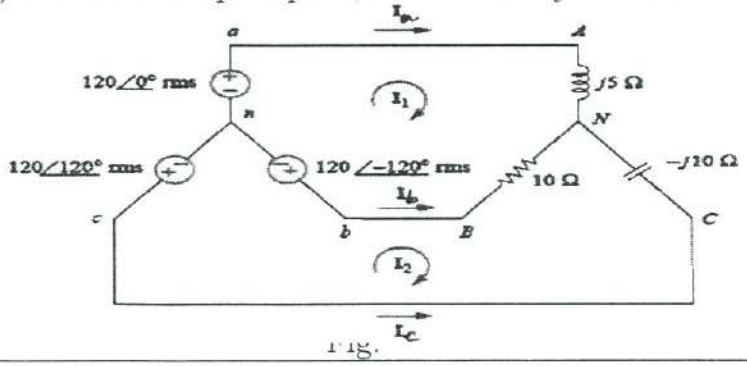
B.Tech. (IV Semester) Regular/Supplementary Examinations

17EE07-NETWORK THEORY-II

(EEE)

Time : 3 hours | Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	State and Explain Reciprocity theorem with example.	6M	CO1	L2
(b)	Find the current i_0 using superposition theorem for the network shown in Fig.  Fig.	6M	CO1	L3
	(OR)			
2(a)	Obtain Milliman's equivalent source across the terminals A & B of the network given in Fig. and hence determine the nature of impedance ZAB and maximum power transferred to it.  Fig.	6M	CO1	L3
(b)	Find ' i' of the network shown in Fig. using Thevenin's theorem.  Fig.	6M	CO1	L3
3(a)	For the unbalanced circuit shown in Fig. find: (i) the line currents, (ii) the total complex power absorbed by the load, and (iii) the total complex power absorbed by the source.  Fig.	6M	CO1	L3

(b)	Deduce the expression for power factor of the load in a 3-phase balanced system by two wattmeter method with neat phasor diagram.	6M	CO1	L3
	(OR)			
4(a)	A balanced Y-connected load with a phase impedance of 40+j25Ω supplied by a balanced, positive sequence delta connected source with a line voltage of 210V.Calculate the phase currents. Use voltage V_{ab} as reference.	6M	CO1	L3
(b)	Explain, with a neat sketch, how a three phase power is measured in a delta connected load using two watt meters?	6M	CO1	L2
5(a)	Derive expressions for admittance parameters of two two-port networks connected in parallel.	6M	CO2	L2
(b)	Express z-parameters in terms of h-parameters and ABCD-parameters.	6M	CO2	L2
	(OR)			
6(a)	Determine the open circuit impedance parameters of a two-port network.	6M	CO2	L3
(b)	The y-parameters of a two-port network are Y11=15 mho, Y22=24 mho, Y12=Y21=6 mho. Determine ABCD parameters.	6M	CO2	L3
7(a)	Derive the coefficients in exponential form of Fourier series.	6M	CO3	L2
(b)	Explain Even function symmetry in Fourier Series.	6M	CO3	L2
	(OR)			
8(a)	Find the trigonometric Fourier series for the square wave $X(t) = \begin{cases} A; 0 < t < \pi \\ -A; \pi < t < 2\pi \end{cases}$	6M	CO3	L3
(b)	Find the Fourier Series of a half wave rectified signal using exponential Fourier Series.	6M	CO3	L3
9(a)	Check whether the polynomials are Hurwitz or not. Give reasons. (i)$s^4+s^3+2s^2+3s+2$ (ii)$s^4+7s^3+4s^2+18s+6$ (iii)s^5+s^3+s.	6M	CO4	L3
(b)	An Impedance is given below find the Foster form-I $Z(s)=\frac{2(s^2+1)(s^2+9)}{s(s^2+4)}$	6M	CO4	L3
	(OR)			
10(a)	List the properties of positive real function and test whether the following function is positive real or not? $F(s)=\frac{s^2+4}{s^3+3s^2+3s+1}$	6M	CO4	L3
(b)	Realize the given driving point impedance function in Foster form-II. $Z(s)=\frac{(s+2)(s+5)}{(s+1)(s+3)}$	6M	CO4	L3

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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 current gain of a hybrid - π CE with load resistance.	6M	CO1	L2
(b)	Explain the transistor at high frequencies.	6M	CO1	L2
	(OR)			
2.	Relate hybrid-π parameters and CE h-parameters with detail derivations.	12M	CO1	L3
3(a)	Discuss different types of distortions present in an amplifier and point out second harmonic distortion.	6M	CO2	L2
(b)	Classify the power amplifier with respect to position of operating point on DC load line and with respect to conduction angle.	6M	CO2	L2
	(OR)			
4(a)	Compare the power amplifiers in all aspects.	6M	CO2	L2
(b)	Demonstrate the Cross over distortion problem of Class-B power amplifier with neat circuit and wave forms.	6M	CO2	L2
5(a)	Explain the concept of current series feedback amplifier with neat block diagram.	6M	CO2	L3
(b)	An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, determine the value of open-loop gain A and feedback factor β.	6M	CO2	L3
	(OR)			
6(a)	Discuss the concept of feedback with neat block diagram. And compare the effect of negative feedback on amplifier parameters.	6M	CO2	L2
(b)	An RC coupled amplifier has a mid frequency gain of 200 and a frequency response from 100 Hz to 20 kHz. A negative feedback network with β=0.02 is incorporated into the amplifier circuit. Develop the new system performance.	6M	CO2	L3
7.	Derive an equation for frequency of oscillations in RC phase shift oscillator by using BJT.	12M	CO3	L3
	(OR)			
8(a)	In a transistorized Hartley oscillator, the two inductances are 2mH and 20 μH while the frequency is to be changed from 950 kHz to 2050 kHz. Calculate the range over which the capacitance need to be varied.	6M	CO3	L3
(b)	Classify the oscillators with respect to frequency of operation and method of generation.	6M	CO3	L2
9(a)	Illustrate the positive peak clamper circuit with and without reference voltage.	6M	CO4	L3
(b)	Demonstrate a circuit to transmit that part of a sine wave which lies between +4V and +8V and explain its working. (peak value of sinusoidal signal is 10V).	6M	CO4	L3
	(OR)			
10(a)	Analyze the response of low pass RC circuit excited by a step input and also derive an expression for rise time.	6M	CO4	L3
(b)	Explain how a low pass RC circuit acts an integrator. What are the limitations?	6M	CO4	L2

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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

17EE09-ELECTRICAL MACHINES-I
(EEE)

Time : 3 hours Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	Explain the principle of energy conversion. Develop the model of an electro mechanical conversion device from a consideration of the various energies involved.	6M	CO1	L2
(b)	What do you understand by line commutation, under commutation and over commutation?	6M	CO1	L2
	(OR)			
2(a)	A 8-pole, 1500rpm DC series generator with 778 lap-connected armature conductors supplies a load of 12Ω resistance and 90V at its terminals. The armature, field resistances are 0.4Ω and 0.9Ω respectively. Calculate i) armature current ii) induced emf and flux per pole.	6M	CO1	L3
(b)	Explain how the direct current voltage is generated by the action of commutator. Give the constructional details of the commutator with neat sketches.	6M	CO1	L2
3(a)	Explain the significance of knowing critical field resistance and critical speed.	6M	CO2	L2
(b)	A 4-pole, 110V, 1000rpm, lap connected, shunt generator with 144 conductors has field resistance of 45Ω. Open circuit characteristics is given below.	6M	CO2	L3

I_f (A)	0	0.5	1	1.5	2	2.5	3
V_{OC} (V)	5	50	85	102	112	116	120

Find open circuit voltage and critical field resistance.

