LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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

Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

B.Tech. (IV Semester) (R17) Semester End Examinations (Supplementary) - November 2025

(2018, 2019 Regular admitted batches and 2020 Lateral Entry admitted batch only)

TIME TABLE

R17

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

Branch	03-11-2025 (Monday)	04-11-2025 (Tuesday)	05-11-2025 (Wednesday)	06-11-2025 (Thursday)	07-11-2025 (Friday)	10-11-2025 (Monday)	11-11-2025 (Tuesday)
ASE	17FE03 - Environmental Science	17FE08 - Probability and Statistics	17AE05 - Thermal Engineering	17AE06 - Manufacturing Technology	17AE07 - Aerodynamics-I	17AE08 - Aircraft Structures-I	---
CE	17FE03 - Environmental Science	17FE08 - Probability and Statistics	17CE08 - Strength of Materials – II	17CE09 - Hydraulics and Hydraulic Machinery Systems	17CE10 - Structural Analysis – I	17CE11 - Geo Technical Engineering – I	---
CSE	17FE11 - Linear Algebra and Numerical Applications	17CI07 - OOPs Through Java	17CI08 - Design and Analysis of Algorithms	17CS01 - Linux Programming	17CI09 - Data Base Management Systems	17CI10 - Software Engineering	17PD03 - Professional Ethics and Human Values
ECE	17FE03 - Environmental Science	17FE09 - Functions of Complex Variables	17EC09 - Electromagnetic Fields and Waves	17EC10 - Digital Signal Processing	17EC11 - Digital System Design	17EC12 - Analog Communications	---
EEE	17FE03 - Environmental Science	17FE10 - Complex Variables and Statistical Methods	17EE06 - Control Systems	17EE07 - Network Theory - II	17EE08 - Electronic Circuit Analysis	17EE09 - Electrical Machines – I	---
EIE	17ME52 - Fundamentals of Fluid Mechanics	17FE09 - Functions of Complex Variables	17EI03 - Electrical and Electronics Measurements	17EI04 - Industrial Instrumentation	17EC05 - Signals and Systems	17EC07 - Pulse and Switching Circuits	17PD03 - Professional Ethics and Human Values
IT	17CI14 - Web Technologies	17FE08 - Probability and Statistics	17CI06 - Computer Architecture	17CI03 - Discrete Mathematical Structures	17CI04 - Python Programming	17IT02 - Object Oriented Analysis and Design	17PD03 - Professional Ethics and Human Values
ME	17ME06 - Operations Research	17FE08 - Probability and Statistics	17ME07 - Fluid Mechanics and Hydraulic Machinery	17ME08 - Production Technology	17ME09 - Applied Thermodynamics	17ME10 - Kinematics of Machines	17PD03 - Professional Ethics and Human Values

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

Date: 17-10-2025

CONTROLLER OF EXAMINATIONS

PRINCIPAL

Copy to: 1. Vice-Principal, Deans & HoDs 2. T&P cell, Transport in-charge & Librarian
3. Canteen, PD, Security & Hostels 4. Coordinator-Disciplinary 5. Notice Boards

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04 NOV 2025

R17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

B.Tech. (IV Semester) 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)	The probability density function a random variable X is defined as $f(x) = \frac{x^2}{9}$ *for* $0 < x \leq 3$, then calculate the mean and variance of the random variable X.	6M	CO1	L2
	(OR)			
2(a)	State and prove multiplication theorem of probability.	6M	CO1	L2
(b)	Calculate the mean and variance of X, if the probability distribution of the discrete random variable X is given by X: -1, 0, 1, 2, 3 P(x): 0.3, 0.1, 0.1, 0.3, 0.2	6M	CO1	L2
3(a)	Derive the mean and variance of Binomial distribution.	6M	CO2	L2
(b)	Suppose that a manufactured product has an average of 2 defects per unit of product inspected. Calculate the probability of finding a product (i) with zero defects (ii) 3 defects and (iii) 4 defects.	6M	CO2	L3
	(OR)			
4(a)	Define Binomial and Poisson distribution.	4M	CO2	L2
(b)	The probability of a man hitting the target if 1/3 , if he fires 5 times, what is the probability of his hitting the target (i)At least twice? (ii) Exactly twice? (iii) At most twice?	8M	CO2	L3
5(a)	Measurements of the weights of a random sample of 200 ball bearings made by a certain machine during one week showed a mean of 0.824 and a standard deviation of 0.042. Estimate 95% confidence limits for the mean weight of all the ball bearings.	6M	CO3	L3
(b)	If out of 80 patients treated with an antibiotic, 59 got cured. Estimate 90% and 99% confidence limits to the true population of the cured.	6M	CO3	L3
	(OR)			
6(a)	A population consists of four numbers {1, 3, 7, 9}.By considering all possible samples of a size 2 taken with replacement from this population, Calculate (i) Mean of sampling distribution of means (ii) Standard deviation of the sampling distribution of means.	6M	CO3	L2
(b)	The mean voltage of a battery is 15 volts and S.D is 0.2 volts. Determine the probability that 4 such batteries connected in series will have a combined voltage of 60.8 or more volts.	6M	CO3	L2
7(a)	Summarize the steps in the procedure for testing of hypothesis.	4M	CO4	L2

