Q.P. Code: 2025401

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Business Economics and Accounting for Engineers (CE, ME, ECE & AI&ML)

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

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

			M	CO	BL
		UNIT - I			
1.		Define Demand forecasting along with its determinants.	12M	CO1	L1
		(OR)			
2.	(a)	Explain the following: Law of Demand and its Exceptions.	6M	CO1	L2
	(b)	Explain any three methods of demand forecasting.	6M	CO1	L2
		UNIT – II			
3.	(a)	Write about the following: Production functions of Cobb-Douglas type?	6M	CO2	L2
	(b)	Properties of Isoquants	6M	CO2	L2
		(OR)			
4.		Examine the usefulness of Break-even analysis for managers in decision making.also Explain the types of Returns to scale.	12M	CO2	L2
		UNIT – III			
5.	(a)	Explain the types of Returns to scale.	6M	CO3	L4
	(b)	Discuss the features of Monopoly market with example.	6M	CO3	L4
		(OR)			
6.	(a)	Discuss the features of Monopoly market with example.	6M	CO3	L1
	(b)	Write a note on cost plus pricing and marginal cost pricing.	6M	CO3	L1
		UNIT – IV			
7.		What do you understand by Double Entry Book Keeping? What are its advantages? Also discuss the preparation of Trail balance.	12M	CO4	L1
		(OR)			
8.		Enter the following transactions in the journal of Kumar swamy.	12M	CO4	L5

Year/ days.	Particulars	Rs,,
2009 March 1.	Commenced business with cash	28,000
2.	Bought 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.		Define ratio analysis? Explain the advantages and limitations of ratio analysis.	12M	CO5	L1
		(OR)			
10.	(a)	Explain the following: Types of Ratios and Liquidity Ratios	6M	CO5	L2
	(b)	Turnover Ratios and Profitability Ratios	6M	CO5	L2

Q.P. Code: 2001402

SET – 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Hydraulics and Hydraulic Machinery (CE)

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

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

		UNIT – I			
1.	(a)	Discuss the characteristics of the boundary layer along a thin flat plate	6M	CO1	L2
	(b)	A flat plate is placed in a flow with a velocity of 10 m/s. The boundary layer thickness at a certain point along the plate is measured to be 5 mm. Calculate the Reynolds number at this point if the kinematic viscosity of the fluid is 1×10^{-6} m^2/s	6M	CO1	L3
		(OR)			
2.	(a)	What is the Magnus effect, and how does it influence the motion of spinning objects in a fluid medium?	8M	CO1	L1
	(b)	Explain Briefly about laminar and turbulent boundary layers?	4M	CO1	L2
		UNIT – II			
3.	(a)	Using Chezy's formula for uniform flow, if the channel slope is 0.001, the hydraulic radius is 2 m, and the Chezy coefficient is 60, calculate the mean velocity of flow	6M	CO2	L4
	(b)	Define critical, sub critical and super critical flows?	6M	CO2	L1
		(OR)			
4.	(a)	Calculate the specific energy of flow in an open channel if the flow depth is 2 m, the velocity is 3 m/s, and the channel bottom slope is 0.002. Assume the gravitational acceleration g as 9.81 m/s^2	6 M	CO2	L3
	(b)	A hydraulic jump occurs in a rectangular channel where the upstream flow depth is 0.8 m and the downstream flow depth is 0.4 m. If the energy loss in the jump is 1 m, calculate the Froude number before and after the jump to determine the type of jump.	6 M	CO2	L4
		UNIT – III			
5.	(a)	A jet of water with a velocity of 20 m/s strikes a stationary vertical vane normally. If the area of the vane exposed to the jet is 2 m^2, calculate the force exerted by the jet on the vane	6M	CO3	L3
	(b)	A jet of water of diameter 50 mm strikes a fixed plate in such a way that the angle between the plate and the jet is 30^0. The force exerted in the direction of the jet is 1471.5 N. Determine the rate of flow of water.	6M	CO3	L4
		(OR)			
6.	(a)	A Jet of water having velocity of 18 m/s , Strikes a curved vanes which is moving with velocity 7 m/s in the same direction as that of the jet at inlet. The vane is so shaped that the jet is deflected through 1350. The diameter of jet is 120mm. Assuming the vane is smooth, Calculate: (i) Force exerted by the jet on the vane in the direction of motion (ii) Power exerted on the vane, and Efficiency.	6M	CO3	L4
	(b)	Derive the expression for force exerted by jet strikes the curved plate at one end tangentially when the plate is symmetrical.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Describe briefly about Pelton Wheel? Explain Velocity triangles & Work done & Efficiencies of Pelton Wheel.	6M	CO4	L1
	(b)	A Pelton turbine has a mean bucket speed of 10 m/s with a jet of water flowing at the rate of 700 li/s under a head of 30 m. the buckets deflect the jet through an angle of 160^0. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume C_V= 0.98	6M	CO4	L4
		(OR)			

8.	(a)	Demonstrate working of francis turbine with a neat sketch?	6M	CO4	L1
	(b)	Describe the governing mechanisms employed in hydraulic turbines. How do these mechanisms regulate the speed and output of the turbine?		CO4	L2

UNIT-V

9.	(a)	The internal and external diameters of the impeller of a centrifugal pump are 200 mm and 400 mm respectively. The pump is running at 1200 rpm. The vane angles of the impeller at inlet and outlet are 20^0 and 30^0 respectively. The water enters the impeller radially and velocity of flow is constant. Determine the work done by the impeller per unit weight of water.	6M	CO5	L4
	(b)	Define the head, losses, and efficiencies associated with centrifugal pumps.	6M	CO5	L2

(OR)