	(OR)			
4(a)	Mention the reasons for the compounding of DC generator. Neatly sketch and explain the external characteristics of a DC compound generator.	6M	CO2	L2
(b)	A 240V, 36 kW DC generator has 500 field turn per pole. On no-load, the generator voltage of 240 is obtained with a field current of 2A. For maintaining 240V at full load and the same speed the field current required is 3.2 A. Calculate the number of series field winding turns per pole required for level compounding.	6M	CO2	L3
5(a)	What are the losses that occur in DC machines? How they vary if load increases?	6M	CO2	L2

(b)	A 400V, shunt motor runs at 500 rpm taking a current of 50A. calculate the speed and percentage change in torque if the load is reduced so that the motor is taking 40A. the resistances of the armature and shunt field circuits are 0.6Ω and 250Ω respectively.	6M	CO2	L3
	(OR)			
6(a)	Describe the applications of DC shunt, series and compound motors.	6M	CO2	L2
(b)	Two identical DC machines when tested by Hopkinson's method gave the following test results: field currents are 2.5 A and 2 A. Line voltage is 220V. Line current including both the field currents is 10A. Motor armature current is 73A. The armature resistance of each machine is 0.05Ω. Calculate the efficiency of both the machines.	6M	CO2	L3
7(a)	Define a transformer. How is the energy transferred from one circuit to another? Distinguish between primary and secondary windings.	6M	CO2	L2
(b)	A 200V, 60 Hz single phase transformer has hysteresis and eddy current losses of 250w and 90w respectively. If the transformer energized from 230V, 50Hz supply, calculate its core losses. Assume Steinmentz's constant equal to 1.6.	6M	CO2	L3
	(OR)			
8(a)	In open circuit test, the ohmic losses are negligible in comparison with normal core losses, in short circuit test, the core loss is negligible in comparison with full load ohmic losses. Explain.	6M	CO2	L2
(b)	A 5KVA, 1000/200V, 50Hz single phase transformer gave the following test results: OC test (LV side) 200V 1.2A 90w SC test (HV side) 50V 5A 110w Compute the parameters of the approximate equivalent circuit referred to LV side. Also draw the exct equivalent circuit referred to LV side.	6M	CO2	L3
9(a)	Why are tap changing transformers required? Explain the operation of no-load tap changing transformer.	6M	CO3	L2
(b)	A 3-phase step down transformer is connected to 6.6kV mains and takes 10A. Calculate the secondary line voltage, line current and output power at 0.8p.f for the Δ/Δ connection. The primary to secondary turns ratio is 12.	6M	CO3	L3
	(OR)			
10(a)	Discuss the various possible poly phase connection with three winding transformers.	6M	CO3	L2
(b)	Explain in detail the working of on-load and off-load tap changing transformer.	6M	CO3	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

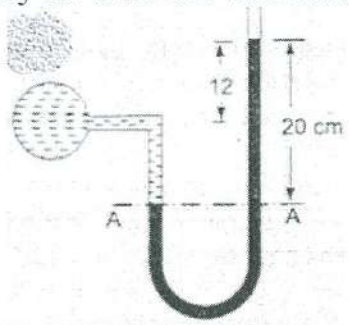
B.Tech. (IV Semester) Regular/Supplementary Examinations

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)	Deduce the expression for capillary Rise and Fall.	6M	CO1	L2
(b)	Define the following properties of fluids. (i) Surface tension (ii) Capillarity (iii)Density	6M	CO1	L1
	(OR)			
2(a)	Deduce an expression for absolute pressure difference using U-tube differential manometer, when two pipes are at same level.	6M	CO3	L3
(b)	The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr.0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in right limb. Find the pressure of fluid in the pipe if the difference of mercury level in the two limbs is 20 cm.  	6M	CO3	L3
3(a)	Deduce the Bernoulli equation from Euler's equation?	6M	CO2	L3
(b)	A pitot tube placed in the centre of a 300mm pipe line has one orifice pointing upstream and other perpendicular to it. The mean velocity in the pipe is 0.8 of the central velocity. Find the discharge through the pipe if the pressure difference between the two orifices is 60mm of water. Take the coefficient of pitot tube as C_v=0.98.	6M	CO3	L3
	(OR)			
4(a)	Illustrate venturimeter with neat sketch.	6M	CO3	L2
(b)	Explain the working principle of Orificemeter.	6M	CO3	L2
5(a)	The resisting force 'R' of a supersonic plane during flight can be considered as dependent upon the length of the aircraft, velocity 'V', air viscosity 'μ' , air density 'ρ' , bulk modulus of air 'k'. Express the functional relation between these variables and resisting force.	6M	CO4	L3

(b)	A pipe of diameter 1.5m is required to transport an oil of specific gravity 0.9 and viscosity 3×10^{-2} poise at the rate of 3000 lit/sec. Tests were conducted on 15cm diameter pipe using water at 20°c . Find the velocity and rate of flow in the model. Viscosity of water at 20°c is 0.01poise.	6M	CO4	L3
	(OR)			
6(a)	State and formulate the Buckingham's π-Theorem.	6M	CO4	L1
(b)	Define the following Forces acting in moving Fluid. (i) Inertia Force (ii) Viscous Force (iii) Gravity Force (iv) Pressure Force	6M	CO4	L1
7(a)	A Francis turbine with overall efficiency 75% is required to produce 148.25 kw power. It is working under a head of 7.62m. The peripheral velocity is $0.26\sqrt{2gH}$the radial velocity of flow at inlet is $0.96\sqrt{2gH}$. The wheel runs at 150 rpm under hydraulic loses in turbine are 22% of the available energy. Determine the guide blade angle (α).	6M	CO5	L3
(b)	Illustrate the main parts of a Kaplan turbine.	6M	CO2	L2
	(OR)			
8(a)	Explain the classification of hydraulic Turbines.	6M	CO2	L2
(b)	Two jets strike the buckets of a pelton wheel, which is having shaft power as 15450 kw. The diameter of each jet is given as 200 mm. If the net head on the turbine is 400m, find the overall efficiency of the turbine. Take C_v=1.	6M	CO5	L3
9(a)	The internal and external diameters of the impeller of a centrifugal pump are 200mm and 400mm respectively. The pump is running at 1200rpm. The vane angles of the impeller at inlet and outlet are 20^0 and 30^0 respectively. The water enters the impeller radially and velocity of flow is constant. Determine the work done by the impeller per unit weight of water.	6M	CO5	L3
(b)	A double-acting reciprocating pump,running at 40r.p.m., is discharging 1.0 $m^3$of water per minute. The pump has a stroke of 400 mm. The diameter of the piston is 200mm. The delivery and suction head are 20m and 5m respectively. Find the slip of the pump and power required to drive the pump.	6M	CO5	L3
	(OR)			
10(a)	Discriminate the advantages and disadvantages of centrifugal pump.	6M	CO2	L2
(b)	Illustrate the working of centrifugal pump.	6M	CO5	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