(b)	A stenographer claims that she can take dictation at a rate of 120 words per minute. Can we reject her claim based on 100 trials in which she demonstrates a mean of 116 words with a standard deviation of 15 words? Analyse at 1% and 5% level of significance.	8M	CO4	L4
	(OR)			
8(a)	A sample of 25 bulbs gives a mean life of 990 hours with a S.D of 20 hrs. The manufacturer claims that the mean life of bulbs is 1000 hrs. Is the sample not up to the standard? (Test at 0.05 level of significance)	6M	CO4	L4
(b)	Based on the information given below about the treatment of 200 patients suffering from a disease, conclude whether their opinion is independent of the type of treatment. (Use 0.05 level of significance) | | Favourable | Not Favourable | | New treatment | 60 | 30 | | Conventional treatment | 40 | 70 |	6M	CO4	L4
9(a)	Estimate the most likely production corresponding to a rainfall of 40 inches from the following data | | Rain fall (in inches) | Production (in quintals) | | Average | 30 | 50 | | Standard deviation | 5 | 10 | The coefficient of correlation between the rainfall and production is 0.8.	6M	CO5	L3
(b)	Seven methods of imparting Technical Education were ranked by the Engineering students of two universities A and B are as follows | Method of Teaching | A | B | C | D | E | F | G | | Rank of A | 2 | 1 | 5 | 3 | 4 | 7 | 6 | | Rank of B | 1 | 3 | 2 | 4 | 7 | 5 | 6 | Calculate the rank correlation coefficient and comment on its value.	6M	CO5	L2
	(OR)			
10(a)	The regression equations of two variables X and Y are as follows. 3X +2Y-26=0 and 6X+Y-31=0 then find (i) the means of X and Y (ii) the regression coefficients (iii) the coefficient of correlation between X and Y.	6M	CO5	L2
(b)	Calculate Spearman's coefficient of correlation (rank correlation) between marks assigned to ten students by judges X and Y in a certain competitive test as shown in the table. | **Student** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | | Marks by X | 52 | 53 | 42 | 60 | 45 | 41 | 37 | 38 | 25 | 27 | | Marks by Y | 65 | 68 | 43 | 38 | 77 | 48 | 35 | 30 | 25 | 50 |	6M	CO5	L3

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B.Tech. (IV Semester) Supplementary Examinations

17CI07-OOPS THROUGH JAVA
(CSE)

Time : 3 hours Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Illustrate the JVM architecture with neat sketch.	8M	CO1	L2
(b)	Write a JAVA program to check the given number is prime number or not.	4M	CO1	L3
	(OR)			
2(a)	What is a byte code in java? and explain its role in JAVA API.	8M	CO1	L1
(b)	Write a Java program to print Fibonacci sequence up to the given range.	4M	CO1	L3
3(a)	What is the purpose of the interface? And differentiate between class and interface.	8M	CO2	L1
(b)	Develop a java application to implement Single inheritance.	4M	CO2	L3
	(OR)			
4(a)	Demonstrate the usages of super keyword with an example.	6M	CO2	L2
(b)	Demonstrate the concept of importing user defined package with an example.	6M	CO2	L2
5(a)	Write a java program to demonstrate the ArrayIndexOutofBounds exception.	8M	CO3	L3
(b)	List out different Thread Priority Constants.	4M	CO3	L1
	(OR)			
6(a)	Describe the inter thread communication with an example program.	6M	CO3	L2
(b)	Write a Java Program to create multiple Threads.	6M	CO3	L3
7(a)	Develop a java application to draw a polygon with five sides using Graphics class.	8M	CO4	L3
(b)	State and explain some real-world applications that use Applets.	4M	CO4	L2
	(OR)			
8(a)	Discuss about Adapter classes.	8M	CO4	L2
(b)	What is the role of the destroy () method in an Applet?	4M	CO4	L1
9(a)	Compare and contrast between swing and awt.	8M	CO5	L2
(b)	Differentiate between CheckBox and CheckBoxGroup.	4M	CO5	L2
	(OR)			
10.	Develop a java application to create login page using SWING components.	12M	CO5	L3

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

17FE09-FUNCTIONS OF COMPLEX VARIABLES
(ECE & EIE)