10.	(a)	Explain the classification of hydropower plants based on their design, operation, and location. Provide examples of each type and discuss the advantages and limitations of different classifications.	6M	CO5	L1
	(b)	Explain the principle and working of a reciprocating pump by neat sketches.	6M	CO5	L2

Q.P. Code: 2001403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Soil Mechanics (CE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Establish the relation for γ_d in terms of n_a, G, γ_w and w.	6M	CO1	L2
	(b)	An undisturbed sample of soil has a volume of 100 cm^3 and mass of 190 g. On an oven drying for 24 hours, the mass is reduced to 160 g. If the specific gravity of grains is 2.68, determine the water content, void ratio and degree of saturation of the soil.	6M	CO1	L5
		(OR)			
2.	(a)	Describe the method of determination of liquid limit of a soil in the laboratory.	6M	CO1	L1
	(b)	The sieve analysis of soil gave the following results: % passing 75μ = 4, % retained on 4.75 mm sieve = 35, Coefficient of curvature = 2.5, Uniformity coefficient = 7. The fine fraction gave the following results: Plasticity Index = 3%, Liquid limit = 15%. Classify the soil according to ISC system.	6M	CO1	L4
		UNIT – II			
3.	(a)	Explain briefly the factors affecting permeability of soil.	6M	CO2	L2
	(b)	The discharge water collected from a constant head permeameter in a period of 15 minutes is 400 ml. The internal diameter of the permeameter is 6 cm and the measured difference in heads between the two gauging points 15 cm apart is 40 cm. Determine the coefficient of permeability and comment on the type of soil.	6M	CO2	L5
		(OR)			
4.	(a)	What is a flow net? Discuss about the properties and applications of Flow nets?	6M	CO2	L2
	(b)	A sand stratum is 10 m thick. The water table is 2 m below ground level. The unit weights of sand layer above and below water table are 17 kN/m^3 and 21 kN/m^3 respectively. The capillary rise above water table is 1 m. Draw the effective stress, pore pressure and total stress diagrams for the sand stratum.	6M	CO2	L5
		UNIT – III			
5.	(a)	Explain Westergaard's theory for the determination of the vertical stress at a point.	6M	CO3	L1
	(b)	A concentrated load of 23 kN acts on the surface of a homogeneous soil mass of large extent. Determine the stress intensity at a depth of 15 m and (i) directly under the load, and (ii) at a horizontal distance of 7.5 m. Use Boussinesq's equations.	6M	CO3	L5
		(OR)			
6.	(a)	Explain the construction and application of Newmark's influence chart.	6M	CO3	L2
	(b)	A load 1000 kN acts as a point load at the surface of a soil mass. Estimate the stress at a point 3 m below and 4 m away from the point of action of the load by Boussinesq's theory. Compare the value with the result from Westergaard's theory.	6M	CO3	L5

UNIT – IV

7. **(a)** Differentiate between normally consolidated and over consolidated soils. **6M CO4 L2**

(b) A 3 m thick clay layer beneath a structure is overlain by a permeable stratum and is underlain by an impervious stratum. The coefficient of consolidation of the clay was found to be 0.028 cm^2/min. The final expected settlement of the layer is 80 mm. Determine the time taken for 75 % of full consolidation and the time required for 2.5 cm. **6M CO4 L5**

(OR)

8. **(a)** What is compaction curve? Give its salient features. **6M CO4 L1**

(b) The following results were obtained from a standard compaction test on a sample of soil. **6M CO4 L5**

Water content (%)	7.7	11.5	14.6	17.5	19.7	21.2
Mass of wet soil (kg)	1.7	1.89	2.03	1.99	1.96	1.92

The volume of the mould used was 950 cc. Make necessary calculations and plot the compaction curve and obtain the maximum dry density and the optimum water content.

UNIT-V

9. **(a)** Derive relationship between principal stresses at failure using Mohr-Coulomb criterion. **6M CO5 L3**

(b) When an unconfined compression test is conducted on a cylinder of soil, it fails under axial stress of 1.2 kg/cm^2. The failure plane makes an angle of 50^0 with the horizontal. Determine the cohesion and angle of internal friction. **6M CO5 L5**

(OR)

10. **(a)** Explain the principle of the direct shear test. What are the advantages of this test? What are its limitations? **6M CO5 L3**

(b) The following results were obtained from a tri-axial test on two soil specimens: **6M CO5 L5**

Sample No	Confining pressure (kpa)	Deviator stress at failure (kpa)	Pore water pressure (kpa)
1	200	244	55
2	300	314	107

Determine the shear strength parameters of the soil in terms of

(i) total stresses and

(ii) effective stresses.

Q.P. Code: 2001404 | **SET - 1**

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Structural Analysis (CE)

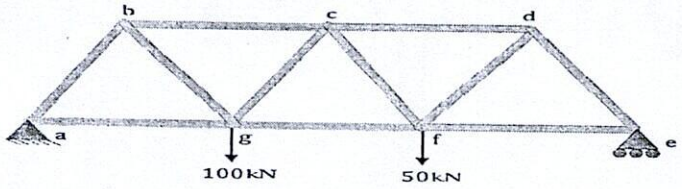
Time: 3 Hours **Max. Marks: 60**

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

		M	CO	BL

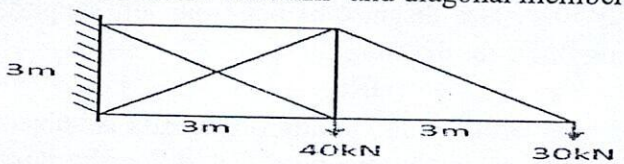
UNIT – I

1. Analyze the truss shown in the figure below. Take L/A as constant — **12M CO1 L4**



(OR)

2. Analyze the truss shown in the figure below. Take areas of vertical members $3000mm^2$, horizontal members $4000mm^2$ and diagonal members $5000mm^2$. — **12M CO1 L4**