17EI03-ELECTRICAL AND ELECTRONICS MEASUREMENTS

(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)	Explain different types of torques in measuring instruments.	6M	CO1	L2
(b)	What are the various errors that occur in measurements and how can they be compensated?	6M	CO1	L1
	(OR)			
2(a)	What are the basic requirements for electrical measuring instruments Explain?	6M	CO1	L1
(b)	Explain the concepts of standardization and calibration.	6M	CO1	L2
3(a)	With a neat sketch, explain the working of three phase dynamo meter type power factor meter.	6M	CO2	L2
(b)	An energy meter is designed to make 100 revolutions of the disc for one unit of energy. Calculate the number of revolutions made by it, when connected to a load carrying 40 A at 230V and 0.4 p.f. for 1 hour. If it actually makes 360 revolutions, find the percentage error.	6M	CO2	L3
	(OR)			
4(a)	Extend the range of dc ammeter using PMMC and discuss its calibration.	6M	CO2	L2
(b)	The dimensions of the coil of a PMMC voltmeter are 4 cm×2.6 cm. The numbers of turns in the coil are 80 and the flux density in the gap is 0.15T. The resistance of the instrument is 15000 Ω. Calculate the deflecting torque produced in the instrument when a voltage of 300 V is applied to its terminals.	6M	CO2	L3
5(a)	Describe the circuit of Kelvin double bridge used for measurement of low resistance. Derive the conditions for balance.	6M	CO3	L2
(b)	A bridge consists of arm ab, a choke coil having a resistance R1 and inductance L1. arm bc a non-inductive resistance R3. When this bridge is fed from a source of 500Hz, balance is obtained under following conditions: R2=2410 Ω, R3=750 Ω, C4=0.35μF, R4=64.5 Ω. The series resistance of capacitance is =0.4 Ω. Calculate the resistance and inductance of the choke coil. The supply is connected between a and c and the detector is between b and d.	6M	CO3	L3
	(OR)			

6(a)	Draw the circuit diagram of Wien's bridge and explain the measurement procedure for measuring unknown frequency using this bridge. Derive the formula used.	6M	CO3	L2
(b)	The four arms of a Hay's bridge are arranged as follows: AB is a coil of unknown impedance; BC is a non-reactive resistor of 100Ω ; CD is a non- reactive resistor of 833Ω in series with a standard capacitor of 0.38μF; DA is non-reactive resistor of 16800Ω. If the supply frequency is 50 Hz, determine the inductance and the resistance at the balanced conditions.	6M	CO3	L3
7(a)	What are the considerations required to be taken into account while selecting an electronic voltmeter and What are the advantages of electronic voltmeter over the other voltmeter?	6M	CO4	L1
(b)	Explain the concept of resolution and sensitivity.	6M	CO4	L2
	(OR)			
8(a)	What are the different types of digital voltmeters? With block diagram explain the operation of "Ramp type" digital voltmeter.	6M	CO4	L2
(b)	A 20 V dc voltage is measured by analog and digital multimeters. The analog instrument is on its 25 V range, and its specified accuracy is ± 2%. The digital meter has 3 ½ digit display and an accuracy of ±(0.6+1). Determine the measurement accuracy in each case.	6M	CO4	L3
9(a)	With a neat diagram explain the internal structure of CRO.	6M	CO5	L2
(b)	Explain the working of Frequency Selective Wave Analyzer with block diagram.	6M	CO5	L2
	(OR)			
10(a)	Describe the measurement of frequency, phase angle and time delay using oscilloscope with suitable diagrams and mathematical expressions.	6M	CO5	L2
(b)	What is meant by strip chart recorders? Explain the working of galvanometer type strip chart recorders.	6M	CO5	L2

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

17EI04-INDUSTRIAL INSTRUMENTATION

(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)	Select a suitable passive type Accelerometer and describe the operation to measure vibrations of an object.	6M	CO3	L3
(b)	Compare any one Mechanical Accelerometer and Electrical Accelerometer.	6M	CO2	L2
	(OR)			
2(a)	What is the relation between displacement, velocity and acceleration? How do you differentiate Linear displacement and angular displacement? Units? List out various transducers to measure Linear and angular Velocity.	6M	CO1	L1
(b)	How do you measure un-known angular velocity of rotating object? Draw the diagram of Photo-Electric Transducer and elaborate working operation with an example.	6M	CO2	L2
3(a)	What are the various types of load cells used in Industry? Describe the working principle and operation of Strain Gauge with neat diagrams.	6M	CO2	L2
(b)	What is the relation between Force and Torque? Units? List out various Force and Torque Transducers and Identify Mechanical and Electrical Transducers.	6M	CO1	L1
	(OR)			
4(a)	Select a suitable Active type force Transducers, which can measure only Dynamic Force and describe the working principle and operation with neat diagram.	6M	CO3	L3
(b)	Compare Mechanical and Electrical dynamometers.	6M	CO2	L2
5(a)	What are the various types of manometers? Describe the operation anyone with neat diagrams.	6M	CO2	L2
(b)	Select a suitable passive type Electrical pressure transducer to measure differential pressure and elaborate its working operation with neat diagram.	6M	CO3	L3
	(OR)			
6(a)	How do you Measure Vacuum? Select a suitable vacuum Measurement device, which works based on principle of thermal conductivity and describe its operation with neat diagrams.	6M	CO3	L3
(b)	Distinguish between Primary Pressure Transducer and Secondary Pressure Transducer.	6M	CO4	L2
7(a)	Describe the operation of Nutating Disc Flow meter with neat diagram.	6M	CO2	L2
(b)	Compare Variable Head Meter and Variable Area Meter. For better visualization, which one is used?	6M	CO2	L2
	(OR)			
8(a)	Select a suitable Flow meter to measure Blood flow and elaborate its working principle and operation with neat diagram.	6M	CO3	L3
(b)	Distinguish between Venturi meter and Orifice Plate. Which one is mostly used in Industry? Why?	6M	CO4	L2
9(a)	What are various types of Temperature Scales? How do you convert? Discuss with an examples.	6M	CO2	L2
(b)	Select a suitable Passive type Transducer to measure low temperature and describe the working operation with neat diagrams.	6M	CO3	L3
	(OR)			
10(a)	Select a suitable temperaturetransducer to measure the temperature above 10000^{0}C and describe its working operation with neat diagrams.	6M	CO3	L3
(b)	Compare a Mechanical and Electrical Temperature Transducer.	6M	CO2	L2

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(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)	Define signal and discuss continuous time, analog, discrete time and digital signals with suitable graphs.	6M	CO1	L2
(b)	Apply convolution operation and compute the signal y(t) = x(t)*h(t), given that x(t) = u(t-1)-u(t-4) and h(t) = u(t-2)-u(t-3).	6M	CO2	L3
	(OR)			
2(a)	Compare the following signals with suitable examples (i) Causal and Non-causal signals (ii)Bounded and Un-bounded signals (iii)Deterministic and Random signals.	6M	CO1	L2
(b)	Draw the graphical representation of y(t)=4x(-2t+3), given that x(t)=u(t+1)+u(t-1)-u(t-2)-u(t-3).	6M	CO1	L3
3(a)	Discuss the properties of complex exponential Fourier series.	6M	CO2	L2
(b)	Evaluate the value of summation $\sum_{n=0}^{\infty}\frac{1}{n^2}$, if x(t) = t for 0<t<1with a fundamental time period of T=1.	6M	CO3	L3
	(OR)			
4(a)	Describe the representation of a periodic signal using Fourier series over entire interval.	6M	CO3	L2
(b)	Determine the complex exponential Fourier series coefficient Cn for n≠0 of a continuous time periodic signal $x(t)=1-2\|t\|, for \|t\|<1/2.$	6M	CO4	L3
5(a)	State and prove time reversal and conjugation properties of Fourier transform.	6M	CO2	L2
(b)	Calculate the Fourier transform of a signal $x(t)=\frac{45}{(4+9t^2)(9+4t^2)}$	6M	CO4	L3
	(OR)			
6(a)	Derive the expression for Fourier Transform of a periodic signal.	6M	CO2	L2
(b)	Determine the output of a low pass filter, when the input message signal m(t)=10Cos(2πx4x10³t)+6 Cos(2πx6x10³t) is sampled at a sampling frequency fs=5kHz is transmitted through low pass filter with cutoff frequency 2kHz.	6M	CO2	L3