Time : 3 hours | Max. Marks : 60

Answer one question from each unit
All questions carry equal marks

Q.No	Questions	Marks	CO	BL
1(a)	Are the given functions analytic anywhere in the complex plane? If analytic find their derivatives in terms of z. (i) $w = e^{\bar{z}}$ (ii) $w = e^{z}$	6M	CO1	L2
(b)	Using Milne-Thomson method form the analytic function $f(z) = u+iv$ whose real part is $u=y^3-3x^2y$	6M	CO1	L3
	(OR)			
2(a)	Show that $u(x,y)=e^x\cos y$ is harmonic and hence find its harmonic conjugate.	6M	CO1	L2
(b)	In a two dimensional flow, if the velocity potential function $\phi(x,y)=x^2-y^2$ then find the stream function $\Psi(x,y)$.	6M	CO1	L2
3(a)	If $\sin(A+iB)=x+iy$, prove that $\frac{x^2}{\cosh^2 B}+\frac{y^2}{\sinh^2 B}=1$ and $\frac{x^2}{\sin^2 A}-\frac{y^2}{\cos^2 A}=1$	6M	CO2	L1
(b)	Separate the real and imaginary parts of *cot z*	6M	CO2	L2
	(OR)			
4(a)	Find the values of z which satisfy $e^z=1+i$	6M	CO2	L2
(b)	Find all the values of $(\frac{\sqrt{3}}{2}+\frac{i}{2})^{(1+i\sqrt{3})}$	6M	CO2	L2
5(a)	If $F(a)=\int_C \frac{4z^2+z+5}{z-a}dz$, where C is the ellipse $\frac{x^2}{4}+\frac{y^2}{9}=1$ then find the values of $F(3), F(2i), F'(-2), F''(-2i)$	6M	CO3	L3
(b)	Apply Cauchy's Integral formula to evaluate $\oint_C \frac{\sin \pi z^2+\cos \pi z^2}{(z-1)(z-2)}dz$ where C is the circle $\|z\|=3$.	6M	CO3	L3
	(OR)			
6(a)	Evaluate using Cauchy's theorem $\int_C \frac{4-3z}{z(z-1)(z-2)}dz$ where C is the circle $\|z\|=\frac{3}{2}$	6M	CO3	L3
(b)	Applying Cauchy's theorem evaluate $\oint_C \frac{z^3}{(z-1)^2(z-3)}$ where 'C' is the circular path $\|z\|=2$	6M	CO3	L3

7(a)	Applying Taylor's theorem expand the function $\cos z$ about the point $z=\frac{\pi}{4}$	6M	CO4	L2
(b)	Find the residues at each pole of the function $f(z)=\frac{\sin^2 z}{\left(z-\frac{\pi}{6}\right)^2}$	6M	CO4	L2
	(OR)			
8(a)	Expand as Laurent's series the function $f(z)=\frac{z^2-1}{z^2+5z+6}$ in the region $2<\lvert z\rvert<3$	6M	CO4	L2
(b)	Find the residues at each pole of the function $f(z)=\frac{2z^2-1}{z(z-5)}$	6M	CO4	L2
9(a)	Applying Residue theorem evaluate $\int_C \frac{\cos \pi z^2}{(z-1)(z-2)}$ where 'C' is the circular path $\lvert z\rvert=\frac{3}{2}$	6M	CO5	L3
(b)	Evaluate the real definite integral $\int_0^{2\pi} \frac{1}{a+b\sin\theta} d\theta\,(a>b>0)$ around the unit circle	6M	CO5	L3
	(OR)			
10(a)	Applying residue theorem evaluate $\int_C \frac{z^3-2z+1}{(z-1)^2} dz$ where C is the circle $\lvert z\rvert=2$	6M	CO5	L3
(b)	Apply Rouche's Theorem to find the number of zeroes of the equation $e^z=az^n,\ a>e$ inside the unit circle	6M	CO5	L3

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B.Tech. (IV Semester) 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)	Derive the formulae for the normal and tangential stresses on an inclined plane in case of bi-axial stress system accompanied with simple shear.	6M	CO1	L6
(b)	The principal stresses at a point in an elastic material are 1.5P (tensile), P (tensile) and P/2 (compressive). The elastic limit in simple tension is 200 N/mm^2.Evaluate the value of P at failure, according to (i) Maximum principal stress theory, (ii) Maximum principal strain theory and (iii) Maximum shear stress theory. μ = 0.3.	6M	CO1	L5
	(OR)			
2(a)	At a point in an elastic material under strain, there are normal stresses of 50N/mm^2 and 30N/mm^2 (both tensile) respectively at right angles to each other with a shearing stress of 25N/mm^2. 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/mm^2, factor of safety = 3 and Poisson's ratio = 0.3.	6M	CO1	L3
3(a)	Derive buckling load for column with one end fixed other free.	6M	CO2	L2
(b)	A solid round bar of 60mm diameter and 2.5m long is used as a strut. Find the safe compressive load for the strut using Euler's formula if both ends are hinged. Take E=2x10^{5}N/mm^2 and factor of safety =3.	6M	CO2	L3
	(OR)			
4(a)	Derive the equation for the Euler's crippling load for a column with one end fixed and other end hinged.	6M	CO2	L6
(b)	Determine the section of a cast iron hollow cylindrical column 5 m long with ends firmly built-in if it carries an axial load of 300 kN. The ratio of internal to external diameter is ¾. Use factor of safety 8. Take yield stress = 567 N/mm^2 and Rankine's constant a = 1/1600.	6M	CO2	L3
5(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=2x10^5 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
	(OR)			
6(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 300mm 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 1x10^4N/mm^2, determine: (i) The slope at the supports and (ii) Maximum deflection.	6M	CO3	L3
7(a)	A fixed beam of length 3 m carries two point loads of 30 kN each at a distance of 1 m from both the ends. Determine the fixing moments and draw the B.M. diagram.	6M	CO4	L3
(b)	Derive the expression for the fixing moments and deflection at the centre of a fixed beam carrying U.D.L. w/m run over the entire length L.	6M	CO4	L6
	(OR)			
8(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
9.	A steel channel section of 250 mm deep, 125 mm wide and 20mm thick is carrying a vertical shear of 3 kN. Compute the shear stress and locate the shear center.	12M	CO5	L3
	(OR)			
10.	A beam of rectangular cross section 90 mm wide and 120 mm deep is simply supported over 2m span and subjected to a central concentrated load of 20 kN. But the trace of the plane of load is orthogonal to one of its diagonals. Locate the neutral axis and compute the stresses at all corners of the cross section.	12M	CO5	L3

