Subject Code: 2001302 **R 20**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech III Semester - Regular Examinations, 2022 - Model Question Paper
Sub: Geology & Building Materials
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 60**

Answer any FIVE Questions choosing One Question from each Unit.

All Questions carries equal marks

UNIT-I

1. (a) Define strike, dip, outcrop, fold, and fault with suitable diagrams? [6M]

   (b) Explain briefly about the geological classification of rocks? [6M]

OR

2. (a) What do you mean by weathering. Explain in detail about various weathering agents? [7 M]

   (b) Enumerate the different types of folds with suitable examples? [5M]

UNIT II

3. (a) Explain briefly about the mineralogy. List any six common Rock forming minerals? [6M]

   (b) Write the physical properties of following minerals [6M]

   1. Hematite 2. Magnetite 3. Quartz and 4. Graphite.

OR

4. (a) Write short notes on the Engineering properties of rocks. [5M]

   (b) Describe the structures, Texture and physical properties of igneous rocks and sedimentary rocks. [7 M]

UNIT III

5. (a) Describe the manufacture of the bricks? [6M]

   (b) Explain briefly about the Different types of Cement? [6M]

OR

6. (a) Explain briefly about any four types of lime and write their applications? [6M]

   (b) Describe in detail about Air seasoning and chemical seasoning of timber? [6M]

UNIT IV

7. (a) Enumerate the differences between conventional roofing materials and Lightweight roofing materials. [5M]

   (b) Write a brief note on 1. G I sheets 2. Asbestos sheets 3. Cement sheets and 4. PU sheets. [7M]

OR

8. (a) What are the functional requirements of flooring. Which is the most suitable flooring for home and a college? [5M]

   (b) Explain about various forms of bitumen and their manufacturing methods in brief? [7M]

UNIT V

9. (a) Explain about glass fibre reinforced sheets? [6M]
   (b) How are composites prepared? Explain about laminar composites? [6M]

OR

10. (a) Explain about FRP. Give its applications in the field of construction? [7M]

    (b) Write short notes on Geo-textiles? [5M]

Course Title	Advanced Strength of Materials				Program & Sem.	B. Tech. & III	
Course Code	Category	Hours/Week			Credits	Maximum Marks	
2001303	PCC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	1	4	40	60	100
Mid Exam Duration: 1.5 Hours					End Exam Duration: 3Hours		

Course Objectives:

Objective of this course is to make the students

- To understand calculation of deflection of beams under different loading conditions
- To understand the basic torsion concepts behind the shafts design and engineering knowledge behind the springs.
- To understand the stress at a point due to uniaxial and by-axial loading on a member and theory of failures from energy theories.
- To understand the fundamentals of Euler's theorem for columns and critical load carrying capacity of columns.
- To understand stresses in closed cylinders and design of thin and thick cylinders.

UNIT – I

Deflection of Beams: Slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, uniformly varying load and couple -Mohr's theorems – Moment area method – Application to simple cases.

UNIT – II

Torsion: Theory of pure torsion, Torsional equation, Torsional moment of resistance, Polar section modulus, Power transmitted by shafts; combined bending, torsion and end thrust; Design of shafts.

Springs: Deflection of close and open coiled helical springs under axial load and axial twist, Springs in series and parallel.

UNIT – III

Principal Stresses and Strains: Stresses on an inclined plane under axial loading, Compound stresses, Normal and tangential stresses on an inclined plane for biaxial stresses, two perpendicular normal stresses accompanied by a state of simple shear, Mohr's circle of stresses, Triaxial state of stresses, Principal stresses and strains.

Theories of Failure: Maximum principal stress theory, Maximum principal strain theory, Maximum shear stress theory, Maximum strain energy theory, Maximum shear strain energy theory.

UNIT – IV

Columns and Struts: Short, medium and long columns, axially loaded compression members, Euler's theorem for long columns, Euler's critical load, Equivalent length of a column, Slenderness ratio, Limitations of Euler's theory, Rankine–Gordon formula, long columns subjected to eccentric loading.

UNIT-V

Thin Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – changes in diameter and volume of thin cylinders – thin spherical shells.

Thick Cylinders: Introduction - Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage.

Course Outcomes:

On completion of the course, the student will be able to:

CO 1:	Apply double integration and Macaulay's methods to calculate deflection of beams.
CO 2:	To calculate stress in shafts due to torsion and spring constant.
CO 3:	To calculate the principal stresses in a body.
CO 4:	To calculate load carrying capacity of columns using Euler's theorem of long columns.
CO 5:	Design thin and thick cylinders.

Mapping of COs with POs and PSOs:

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	3	1	1			1							3		
CO 2	3	1	1			1							3		
CO 3	3	1	1			1							3		
CO 4	3	1	1			1							3		
CO 5	2	1	3			1							3		

Influence of the course outcome (1-Low, 2-Medium, 3- High)

Textbooks:

1. Punmia, B. C., Ashok Kumar Jain and Arun Kumar Jain, Mechanics of Materials, Laxmi Publications Pvt. Ltd., 2001.
2. Bhavikatti, S. S., Strength of Materials, Vikas Publishing House, 3rd Edition, 2010.

References:

1. Rajput, R. K., Strength of Materials (Mechanics of Solids), S. Chand & Company LTD, 5th Edition, 2006.
2. Basu, A. R., Strength of Materials, Dhanpat Rai & Co. (P) Ltd., 2nd Revised Edition, 2015.
3. Junnarkar, S. B. and Shah, H. J., Mechanics of Structures – Vol. I (Strength of Materials), Charotar Publishing House Pvt. Ltd., 27th Revised and Enlarged Edition, 2008.
4. Khurmi, R. S., Strength of Materials, S. Chand & Company Ltd., 23rd Edition, 2005.

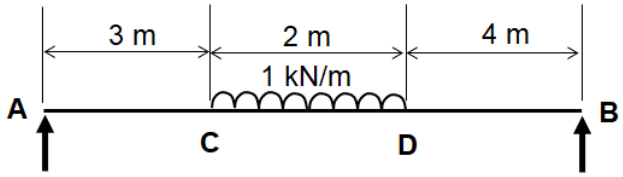
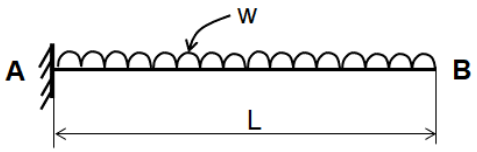
Subject Code: 2001303 **R 20**

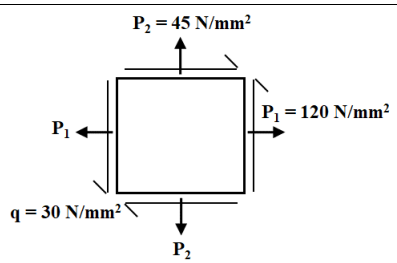
K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech. III Semester - Regular Examinations, 2022 - Model Question Paper
Sub: Advanced Strength of Materials
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 60**

Answer any FIVE Questions choosing One Question from each Unit.

All Questions carries equal marks

	UNIT-I	
1.	Determine the deflection and slope at point **5.5 m** away from the support '**A**'in the beam **AB** using Macaulay's Method. Take E = 2 x 10^5 N/mm^2 and I = 1.5 x 10^9. 	(12 M)
	OR	
2.	(a) Derive the differential equation of the deflection curve of an elastic beam.	(6 M)
	(b) Find out the slope and deflection at point 'B' of the given cantilever beam **AB** using Moment Area Method. Consider **'I'** is moment of inertia and **'E'** is the elastic modulus. 	(6 M)
3.	Evaluate the optimum dimensions of a hallow circular shaft transmitting power of 500 kW at 200 rpm. The maximum allowable shear stress in the shaft is 80 N/mm^2 and the maximum allowable twist in the shaft should not exceed 2°/meter length. (Use shear modulus = 0.8 x 10^5 N/mm^2)	(12 M)
	OR	
4.	A composite spring has two closed coil springs in series. Each coil has mean coil diameter 10 time the spring wire diameter. One spring has 10 coils of diameter 2 mm and other spring has 20 coils of diameter 1.5 mm. (a) Find out the stiffness of the composite spring. (b) Find out the stiffness of the composite spring if the springs are arranged in parallel. (Use G = 0.8 x 10^5 N/mm^2)	(12 M)
5.	An element in plane stress is subjected to stress P_1 = 120 N/mm^2 P_2 = 45 N/mm^2 (both tensile) & shearing stress of 30 N/mm^2 as shown in Figure. Determine the stresses acting as an element rotated through an angle θ = 45°.	(12 M)

		
OR		
6.	(a) Write a detailed note on Rankine's strength theory. (b) Write a detailed note on Max. Principal Strain theory.	(6 M) (6 M)
7.	Calculate the safe compressive load on a hollow cast iron column (one end rigidly fixed and other hinged) of 15 cm external diameter, 10 cm internal diameter and 10 m in length. Use Euler's formula with a factor of safety of 5 and E = 95 kN/mm^2.	(12 M)
OR		
8.	A hollow cylindrical cast iron column is 4 m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250 kN with a factor of safety of 5. Take the internal diameter as 0.8 times the external diameter. Take σ_c = 550 N/mm^2 and α = 1/1600 in Rankine's formula.	(12 M)
9.	Explain in detail the following stresses in thin cylinder (a) Hoop Stresses (b) Longitudinal Stresses (c) Radial Compressive Stress (d) Max. Shear Stress in cylindrical shell	(12 M)
OR		
10.	A thick cylinder 125 mm inside diameter and 250 mm outside diameter is subjected to an internal fluid pressure of 50 N/mm^2. Calculate the maximum & minimum intensities of circumferential stress & sketch the distribution of circumferential stress intensity & radial pressure intensity across the section.	(12 M)

Subject Code: 2001304 **R 20**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech III Semester - Regular Examinations, 2022 - Model Question Paper
Sub: Fluid Mechanics
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 60**

Answer any FIVE Questions choosing One Question from each Unit.