7(a)	Differentiate continuous time systems with discrete time systems with an example.	6M	CO3	L2
(b)	Examine the continuous time system $y(t)=\frac{d}{dt}x(t)+\frac{d^2}{dt^2}x(t)$ for Linearity, Time invariance and BIBO stability.	6M	CO3	L3
	(OR)			
8(a)	Discuss ideal and practical filter characteristics of linear systems with necessary diagrams.	6M	CO1	L2
(b)	Evaluate Bandwidth and rise time of a RC low pass filters and obtains the relation between them.	6M	CO3	L2
9(a)	Illustrate the concept of relation between Laplace transform and Fourier transform.	6M	CO1	L2
(b)	A LTI system described by differential equation $\frac{d}{dt}(y(t))+4y(t)+3\int_{-\infty}^{t}y(\tau)d\tau=x(t)$ then calculate the system function, Impulse response h(t) and response of a system for an input of x(t)=u(t)+δ(t).	6M	CO4	L3
	(OR)			
10(a)	Describe the concept of ROC and with its properties.	6M	CO1	L2
(b)	Evaluate the causal signal x(t) from its s-domain $X(s)=\frac{s^2}{(s^2+16)(s^2+36)}$.	6M	CO4	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

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)	Obtain the output equation of a low pass RC circuit when the pulse input is applied and also sketch the all input and output waveforms.	6M	CO1	L3
(b)	An RC differentiator circuit is driven from a 1KHz symmetrical square wave of 12V Peak-to peak. Calculate the output voltage levels under steady state if RC = 1msec	6M	CO1	L3
	(OR)			
2(a)	A symmetrical square wave whose peak-to-peak amplitude is 2V and whose average value is zero is applied to an RC integrating circuit. The time constant of the circuit is equal to half the period of the square wave. Outline the peak-to-peak value of the output amplitude.	6M	CO1	L3
(b)	Derive the expression for the output of high pass RC circuit excited by a step input, and plot the output waveforms.	6M	CO1	L3
3(a)	Develop a circuit to transmit that part of a sine wave which lies between -4V and +7V and explain its working.	6M	CO2	L3
(b)	Discuss the negative peak clamper with its operation.		CO2	L2
	(OR)			
4(a)	Identify about transistor clippers with necessary waveforms.	6M	CO2	L1
(b)	A 100V peak square wave with an average value of 0V and a period of 20ms is to be negatively clamped at 25V. Plan the input and output waveforms and necessary circuit diagram.	6M	CO2	L3
5(a)	For a common emitter circuit, V_{cc} = 15V, R_C =1.5K Ω and I_b=0.3mA. Determine the value of h_{FE}(min) for saturation to occur.	6M	CO3	L3
(b)	With the help of neat circuit diagram, explain the working principle of bistable multi vibrator with necessary wave forms at both bases and collectors.	6M	CO3	L2
	(OR)			
6(a)	Describe the concept of transistor switch.	6M	CO3	L2
(b)	Illustrate a fixed bias Bi stable multivibrator to meet the following specifications. $V_{cc}=V_{bb}=12V, I_c(sat)=6mA, h_{FE}(min)=25$.	6M	CO3	L3
7(a)	With the help of neat circuit diagram and waveforms, Model the working of a Schmitt trigger.	6M	CO4	L2
(b)	Derive the expression for voltage to time converter as mono stable multivibrator.	6M	CO4	L3
	(OR)			
8(a)	A Schmitt trigger has the following circuit components $R_1=R_2$ =20KΩ, $R_{C1}=R_{C2}$=5KΩ and R_e=2KΩ. The supply voltage is 15V. For the n-p-n, Si transistors used h_{FE}=100. Identify UTP and LTP values.	6M	CO4	L3
(b)	If R_1=20 KΩ, R_2 =10KΩ and $C_1=C_2$=0.01μF. Simplify the frequency and duty cycle of Astable output.	6M	CO4	L3
9(a)	Classify the different type of error related to time base generators.	6M	CO5	L2
(b)	Discuss the cancellation of pedestal in a sampling gate with suitable circuit diagram.	6M	CO5	L2
	(OR)			
10(a)	Discuss the time base generators.	6M	CO5	L2
(b)	Discuss the circuit diagram of bidirectional sampling gate using transistor with explanation.	6M	CO5	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

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)	Explain how tables are created using HTML.	6M	CO1	L2
(b)	Describe various HTML formatting tags.	6M	CO1	L2
	(OR)			
2(a)	Write about various objects used in Java Script.	6M	CO1	L1
(b)	What is Java Script form validation?	6M	CO1	L1
3(a)	Explain various types of XMI schemes.	6M	CO2	L2
(b)	What is DOM and SAX in XML?	6M	CO2	L1
	(OR)			
4(a)	Discuss Java beam API.	6M	CO2	L2
(b)	Explain advantage of java beam.	6M	CO2	L2
5.	Discuss various types of drivers used in JDBC.	12M	CO3	L2
	(OR)			
6.	Explain data base operations using JDBC.	12M	CO3	L2
7(a)	What is servlet config?	6M	CO4	L1
(b)	What are the phases of servlet life cycle?	6M	CO4	L4
	(OR)			
8(a)	Discuss about servlet context object.	6M	CO4	L2
(b)	What is HTTP servlet? Differentiate doGet()&doPost() Methods.	6M	CO4	L1
9(a)	Discuss Debugging in JSP.	6M	CO5	L2
(b)	Explain implicit objects in JSP.	6M	CO5	L2
	(OR)			
10(a)	What is overview of MVC design pattern?	6M	CO5	L2
(b)	Discuss about struts.	6M	CO5	L2

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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

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)	What is Register Transfer Language? Elaborate few RTL statements with their functioning.	6M	CO1	L2
(b)	Draw the block diagram of Von-Neumann Architecture and give its advantages.	6M	CO1	L2
	(OR)			
2(a)	Design a 4-bit Adder/Subtractor circuit which performs both addition and subtraction operations.	6M	CO1	L2
(b)	Design a digital circuit that performs four logic operations Exclusive NOR, Exclusive OR, NOR, NAND.Use two selection variables and show the logic diagram of one typical stage.	6M	CO1	L2
3(a)	List out the Data manipulation instructions with mnemonics.	6M	CO2	L1
(b)	What is the purpose of Program Control Instructions? List the typical Program Control Instructions with mnemonics.	6M	CO2	L2
	(OR)			
4.	Demonstrate Binary Addition and subtraction with signed magnitude data with a flowchart.	12M	CO2	L2
5(a)	Discuss about address sequencing capabilities in control memory in detail	6M	CO3	L2
(b)	Distinguish between Hardwired control unit and Micro-programmed control unit.	6M	CO3	L2
	(OR)			
6(a)	What are the methods for designing a control unit? Give the general configuration of a micro-programmed control unit.	6M	CO3	L2
(b)	Give a format of microinstruction. How could an instruction code be mapped into micro-instruction address?	6M	CO3	L3
7(a)	Illustrate aboutmemory hierarchy in computer system.	6M	CO4	L2
(b)	Demonstrate associative memory in detail?	6M	CO4	L2
	(OR)			
8.	Demonstrate the different mapping techniques used in cache memory and give their advantages and disadvantages.	12M	CO4	L2
9(a)	With a neat diagram, explain the strobe control data transfer method and state its disadvantages.	6M	CO5	L2
(b)	With a neat diagram, explain the handshaking data transfer method and state its advantages.	6M	CO5	L2
	(OR)			
10(a)	Illustrate the concept of DMA controller in a computer.	6M	CO5	L2
(b)	Explain about the techniques to handle a hardware priority interrupt.	6M	CO5	L2