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B.Tech. (IV Semester) 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)	Deduce the expression for capillary Fall of a liquid.	6M	CO1	L2
(b)	The capillary rise in the glass tube is not to exceed 0.2mm of water. Evaluate its minimum size, given that tension for water in contact with air=0.0725N/m.	6M	CO1	L3
	(OR)			
2(a)	Define the following terms (i) stream line (ii) path line (iii) stream tube	6M	CO1	L2
(b)	Elucidate the different types of fluid flows.	6M	CO1	L2
3(a)	Deduce an expression for loss of head due to an obstruction in a pipe flow.	6M	CO2	L2
(b)	Illustrate the flow through the seriespipes.	6M	CO2	L2
	(OR)			
4(a)	Describe the flow through the parallelpipes with neat sketch.	6M	CO2	L2
(b)	Distinguish Total Energy Line and Hydraulic Gradient Line.	6M	CO2	L2
5(a)	Deduce an expression for the force exerted by a jet on a curved plate when jet strikes curved plate at one end tangentially, when the plate is unsymmetrical.	6M	CO3	L2
(b)	Discover the force exerted by a jet of water 75mm on a stationary flat plate, when the jet strikes the plate normally with velocity of 20m/s.	6M	CO3	L2
	(OR)			
6(a)	Obtain an expression for the force exerted by the jet on flat vertical plate moving in the direction of jet.	6M	CO3	L2
(b)	Deduce an expression for the force exerted by the jet on the inclined plate moving in the direction of the jet.	6M	CO3	L2
7(a)	Define the following terms (i) hydraulic efficiency (ii) mechanical efficiency	6M	CO4	L2
(b)	Explain the essential parts of Pelton wheel turbine.	6M	CO4	L2
	(OR)			
8(a)	Discuss about draft tube theory.	6M	CO4	L2
(b)	A pelton wheel is to be designed for a head of 60m when running at 200rpm. The pelton wheel develops 95.6475kw shaft power. The velocity of the buckets=0.45 times the velocity of the jet. Overallefficiency = 0.85 and co-efficient of the velocity is equal to 0.98.	6M	CO4	L3
9(a)	Illustrate the operating characteristic curves for centrifugal pumps.	6M	CO5	L2
(b)	Define suction head, delivery head, static head and manometric head.	6M	CO5	L3
	(OR)			
10(a)	Formulate an expression for net positive suction head.	6M	CO5	L2
(b)	Illustratethe main characteristic curves for centrifugal pumps.	6M	CO5	L3

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B.Tech. (IV Semester) Supplementary Examinations

17CE09-HYDAULICS 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)	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
	(OR)			
2(a)	For a trapezoidal channel of most economical section, prove that (i) Half of top width =length of one of the sloping sides (ii) Hydraulic mean depth =1/2 X depth of flow.	6M	CO1	L3
(b)	A rectangular channel needs to be designed to carry a flow of 0.6 cuecs under uniform flow conditions. If the bed slope of the channel is 1 in 3000. Determine the most economical dimensions of the channel. Take Chezy's C=50.	6M	CO1	L5
3(a)	Explain the characteristics of hydraulic jump.	6M	CO2	L3
(b)	A hydraulic jump occurs in a 0.5m. Wide rectangular channel at the point, where depth of water flow is 0.15 m. and Froude number is 2.5. Calculate the specific energy, critical and sequent depths, loss of head and energy dissipated.	6M	CO2	L2
	(OR)			
4(a)	Derive dynamic equation for gradually varied flow	6M	CO2	L4
(b)	Derive an expression for loss of head due to Hydraulic jump in Horizontal channels.	6M	CO2	L2
5(a)	Derive an expression for the efficiency of a series of moving curved vanes when a jet of water strikes the vanes at one of its tips.	6M	CO3	L4
(b)	A jet of water strikes with a velocity of 35m/s a flat plate inclined at 30^0 with the axis of the jet. If the cross sectional area of the jet is $25cm^2$, determine (i) The force exerted by the jet on the plate (ii) The components of the force in the direction normal to the jet (iii) The ratio in which the discharge bets divided after striking the plate.	6M	CO3	L5
	(OR)			
6(a)	Derive an expression for force exerted by a jet on moving flat vertical plate in the direction of the jet.	6M	CO3	L3