All Questions carries equal marks

UNIT-I

1. A) Calculate the specific weight, Mass density and Specific gravity of one liter of liquid which weigh 7 N. [6M]
   B) Define surface tension. Obtain the relationship between surface tension and pressure inside a droplet of liquid in excess of outside pressure. [6M]

OR

2. A) State and prove Pascal's law and explain its applications. [6M]
   B) Derive an expression for the depth of centre of pressure from free surface of liquid of an inclined plane surface submerged in the liquid. [6M]

UNIT II

3. A) Explain in detail different types of flows**?** [6M]

B) If for a two – diamantine potential flow, the velocity potential is given by $\phi = x(2y - 1)$ determine the velocity at the point P (4, 5). Also determine the value of stream function Ψ at the point P. [6M]

OR

4. A) Sate and prove Bernoulli's Theorem with assumptions. [6M]

B) Oil of specific gravity of 0.90 flows in a pipe 300 mm diameter at the rate of 120 lit/s and the pressure at a point A is 25 KPa If the point A is 5.2 m above the datum line, calculate the total energy at point A in terms of m of oil? [6M]

UNIT III

5. Identify the expression for discharge through venturimeter. [12 M]

OR

6. Identify the expression for discharge over a triangular notch. [12 M]

UNIT IV

7. The water is flowing through a pipe having diameter 300mm and 200 mm at the sections at the bottom and upper end respectively. The intensity of pressure at the bottom

end is 24.5N/cm^2 and the pressure at upper end is 9.81 N/cm$^{2.}$ Determine the difference in datum head if the rate of flow through the pipe is 40L/s.

A piping system consists of three pipes arranged in series

Pipe	Length	Diameter
AB	2000 m	40 cm
BC	1500 m	30 cm
CD	1000 m	20 cm

Transform the system to (1) an equivalent length of 30 cm diameter (2) an equivalent diameter for the pipe 4500m long. [12 M]

OR

8. Explain the following A). Hardy cross method B). Water hammer. [12 M]

UNIT V

9. Explain Reynolds's Experiment in detail. [12 M]

OR

10. A) Define and explain about the Buckingham's π-theorem. Check the dimensional homogeneity of the following common equations in thefield of hydraulics. a) $Q = C_d$. a.$\sqrt{2gH}$ b) V = C. [12 M]

Subject Code: 2001305 **R 20**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech III Semester - Regular Examinations, 2022 - Model Question Paper
Sub: Geomatics
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 60**

Answer any FIVE Questions choosing One Question from each Unit.

All Questions carries equal marks

	UNIT – I	
1 a)	Define surveying and state the principal of surveying and classify surveying on the basis of instruments used and name all equipments.	6M
b)	Describe the various Chain Corrections.	6M
	(Or)	
2 a)	What are the sources of errors in compass	6M
b)	The following bearings were observed in running a closed traverse. At what stations do you suspect local attraction? Find the correct bearings of lines and also compute the included angles. LINE FB BB AB $191^0 45'$ $13^0 0'$ BC $39^0 30'$ $222^0 30'$ CD $22^0 45'$ $200^0 30'$ DE $242^0 45'$ $62^0 45'$ EA $330^0 15'$ $147^0 45'$	6M
	UNIT – II	
3 a)	Write step by step procedure by two point and problem and three point problem its uses.	6M
b)	Define plane table surveying. Explain briefly about Inter section method, Radiation method.	6M
	(Or)	
4 a)	The following consecutive reading were taken with a Dump Level 1.895, 1.500, 1.865,2.570, 2.990, 2.020, 2.410, 2.520, 2.960, 3.115. The level was shifted after fourth, sixth, and eight readings, the R.L of first point was 30.500. Rule out a page as a level book and fill all columns system and apply the usual checks. Indicate the highest and lowest points.	6M
b)	Define contour? Write characteristics of contours and uses of contours?	6M
	UNIT – III	
5 a)	Explain briefly about parts of the Transit Theodolite. Explain in detail with neat sketch	6M
b)	What are the different errors in theodolite work? How are they eliminated?	6M
	(Or)	

<table>
<tr><td>6</td><td>A Tacheometer was set up at a station at as station C and the following readings were obtained on a staff vetically
<table>
<tr><th>Inst. Station</th><th>Staff Station</th><th>Vertical Angle</th><th>Hair Readings</th><th>Remarks</th></tr>
<tr><td>C</td><td>BM</td><td>$-5^{o}30'$</td><td>1.60, 1.80, 2.450</td><td>RL of BM = 750.50m</td></tr>
<tr><td>C</td><td>D</td><td>$+8^{o}14'$</td><td>0.750, 1.500, 2.250</td><td></td></tr>
</table></td><td>12M</td></tr>
<tr><td></td><td>UNIT - IV</td><td></td></tr>
<tr><td>7 a)
b)</td><td>Describe Field Procedure for Setting Out Curve by Method of Offsets from Long Chord Method
Describe the method of setting a circular curve by Rankin’s deflection angle method two tangents intersect at a Chainage of 1000m, the angle of intersection is 150^{o}. Let us Calculate all data necessary for setting out a curve of 250m radius. The Peg Intervals may be taken as 20m. Prepare a setting out table when the least count of the Vernier is 20”.</td><td>6M
6M</td></tr>
<tr><td></td><td>(Or)</td><td></td></tr>
<tr><td>8 a)
b)</td><td>Derive an expression for Simpson’s rule for computing area between boundary and chain line.
The following are the perpendicular offsets were taken from a chain line to a hedge
Calculate area by (1) Trapezoidal rule (2) Simpsons rule
Distance (m) _ 0 5 10 15 20 30 40 50 65
Offset (m) _ 3.40 4.25 2.60 3.70 2.90 1.80 3.20 4.50 3.70</td><td>6M
6M</td></tr>
<tr><td></td><td>UNIT – V</td><td></td></tr>
<tr><td>9 a)
b)</td><td>What are different types of photogrammetry?
How will you measure the horizontal angle and vertical angle by using total station?</td><td>6M
6M</td></tr>
<tr><td></td><td>(Or)</td><td></td></tr>
<tr><td>10 a)
b)</td><td>Explain with sketch the principle of EDM instrument.
What are Platforms and sensors? Write different types of platforms and sensors?</td><td>6M
6M</td></tr>
</table>

Subject Code: 2002301

K.S.R.M. COLLEGE OF ENGINEERING(AUTONOMOUS),KADAPA

B.Tech III Semester (EEE-R20) Regular Examinations

SUB: SWITCHING THEORY AND LOGIC DESIGN

Time: 3 Hours Max.Marks:60

Answer any FIVE Questions choosing One Question from each Unit
All questions carry equal Marks

UNIT-I

1. Convert the following Numbers 12 M
   a) $(360)_8$ to Hexadecimal
   b) $(2262)_{10}$ to Hexadecimal
   c) $(268.75)_{10}$ to Binary

(OR)

2. a) Given the 8-bit data word 10111001, Generate the 12-bit Hamming code considering Odd Parity . 6M

   b) Perform the subtraction using 2's Complement on the given two binary numbers 011100 - 001111. 6M

UNIT-II

3. Simplify the following Boolean expression Using Tabular 12M

$$Y = \overline{A}\,B\,\overline{C}\,\overline{D} + \overline{A}\,B\,\overline{C}\,D + A\,B\,\overline{C}\,\overline{D} + A\,B\,\overline{C}\,D + A\,\overline{B}\,\overline{C}\,D + \overline{A}\,\overline{B}\,C\,\overline{D}$$

(OR)

4. a) Prove that $AB + BC + \overline{A}C = AB + \overline{A}C$ 4M

   b) Reduce the function $F = \sum m(0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13)$ using K-Map and draw the logic diagram by using Only NAND gates. 8M

UNIT-III

5. a) Design a BCD adder circuit using a 4-bit Parallel adder 6M
   b) Explain in detail about Full adder. 6M

(OR)

6. a) Implement the following function with 4:1 multiplexer 6M

$$F(A, B, C) = \sum m(1, 3, 5, 6)$$

   b) Realize a Full adder using 3-line to 8-line decoder. 6M

UNIT-IV

7. a) Convert JK Flip Flop into T-Flip Flop 6M
   b) Compare Synchronous and Asynchronous Circuits 6M

(OR)

8. Explain in detail about bi-directional Shift register 12M

UNIT-V

9. a) Explain the difference between PROM and EPROM 4M
   b)Explain PAL with an example 8M

(OR)

10. Implement the following Boolean functions with PLA 12M

$F_1(A, B, C) = \sum m(3, 5, 6, 7)$

$F_2(A, B, C) = \sum m(0, 2, 4, 7)$

Code: 2002302

KSRM College of Engineering (AUTONOMOUS), KADAPA

B.Tech., III Semester (R20) Regular Examinations of February/March 2022

Sub: Electromagnetic Field Theory

Model Paper

Time: 3 Hrs Max. Marks: 60

Answer any Five Questions choosing one from each Unit
All Questions Carry Equal Marks