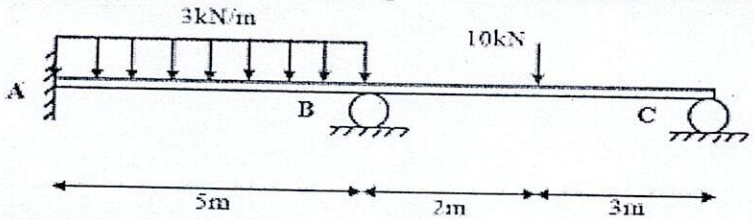


UNIT – II

3. A fixed beam of span 8m is subjected to two unequal point loads of magnitude 100kN and 60kN at a distance of 2m and 4m from left right respectively. Find fixed end moments, reactions and draw SFD and BMD. — **12M CO2 L5**

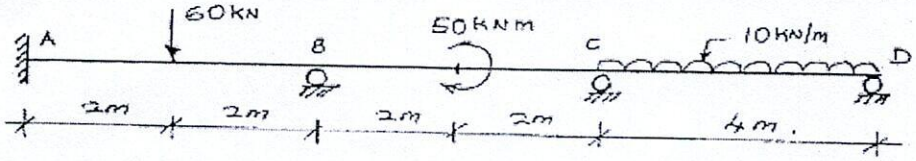
(OR)

4. Analyze the continuous beam using Slope deflection method and draw BMD — **12M CO2 L4**



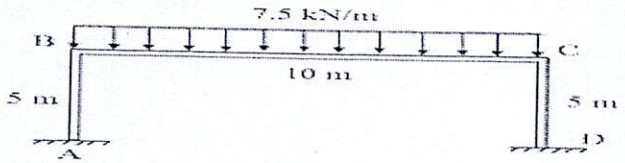
UNIT – III

5. Analyze the continuous beam using Slope deflection method and draw BMD — **12M CO3 L4**



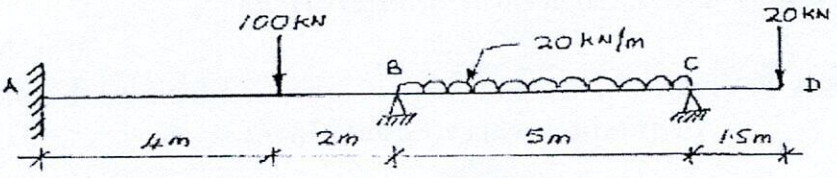
(OR)

6. Analyze the frame given below using Slope deflection method and draw BMD — **12M CO3 L4**



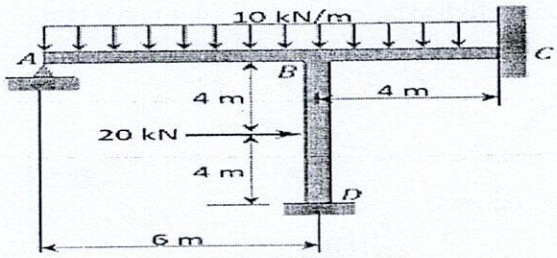
UNIT – IV

7. Analyze the continuous beam using Moment distribution method and draw BMD **12M CO4 L4**



(OR)

8. Analyze the frame given below using Moment distribution method and draw BMD **12M CO4 L4**



UNIT – V

9. A three hinged parabolic arch of spam 35m with a central rise 12m is subjected to a point load 50kN at a distance of 6m from left support. Find support reactions and draw BMD for the arch. **12M CO5 L5**

(OR)

10. A two–hinged parabolic arch with secant variation of inertia is subjected to the loads at 3rd points as shown in the diagram. Determine the horizontal thrust at abutments & plot the B.M.D. Verify your answer by numerical integration. **12M CO5 L5**

Q.P. Code: 2001405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Transportation Engineering (CE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT - I			
1.	(a)	What are the significant recommendations of Jayakar Committee Report?	6M	CO1	L1
	(b)	What is an alignment? List and briefly explain various surveys governing design of an alignment.	6M	CO1	L2
		(OR)			
2.	(a)	List and explain briefly the various factors affecting the road alignment.	6M	CO1	L1
	(b)	Write short notes on recent Road Development programs in India.	6M	CO1	L2
		UNIT – II			
3.	(a)	What are the objectives of highway geometric design? List the various geometric elements to be considered in highway design.	6M	CO2	L3
	(b)	Derive an equation for computing overtaking sight distance.	6M	CO2	L3
		(OR)			
4.	(a)	With a neat sketch of Highway cross section identify important cross-sectional elements.	6M	CO2	L4
	(b)	Calculate safe stopping distance (SSD) required for avoiding head on collision of two cars approaching from opposite directions at 100 kmph and 80 kmph. Assume coefficient of friction = 0.36 & Reaction time=2 sec.	6M	CO2	L3
		UNIT – III			
5.	(a)	Explain the basic diagrams of traffic flow.	6M	CO3	L2
	(b)	What are the objectives of carrying out traffic volume studies?	6M	CO3	L2
		(OR)			
6.	(a)	Classify different types of traffic signs and mention the general objective of each type of sign.	6M	CO3	L2
	(b)	What do you understand by following terms with respect to road accidents? Explain briefly: (i) Condition Diagram (ii) Collision Diagram	6M	CO3	L2
		UNIT – IV			
7.	(a)	Differentiate between "Flexible and Rigid" pavements.	6M	CO4	L4
	(b)	What are the factors to be considered for the design of flexible pavements? Discuss significance of each.	6M	CO4	L2
		(OR)			
8.	(a)	What are the factors causing warping stresses in rigid pavements?	6M	CO4	L2
	(b)	Compute the radius of relative stiffness of 25cm thick cement concrete slab using the following data; Modulus of elasticity of cement concrete = 3×10^5 N/mm^2; Poisson's ratio for concrete = 0.15; Modulus of subgrade reaction, K = 20 kg/cm^3	6M	CO4	L3
		UNIT-V			
9.	(a)	Explain the desirable properties of aggregates to be used in different types of pavement construction.	6M	CO5	L1
	(b)	List different tests on road aggregates and mention their advantages and limitations.	6M	CO5	L2
		(OR)			
10.	(a)	Mention the specifications of materials and construction steps for Wet Mix Macadam base course.	6M	CO5	L3
	(b)	List desirable properties of Paving bitumen and test to evaluate the same.	6M	CO5	L2