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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)	Show that $\neg(P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Leftrightarrow (\neg P \vee Q)$	6M	CO1	L3
(b)	Show that $(\exists x)(P(x) \wedge Q(x)) \Rightarrow (\exists x)P(x) \wedge (\exists x)Q(x)$	6M	CO1	L3
	(OR)			
2(a)	Apply rules of inference, to prove that R is a valid inference from the premises $P \rightarrow Q, Q \rightarrow R$ and P.	6M	CO1	L3
(b)	Describe the derivation of the implication $(x)(H(x) \rightarrow M(x)) \wedge H(s) \Rightarrow M(s)$	6M	CO1	L3
3(a)	Show that R={(x,y) | (x-y) is divisible by 3} on set $X = \{1,2,3,4,5,6,7\}$ is an equivalence relation.	6M	CO2	L3
(b)	Draw the Hasse diagram for the divisibility relation defined on set A={2,3,6,12,24,36}, check whether the relation R is POSET or not.	6M	CO2	L2
	(OR)			
4(a)	Calculate the transitive closure of a relation R={(a,b), (b,c), (c,a)} on set X={a, b, c}.	6M	CO2	L3
(b)	Let f, g and h be the three functions from R to R defined by f(x)=x+2,g(x)=x-2,h(x)=3x. Find g o f, f o g, f o f, g o g, f o h, h o g, h o f.	6M	CO2	L3
5(a)	Explain the construction of a Hamiltonian graph with an example.	6M	CO3	L2
(b)	Examine whether there is a simple graph with degree sequence (1,1,3,3,3,4,6,7).	6M	CO3	L3
	(OR)			
6(a)	Calculate the chromatic number of the complete graph k_n with n vertices.	6M	CO3	L3
(b)	Differentiate Prim's algorithm and Kruskal's algorithm to find minimum spanning tree.	6M	CO3	L2
7(a)	Show that $(Z, +)$ is an abelian group.	6M	CO2	L3
(b)	Use the properties of binary operations to show that (Z,*) is a group where * is defined by a*b = a+b+1.	6M	CO2	L3
	(OR)			
8.	Apply Pigeonhole principle to show that there is some pair of 8 distinct integers $x_1, x_2, \ldots\ldots, x_8$ with the same remainder when divided by 7.	12M	CO5	L3
9(a)	Solve the recurrence relation $a_n = ca_{n-1} + f(n)$ for $n \geq 1$.	6M	CO2	L3
(b)	Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 0$ for $n \geq 2$ by generating functions.	6M	CO2	L3
	(OR)			
10(a)	Solve the recurrence relation $a_n - 6a_{n-1} + 12a_{n-2} - 8a_{n-3} = 0$ for $n \geq 3$ by generating functions.	6M	CO2	L3
(b)	Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = 0$ where $a_0 = 2$ and $a_1 = 5$ by the method of characteristic roots.	6M	CO2	L3

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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)	Develop a Python script to calculate number of seconds in a day.	[6M]	CO1	L3
(b)	How would you classify literals and explain with the help of examples?	[6M]	CO1	L2
	(OR)			
2(a)	Identify Membership and Identity operators with examples.	[6M]	CO1	L2
(b)	Develop a Python script to read person's age from keyboard and display whether he is eligible for voting or not.	[6M]	CO1	L3
3(a)	Explain the following: (i) Import (ii) random().	[6M]	CO2	L2
(b)	Develop a Python Script to check given year is Leap year or not.	[6M]	CO2	L3
	(OR)			
4(a)	Identify the need of a List. And discuss about creation of a list and accessing elements of a list with example.	[6M]	CO2	L2
(b)	Develop a Python script to create a list of both positive and negative integers. Create a new list with only positive numbers.	[6M]	CO2	L3
5(a)	Discuss the following with examples: (i) Triple Quotes (ii) Raw Strings (iii) Unicode.	[6M]	CO3	L2
(b)	What is a string? How to create a string in Python? Explain comparison of strings using comparison operators with examples.	[6M]	CO3	L2
	(OR)			
6(a)	Construct a function that generates Fibonacci sequence using recursion.	[6M]	CO3	L3
(b)	Compare Built-in, User-defined and Anonymous/Lambda functions with suitable examples.	[6M]	CO3	L2
7(a)	Compare Tuple and list. Give syntax for creating a tuple and accessing elements in a tuple with suitable examples.	[6M]	CO4	L2
(b)	Solve the following code: t = (1, 2, 3, 7, 9, 0, 5) (i) print(t) (ii) print(t[0]) (iii) print(t[1: 3]) (iv) print(t[-1]) (v) print(sum(t)) (vi) print(len(t))	[6M]	CO4	L3
	(OR)			
8(a)	Examine the reading and writing operations in sequential files with examples.	[6M]	CO4	L2
(b)	Develop a Python script to copy file contents from one file to another.	[6M]	CO4	L3
9(a)	Apply Bubble sort technique to sort the following elements: 30, 52, 29, 87, 63, 27, 18, 54.	[6M]	CO5	L3
(b)	Construct a Python script to check the element is in the list or not by using Binary Search using recursion.	[6M]	CO5	L3
	(OR)			
10(a)	Elaborate the following blocks with suitable examples: (i) try (ii) except (iii) raise (iv) finally.	[6M]	CO5	L2
(b)	Identify the benefits of exception handling. How do you raise an exception?	[6M]	CO5	L3

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

17IT02-OBJECT ORIENTED ANALYSIS AND DESIGN

(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)	Why analysis is a difficult activity in OOAD?	6M	CO1	L1
(b)	Illustrate the activity diagram of library management system.	6M	CO1	L2
	(OR)			
2(a)	List the guidelines for identifying the actors and identify the differences between users and actors.	6M	CO1	L1
(b)	What are the guidelines for finding the use case? List the steps of object oriented analysis process.	6M	CO1	L1
3.	Make use of "extends" relationship to design use case diagram for library management system.	12M	CO2	L2
	(OR)			
4(a)	Compare static and dynamic models. List the primary goals in the design of the UML.	6M	CO2	L2
(b)	Explain the different models available and define model.	6M	CO2	L2
5(a)	Illustrate super-sub class relationships and its advantages.	6M	CO3	L2
(b)	Summarize aggregation and its two major properties. Elaborate with an example.	6M	CO3	L2
	(OR)			
6(a)	Construct class diagram for the hospital management system.	6M	CO3	L2
(b)	Construct use case diagram and activity diagram for the digital library system.	6M	CO3	L3
7(a)	Describe the UML state chart and activity diagram with an example.	6M	CO4	L2
(b)	Identify the flow of steps for sequence diagram and collaboration diagram.	6M	CO4	L2
	(OR)			
8(a)	Construct the interaction diagram for banking system.	6M	CO4	L3
(b)	Construct the state chart diagram for banking system.	6M	CO4	L2
9(a)	How can extensibility of the UML be provided?	6M	CO5	L1
(b)	Construct deployment diagram for library management system, online reservation system.	6M	CO5	L2
	(OR)			
10(a)	Show refining attributes for the VIANET Bank objects.	6M	CO5	L2
(b)	List the design issues in OOAD.	6M	CO5	L1