Q. No.	Questions	Marks	CO	BL
	Unit I			
1.	a) State and explain coulomb's law.	6	CO1	L2
	b) Determine the force on a unit positive charge at P (2, 0)m due to the charges Q_1 at origin and Q_2 at (1, 0). Where Q_1 = 1000 PC, Q_2 = - 2000 PC.	6	CO5	L3
	(OR)			
2.	a) Define Electric Dipole and derive an expression for the Potential (V) and Electric Field Intensity ($\bar{E}$) at any point in free space due to Dipole.	6	CO3	L2, L4
	b) Derive Maxwell's First Equation $\nabla . \bar{D} = \rho_v$.	6	CO2,3	L3
	Unit II			
3.	a) State Equation of Continuity and derive the expression in Point form and Integral form.	6	CO3	L2
	b) Given $\bar{J} = 100 sin\theta \overline{a_r}\ A/m^2$ in Spherical Coordinates, Determine the current crossing the Spherical Shell at r = 0.02m.	6	CO5	L3
	(OR)			
4.	a) Derive the boundary conditions for $\bar{E}$ and $\bar{D}$ at the boundary between two perfect dielectrics.	6	CO3	L3, L4
	b) A capacitor with a dielectric of ϵ_r = 5 has a plate separation of 4mm and plate area of 64cm^2. A voltage of 200V is applied between the plates. Obtain the surface charge density and energy stored in the capacitor.	6	CO3	L3
	Unit III			
5.	a) Determine **B** due to a straight conductor of length Lm and steady current I Amps at a distance of R m from the centre of line current.	6	CO5	L2
	b) If the magnetic field intensity is $\bar{H} = x^2 \overline{a_x} + 2yz\overline{a_y} + (-x^2)\overline{a_z}\ A/m$. Find the current density at point 1. 2, 3, 4 2. ρ = 6, ϕ = 45^0, z = 3 3. r = 3.6, Θ= 60^0, ϕ = 90^0	6	CO5	L2

	(OR)			
6.	a) State and explain Ampere's Circuital Law.	6	CO5	L2
	b) In the region 0<r<0.5m in cylindrical coordinators, the current density is $\bar{J} = 4.5e^{-2r}\overline{a_z}$ A/m^2 and $\bar{J} = 0$ elsewhere. Use Ampere's Circuital Law to find $\bar{H}$.	6	CO5	
	Unit IV			
7.	a) Derive Lorentz Force Equation. Obtain the expression for the force experienced by a conductor placed in magnetic fields.	6	CO4	L2, L3
	b) Calculate the force on a straight conductor of length 30cm carrying a current of 5A in $\overline{a_z}$ direction and the magnetic field is $\bar{B} = 3.5x10^3(\overline{a_x} - \overline{a_y})Tesla$. Where $\overline{a_x}\ and\ \overline{a_y}$ are unit vectors	6	CO4	L3
	(OR)			
8.	a) Derive formulae for self inductance of a solenoid. Use this formulae, Determine self inductance of a solenoid having 500 turns, mean diameter equal to 10cm and length equal to 5cm. Assume medium to be air.	6	CO4	L2, L3
	b) What is the torque experienced by a closed circuit carrying a current of I amps and placed in a uniform magnetic field B-Tesla.	6	CO4	L3
	Unit V			
9.	a) Explain Faraday's Law of Electromagnetic Induction and derive Maxwell's equation in Integral and Differential Form.	6	CO2	L2, L3
	b) Find the displacement current density within a Parallel Plate Capacitor where $\epsilon = 100\epsilon_o$, a = 0.01m^2, d=0.05mm and the capacitor voltage is 100sin200πt volts.	6	CO2	L2
	(OR)			
10.	a) Write down Maxwell's equations in differential form and hence obtain the corresponding equations in integral form.	6	CO2	L2
	b) A conductor of length 100cm moves at right angles to a uniform field of strength 10,000 lines/cm^2, with a velocity of 50m/sec. Calculate the EMF induced in it. Find also the value of the induced EMF when the conductor moves at an angle of 30^0 to the direction of the field.	6	CO5	L3

K.S.R.M COLLEGE OF ENGINEERING(AUTONOMOUS): KADAPA

B.Tech III Semester (R-20) EEE End Examinations

Model paper

Subject: ELECTRICAL CIRCUIT ANALYSIS -II

Time: 3 hours Max.Marks:60

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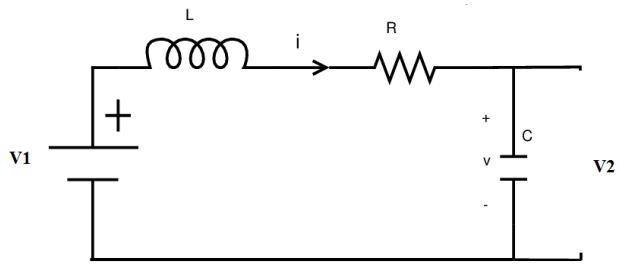
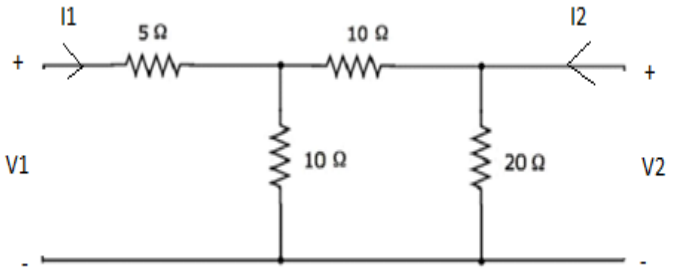
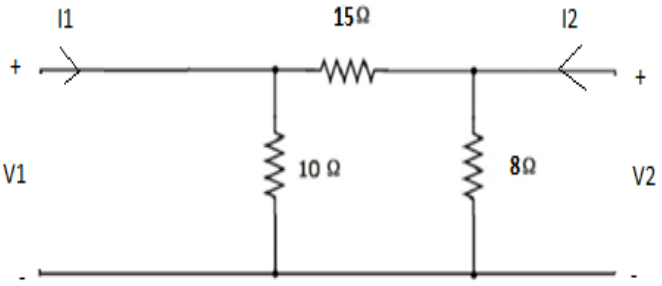
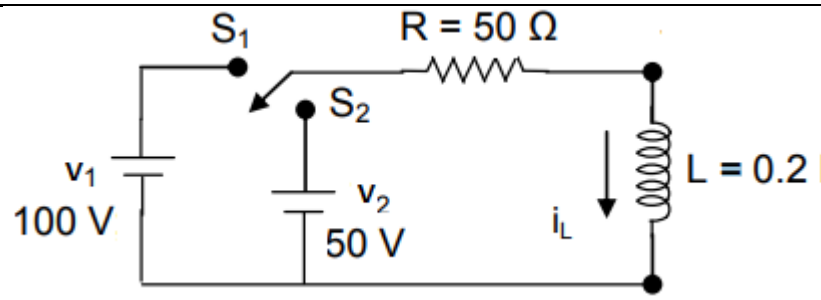
Note: Answer all Questions . Each Question carries equal marks.

Q. No	Question	Marks	CO	BL
	UNIT-I			
1	a) What is resonance? Derive the expression for bandwidth series resonance circuit.	**8**	**CO 1**	**L2**
	b) For the series RLC circuit determine the resonance frequency, Quality factor, half power frequencies if R =25 Ω,L=3mh And C=0.5μF.	**4**	**CO 1**	**L3**
	OR			
2	Derive the expression to draw the locus diagram of series RC circuit with variable capacitive reactance.	**12**	**CO 1**	**L3**
	UNIT-II			
3	a) Write the necessary conditions for driving point functions.	**8**	**CO 1**	**L2**
	b) Obtain the voltage transfer function of the network. 	**4**	**CO 4**	**L4**
	OR			
4	A transfer function is given by V(s) = $\frac{3S}{(S+1)(S+4)}$. Plot the pole zero plot and obtain the time domain response.	**12**	**CO 4**	**L4**

	UNIT-III			
5	a) Derive the expression for Y parameters.	**5**	**CO3**	**L2**
	b) Determine ABCD -Parameters for the network given below. 	**7**	**CO3**	**L3**
	OR			
6	a) Derive the conditions for symmetry and reciprocity for Z parameters.	**6**	**CO3**	**L3**
	b) Determine h-parameters for the network given below. 	**6**	**CO3**	**L4**
	UNIT-IV			
7	a) Obtain the transient response for Series R-C circuit for DC excitation.	**6**	**CO2**	**L2**
	b) For the circuit shown, with zero inductor current the switch is closed on to position S1 at time t = 0. At one milli second it is moved to position S2. Obtain the equation for the currents in both the intervals using Laplace transforms.	**6**	**CO2**	**L4**

				
	OR			
8	Derive the transient response for series RLC circuit in differential form.	**12**	**CO 2**	**L2**
	UNIT-V			
9	Obtain the transient response for Series R-L circuit for AC excitation.	**12**	**CO 2**	**L3**
	OR			
10	Obtain the transient response for Series R-C circuit for AC excitation.	**12**	**CO 2**	**L3**

KSRM COLLEGE OF ENGINEERING, KADAPA
(AUTONOMOUS)
B.TECH III SEMESTER EXAMS OF MARCH 2021
SUB: ELECTRICAL MEASUREMENTS & MEASURING INTRUMENTS

Time:90 Min Max. Marks: 60

Unit-I

1(a) Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring control. 8 M

1(b) A 2mA meter with an internal resistance of 100 ohms is to be converted to (0-150) mA ammeter .Calculate the value of the shunt resistance. 4M

OR

2(a) The law of deflection of moving iron ammeter is given by I=4 ampere where θ is the deflection in radian and n is a constant. The self –inductance when the meter current is zero is10mH.The spring constant is 0.16N-m/rad.

(i) Determine an expression for self-induction of the meter as a function of θ and n.

(ii) With n=0.75 Calculate the meter current and the deflection that corresponds to a self –inductance of 60mH. 6M

2(b) Explain in detail about Repulsion type moving iron Instrument. 6M

Unit-II

3(a) Derive the deflecting torque expression of single phase dynamometer wattmeter. 8M

3(b) An electro dynamic wattmeter is rated at 10A and 100V will full scale reading of 1000W .The inductive of voltage circuit is 5mH and its resistance is 2000 ohms .If the voltage drop across the current coil of the wattmeter is negligible ,What is the error in the wattmeter at the rated VA rating with zero power factor the supply frequency is 50Hz. 4M

OR

4.(a) Explain the construction & working of single phase Induction type energy meter. 8M

(b) A correctly adjusted,single phase 240 V induction watthour meter has a meter constant of the 600 revolutions per kwh .Determine the speed of the disc for a current of 10 A at a power factor of 0.8 lagging.