Q.P. Code: 2024410

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Universal Human Values (CE, ME & CSE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Write a note on 'Respect for others' and discuss with examples.	6M	CO1	L1
	(b)	Define Human values and explain any three in detail.	6M	CO1	L2
		(OR)			
2.	(a)	Write a short note to the followings: i) Empathy ii) Self-Confidence	6M	CO1	L5
	(b)	Elaborate the terms: i) Civic Virtues ii) Living Peacefully.	6M	CO1	L1
		UNIT – II			
3.	(a)	Recall the Engineering Ethics and relate them to Engineering.	6M	CO2	L2
	(b)	What is moral development? Elucidate Lawrence Kohlberg's theory.	6M	CO2	L1
		(OR)			
4.	(a)	Define Moral issue and list out the variety of Moral issues.	6M	CO2	L4
	(b)	Explain Moral Dilemma and Moral Autonomy in detail.	6M	CO2	L1
		UNIT – III			
5.	(a)	Engineering disaster- Explain Chernobyl nuclear reactor plant disaster.	6M	CO3	L3
	(b)	How to reduce the risks in disaster time. List out examples for improving the safety.	6M	CO3	L4
		(OR)			
6.	(a)	What is the significance of Safety and Risk during the disaster management?	6M	CO3	L1
	(b)	Explain any disaster management approach which you are experienced or acknowledged.	6M	CO3	L3
		UNIT – IV			
7.	(a)	What is Self-Exploration? Draw the process of Self exploration.	6M	CO4	L5
	(b)	Define Value Education and explain its significance in present scenario.	6M	CO4	L2
		(OR)			
8.	(a)	Write a short note on 'Happiness' and 'Prosperity' in detail.	6M	CO4	L5
	(b)	Explain the importance of understanding Human Relations and Values in your perspective.	6M	CO4	L1
		UNIT – V			
9.	(a)	Why it is an important to understand the Harmony in the Society? Explain.	6M	CO5	L5
	(b)	What is Justice and how does it lead to Mutual Happiness?	6M	CO5	L4
		(OR)			
10.	(a)	'Trust is the base of Values'- Justify with relevant points.	6M	CO5	L2
	(b)	Explain the holistic perception of harmony.	6M	CO5	L5

Q.P. Code: 2021401 | SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 202 4

SUB: Special Functions and Complex Analysis (EEE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	Prove that $xJ_n'(x) = -nJ_n(x) + xJ_{n-1}(x)$, n is an integer.	6M	CO1	L5
	(b)	Show that $J_4(x) = \left(\frac{48}{x^3} - \frac{8}{x}\right)J_1(x) + \left(1 - \frac{24}{x^2}\right)J_0(x)$.	6M	CO1	L1
		(OR)			
2.		State and Prove Orthogonality of Legendre Polynomials.	12M	CO1	L5
		UNIT – II			
3.		Prove that the function $f(z)$ defined by $f(z) = \frac{x^5(1+i)-y^5(1-i)}{x^2+y^2}$, 0 and $f(0) = 0$ is continuous and Cauchy – Riemann equations are satisfied at the origin, yet $f'(0)$ does not exist.	12M	CO2	L5
		(OR)			
4.	(a)	If f(z) is regular function of z prove that $(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2})\|f(z)\|^2 = 4\|f'(z)\|^2$	6M	CO2	L5
	(b)	Determine analytic function f(z), whose real part is $\frac{\sin 2x}{(\cosh 2y - \cos 2x)}$.	6M	CO2	L2
		UNIT – III			
5.	(a)	Find the image of the region in the z-plane between the lines $y = 0$ and $y = \frac{\pi}{2}$ under the transformation $w = e^z$	6M	CO3	L1
	(b)	Under the transformation $w = \frac{1}{z}$ find the image of the circle $\|z - 2i\| = 2$.	6M	CO3	L3
		(OR)			
6.	(a)	If $w = \frac{1+iz}{1-iz}$ find the image of $\|z\| < 1$..	6M	CO3	L1
	(b)	Find the bilinear transformation which maps the points $(-1,0,1)$ into the points $(0, i, 3i)$.	6M	CO3	L2
		UNIT – IV			
7.		Evaluate $\int_{(0,0)}^{(1,1)}(3x^2 + 4xy + ix^2)\,dz$ along $y = x^2$.	12M	CO4	L2
		(OR)			
8.		Evaluate $\oint \frac{z-3}{z^2+2z+5}\,dz$ Where c is $\|z+1-i\|=2$ using Cauchy's Integral formula.	12M	CO4	L2
		UNIT – V			
9.	(a)	Find the poles of the function $\frac{z+1}{z^2(z-2)}$ and the residues at these poles.	6M	CO5	L1
	(b)	Evaluate $\oint \frac{4-3z}{z(z-1)(z-2)}\,dz$ where c is the circle $\|z\| = 3$.	6M	CO5	L2
		(OR)			
10.		By the method of contour integration, evaluate $\int_0^\infty \frac{\cos ax}{1+x^2}\,dx$.	12M	CO5	L2