(b)	A jet of water diameter 10cm strikes a flat plate normally with a velocity of 16m/s, the plate is moving with a velocity of 7m/s in the direction of the jet and away from the jet. Find the force exerted by the jet on the plate.	6M	CO3	L3
7(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
	(OR)			
8(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
9(a)	Derive the expression for minimum starting speed of a centrifugal pump.	6M	CO5	L3
(b)	Explain indicator diagram in detail.	6M	CO5	L4
	(OR)			
10(a)	List the main parts of a centrifugal pump and explain it.	6M	CO5	L1
(b)	A centrifugal pump rotating at 900 rpm delivers 50LPS against a net head of 15m.The vane angle at the outlet is 30^0 and the flow velocity at outlet is 1.4m/s. If the manometric efficiency of the pump is 85%.Find the diameter and the width of the impeller at outlet.	6M	CO5	L3

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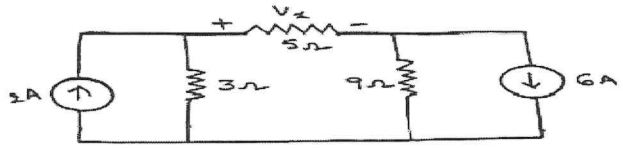
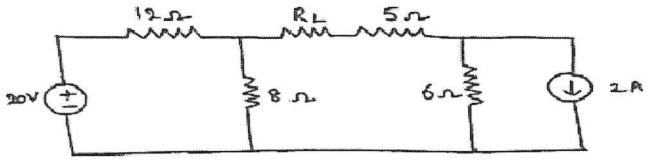
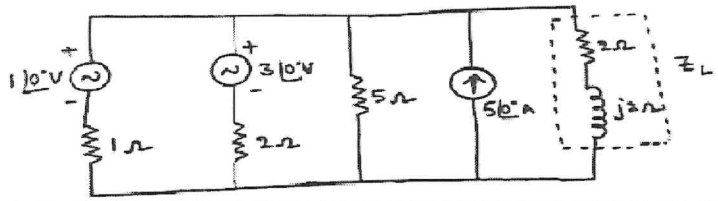
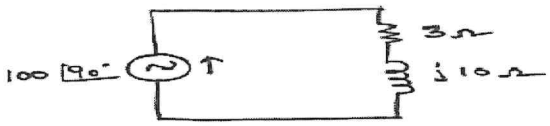
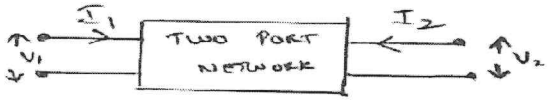
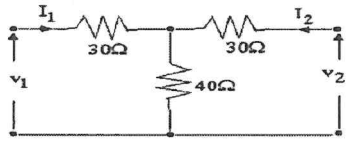
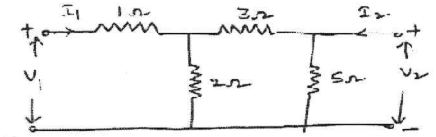
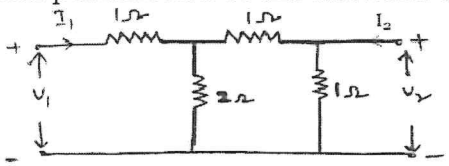
B.Tech. (IV Semester) Supplementary Examinations