If the lag adjustment is altered so that the phase angle between voltage coil flux and flux and applied voltage is 86°.Calculate the error introduced at (a) Unity power factor. (b) 0.5 Power factor lagging .

Comment upon the result.

Unit-III

5. Draw the Kelvin's double bridge circuit and explain the measurement of low resistance using this bridge. 12M

OR

6. Explain about the Maxwell's Bridge for both inductance and capacitance comparison. 12M

Unit-IV

7.Draw neat connection diagram for measuring high voltage and high current with the help of potential transformer and current transformer. What purpose do they serve? 12M

OR

8(a). Describe the construction and working of a polar type ac potentiometer. 6M

8(b) Draw the diagram and explain the operation of DC Crompton's potentiometer. 6M

Unit-V

9(a) Explain about the block diagram of Cathode Ray oscilloscope 8M

9(b) Describe how to measure phase by using lissajous patterns 4M

OR

10.Explain about the ramp and integrating type of digital voltmeters 12M

KSRM COLLEGE OF ENGINEERING (AUTONOMOUS): KADAPA

B. Tech III Semester (R-20)EEE End Examinations **Model paper**

Subject: DC MACHINES AND TRANSFORMERS

Time: 3 hours Max.Marks:60

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Q. No	Question	Marks	CO	BL
	UNIT-I			
1	a) Derive the EMF equation of a DC generator.	**6**	**CO1**	**L3**
	b) A 4-pole DC generator has a wave wound armature with 792 conductors. The flux per pole is 0.0121 wb. Determine the speed at which it should be run to generate 240V on no-load.	**6**	**CO1**	**L4**
	OR			
2	Analyze theparallel operation of DC Generators.	**12**	**CO2**	**L3**
	UNIT-II			
3	a)Explain the characteristics of DC shunt motors.	**6**	**CO2**	**L2**
	b) A 4-pole, 220V Shunt motor has 540 lap-wound conductors. It takes 32A from the supply mains and develops output power of 5.595kW. The field winding takes 1A. The R_a is 0.09Ω and the flux per pole is 30mWb. Calculate (i) Speed (ii) Armature torque and (iii) Output torque.	**6**	**CO3**	**L4**
	OR			
4	a) Explain 3-point starter with a neat diagram.	**7**	**CO2**	**L3**
	b) A 220V DC series motor is running at a speed of 800rpm and draws 100A. Calculate at what speed the motor will run when developing half the torque. Total resistance of armature and field is 0.1Ω. Assume that the magnetic circuit is unsaturated.	**5**	**CO3**	**L4**
	UNIT-III			
5	Explain in detail about the Losses and Efficiency of a DC Machine and also derive the Condition for maximum Efficiency.	**12**	**CO3**	**L2**

	OR			
6	a) Explain Swinburne's test on DC machines. Also state its advantages & disadvantages.	**8**	**CO3**	**L3**
	(b)A 200V DC motor takes 25 A while running at a speed of 1000r.p.m during brake test. If the spring balances read 5kgand 25 kg, find the output and efficiency. Diameter of the brake drum is given as 40cm	**4**	**CO2**	**L4**
	UNIT-IV			
7	a) Derive an expression for the induced e.m.f of a transformer.	**6**	**CO1**	**L2**
	b) The core of a 100kVA, 11000/550V, 50-Hz, 1-phase transformer has a cross section of 20cmX20cm. find (i) The number of turns in LV and HV windings. (ii) EMF per turn. The maximum flux density is 1.3 Tesla and assume a stacking factor of 0.9	**6**	**CO1**	**L4**
	OR			
8	a) Explain Sumpner's test on transformer.	**6**	**CO3**	**L2**
	b)Obtain the equivalent circuit of a 200/400V, 50Hz, 1-phase transformer from the following test data: OC test: 200V, 0.7A, 70W – on LV side SC test: 15V, 10A, 85W – on HV side. Calculate the equivalent circuit parameters and show them on equivalent circuit.	**6**	**CO3**	**L4**
	UNIT-V			
9	Draw and analyze the connection diagram of a transformer for converting 3-phase supply into 2-phase supply	**12**	**CO4**	**L3**
	OR			
10	a) Discuss the advantages of Auto transformers over two winding transformers	**6**	**CO4**	**L3**
	b) Discuss various types of connections used for 3-=phase transformers.	**6**	**CO4**	**L2**

Code: 2003301

R 20

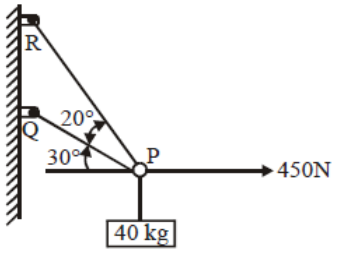
K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)
B.Tech III semester (R20) Regular Examinations, March 2022
FUNDAMENTALS OF STATISTICS AND DYNAMICS
(Mechanical Engineering)
MODEL QUESTION PAPER

Time: 3 hrs **Max Marks:60**

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

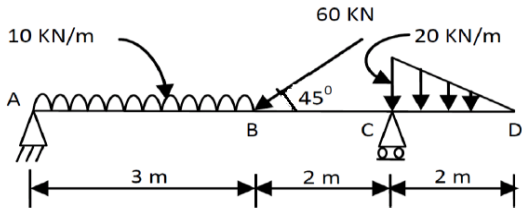
UNIT -I

1. Determine the tension in cable PQ and PR required to hold 50 kg weight shown in figure. 12 M

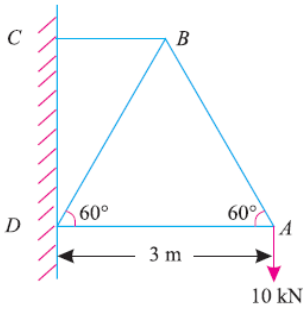


(OR)

2. Calculate reactions at support due to applied load on the beam as shown in Figure. 12 M

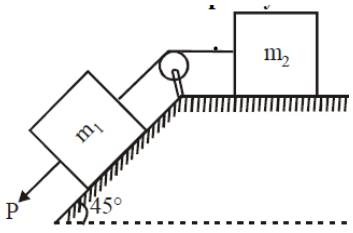


3. A cantilever truss of 3 m span is loaded as shown in Figure. Find the forces in the various members of the framed truss, and tabulate the results. 12 M

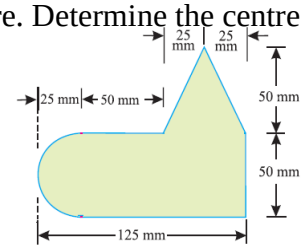


(OR)

4. Determine the necessary force P acting parallel to the plane as shown in figure to cause motion to impend. Assume the co-efficient of friction as 0.25 and the pulley to be smooth. m1 =50kg m2 =150kg . 12 M

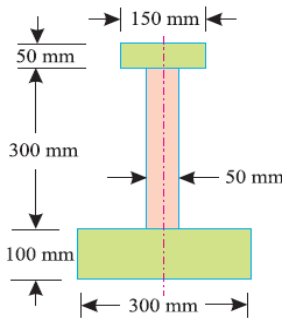


5.A uniform lamina shown in Figure. Determine the centre of gravity of the lamina. 12 M

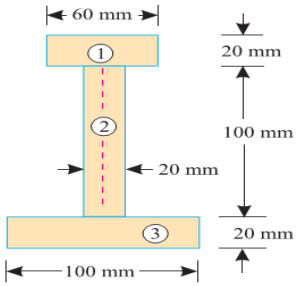


(OR)

6. Locate the centroid of the area shown below. 12 M

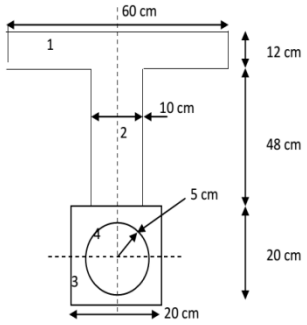


7. An I-section is made up of three rectangles as shown in Figure. Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the section. 12 M



(OR)

8. Find the moment of inertia about horizontal axis for the section shown in figure. 12 M



9. A burglar's car had a start with an acceleration of 2 m/sec^2. A police vigilant party came after 5 seconds and continued to chase the burglar's car with a uniform velocity of 20 m/sec. Find the time taken, in which police van will overtake the burglar's car. 12 M

(OR)

10. The motion of a particle is given by $a = t^3 - 3t^2 + 5$. Where 'a' is the acceleration in m/sec^2 and 't' is the time in seconds. The velocity of the particle at t = 1 second is 6.25 m/sec and the displacement is 8.8 meters. Calculate the displacement and velocity at t = 2 seconds. 12 M

Subject code: 2003302

K.S.R.M COLLEGE OF ENGINEERING (Autonomous), KADAPA

B.Tech III Sem (R20) Regular Examinations, MARCH (2022)

Subject: MECHANICS OF FLUIDS

(Mechanical Engineering)

MODEL QUESTION PAPER

Time:3 Hrs **Max Marks:60**

Answer any Five questions. Selecting one question from each unit.

All Questions carry equal marks

Unit-I

1. a) Calculate the density, specific weight and weight of one litre of petrol of specific gravity is 0.7

   b) Describe properties of fluid?

OR

2. a) A plate of 0.025mm distant from a fixed plate moves at 50 cm/sec and requires a force of 1.471 N/m^2 to maintain this speed . Determine the fluid viscosity between the plates.

   b) Discuss Unit and Specific Quantites in Detail?

Unit-II

3. a) Explain the terms:
   (i)Path line (ii) Streak line (iii) Stream line, and (IV) Stream tube

   b) Describe the methods in fluid motion and Explain in detail?

OR

4. What is Euler's equation of motion? How will you obtain Bernoulli's equation from it? What are the assumptions made in the derivation of Bernoulli's equation?