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

17PD03-PROFESSIONAL ETHICS AND HUMAN VALUES
(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)	Recall Kohlberg's theory with an example.	6M	CO2	L2
(b)	List and give a detail note on various steps to be taken in dealing with moral dilemma.	6M	CO2	L1
	(OR)			
2(a)	Examine different types of inquiry.	6M	CO2	L2
(b)	Summarize different models of professional roles.	6M	CO2	L2
3(a)	Elaborate the concepts of Co-operation and Commitment.	6M	CO1	L2
(b)	What is Civic Virtue? And describe the importance of respect for others.	6M	CO1	L1
	(OR)			
4(a)	Define Valuing time. Explain the concept of Empathy.	6M	CO1	L1
(b)	Discuss about the concepts of work ethics and service learning.	6M	CO1	L2
5.	Compare and contrast engineering experiments with standard experiments.	12M	CO5	L2
	(OR)			
6(a)	Determine various functions of code of ethics with suitable examples.	6M	CO3	L3
(b)	Interpret various types of Industrial Standards.	6M	CO5	L1
7(a)	Describe Occupational Crimes in detail.	6M	CO3	L2
(b)	How the excellent team work can be achieved with subordinates and colleagues?	6M	CO3	L2
	(OR)			
8(a)	Explain in detail about Human Rights.	6M	CO3	L2
(b)	Write about two senses and obligations of loyalty.	6M	CO3	L1
9(a)	Discuss the significance of Environmental Ethics.	6M	CO5	L2
(b)	What is Globalization, elaborate the ethics related to multinational corporations?	6M	CO5	L1
	(OR)			
10(a)	Illustrate the role of an engineer in weapons development.	6M	CO5	L2
(b)	Why Code of ethics is important for Engineers?	6M	CO3	L2

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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)	Solve the following LP problem graphically maximize $Z=8000x_1+7000x_2$ Subjected to $3x_1+x_2 \le 66$, $x_1+x_2 \le 45$, $x_1 \le 20$, $x_2 \le 40$ and $x_1,x_2 \ge 0$.	6M	CO1	L3
(b)	Discuss the advantages and limitations of Operations Research.	6M	CO1	L2
	(OR)			
2.	Use simplex method to obtain the maximize value of $Z = 3x_1+2x_2+5x_3$, Subjected to $x_1+2x_2+x_3 \le 430$, $3x_1+2x_3 \le 460$, $x_1+4x_2 \le 420$, x_1, x_2 and $x_3 \ge 0$.	12M	CO1	L3
3(a)	Describe various initial basic feasible methods for solving transportation problems.	6M	CO2	L2
(b)	Solve the following problem and find the initial basic feasible solution using VAM method.	6M	CO2	L3
	(OR)			
4(a)	A company operates in four territories and four salesmen available for an assignment. The matrix is given having territories I, II, III, IV & salesmen A, B, C, D. Find maximum expected total sales and assign best salesmen to richest territory and verify this answer by assignment technique.	6M	CO2	L3

	D1	D2	D3	D4	Supply
O1	6	4	1	5	14
O2	8	9	2	7	16
O3	4	3	6	2	5
Demand	6	10	15	4	

	Territory				
		I	II	III	IV
Salesmen	A	42	35	28	21
	B	30	25	20	15
	C	30	25	20	15
	D	24	20	16	12

(b)	Solve the following transportation problem and find optimal transportation cost.	6M	CO2	L3

	A	B	C	Supply
P	7	3	6	5
Q	4	6	8	10
R	5	8	4	7
S	8	4	3	3
Demand	5	8	10	

5(a)	Explain the dominance principle for reducing payoff matrix with suitable example.	6M	CO3	L2
(b)	Solve the following 2x5 game by graphical method.	6M	CO3	L3

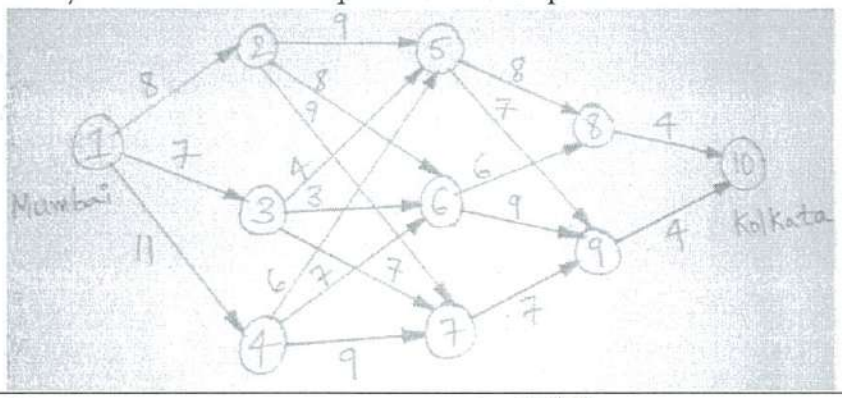
	Player B					
		1	2	3	4	5
Player A	1	-5	5	0	-1	8
	2	8	-4	-1	6	-5

(OR)

6.	The cost of a machine is Rs.6, 300 and its scrap value is Rs 300. The maintenance costs found from experience are as following .When should the machine be replaced?	12M	CO3	L3

Year	1	2	3	4	5	6	7	8
Maintenance Cost(Rs.)	100	250	400	600	900	1,200	1,600	2,000

7(a)	A self-service store employs one cashier at its counter. An average of ten customers arrives every 6 minutes while the cashier can serve 12 customers in 6 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service rate, find (i) Average number of customers in the system. (ii) Average number of customers in the queue or average queue length.	6M	CO3	L3
(b)	Discuss the necessity of inventory management.	6M	CO3	L2
	(OR)			
8(a)	A particular item has a demand of 9000 units per year. The cost of one procurement is Rs. 100 and the holding cost per unit is Rs. 2.40 per year. The cost of shortage is Rs. 5 per unit per year. Determine (i) the economic lot size, (ii)the number of orders per year, (iii) the time between orders.	6M	CO4	L3

(b)	Annual demand for an item is 6000 units. Ordering cost is Rs. 600 per order. Inventory carrying cost is 18 % of the purchase price per unit per year. The price break up is as shown below. Find the optimal order quantity. **Quantity** | **Price** $0 \le q_1 \le 2000$ | 20 $2000 \le q_2 < 4000$ | 15 $4000 \le q_3$ | 9	6M	CO4	L3
9.	A salesman is planning a business tour from Mumbai to Kolkata in the course of which he proposes to cover one city from each of the company's different marketing zones en route. As he has limited time at his disposal, he has to complete his tour in the shortest possible time. The network in figure shows the number of days' time involved for covering any of the various intermediate cities (time includes travel as well as working time).Determine the optimum tour plan. 	12M	CO5	L3
	(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. 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	12M	CO5	L3