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)	Use superposition theorem to compute V_x in the network shown below: 	6M	CO1	L3
(b)	With reference to the network shown below, (i) Determine the value of R_L to which maximum power can be delivered and (ii) what is the maximum power that could be dissipated in R_L? 	6M	CO1	L3
	(OR)			
2(a)	Use Millman's theorem to find the current in the load Z_L in the circuit shown below: 	6M	CO1	L3
(b)	For the circuit shown below: find the change in current by using Compensation theorem when the reactance has changed to j5Ω. 	6M	CO1	L3
3(a)	Explain the advantages of three-phase supply over single-phase supply for distribution purposes.	6M	CO1	L2
(b)	Each branch of a 3-phase, star(Y)-connected load consists of a coil of resistance 4.2Ω and reactance 5.6Ω connected in series. The load is supplied at a line voltage of 400V, 50Hz. The total active power supplied to the load is measured by the two-wattmeter method. Draw a circuit diagram with the wattmeter connections in lines A and B and calculate the readings of the two wattmeters.	6M	CO1	L3
	(OR)			
4(a)	A balanced Y-connected load with a phase impedance of is 40+j25Ω supplied by abalanced, 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)	For the two port network shown in the figure, the currents I_1 and I_2 entering at port 1 and 2 respectively are given by the equations. I1 = 0.5 V1 - 0.2 V2 I2 = -0.2V1 + V2  Where V1 and V2 are the port voltages at port 1 and 2 respectively. Find the Y, Z parameters for the network.	6M	CO3	L1
(b)	For the symmetrical 2-port network shown in Figure below find the ABCD parameters. 	6M	CO3	L2
	(OR)			
6(a)	Find the Z-parameters for the circuit shown below: 	6M	CO2	L5
(b)	Obtain transmission parameters of the network shown below: 	6M	CO2	L5
7(a)	Derive the coefficients in exponential form of Fourier series.	6M	CO3	L1
(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)	Considering the driving point impedance Z(s) to be Z(s)=(s+3)(s+5)/(s(s+4)), find the Cauer-I form of RC network.	6M	CO4	L4
(b)	Synthesize the second Foster form of the driving point LC impedance function, given $Z(s)=2(s^2+1)(s^2+9)/(s(s^2+4))$.	6M	CO4	L4
	(OR)			
10(a)	List the properties of positive real function and test whether the following function is positive real or not? $F(s) = \frac{s(s^2+6)}{(s^2+6)^2}$	6M	CO4	L1
(b)	Determine the Foster I form of realization of the RC impedance function. $Z(s) = \frac{(s+1)(s+3)}{s(s+2)(s+4)}$	6M	CO4	L5

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

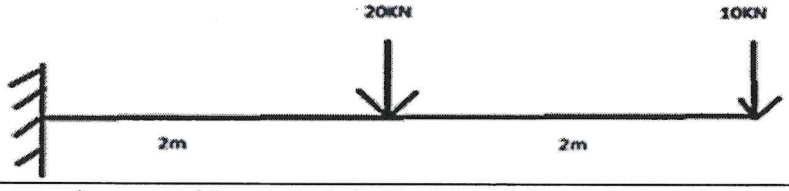
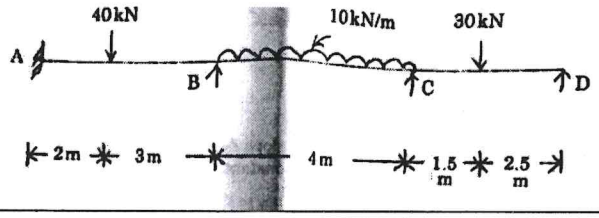
B.Tech. (IV Semester) Supplementary Examinations

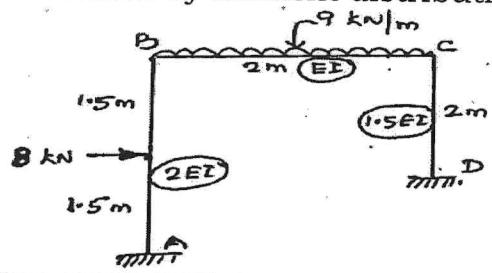
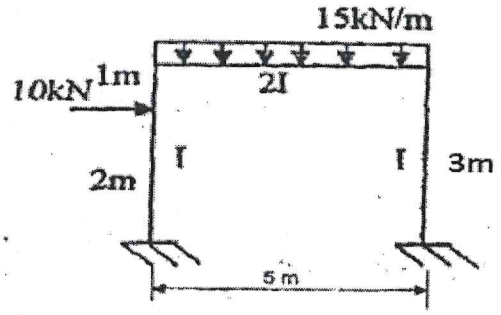
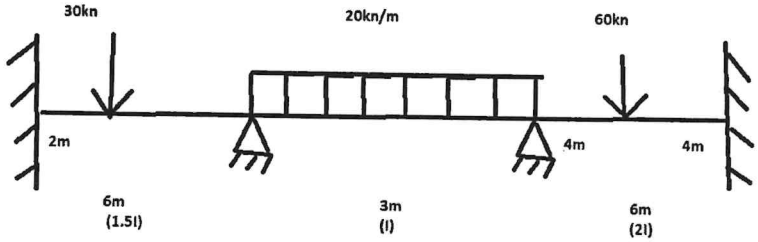
17CE10-STRUCTURAL ANALYSIS-I

(CE)

Time : 3 hours | Max. Marks : 60

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

Q.No	Questions	Marks	CO	BL
1(a)	A cantilever beam is given below. Determine the slope and deflection at free end of cantilever beam by conjugate beam method. (Take E= 200 KN/mm^2, I= 1.68 x 10^{8}mm^4). 	6M	CO1	L5
(b)	A cantilever beam of length L is subjected to a couple moment of M_0 at the free end of beam. Determine the slope and deflection at free end by conjugate beam method.	6M	CO1	L5
	(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)	Prove that a cable hanging on its own weight takes the shape of a catenary.	6M	CO1	L3
(b)	List the assumption made in the analysis of three hinged suspension cable with stiffening girder. Mention their importance.	6M	CO2	L1
	(OR)			
4.	Analyze the effect of temperature changes in dip and horizontal thrust of suspension cables.	12M	CO2	L4
5.	Determine the end moments of continuous beam by moment distribution method and draw shear force and bending moment diagrams. 	12M	CO3	L5
	(OR)			