Unit-III

5. Derive an expression for Darcy weisbach equation ?

OR

6. Explain the principle of venturimeter with a neat sketch.Derive the expression for the rate of flow of fluid through it.

Unit-IV

7. Find the displacement thickness, the momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U}=2(\frac{y}{\delta})-(\frac{y}{\delta})^2$

OR

8. a) What do you mean by boundary layer separation? What is the effect of pressure gradient on boundary layer separation?

b) Air is flowing over a flat plate 500 mm long and 600mm wide with a velocity of 4m/sec.The kinematic viscosity of air is given as $0.15*10^{-4}m^2s$.find

i) The Boundary thickness at the end of the plate.

ii) Shear stress at 200 mm from the leading edge and

iii)Drag force on one side of the plate .

take the velocity profile over the plate as u/U=sin(∏/2,u/∂) and density of air 1.24 kg/m^2.

Unit-V

9. a) A single acting reciprocating pump has a plunger of diameter 250mm and stroke 350mm.if the speed of the pump is 60r.p.m and it delivers 16.5 lps of water against a suction head of 5m and a delivery head of 20m, Find the theoretical discharge,coefficient of discharge the slip percentage of the pump and the power required to drive the pump.

OR

10. a) Define centrifugal pump. Explain the working of a single stage centrifugal pump with neat sketch?

b) Obtain an expression for the minimum speed for starting centrifugal pump.

R 20

Code: (2003303)

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)

B. Tech III semester (R20) Regular Examinations, MARCH-2022

MANUFACTURING PROCESSES

(Mechanical Engineering)

MODEL QUESTION PAPER

Time: 3 hrs **Max Marks: 60**

Answer five questions. Selecting one Question from each unit
All Questions carry equal marks

UNIT-I

1) Explain the concept of Allowances? Write different types of allowances?

(OR)

2) Define pattern and briefly explain about any six types of patterns with a neat sketch

UNIT-II

3) Describe briefly the types of hot chamber die-casting machines with a neat sketch?

(OR)

4) Explain in detail the working of a cupola furnace with a neat sketch.

UNIT-III

5) Explain Briefly about TIG and MIG welding with a neat sketch.

(OR)

6) With a neat sketch, explain the working principle of submerged arc welding process.

UNIT-IV

7) How do you classify Extrusion processes? Explain Hydrostatic Extrusion with a neat Sketch?

(OR)

8) a) With a neat sketch explain "Smith forging".
b) Explain any four forging defects with a neat sketch

.

UNIT – V

9) Explain the types of presses and press tools ?

.

(OR)

10. Describe the following with neat sketch?
a) Blanking operations b) wire drawing c) Hot and cold spinning

.

SUBJECT CODE: 2003304 **R20**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. III Sem. (R20) Regular Examinations

SUB: Engineering Thermodynamics

Time : 3 Hours **Max. Marks: 60**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

MODEL PAPER

UNIT - I

1.	(a)	Classify the 'Thermodynamic system'. Give example for each type with justification	6M
	(b)	What do you understand by macroscopic and microscopic view points?	6M
		(OR)	
2.	(a)	What is 'Thermal Equilibrium' and define 'Zeroth Law of Thermodynamics'	6M
	(b)	A gas expands from an initial state where the pressure is 340 kPa and the volume is 0.0425 m^3 to a final pressure of 136 kPa. The relationship between the pressure and volume of the gas is pv^2 = Constant. Determine the work transfer for the process.	6M

UNIT – II

3.	(a)	Explain 'First Law of Thermodynamics' for a closed system executing a cycle.	6M
	(b)	A system changes from state 1 to state 2 along the path 1A2 and absorbs 75 Kj of heat and does 30 kj of work. The system is returned from state 2 to state 1 along the path 2B1 by doing a work of 10 Kj. Find out the heat transfer along the path 2B1.	6M
		(OR)	
4.	(a)	Write down the general steady flow energy equation for a steady flow system and simplify when applied for the steam turbine.	6M
	(b)	At the inlet to a certain nozzle the enthalpy of the fluid is 3025 KJ/Kg and the velocity is 60 m/s. At the exit from the nozzle the enthalpy is 2790 KJ/Kg. The nozzle is horizontal and there is negligible heat loss from it. Find the (i) velocity of the fluid at the exit. (ii) if the inlet area is 0.1 m^2 and specific volume at inlet is 0.19 m^3/Kg, find the rate of flow of fluid.	6M

UNIT – III

5.	(a)	State and explain 'Second Law of Thernodynamics'.	6M
	(b)	A heat engine receives heat at the rate of 1500 KJ/min and gives an output of 8.2 Kw. Determine (i) the thermal efficiency (ii) The rate of heat rejection.	6M
		(OR)	
6.	(a)	Explain PMM-II?	4M
	(b)	An inventor claims that his engine has the following specifications: Temperature limits: $T_1 = 750^0$ C and $T_2 = 25^0$ C; Power developed = 75 Kw; Fuel burned per hour = 3.9 Kg; Heating value of the fuel = 74500 Kj/kg. Assess whether his claim is valid or not.	8M

UNIT – IV

7.	(a)	Prove that entropy is a property of a system.	6M
	(b)	One kg of air in a closed system, initially at 5^0 C and occupying 0.3 m^3 volume, undergoes a constant pressure heating process to 100^0 C. There is no work other than pdv work. Find the entropy change of the gas.	6M

(OR)

8.	(a)	What is available energy and unavailable energy?	6M
	(b)	Derive an expression for availability in steady flow systems.	6M

UNIT-V

9.	(a)	Describe the process of formation of steam and give its graphical representation also..	6M
	(b)	Find the specific volume, enthalpy and internal energy of wet steam at 18 bar pressure and dryness fraction of 0.9.	6M

(OR)

10.	(a)	Define the terms Dry bulb temperature, Dew point temperature, Relative humidity and Specific humidity.	6M
	(b)	The atmospheric conditions are: 20^0 C and specific humidity of 0.0095 Kg/ Kg of dry air. Calculate the following: (i) Partial pressure of vapor (ii) Relative humidity (iii) Dew point temperature	6M

R 20

Code: **2003305**

K.S.R.M COLLEGE OF ENGINEERING, KADAPA (AUTONOMOUS)

B.

Tech III SEMESTER (R20) Regular Examinations, March-2022

MECHANICS OF MATERIALS

(Mechanical Engineering)

Model Question Paper

Time: 3 hours Max Marks: 60

Answer any five questions. Selecting one question from each unit

All questions carry equal marks

UNIT I

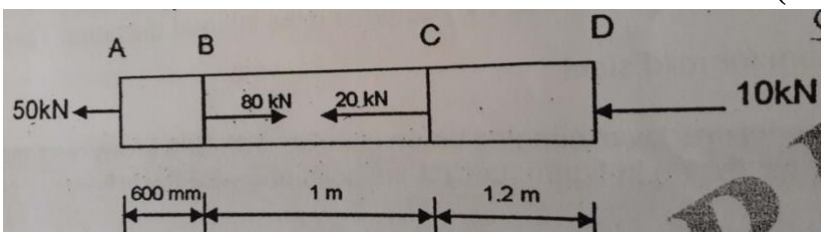
1. a) Derive the relationship between the elastic modulii. (6 marks)

b) A reinforced short concrete column 250mm X 250mm in section is reinforced with 8 steel bars in 2500 mm^2. The column carries a load of 390KN. If the modulus of elasticity for steel is 15 times that of concrete. Find the stresses in steel and concrete. (6 marks)

OR

2. a) Derive the expression for the strain energy stored in a body when the load is suddenly applied. (6marks)

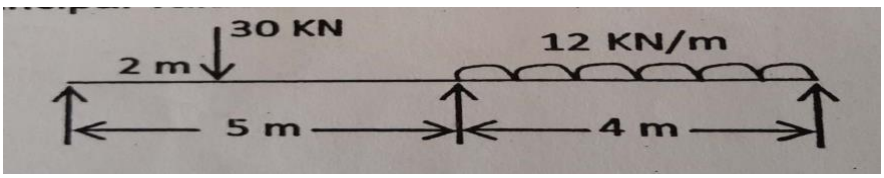
b) A brass bar having cross sectional area of 1000 mm^2 is subjected to axial forces as shown in fig. Find the total elongation of the bar, Take $E=1.05\times10^5$ N/mm^2 (6 marks)



UNIT II

3. a) what are the different types of beams. Differentiate between a point load and uniformly distributed load. (6 Marks)

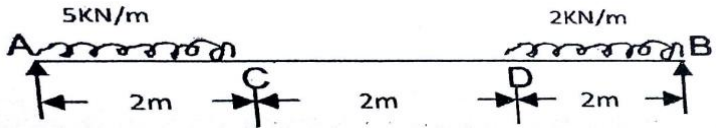
b) A simply supported beam of 9m span is loaded as shown in figure. Draw the bending moment and shear force diagram indicating principal values. (6 marks)



OR

4 .a) Define shear force and bending moment with sign conventions (6 Marks)

b) Draw shear force and bending moment diagram for the shown in fig indicating principal values (6 marks)



UNIT III

5. a) Write the assumptions of theory of simple bending (6 Marks)

b) A timber beam of rectangular section is to support a load of 20 KN over a span of 4m. If the depth of the section is to be twice the breadth and the stress in the timber is not to exceed 60 N/mm^2, find the dimensions of the cross section. How would you modify of the beam it were a concentrated load placed at the center with the same ratio of breadth to depth? (6 Marks)

OR

6. Two beams are simply supported over same span and have the same flexural strength, compare the weight of these two beams, if one of them is solid and the other is hollow circular with internal diameter half of the external diameter . (12 marks)

UNIT 1V

7. A Cantilever beam of span 2.4 m carries a point load of 15 KN at a distance of 1.8 m from the fixed end. What are the values of slope and deflection at the free end of the cantilever , if the flexural rigidity of the beam is 9×10^{12} N/mm^2 . (12 Marks)