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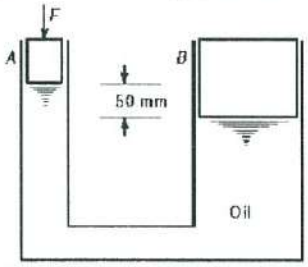
B.Tech. (IV Semester) Regular/Supplementary Examinations

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)	A cylinder of 0.30m diameter rotates concentrically inside a fixed cylinder of 0.31m diameter. Both the cylinders are 0.3 m long. Determine the viscosity of the liquid which fills the space between the cylinder if a torque of 0.98 N.m is required to maintain an angular velocity of 2π rad/s.	6M	CO1	L3
(b)	A U-tube differential gage is attached to two sections *A* and *B* in a horizontal pipe in which oil of specific gravity 0.8 is flowing. The deflection of the mercury in the gage is 60 cm, the level nearer to *A* being the lower one. Evaluate the difference of pressure in kg(f)/ cm^2 between the sections *A* and *B*.	6M	CO1	L3
	(OR)			
2(a)	Define and distinguish between (i) Steady and unsteady flow (ii) uniform and non-uniform flow (iii) rotational and irrotational flows.	6M	CO1	L2
(b)	In the following figure the areas of the plunger *A* and cylinder *B* are 40 and 4000 cm^2 respectively. The weight of cylinder *B* is 4100 kg(f). The vessel and the connecting passages are filled with oil of specific gravity 0.750. What force *F* is required for equilibrium, if the weight of *A* is neglected? 	6M	CO1	L2
3(a)	Develop an expression to find the discharge through a orifice meter.	6M	CO2	L3
(b)	A bend in pipeline conveying water gradually reduces from 0.6 m to 0.3 m diameter and deflects the flow through angle of 60°. At the larger end the gauge pressure is 171.675 kN/m2 [1.75 kg(f)/cm2]. Evaluate the magnitude and direction of the force exerted on the bend, (i) when there is no flow, (ii) when the flow is 876 litres/s.	6M	CO2	L3
	(OR)			
4(a)	Derive Darcy's- Weisbach Equation.	6M	CO2	L3
(b)	A pipe 50mm diameter is 6 m long and the velocity of flow of water in the pipes is 2.4 m/s. What loss of head and the corresponding power would be saved if the central 2m length of pipe was replaced by 75mm diameter pipe, the change of section being sudden? Take f=0.04 for the pipes of both diameters.	6M	CO2	L1
5(a)	Define boundary layer and explain the fundamental causes of its existence. Also discuss the various methods of controlling the boundary layer.	6M	CO3	L2

(b)	The velocity distribution in the boundary layer is given as $\frac{u}{v}=\frac{3}{2}\eta-\frac{1}{2}\eta^2$ in which $\eta=\left(\frac{y}{\delta}\right)$. Determine$\left(\frac{\delta^*}{\delta}\right)$ and $\left(\frac{\theta}{\delta}\right)$.	6M	CO3	L3
	(OR)			
6(a)	Develop an equation to find the hydro dynamic force acting stationary curved vane when the jet is striking at center.	6M	CO3	L3
(b)	A jet of water moving at 15 m/s impinges on a symmetrical concave vane shaped to deflect the jet through 140^0. If the vane is moving at 6 m/s, find the angle of the jet so that there is no shock at inlet. Also determine the absolute velocity of exit in magnitude and direction and the work done per unit weight of water.	6M	CO3	L3
7(a)	A pipeline 1200 m long supplies water to 3 single jet Pelton wheels. The head above the nozzle is 360 m. The velocity coefficient for the nozzle is 0.98 and the coefficient of friction for the pipeline is 0.02. The turbine efficiency based on the head at the nozzle is 0.85. The specific speed of each turbine is 15.3 (in m, kW, r.p.m., units) and the head lost due to friction in the pipeline is 12 m of water. If the operating speed of each turbine is 560 r.p.m., determine: (i) the total power developed (ii) the diameter of each nozzle (iii) the diameter of the pipeline (iv) volume of water used per second.	6M	CO4	L3
(b)	Illustrate the working principle Pelton turbine.	6M	CO4	L2
	(OR)			
8(a)	Determine the efficiency of a Kaplan turbine developing 3000 kW under a net head of 5m. It is provided with a draft tube with its inlet (diameter 3 m) set 1.6 m above the tail race level. A vacuum gauge connected to the draft tube indicates a reading of 5 m of water. Assume draft tube efficiency as 78%.	6M	CO4	L3
(b)	A propeller turbine runner has outer diameter of 4.5 m, and the diameter of the hub 2 m. It is required to develop 20600 kW when running at 150 r.p.m., under a head of 21 m. Assuming hydraulic efficiency of 94% and overall efficiency of 88%, determine the runner vane angles at inlet and exit at the mean diameter of the vanes.	6M	CO4	L3
9(a)	Explain the different efficiencies of a centrifugal pump.	6M	CO5	L2
(b)	A centrifugal pump has to discharge 225 liters of water per second against a head 25m when the impeller rotates at a speed of 1500 rpm. Determine (i) the impeller diameter, and (ii) the vane angle at the outlet edge of the impeller. Assume that η_{mano}=0.75; the loss of head in pump in meters due to fluid resistance is $0.03V_1^2$, where V_1 m/s is the absolute velocity of water leaving the impeller, the area of the impeller outlet surface is $(1.21D_1^2)\ m^2$, where $D_1$is the impeller diameter in m, and water enter the impeller without whirl.	6M	CO5	L3
	(OR)			
10(a)	Explain the working of a double acting reciprocating pump with a neat sketch and state its advantages over a single acting pump.	6M	CO5	L2
(b)	Determine the maximum speed at which a double acting reciprocating pump can be operated under the following conditions: (i) no air vessel on the suction side; The suction lift is 4m, length of suction pipe 6.5, diameter of suction pipe 100 mm, diameter of piston 150 mm and length of stroke is 0.45 m. Assume simple harmonic motion, atmospheric pressure head as 10.3 m of water and separation occurs at 2.6 m of water absolute. Take Darcy's f= 0.024.	6M	CO5	L3