6.	Analyze the portal frame by moment distribution method. 	12M	CO3	L4
7.	Analyze the portal frame by kani's method 	12M	CO4	L4
	(OR)			
8.	Determine the end moments by kani's method and draw Shear force and bending moment diagrams of the beam. 	12M	CO4	L5
9(a)	State and Prove Castigliano's Theorem – I.	6M	CO2	L1
(b)	Using Castigliano's Theorem – I, determine the deflection at the mid span of a simply supported beam subjected UDL.	6M	CO2	L1
	(OR)			
10(a)	State and Prove Castigliano's Theorem – II.	6M	CO5	L3
(b)	Using Castigliano's Theorem – II, end moments in a fixed beam subjected to concentrated at mid span.	6M	CO5	L2

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LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)

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

B.Tech. (IV Semester) Supplementary Examinations

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)	Show that in Hybrid π model, the diffusion capacitance is proportional to the emitter bias current.	6M	CO2	L2
(b)	How do the parameters of hybrid-π model transistors vary with temperature?	6M	CO2	L2
	(OR)			
2(a)	Derive various Resistive parameters of Hybrid π model of a transistor in terms of h parameters.	6M	CO2	L1
(b)	What is the relationship between fT and fβ? Discuss the significance of fT .	6M	CO2	L1
3(a)	A single transistor is operating as an ideal class B amplifier with a 500Ω load. A DC meter in the collector circuit reads 10mA. How much signal power is derived to the load?	6M	CO1	L4
(b)	Draw a neat circuit diagram of push pull class B amplifier. Explain its working.	6M	CO1	L3
	(OR)			
4(a)	Derive the expression for maximum value of conversion efficiency of class A power amplifier.	6M	CO1	L1
(b)	Prove that in class A power amplifier if the distortion is 10% then the power given to the load increased by 1%.	6M	CO1	L4
5(a)	A voltage-series negative feedback amplifier has a voltage gain without feedback A=500, input resistance R_i=3kΩ, output resistance R_o=20kΩ and feedback ratio β=0.01. Determine the voltage gain with feedback A_f, input resistance R_{if} and output resistance R_{of} of the amplifier with feedback.	6M	CO2	L5
(b)	Identify the type of feedback present in a CE amplifier without bypass capacitor from its β value.	6M	CO2	L3
	(OR)			
6(a)	Model the concept of current shunt feedback amplifier with neat block diagram.	6M	CO2	L3
(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)	Classify the different types of Clippers circuits. And explain any one of Clipper circuit operation with the aid of transfer characteristics.	6M	CO4	L2
(b)	Design a circuit to transmit that part of a sine wave which lies between +4V and +8V. (peak value of sinusoidal signal is 10V).	6M	CO4	L6
	(OR)			
10(a)	Construct the High pass RC circuit which is excited by an Ideal 1 μsec pulse and plot RC High Pass response under the fallowing conditions. The upper cut of frequency is i) 10 MHZ (ii) 0.1 MHZ.	6M	CO4	L6
(b)	Diagram the response of a low pass RC circuit with small, medium and large time constants when input is square wave and also prove that $V_1 = (V/2)\text{Tan}(hx)$.	6M	CO4	L4

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B.Tech. (IV Semester) 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)	Write the equations of Energy stored in the coils (Stator, Rotor and mutual inductance between stator and rotor coils).	6M	CO1	L2
(b)	A shunt generator delivers 450 A at 230 V and the resistance of the shunt field and armature are 50 Ω and 0.03 Ω respectively. Calculate the generated e.m.f.	6M	CO1	L3
	(OR)			
2(a)	Derive the E.M.F equation of DC Generator.	6M	CO2	L2
(b)	Paraphrase the methods of reducing the effects of armature reaction.	6M	CO2	L2
3(a)	Compare the External characteristics of D.C Compound and Series Generators.	6M	CO2	L1
(b)	Draw and describe the Internal characteristics of D.C Series Generator.	6M	CO2	L1
	(OR)			
4(a)	Describe the procedure to calculate the critical speed from the O.C.C. characteristics of a DC Generator.	6M	CO2	L1
(b)	Compare the Internal characteristics of D.C Shunt and Series Generators.	6M	CO2	L1
5(a)	List out the losses that occur in a D.C motor.	6M	CO2	L1
(b)	List out the precautions to be taken while conducting brake test on a D.C shunt motor.	6M	CO2	L1
	(OR)			
6(a)	Compare the characteristic of D.C compound motor with D.C series motor.	6M	CO2	L2
(b)	Explain the importance of starters in starting a D.C Motor.	6M	CO2	L2
7(a)	Discuss how the voltage regulation of transformer is calculated with no-load.	6M	CO2	L2
(b)	Describe the voltage regulation of transformer with lagging power factor loads with a phasor diagram.	6M	CO2	L2
	(OR)			
8(a)	Describe the procedure of conducting O.C and S.C test on single phase transformer with electrical circuit connection diagram.	6M	CO2	L2
(b)	Why Sumpner's Test is conducted on transformer, mention the outcome of the test.	6M	CO2	L2
9(a)	Draw and describe the electrical circuit of Poly-phase transformer Scott-connection.	6M	CO3	L2
(b)	Draw and describe the electrical circuit of Poly-phase transformer Δ-Y.	6M	CO3	L2
	(OR)			
10(a)	Draw the phasor diagrams of Y/Δ connected poly-phase transformer.	6M	CO3	L2
(b)	Compare the applications of different poly-phase transformers (Y/Y, Y/Δ).	6M	CO3	L3