OR

8. A hollow alloy tube 4 m long with external and internal diameter of 40 mm and 25 mm respectively was found to extent 4.8 mm under a tensile load of 60 KN. Find the buckling load for the tube with both ends pinned. Also Find the safe load on the tube, taking factor of safety as 5 (12Marks)

UNIT V

9 a) Derive the formula for longitudinal and circumferential stresses (6Marks)

b).A cylindrical shell 2.4 m long 0.6 meter in diameter is made up of 12 mm thin plate. Find the change in length and diameter when the shell is subjected to an internal pressure of $2N/mm^2$. Take $E= 2x10^5 N/mm^2$ and $\mu=0.25$ (6 Marks)

OR

10. The stresses at point of a machine component are 150MPa and 50 MPa both tensile. Find the intensities of normal, shear and resultant stresses on a plane inclined at an angle of 55^0 with the axis of major tensile stress. Also find the magnitude of the maximum shear stress in the component. (12 marks)

B.Tech III Semester (R20) Model paper

(Electronics & Communication Engineering)

Sub: Signals and Systems (2004301)

Time: 3 hours **Max Marks: 60M**

Answer the following Questions

All Questions carry equal marks

Unit-I

1. (a) What are the different classifications of continuous time signals & explain it. 6M

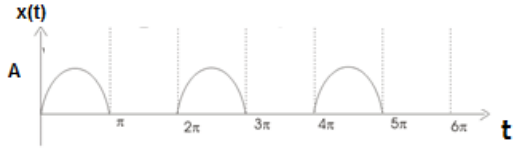
   (b) Draw the following signals by applying basic operations on unit step signal. 6M

   i.) u(-2t+3) ii.) u((t/2) - 2)

(Or)

2. (a) Explain the conditions for existence of Fourier series Expansion for periodic signals. 4M

   (b) Expand the signal show in below figure by using trigonometric Fourier series expansion. 8M



Unit-II

3. (a) State and prove convolution in time & integration properties of Fourier Transform 6M

   (b) Find the Fourier transform of unit impulse, unit step & Rectangular function. 6M

(Or)

4. (a) Explain about Fourier Transform for periodic signals. 6M

   (b) Find Fourier transform of $x(t) = \sum_{n=-\infty}^{\infty} \delta(t - nT)$ 6M

Unit-III

5. Explain the process of sampling in detail with neat sketches 12M

(Or)

6. Compute the convolution of the given signals:

   (i) x(t) = u(t-3) – u(t-5), h(t) = u(t). 6M

   (ii) x(t) = u(t), h(t) = u(t). 6M

Unit-IV

7. a) Derive the expression for the Response of LTI systems. 6M

   b) Explain about distortion less transmission through LTI systems. 6M

(Or)

8. a) Find the DTFT of x(n) = $(1/3)^n$ u(n) and sketch its spectrum. 6M

   b) State and prove the time reversal and time scaling properties of Discrete time Fourier transform. 6M

Unit-V

9. (a) Find the Laplace transform of i) $x(t) = e^{-at}cos(\omega_0 t)u(t)$ $ii)$ $x(t) = te^{-at}u(t)$ 6M

   (b) Find the inverse transform of $X(s) = 1/(s(s+1)(s+2)(s+3))$ 6M

(Or)

10. (a) Find the Z-Transform of $i)$ $x(n) = a^n u(n)$ $ii)$ $x(n) = na^n u(n)$ 6M

    (b) State and prove initial & final value theorems in Z-Transforms 6M

K.S.R.M.COLLEGE OF ENGINEERING, KADAPA-03

B.TECH III SEM ECE (R20)(AUTONOMOUS) MODEL QUESTION PAPER

SUB: DIGITAL SYSTEM DESIGN (2004302)

Time: 3Hrs **Max.Marks:60**

Answer ALL questions

All questions carry equal marks

UNIT -1

1. a)Convert the following numbers (8M)

i) $(4310)_5$ to base 10

ii) $(C3DF)_{16}$ to base 2

iii) $(6054.263)_8$ to base 16

iv) $(420.6)_{10}$ to base 8

b) Encode the word DATA into 7-bit ASCII code (4M)

(OR)

2. a) Convert the following numbers in to Gray code (4M)

i.$(96)_{10}$ ii. $(234)_8$

b) Subtract the following numbers by using BCD code (8M)

i. 920-356 ii. 476.7-258.9 iii. 206.7-147.8

UNIT-2

3. a) Simplify the following Boolean function for minimal POS using K-map (6M)

F(A,B,C,D)= ∑(1,2,5,6,9)+d(10,11,12,13,14,15)

b) Find the complement of F=wx+yz , then show that FF'=0 and F+F'=1 (6M)

(OR)

4. a)Discuss about ECL and TTL logic families (6M)

b) Compare different logic families (6M)

UNIT-3

5. a)Design a 4-bit binary to gray code converter. (6M)

b) Implement the following Boolean function with a 4:1 MUX and external gates.

F(A,B,C,D)=∑(1,3,4,11,12,13,14,15) (6M)

(OR)

6. a) Construct a 5-to-32 line decoder with four 3-to-8 line decoders with enable and 2- to-4 line decoder. (6M)

b) Define Hazard? Explain the types and Hazard free realization. (6M)

UNIT-4

7.a) Design a mod-12 synchronous counter using T-flip-flop. (6M)

b) Draw the state diagram and the state table for a sequence detector to detect the sequence 1010 and implement by using D-flip-flop (6M)

(OR)

8. a)Design a 3-bit up-down counter which counts up when the control signal M=1 and counts down when M=0. (6M)

b) Explain the flip-flop operating characteristics (6M)

UNIT-5

9. a)Design a combinational circuit using a ROM .The circuit accepts 3-bit binary number and generates an output binary number equal to the square of the input number. (6M)

b) Compare the three combinational PLD's- PROM , PLA and PAL (6M)

(OR)

10. a) Explain about the RAM types and its internal structure in detail (6M)

b) Design a BCD to XS-3 code converter using a PLA (6M)

KSRM COLLEGE OF ENGINEERING, KADAPA
(AUTONOMOUS)
B. TECH., III SEM (R20)DEPARTMENT OF ECE
SUB: ANALOG CIRCUITS MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 60**

Note: Answer all questions choosing *one* from each unit
All questions carry equal marks

UNIT - I

1. (a) Draw the circuit of a MOS differential pair with common mode input voltage and derive an expression for overdrive voltage. (6M)
   (b) Derive an expression for CMRR of MOS differential amplifier. (6M)

(OR)

2. (a) Draw the circuit of a BJT differential pair with large signal input and derive expressions for emitter currents. (6M)
   (b) Explain the small signal operation of a BJT differential pair. (6M)

UNIT - II

3. (a) Draw the high frequency response of a CG amplifier and explain. (6M)
   (b) Define gain bandwidth product and explain. (6M)

(OR)

4. (a) Draw the hybrid pi model of a CE transistor and define each parameter. (6M)
   (b) Derive an expression for CE short circuit current gain. (6M)

UNIT - III

5. (a) Derive an expression for gain of negative & positive feedbacks. (6M)
   (b) Draw the circuit of a Hartley oscillator and explain. (6M)

(OR)

6. (a) Draw the block diagram for voltage series feedback and explain with the help of a practical example. (6M)
(b) Draw the circuit of an RC oscillator and explain. (6M)

UNIT - IV

7. (a) Draw the circuit of a transformer coupled class A amplifier and explain. (6M)
   (b) Derive the expression for Q factor of an inductor and a capacitor. (6M)

(OR)

8. (a) Draw the circuit of a single tuned amplifier and explain. (6M)
   (b) Draw the circuit of a transformer coupled push-pull amplifier and explain. (6M)

UNIT - V

9. (a) Draw the circuit diagram of a Bistable multivibrator and explain the operation. (6M)
   (b) Write about the general characteristics of a time base signal. (6M)

(OR)

10. (a) Explain the operation of a Schmitt trigger using BJT with the help of circuit diagram. (6M)
(b) Draw the circuit diagram of an Astable multivibrator and explain the operation. (6M)

K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA.

Model Question paper

B.Tech III Sem (R20)

Network Theory(2004304)

(ECE Branch)

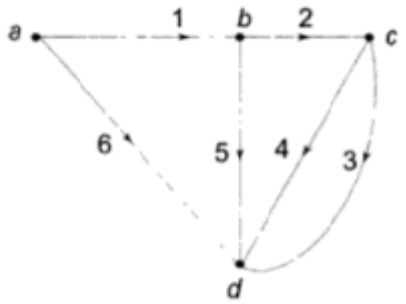
Time: 3 Hrs. **Max Marks : 60**

Note: Answer any **FIVE** questions by choosing one from each unit.
All questions carry equal marks.