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(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)	Enumerate and explicate the steps in casting process.	6M	CO1	L2
(b)	Discuss the moulding sand properties .	6M	CO2	L2
	(OR)			
2(a)	With the help of neat sketches elucidate the types of patterns used in foundries.	6M	CO1	L2
(b)	Explicate the steps in investment casting and state its advantages over other casting processes.	6M	CO1	L2
3(a)	Describe oxyacetylene gas welding process with neat sketch.	6M	CO2	L2
(b)	Illustrate the process of Carbon Arc welding and state its advantages over other welding techniques.	6M	CO2	L2
	(OR)			
4(a)	What is electric arc welding? Sketch and explain the electric arc welding processes.	6M	CO2	L2
(b)	Differentiate Tungsten Inert Gas welding (TIG) and Metal Inert Gas (MIG) welding processes.	6M	CO2	L2
5(a)	Explicate the process of the Induction welding for conductor materials.	6M	CO3	L2
(b)	Distinguish between Brazing and soldering operations.	6M	CO3	L2
	(OR)			
6(a)	Illustrate spot welding process for thin sheets.	6M	CO3	L2
(b)	Elaborate Explosive welding process for hard metals.	6M	CO3	L2
7(a)	Differentiate hot working and cold working.	6M	CO4	L2
(b)	With neat sketches explain the Drop forging process.	6M	CO4	L2
	(OR)			
8(a)	Describe the processes of wire drawing and Tube drawing.	6M	CO4	L2
(b)	Explicate the forging operations with neat sketches.	6M	CO4	L2
9(a)	Describe the hydrostatic extrusion and write its specific applications.	6M	CO5	L2
(b)	Explain with sketches, the differences between forward extrusion and backward extrusion.	6M	CO5	L2
	(OR)			
10(a)	Differentiate the blanking and piercing operations.	6M	CO5	L2
(b)	Illustrate the blow moulding process with a neat sketch.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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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)	Derive an expression for efficiency of a Rankine vapour power cycle with T-S and P-V diagrams.	6M	CO1	L3
(b)	In a steam power cycle, the steam supply is at 15bar, dry and saturated. The condenser pressure is 0.4bar. Calculate the Carnot and Rankine efficiencies of the cycle. Neglect pump work.	6M	CO1	L3
	(OR)			
2(a)	Justify the role of a reheat cycle in improving thermal efficiency of Rankine cycle with suitable diagram.	6M	CO1	L2
(b)	Compare the merits and demerits of liquid fuels over gaseous fuels.	6M	CO1	L1
3(a)	Illustrate the working principle of a Babcock and Wilcox boiler.	6M	CO2	L2
(b)	Differentiate fire tube and water tube boilers.	6M	CO2	L2
	(OR)			
4(a)	Illustrate the working principle of Cochran boiler.	6M	CO2	L2
(b)	A boiler is equipped with a chimney of 30 m height. The ambient temperature is 25^0 C . The temperature of flue gases passing through the chimney is 300 ^{0}C. If the air flow is 20 kg per kg of fuel burnt. Evaluate the draught produced and velocity of flue gases through the chimney.	6M	CO2	L3
5(a)	List the different types of nozzles and develop an expression for exit velocity of steam from a nozzle.	6M	CO3	L3
(b)	Dry saturated steam at a pressure of 10bar enters a convergent-divergent nozzle and leaves at a pressure of 2 bar. If the flow is adiabatic and frictionless, Determine (i)The exit velocity of steam (ii)Ratio of cross-section at exit and that at throat. Assume the index of adiabatic expansion to be 1.135.	6M	CO3	L3
	(OR)			
6(a)	Classify condensers and justify the role of a condenser in a thermal power plant.	6M	CO3	L2
(b)	Demonstrate the working principle of evaporative surface condenser.	6M	CO3	L2
7(a)	Illustrate the working principle of De-Laval turbine.	6M	CO4	L2
(b)	In a De-Laval turbine, the steam issues from the nozzles with a velocity of 850 m/s. The nozzle angle is 20^0.Mean blade velocity is 350 m/s, the blades are equiangular. The mass flow rate is 1000 kg/min. Friction factor is 0.8. Determine (i) blade angles (ii) axial thrust (iii) power developed in kW (iv)blade efficiency.	6M	CO4	L3
	(OR)			
8(a)	Illustrate the working principle of reaction turbine and state its merits and demerits.	6M	CO4	L2
(b)	The nozzles of a De-Laval turbine deliver 1.5 kg steam per sec at a speed of 800 m/sec to a set of blades moving at 200 m/sec. The nozzles are inclined at 16^0 to the vane of wheel allowing blade velocity coefficient of 0.8. Calculate (i) power developed in kW (ii) Axial thrust (iii) Blade efficiency (iv) Energy lost in the friction.	6M	CO4	L3
9(a)	A single- stage reciprocating compressor takes 2.5 m^3 of air per minute at 1.013 bar and 22 ^{0}C and delivers it at 7bar. Assuming that the law of compression is $pv^{1.3}$=constant, and the clearance is negligible, calculate the indicated power.	6M	CO5	L3
(b)	Differentiate reciprocating and rotary compressors.	6M	CO5	L2
	(OR)			
10(a)	Differentiate between centrifugal and axial flow compressors.	6M	CO5	L2
(b)	Explain the working of a roots blower with a suitable diagram.	6M	CO5	L2

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

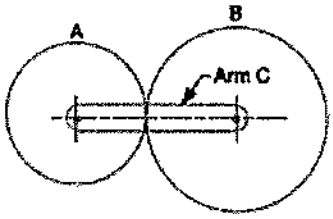
17ME10-KINEMATICS OF MACHINES

(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 kinematic pair. Classify various kinematic pairs based on relative motion. Give examples for each type.	6M	CO1	L1
(b)	Discuss the Skotch yoke mechanism with an illustration.	6M	CO1	L2
	(OR)			
2(a)	Show how the Peaucellier mechanism satisfies the condition for exact straight line motion.	6M	CO1	L2
(b)	Describe the T. Chebicheff straight-line motion mechanism with neat sketch.	6M	CO1	L2
3(a)	Derive the expression for radial and tangential components of acceleration of a rotating link.	6M	CO2	L2
(b)	A four bar chain is represented by a quadrilateral ABCD in which AD is fixed and is 0.6 m long. The crank AB = 0.3 m long rotates in a clockwise direction at 10 rad/s clockwise. The crank drives the link CD (=0.36 m) by means of the connecting link BC (= 0.36 m). The angle BAD = 60°. Using graphical method, determine the angular velocities of CD and BC.	6M	CO2	L3
	(OR)			
4(a)	Derive the condition of correct steering in case of an automobile.	6M	CO2	L2
(b)	The angle between the two shaft axes of a Hooke's joint is 30^0. The driving shaft rotates uniformly at 1200 rpm. Find the maximum acceleration of the driven shaft and the maximum torque required if the driven shaft carries a wheel of mass 10 kg and 90 mm radius of gyration.	6M	CO2	L3
5.	A cam with a minimum radius of 25mm is to be designed for a knife-edge follower with the following data: (i) To raise the follower through 35mm during 60^0 rotation of the cam (ii) Dwell for next 40^0 of the cam rotation (iii) Descent of the follower during the next 90^0 of the cam rotation (iv) Dwell during the rest of the cam rotation. Draw the profile of the cam if the ascent and descent of the cam is with simple harmonic motion and the line of stroke of the follower is passing through the axis of the camshaft. Calculate the maximum velocity and acceleration of the follower during the ascent and the descent if the cam rotates at 150rpm.	12M	CO3	L3
	(OR)			

6(a)	Discuss the displacement, velocity and acceleration curves of a Uniform acceleration and deceleration follower.	6M	CO3	L2
(b)	Illustrate the cam nomenclature clearly.	6M	CO3	L2
7(a)	Derive the condition for maximum power transmission by a belt drive considering the effect of centrifugal tension.	6M	CO4	L3
(b)	Two pulleys, one 450 mm diameter and the other 200 mm diameter are in parallel shafts 1.95 m apart and are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley.	6M	CO4	L3
	(OR)			
8.	A pulley is driven by a flat belt, the angle of lap being 120°. The belt is 100 mm wide by 6 mm thick and density1000 kg/m^3. If the coefficient of friction is 0.3 and the maximum stress in the belt is not to exceed 2 MPa, find the greatest power which the belt can transmit and the corresponding speed of the belt.	12M	CO4	L3
9(a)	Derive the expression for the length of path of approach for two meshing spur gears having involute profile.	6M	CO5	L2
(b)	A pair of involute gears with 14 and 21 teeth have pressure angle 16°. Find maximum addenda on pinion and gear to avoid interference if module is 6 mm. Find the length of path of contact and contact ratio.	6M	CO5	L3
	(OR)			
10.	In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 rpm in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed makes 300 rpm in the clockwise direction, Calculate the speed of gear B. 	12M	CO5	L4

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