Q.P. Code: 2025402

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Fundamentals of Management for Engineers (EEE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Define Management. Elucidate the Nature and Scope of Management.	6M	CO1	L1
	(b)	What are the skills of a manager in modern times?	6M	CO1	L2
		(OR)			
2.	(a)	Explain in brief the Systems Approach and IT Approach.	6M	CO1	L2
	(b)	Classify the different levels of Management and explain the functions of Lower-level management.	6M	CO1	L2
		UNIT – II			
3.	(a)	Define Planning? What are the different types of plans?	6M	CO2	L1
	(b)	Interpret the steps involved in decision making process.	6M	CO2	L2
		(OR)			
4.	(a)	Compare and contrast Programmed and Non-Programmed decisions.	6M	CO2	L4
	(b)	Define bounded rationality and its influence on decision making.	6M	CO2	L1
		UNIT – III			
5.	(a)	What are the Principles of an Organization?	6M	CO3	L2
	(b)	Describe the types of Organizational Structure.	6M	CO3	L5
		(OR)			
6.	(a)	What is Human Resource Planning? Explain its need in an Organization.	6M	CO3	L2
	(b)	Briefly explicate the Recruitment Process.	6M	CO3	L5
		UNIT – IV			
7.	(a)	Discuss the Behavioral Leadership and Situational Leadership	6M	CO4	L6
	(b)	Discuss the concepts of Power and Authority.	6M	CO4	L6
		(OR)			
8.	(a)	What do you mean by Motivation? Interpret the types of Motivation.	6M	CO4	L5
	(b)	Explain Maslow's Need Hierarchy Theory of Motivation.	6M	CO4	L2
		UNIT – V			
9.		What is Organizational Control? Discuss need for establishing control system in an organization.	12M	CO5	L6
		(OR)			
10.	(a)	Differentiate Budgetary and Non-Budgetary Controls.	6M	CO5	L4
	(b)	Explain the characteristics of effective control.	6M	CO5	L2

Q.P. Code: 2002403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Induction Motors & Synchronous Machines (EEE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	Draw and explain the equivalent circuit parameters of 3 phase induction motor	6M	CO1	L1
	(b)	Explain the procedure to draw the Circle diagram of an Induction Motor from No-load and Blocked Rotor tests.	6M	CO1	L2
		(OR)			
2.	(a)	Illustrate Auto transformer starter used for starting Squirrel cage rotor Induction motor	6M	CO1	L2
	(b)	Derive the relation between rotor frequency-rotor emf, current, power and power factor at standstill and running conditions	6M	CO1	L3
		UNIT – II			
3.		Explain the DOL starter used for starting Squirrel cage rotor Induction motor	12M	CO2	L2
		(OR)			
4.		Explain construction and working of capacitor start capacitor run 1-Ø induction motor.	12M	CO2	L2
		UNIT – III			
5.	(a)	Derive the expression for induced emf in an alternator.	6M	CO3	L3
	(b)	A 4-pole 1-Φ alternator has an armature with 25 slots and 8 conductors per slot and rotates at 1500rpm and the flux per pole is 0.05 wb. Calculate the emf generated, if winding factor is 0.96 and all the conductors are in series.	6M	CO3	L4
		(OR)			
6.		Define voltage regulation. Explain how regulation can be determined by ZPF method.	12M	CO3	L1
		UNIT – IV			
7.		Derive the expression of synchronous power delivered by synchronous machine and hence, draw the power angle characteristics.	12M	CO4	L3
		(OR)			
8.	(a)	What is meant by synchronization? Explain the way of synchronizing an alternator to the infinite busbar.	6M	CO4	L2
	(b)	Two 1-phase alternators operate in parallel and supply a load impedance of (3+j4)Ω. Determine the terminal voltage, power factor and kW output of each machine if the impedance of each machine is (0.2+j2)Ω and emfs are (200+j0) and (220+j0) volts respectively.	6M	CO4	L4
		UNIT – V			
9.		Discuss the behavior of 3-phase synchronous motor at no-load with change of excitation with suitable phasor diagrams.	12M	CO5	L5
		(OR)			
10.	(a)	Explain how damper winding is helpful in minimizing hunting in synchronous machine.	6M	CO5	L2
	(b)	A 500V, 50Hz, 3-phase circuit takes 20A at a lagging power factor of 0.8. A synchronous condenser is used to rise the power factor to unity. Calculate kVA input to the motor and its power factor when driving a mechanical load of 7.5kW. The motor has an efficiency of 85%.	6M	CO5	L4

Q.P. Code: 2002404

SET - 1

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

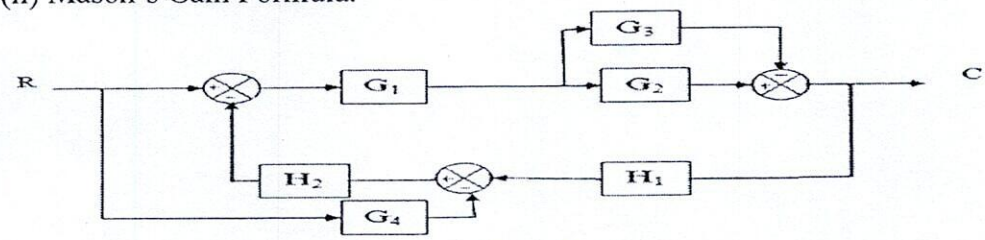
B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Linear Control Systems (EEE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	Compare open loop and closed loop control systems based on different aspects?	6M	CO1	L2
	(b)	Distinguish between Block diagram Reduction Technique and Signal Flow Graph?	6M	CO3	L2
		(OR)			
2.		Develop the transfer function for the block diagram shown in figure. using (i) Block diagram reduction technique. (ii) Mason's Gain Formula.	12M	CO3	L3
					