UNIT - I

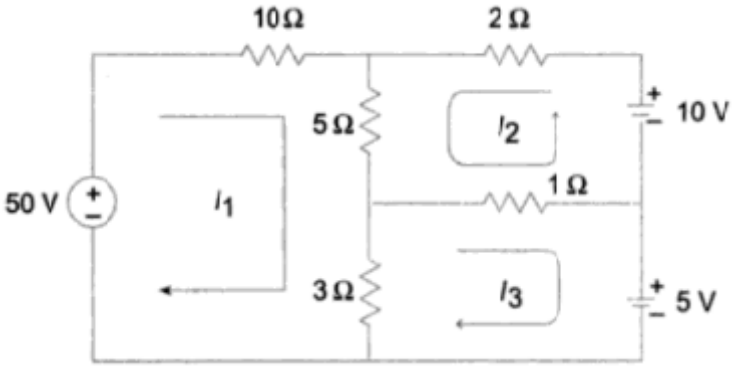
1 (a) Illustrate the properties of Incidence matrix with an example? (6M)

(b) For the given circuit form a Tie Set matrix? (6M)



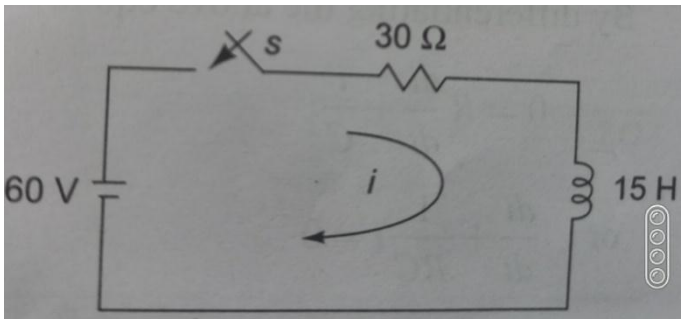
(OR)

2 Determine the mesh currents for the given circuits? (12M)



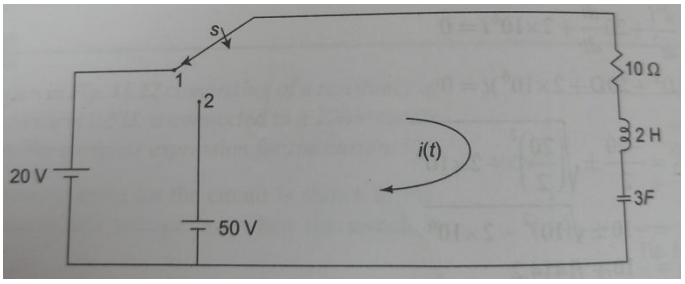
UNIT – II

3 A Series RL circuit with R=30Ω and L=15H has a constant voltage V=60V applied at t=0 as shown in fig. Determine the current, Voltage across resistor and voltage across Inductor with necessary equations? (12M)



(OR)

4 In the network shown in fig, The switch is moved from the position 1 to the position 2 at t=0. The switch is in position 1 for a long time. Determine the current expression i(t)? (12M)



UNIT – III

5. Explain the response of R-L network if the input is excited by a sinusoidal signal with necessary equations? (12M)

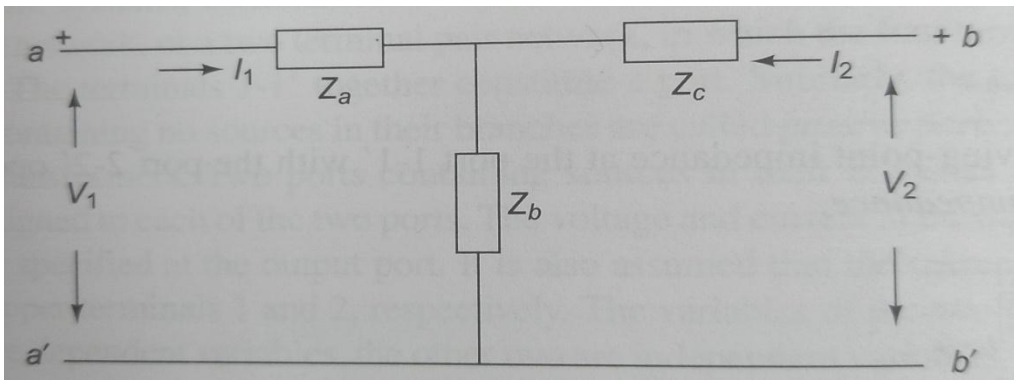
(OR)

6. (a) Explain about series resonance? (6M)

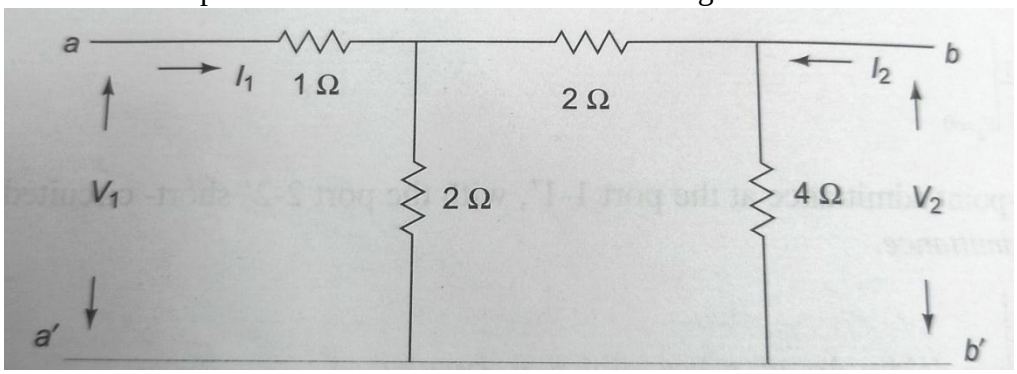
(b) Explain in detail about Bandwidth and Quality factor of tuned circuits? (6M)

UNIT – IV

7 a) Evaluate the open circuited parameters for the given circuit (6M)



b) Determine the Y-parameters for the network shown in fig? (6M)



(OR)

8 Evaluate Impedance, Admittance & ABCD parameters with necessary equations (12M)

UNIT – V

9. Explain the synthesis of R-L network by the Cauer method? (12M)

(OR)

10. Explain the synthesis of R-C network by the Foster method? (12M)

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
Model Question Paper
(2005302) DATASTRUCTURES
B.Tech. III Semester (CSE) (R20) Degree Examinations

Time: 3 hrs. **Max. Marks: 60**

Note: - Answer any FIVE questions choosing ONE question from each unit.
All questions carry Equal marks.

UNIT-I

1. a) Differentiate linear and non-linear data structures. 6M
   b) Explain about Towers of Hanoi. 6M

(OR)

2. What is Stack? Write and explain the algorithms of Push and Pop operations. 12M

UNIT-II

3. Define Queue. Write and explain the algorithms of insertion and deletion operations. 12M

(OR)

4. a) Discuss about circular queue. 5M
   b) What is Binary Tree? Explain the properties of a Binary Tree. 7M

UNIT-III

5. a) Construct the Binary Tree with the following inorder and preorder traversals. 6M

   Inorder: EACKFHDBG Preorder: FAEKCDHGB

   b) Discuss about priority queues. 6M

(OR)

6. a) What is BST? Explain insertion and deletion operations with suitable examples. 8M
   b) Discuss about Red-Black Tree. 4M

UNIT-IV

7. Briefly explain about Breadth First Search (BFS) with suitable example. 12M

(OR)

8. Explain in detail about Heap sort algorithm with an example. 12M

UNIT-V

9. a) Explain about various Hash functions with suitable example. 6M
   b) Define collision and explain about separate chaining with example. 6M

(OR)

10) What is B tree? Explain about various operations of B tree with examples. 12M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
Model Question Paper
(2005303) FORMAL LANGUAGES AND AUTOMATATHEORY
B.Tech. III Semester (CSE) (R20) Degree Examinations

Time: 3 hrs. **Max. Marks: 60**

Note: - Answer any FIVE questions choosing ONE question from each unit.
All questions carry Equal marks.

UNIT-I

1. a) Define NFA ? Give state diagram of NFA with specified number of states recognizing the given language {w/w ends with 00} with three states over the input {0,1}. 7M

   b) Explain the procedure of minimization of Finite state machine with example. 7M

(OR)

2. a) Elaborate the procedure to convert NFA to DFA with suitable example. 7M
   b) What are the differences between NFA andDFA? 7M

UNIT-II

3. a) Explain the procedure for converting Regular Expression to Finite Automata with suitable example. 7M
   b) Construct NFA for the regular expression (a+b)*aa(b+a)*. 7M

(OR)

4. a) State and Prove Arden's theorem. 7M
   b) Construct NFA for regular expression (11+0)*(00+1)* 7M

UNIT-III

5. Define the following 8M
   a) I) Left most derivation ii)Right most derivation
      iii) Derivation tree iv) Ambiguous grammar

   b) Write the procedure for Eliminating Unit productions in the given grammar. 6M

(OR)

6. Explain the procedure of converting the given CFG to Greibach Normal Form(GNF) with suitable example. 10M

UNIT-IV

7. a) Define PDA.Design a PDA for equal number of a's and b's. 7M
   b) Convert the following CFG to a PDA.
      S→aAA , S→aS/bS/a 7M

(OR)

8. a) Design a Pushdown Automata which accepts L={wcw^r/wE(0+1)*. 7M
   b) Explain about Two Stack PDA. 7M

UNIT-V

9. a) Give the formal definition of TM? What are the different types of TM's? Explain. 7M
   b) Explain about undecidable problem. 7M

(OR)

10. a) Design a Turing Machine to find whether the given number is prime or not. 7M
    b) Explain Church's Hypothesis with suitable example. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

Model Question Paper

(2005304) OBJECT ORIENTED PROGRAMMING THROUGHJAVA

B.Tech. III Semester (CSE) (R20) Degree Examinations

Time: 3 hrs. **Max. Marks: 60**

Note: - Answer any FIVE questions choosing ONE question from each unit.

All questions carry Equal marks.

UNIT -I

1. a) Write briefly about OOP concepts. 8 M
   b) Write about access control in java. 4 M

OR

2. a) Explain Overloading methods in Java with example program. 6 M
   b) Write briefly about Java buzzwords. 6 M

UNIT -II

3. Explain different types of inheritance in Java with one example each 12 M

OR

4. a) Explain the differences between classes and interfaces with examples. 6 M
   b) Explain about creating and accessing a package with one example. 6 M

UNIT- III

5. a) Explain the process of Exception Handling in java. 6 M
   b) Explain user-defined exceptions with example program. 6 M

OR

6. a) Explain Thread Life cycle. 6 M
   b) Explain about multithreading concept in java with example program. 6 M

UNIT -IV

7. a) Write about Mouse and Keyboard events in java. 6 M
   b) Explain button and text components in java. 6 M

OR

8. Write about Layout manager types in java. 12 M

UNIT- V

9. a) What is an applet? Explain in detail about applet life cycle with suitable diagram. 8 M
   b) Write an applet program draw circle and rectangle filled with red color. 4 M

OR

10. a) Write about JFrames and JComponents in swings. 6 M
    b) Explain Checkboxes and Radio button in swings with example program. 6 M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
Model Question Paper
(2005305) DATABASE MANAGEMENT SYSTEMS
B.Tech. III Semester (CSE) (R20) Degree Examinations

Time: 3 hrs. **Max. Marks: 60**

Note: - Answer any **FIVE** questions choosing **ONE** question from each unit.
All questions carry Equal marks.