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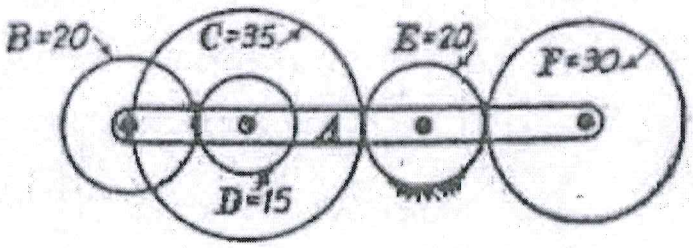
B.Tech. (IV Semester) Supplementary Examinations

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)	Describe the working of reciprocating engine mechanism.	4M	CO1	L2
(b)	Describe the working of crank & slotted lever mechanism and derive the expression for the ratio of time taken in forward and return stroke.	8M	CO1	L2
	(OR)			
2(a)	What do you understand by straight line motion mechanisms? Name the different mechanisms which are used for achieving approximate straight line motion.	4M	CO1	L2
(b)	Derive the condition to be satisfied by a mechanism required to produce an exact straight line motion.	8M	CO1	L3
3(a)	Enumerate the procedure for the velocity diagram of 4 bar mechanism by assuming suitable proportions.	6M	CO2	L3
(b)	Locate all instantaneous centres of the slider crank mechanism; the length of crank OB and Connecting rod AB are 125 mm and 500 mm respectively. The crank speed is 600 rpm clockwise. When the crank has turned 45° from the IDC. Determine (i) velocity of slider 'A' (ii) Angular Velocity of connecting rod 'AB'.	6M	CO2	L3
	(OR)			
4(a)	State and explain Kennedy's theorem as applicable to instantaneous center of rotation of three bodies.	6M	CO2	L3
(b)	The crank (50mm) of slider crank mechanism rotates of 300 rpm in a clockwise direction. Determine (i)Angular velocity of connecting rod and (ii) Velocity of slider. Take the connecting rod length as 150mm.	6M	CO2	L3
5.	Draw the profile of a cam in which a knife-edged follower is raised with uniform acceleration and retardation, and is lowered with SHM. Least radius of cam = 60 mm; Lift of follower = 45 mm; Angle of ascent = 60^0; Angle of dwell between ascent and descent = 40^0; Angle of descent = 75^0.	12M	CO3	L4
	(OR)			
6(a)	Discuss the displacement, velocity and acceleration curves of a Uniform velocity follower.	6M	CO3	L2
(b)	Classify with neat sketches the cam follower according to their line of motion.	6M	CO3	L2
7(a)	Derive the expression for centrifugal tension for flat belt drive.	6M	CO4	L3

(b)	Two pulleys, one 450 mm diameter and the other 200 mm diameter are on parallel shafts 2.1 m apart and are connected by a belt, as a cross belt drive. The larger pulley rotates at 225 r.p.m. The maximum permissible tension in the belt is 1kN and the coefficient of friction between the belt and the pulley is 0.25. Find the power that can be transmitted.	6M	CO4	L3
	(OR)			
8.	A flat leather belt is required to transmit 8 kW from a pulley 1.5m diameter running at 240rpm. The angle of contact is 160^0 and the coefficient of friction between belt and pulley is 0.25. The safe working stress for leather is 1.5Mpa and density of leather is 1000 kg/m^3. Determine the width of the belt if its thickness is 10mm.Take into account the effect of centrifugal tension.	12M	CO4	L3
9(a)	State and prove the law of gearing for constant velocity ratio.	6M	CO5	L3
(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. also find the length of path of contact and contact ratio.	6M	CO5	L3
	(OR)			
10.	The figure shows an epicyclic gear train arrangement. Wheel E is a fixed wheel and wheels C and D are integrally cast, and mounted on one pin. If the arm A makes one revolution/sec. counter-clockwise, determine the speed and the direction of rotation of wheels B and F. 	12M	CO5	L4

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