		UNIT – II			
3.		Obtain expressions for rise time, peak time, maximum peak overshot and settling time for a second order feedback control system for step input.	12M	CO1	L5
		(OR)			
4.		Derive an expression for the under damped response of a second order feedback control system for step input and also explain about the position of the roots .	12M	CO1	L4
		UNIT – III			
5.		With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations: (i) $S^4 + 8S^3 + 18S^2 + 16S + 5 = 0$. (ii) $S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0$	12M	CO2	L4
		(OR)			
6.		The open loop transfer function of a unity negative feedback control system is given by $G(S) = \frac{K(S+9)}{S(S^2+4s+11)}$. Sketch the root locus for the system	12M	CO2	L4
		UNIT – IV			
7.		The open loop transfer function of a system is given by $G(s) = \frac{20}{S(S+1)(1+0.01S)}$. Sketch the Bode plot and determine the gain Margin and Phase Margin.	12M	CO2	L3
		(OR)			
8.	(a)	Describe about the frequency domain specifications of a typical system.	6M	CO1	L1
	(b)	Define and derive the expression for resonant frequency	6M	CO1	L1
		UNIT – V			
9.		Explain Design of lag Compensator in frequency domain.	12M	CO4	L2
		(OR)			
10.		Draw a network of lag-lead compensator consisting of resistors and capacitors and derive its transfer function.	12M	CO4	L4

Q.P. Code: 2002405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Power Systems – I (EEE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Write the importance and the differences between Conventional and Non-Conventional sources of energy?	6M	CO1	L1
	(b)	Draw the line diagram and explain the working principle of hydro- electric power station.	6M	CO1	L2
		(OR)			
2.		Explain the following Components of Thermal Power Plant. (i) Super Heater (ii) Economizer (iii) Air Preheater and (iv) Cooling Towers	12M	CO1	L2
		UNIT – II			
3.	(a)	Define the following terms: (i) Load curve (ii) Demand factor (iii) Diversity Factor (iv) Load factor and (v) Plant Capacity Factor	6M	CO1	L1
	(b)	What is Depreciation? Explain various types of depreciation methods.	6M	CO5	L2
		(OR)			
4.	(a)	A generating station has the following daily load cycle : Time (hours) 0—6 6—10 10—12 12—16 16—20 20—24 Load (MW) 20 25 30 25 35 20 Draw the load curve and find: (i) maximum demand, (ii) units generated per day, (iii) average load, (iv) load factor.	6M	CO1	L2
	(b)	Explain the Various types of Tariff charges on consumers.	6M	CO5	L2
		UNIT – III			
5.	(a)	Write the methods of improving string efficiency.	6M	CO3	L2
	(b)	A string of four insulators has a self-capacitance equal to 5 times pin to earth capacitance. Find (i) the voltage distribution across various units as a percentage of total voltage across the string and (ii) string efficiency.	6M	CO3	L2
		(OR)			
6.	(a)	Explain briefly about Types of Insulators.	6M	CO3	L2
	(b)	Derive the expression for sag for unequal supports.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Derive the expression for an inductance for three phase transposed line.	6M	CO4	L2
	(b)	Derive the expression for capacitance for single phase overhead transmission line.	6M	CO4	L3
		(OR)			
8.		Two conductors of a single phase line, each of 1 cm diameter, are arranged in a vertical plane with one conductor mounted 1 m above the other. A second identical line is mounted at the same height as the first and spaced horizontally 0·25 m apart from it. The two upper and the two lower conductors are connected in parallel. Determine the inductance per km of the resulting double circuit line.	12M	CO4	L3
		UNIT – V			
9.	(a)	Write briefly about types of cables and insulation in cable.	6M	CO5	L1
	(b)	Explain the methods of reducing corona effect.	6M	CO5	L2
		(OR)			
10.	(a)	What is meant by gradient? Write the effects of gradient on cables.	6M	CO5	L2
	(b)	What are the factors affecting corona.	6M	CO5	L2

Q.P. Code: 2021402

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Probability, Statistics and Numerical Methods (ME)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	**(a)**	Fit a Poisson distribution to the following data	6M	CO1	L1

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

	(b)	If the mean of a Poisson distribution is 1.8 then find $p(X>1)$.	6M	CO1	L2
		(OR)			
2.		In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and S.D of 60 hours. Estimate the number of bulbs likely to burn for (a) more than 2150 hours, (b) less than 1950 hours and (c) more than 1920 hours and but less than 2160 hours.	12M	CO1	L5
		UNIT – II			
3.	**(a)**	A coin was tossed 400 times and the head turned up 216 times. Test the hypothesis that the coin is unbiased at 5% level of significance	6M	CO2	L4
	(b)	A group of scientific men reported 1705 sons and 1527 daughters. Do these figures conform to the hypotheses that the sex ratio is $\frac{1}{2}$.	6M	CO2	L2
		(OR)			
4.		Samples of students were drawn from two universities and from their weights in kilograms, mean and standard deviations are calculated and shown below. Make a large sample test to test the significance of the difference between the means.	12M	CO2	L4

	Mean	S.D	Size of the sample
University A	55	10	400
University B	57	15	100

		UNIT – III			
5.	**(a)**	A machinist is making engine parts with axle diameter of 0.7 inch. A random sample of 10 parts shows mean diameter of 0.742 inch with a standard deviation of 0.04 inch. On the basis of this sample, would you say that the work is inferior?	6M	CO3	L4
	(b)	The means of two random samples of sizes 9 and 7 are 196.42 and 198.82 respectively. The sums of the squares of the deviations from the mean are 26.94 and 18.73 respectively. Can the samples be considered to have been drawn from the same normal population?	6M	CO3	L2
		(OR)			
6.		To examine the hypothesis that the husbands are more intelligent than the wives, an investigator took a sample of 10 couples and administered them a test which measures the I.Q. The results are as follows:	12M	CO3	L4

Husbands	117	105	97	105	123	109	86	78	103	107
Wives	106	98	87	104	116	95	90	69	108	85

Test the hypothesis with a reasonable test at the level of significant of 0.05 and also calculate F-test.