UNIT-I

1. a) Write about Database users and Administrators 6M
   b) Explain Database system architecture with a neat diagram. 6M

(OR)

2. a) Explain about three levels of data abstraction. 6M
   b) What is E-R model? Explain various components of E-R model. 6M

UNIT- II

3. Explain Fundamental Relational Algebra operations in detail. 12 M

(OR)

4. a) Explain about various keys used in relational model 6M
   b) Prove $R \bowtie_{\Theta} S = \sigma_{\Theta}(R \times S)$ Where R and S are relation Schemas. 6M

UNIT-III

5. a) Explain SELECT statement with the following clauses
   i) Where ii) group by iii) order by iv) having 6M
   b) Explain about Tuple Relational Calculus with example queries 6M

(OR)

6. a) Discuss about various aggregate functions used in SQL 6M
   b) Explain about nested sub queries in SQL with suitable examples. 6M

UNIT-IV

7. a) Discuss various problems caused by redundancy. 6M
   b) Explain 1NF, 2NF and 3NF with example. 6M

(OR)

8. a) What is Functional dependency? Write about Decompositions. 6M
   b) What is Multi-Valued and Join dependency? Write about Fourth and Fifth normal forms. 6M

UNIT-V

9. a) What is a Transaction? Write about properties of Transaction. 6M
   b) Explain about Two-Phase locking protocol. 6M

(OR)

10. a) Explain about Log-Based recovery. 6M
    b) Discuss about conflict serializability. 6M

Subject Code: 2021301 **R 20**

K S R M College of Engineering (Autonomous), KADAPA – 516 003
B. Tech. III Semester - Regular Examinations, 2022 - Model Question Paper
Sub: Probability, Statistics & Numerical Methods
(Civil Engineering)

Time: 03:00 Hrs. **Max. Marks: 60**

Answer any FIVE Questions choosing One Question from each Unit.

All Questions carries equal marks

	UNIT-I	
1.	(a) Assume that 50% of all engineering students are good in Mathematics. Determine the probabilities that among 18 engineering students (i) exactly 10 (ii) at least 2 and at most 9 are good in Mathematics. (b) Average number of accidents on any day on a national highway is 1.8. Determine the probability that the number of accidents is (i) at least one (ii) at most one.	**06 M** **06 M**
	OR	
2.	The weekly wages 1000 workmen are normally distributed around a mean of Rs.70 with standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be (i) between Rs. 69 and Rs.72 (ii) less than Rs.69 and (ii) more than Rs.72.	**12 M**
	UNIT – II	
3.	(a) A manufacturer of mercury vapour lamps in manufacturing lamps to last 4000 lighting hours on the average with a standard deviation of 300 hours. A certain random sample of 100 lamps from his production has a mean life of 3900 hours. (b) A machine puts out 1600 imperfect articles in batch of 500. After the machine is overhauled, it puts out 3 imperfect articles in a batch of 100. Has the machine improved?	**06 M** **06 M**
	OR	
4.	(a) In a random sample of size 500, the mean is found to be 20. In another independent sample of size 400, the mean is 15. Could the samples have been drawn from the same population with standard deviation 4? (b) A salesman in a departmental store claim that at most 60 percent of the shoppers entering the store leave without making a purchase. A random sample of 50 shoppers showed that 35 of them left without making a purchase. Are these sample results consistent with the claim of the salesman? Use on LOS of 0.05.	**06 M** **06 M**

UNIT – III

5. (a) A sample of 26 bulbs used a mean life of 990 hours with a standard deviation of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Is the sample not up to the sample? **06 M**

(b) Two independent samples of 8 and 7 items respectively had the following values of the variable: **06 M**

Sample 1	9	11	13	11	15	9	12	14
Sample 2	10	12	10	14	9	8	10	

Do the two estimates of population variance differ significantly at 5% LOS?

OR

6. Fit a Poisson distribution for the following data and test the goodness of fit: **12 M**

x	0	1	2	3	4	5	Total
f	142	156	69	27	5	1	400

UNIT – IV

7. (a) Find a root of the equation $x^3 - 2x - 5 = 0$ using bisection method corrected to four decimal places. **06 M**

(b) Using Newton – Raphson method, find the positive root of $x log_{10} x = 1.2$ correct to four decimal places. **06 M**

OR

8. Solve the equations $28x + 4y - z = 32,\quad x + 3y + 10z = 24,\ 2x + 17y + 4z = 35$ by Gauss-Seidel iteration method **12 M**

UNIT – V

9. The table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface: **12 M**

Height (x)	100	150	200	250	300	350	400
Distance (y)	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the values of y when (i) x = 110 ft (ii) x =410ft

OR

10. Using Lagrange's formula, express the function $\frac{x^2+x-3}{x^3-2x^2-x+2}$ as sum of partial fractions. **12 M**

K.S.R.M. COLLEGE OF ENGINEERING (Autonomous), KADAPA.

Model Question paper

B.Tech III Sem (R20)

Special Functions and Complex Analysis

(ECE Branch)

Time: 3 Hrs. **Max Marks : 60**

Note : Answer any **FIVE** questions by choosing one from each unit.
All questions carry equal marks.

UNIT - I

1 (a) Prove that $J_{-n}(x)=(-1)^n J_n(x)$, n is an integer. (6M)

(b) Show that $J_{n+1}(x) = \frac{2n}{x}J_n(x) - J_{n-1}(x)$ (6M)

(OR)

2 State and prove Rodrigue's formula. (12M)

UNIT – II

3 Prove that the function $f(z)$ defined by $f(z) = \frac{x^3(1+i)-y^3(1-i)}{x^2+y^2}$, $z \neq 0$ and $f(0) = 0$ is continuous and Cauchy – Riemann equations are satisfied at the origin, yet $f'(0)$ does not exist. (12M)

(OR)

4 (a) Determine analytic function f(z), whose real part is $\frac{sin2x}{(cosh2y-cos2x)}$ (6M)

(b) If f (z) is an analytic function with constant modulus, Show that f (z) is constant. (6M)

UNIT – III

5. Find the bilinear transformation which maps the points z=-1, i, 1 onto the points w= 1, i, -1. Hence find the invariant points of this transformation. (12M)

(OR)

6. Discuss the transformation $w = sinz$. (12M)

UNIT – IV

7 a) Evaluate $\int_0^{2+i}(x^2 - iy)dz$, along the line $y = x$. (6M)

b) Evaluate, using Cauchy's Integral Formula $\oint_c \frac{\sin\pi z^2+\cos\pi z^2}{(z-1)(z-2)}\, dz$ where c is the circle $|z| = 3$.

(OR)

8 Evaluate $\oint_c \frac{e^z}{(z^2+\pi^2)^2}\, dz$, where c is the circle $|z| = 4$ (12M)

UNIT – V

9. a) State and prove Cauchy's residue theorem (6M)

b) Evaluate $\oint_c tan\, z\, dz$ where 'c' is the circle $|z| = 2$ (6M)

(OR)

10. Evaluate $\int_0^{\infty} \frac{\cos ax\, dx}{1+x^2}$ (12M)

R-20 **Code: 2024301**

K.S.R.M.College of Engineering (Autonomous), Kadapa

B.Tech. III SEM (R20) COMPUTER SCIENCE ENGINEERING

Sub: **BUSINESS ECONOMICS AND ACCOUNTING FOR ENGINEERS**

Time : 3Hrs. Max.Marks : 60

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*Answer any **Five** Questions choosing one question from each unit.

UNIT – I

1) Define Business economics. Explain its Nature and Scope ? 12M

(or)

2) a) Explain the Law of demand and its exceptions 6M
   b) Explain the demand forecasting methods 6M

UNIT – II

3) a) Explain Law of Variable proportion 6M
   b) What are the Internal economies of scale ? 6M

(or)

4) What is cost Analysis ? Explain about fixed, variable and Marginal cost in detail. 12M

UNIT – III

5) What is perfect competition Market ? Explain its features and price determination under perfect competition 12M

(or)

6) a) Explain any five pricing methods. 6M
   b) Explain the features of monopoly market 6M

UNIT – IV

7) Define Accounting and Explain merits and Demerits of Double entry bookkeeping ? 12M

(or)

8) a) write a short note on Trial balance 4M
   b) Journalize the following transactions in the Books of kumar swamy. 8M

Year/ days.	Particulars	Rs,,
2019 March 1.	Commenced business with cash	28,000
2.	Brought goods for cash	18,000
3.	Paid wages	200
5.	Paid for stationary	100
8.	Purchase goods from Rama	16,000
9.	Goods returned to Rama	1,500
11.	Goods sold to Bhaskar	4,000
16.	Received cash from Bhanu	4,000

UNIT – V

9) What is Ratio analysis ? Explain various types of financial ratios with examples. 12M

(or)

10) a) Benefits of ratio analysis 6M

b) From the following balance sheet of X Co. Ltd., calculate the following ratos: a) Current ratio b) Quick ratio c) Debt-equity ratio. 6M

Balace sheet of X Co. Ltd. As on 31.12.2020.			
Liabilities	Amount in Rs.	Assets	Amount in Rs.
Equity share capital	1500000	Plant and machinery	975000
Debentures	400000	Stock	550000
Creditors	200000	Debtors	550000
Outstanding expenses	100000	Cash in hand	375000
Profit and loss account	100000	Prepaid expenses	50000
Bank loan (long term	200000		
Total	2500000	Total	2500000