UNIT – IV

7. **(a)** Find a real root of the equation $2x - log_e x = 7$ by regula-falsi method correct to four decimal places. **6M** **CO4** **L2**

(b) Find a real root of the equation $3x = cosx + 1$ using Newton-Raphson method correct to three decimal places. **6M** **CO4** **L2**

(OR)

8. Solve the equations $10x + y - z = 11.19$, $x + 10y + z = 28.08$, $-x + y + 10z = 35.61$ by Gauss Seidel iteration method. **12M** **CO4** **L3**

UNIT – V

9. Apply Newton's forward interpolation formula and the given table of values **12M** **CO5** **L3**

x	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

Obtain the value of $f(x)$ when $x=1.4$.

(OR)

10. **(a)** The population of a town in the decimal census was given below. Estimate the population for the years 1895 and 1925. **6M** **CO5** **L5**

year x	1891	1901	1911	1921	1931
Population y (thousands)	46	66	81	93	101

(b) Apply Lagrange's formula to find the value of f (6) from the following data. **6M** **CO5** **L3**

x	1	2	4	7	8
f(x)	22	30	82	106	206

Q.P. Code: 2003403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 202 4

SUB: Applied Thermodynamics (ME)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	Derive the expression for the efficiency of a Otto Cycle	6M	CO1	L1
	(b)	An engine of 250 mm bore and 375 mm stroke works on Otto cycle. The clearance volume is 0.00263 m^3. Determine the air standard efficiency of the engine.	6M	CO1	L2
		(OR)			
2.	(a)	Explain with a neat sketches the working of spark ignition engine?	6M	CO1	L2
	(b)	Compare a four stroke and a Two stroke engine	6M	CO1	L2
		UNIT – II			
3.	(a)	Briefly explain the stages of combustion in SI engines.	6M	CO2	L2
	(b)	What is delay period and explain the factors that affect the delay period	6M	CO2	L2
		(OR)			
4.	(a)	Explain the phenomenon of knock in CI engines	6M	CO2	L2
	(b)	Briefly explain the stages of combustion in SI engines.	6M	CO2	L2
		UNIT – III			
5.	(a)	Define the terms mean effective pressure and brake specific fuel consumption	6M	CO3	L1
	(b)	The following readings were taken during a test of a single cylinder four stroke oil engine. Cylinder diameter 250mm, stroke length 400mm, gross mean effective pressure 7bar, pumping mean effective pressure 0.5bar, engine speed 250rpm, net load on the brake 1080N, effective diameter of the brake 1.5m, fuel used per hour 10kg, calorific value of fuel 44300 KJ/Kg, determine i) Indicated power ii) brake power iii) mechanical efficiency iv) indicated thermal efficiency	6M	CO3	L5
		(OR)			
6.	(a)	Briefly explain about the emissions that come out of Engine exhaust.	6M	CO3	L2
	(b)	Explain BS norms	6M	CO3	L2
		UNIT – IV			
7.	(a)	Derive the expression for Rankine cycle efficiency.	6M	CO4	L3
	(b)	A simple Rankine cycle works between pressure of 30 bar and 0.04 bar, the initial condition of steam being dry saturated, calculate the cycle efficiency	6M	CO4	L3
		(OR)			
8.		Explain the methods of increasing the thermal efficiency of a Rankine cycle.	12M	CO4	L2
		UNIT – V			
9.	(a)	Derive the expression for the mass of steam discharged through a nozzle	6M	CO5	L3
	(b)	Dry saturated steam enters a steam nozzle at pressure of 12 bar and is discharged to a pressure of 1.5 bar. If the dryness fraction of the discharged steam is 0.95, what will be the final velocity of steam? Neglect initial velocity of steam. If 12% of the heat drop is lost in friction, determine the percentage reduction in the final velocity.	6M	CO5	L5
		(OR)			
10.	(a)	Explain briefly simple vapour compression system	6M	CO5	L2
	(b)	What do you mean by multi-stage compression? State its advantages.	6M	CO5	L2

Q.P. Code: 2003404

SET – 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Kinematics of Machinery (ME)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Classify the constrained motion.	6M	CO1	L1
	(b)	Explain different types of constrained motions with the help of neat sketches	6M	CO1	L1
		(OR)			
2.		What is an inversion? Explain any two inversions of single slider crank chain	12M	CO1	L1
		UNIT – II			
3.	(a)	A link AB of a four bar ABCD revolves uniformly at 120 rpm in a clock wise direction. Find the angular acceleration of the links BC and CD and acceleration of point E on link BC. Take AB=75mm; BC=175mm; EC=50mm; CD=150mm; DA=100mm and angle BAD=90^0.	12M	CO2	L2
		(OR)			
4.		The crank and connecting rod of a theoretical steam engine are 0.5 m and 2 m long respectively. The crank makes 180 rpm. in the clockwise direction. When it has turned 45° from the inner dead centre position, determine: (i) velocity of piston, (ii) angular velocity of connecting rod, (iii) Velocity of point E on the connecting rod 1.5 m from the gudgeon pin, (iv) velocities of rubbing at the pins of the crank shaft, crank and crosshead when the diameters of their pins are 50 mm, 60 mm and 30mm respectively, (v) Position and linear velocity of any point G on the connecting rod which has the least velocity relative to crank shaft.	12M	CO2	L2
		UNIT – III			
5.		Locate all the instantaneous centres of the slider crank mechanism as shown in Fig. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, Determine: (i) Velocity of the slider A, and (ii) Angular velocity of the connecting rod AB.	12M	CO3	L3

		(OR)			
6.		Give a neat sketch of the straight-line motion Peaucellier mechanism. Prove that it produces an exact straight-line motion.	12M	CO3	L2
		UNIT – IV			
7.		A cam with minimum radius of 25 mm, rotating clockwise at uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below: To raise the valve through 50 mm during 1200 rotation of the cam, to keep the valve fully raised through next 30^0, to lower the valve during next 60^0 and to keep the valve closed during rest of the revolution i.e. 1500. The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when the line of stroke of the valve rod passes through the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion. Determine the maximum acceleration of the valve rod when the cam shaft rotates at 100 rpm.	12M	CO4	L3
		(OR)			

8.		Draw the profile of a cam operating a knife edge follower from the following data: i) Follower to move outward through 40 mm during 60^0 of a cam rotation, ii) Follower to dwell for the next45^0 iii) Follower to return its original position during next 90^0 iv) Follower to dwell for the rest of the cam rotation. The displacement of the follower is to take place with SHM during both outward and return strokes. The least radius of the cam is 50 mm. If the rotates at 300 rpm, determine the maximum velocity and acceleration of the follower during the outward stroke and return stroke.	**12M**	**CO4**	**L3**
		UNIT – V			
9.	**(a)**	State and prove the law of gearing. Show that involute profile satisfies the conditions for correct gearing.	**6M**	**CO5**	**L2**
	(b)	Clearly explain the phenomena of interference.	**6M**	**CO5**	**L1**
		(OR)			
10.		Derive an expression for the minimum number of teeth required on the pinion in order to avoid interference in involute gear teeth when it meshes with wheel.	**12M**	**CO5**	**L3**

Q.P. Code: 2003405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Machine Tools (ME)

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

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

		M	BL	CO
	UNIT – I			
1.	Summarize the work holding devices that are used on a lathe and explain any four work holding devices with a line diagram	12M	L2	CO1
	(OR)			
2.	Analyze the nomenclature of a single point cutting tool as per ASA system?	12M	L2	CO1
	UNIT – II			
3.	Illustrate the working principle of EBM process with a neat sketch and what are its applications?	12M	L2	CO2
	(OR)			
4.	Explain the working principle of a shaper and planer with a neat sketch?	12M	L2	CO2
	UNIT – III			
5.	How are boring machines classified? Explain the parts of a Jig boring machine with a neat sketch?	12M	L3	CO3
	(OR)			
6.	Summarize the types of drilling machines and explain the parts of radial drilling machine with a neat sketch?	12M	L2	CO3
	UNIT – IV			
7.	Identify the operations that are performed on a milling machine and explain any five operations with a neat sketch?	12M	L3	CO4
	(OR)			
8.	Illustrate the working mechanism of universal dividing head with a neat sketch?	12M	L2	CO4
	UNIT – V			
9.	Explain about centre less grinders and the methods of giving feed to the work with a neat sketch?	12M	L2	CO5
	(OR)			
10.	Explain the factors that are to be considered in the selection of a grinding wheel	12M	L2	CO5

Q.P. Code: 2021403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Probability Theory and Stochastic Process (ECE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.	(a)	Discuss the significance of Bayes theorem.	6M	CO1	L1
	(b)	We are given a box containing 5000 transistors, 1000 of which are manufactured by company X and the rest by company Y. 10% of the transistors made by company X are defective and 5% of the transistors made by company Y are defective. If a randomly chosen transistor is found to be defective, find the Probability that it came from company X.	6M	CO1	L3
		(OR)			
2.	(a)	State the properties of CDF and prove any two of them.	6M	CO1	L1
	(b)	The PDF of a continuous random variable is given by $$f_X(x) = \begin{cases} C(x-1); & 1 \le x \le 4 \\ 0; & \text{else where} \end{cases}$$ (i) Find the value of constant 'C' (ii) Find $P\{2 \le X \le 3\}$	6M	CO1	L3
		UNIT – II			
3.	(a)	Suppose a random variable X has finite second moment, then for any constant c > 0, prove that: $$P\{\lvert X \rvert \ge c\} \le \frac{E[X^2]}{c^2}$$	6M	CO2	L2
	(b)	Write short notes on the Chernoff's inequality.	6M	CO2	L1
		(OR)			
4.	(a)	Prove that the MGF of random variable 'X' having PDF $$f_X(x) = \begin{cases} \frac{1}{3}; & -1 < x < 2 \\ 0; & \text{otherwise} \end{cases}$$ is given by $$M_X(v) = \begin{cases} \frac{e^{2v} - e^{-v}}{3v}; & v \neq 0 \\ 1; & v = 1 \end{cases}$$	6M	CO2	L2
	(b)	Discuss about the Non-Monotonic Transformations of a discrete random variable	6M	CO2	L2
		UNIT – III			
5.	(a)	State and explain probability density function for two random variables.	6M	CO3	L2
	(b)	The joint probability density functions of two random variables is given by: $$f(x, y) = \frac{9(1+x+y)}{2(1+x)^4(1+y)^4}, \; 0 \le x < \infty, \; 0 < y < \infty$$ Find the marginal distributions of Y for X = Y.	6M	CO3	L3
		(OR)			
6.	(a)	Discuss about the Linear Transformation of Gaussian random variable	6M	CO3	L1
	(b)	The resistors R_1, R_2, R_3 and R_4 are independent random variables and each is uniform in the interval (450, 550). Using the central limit theorem find $P(1900 \le R_1 + R_2 + R_3 + R_4 \le 2100)$.	6M	CO3	L4

UNIT – IV

7.	(a)	Explain wide sense stationary random process?	6M	CO4	L2
	(b)	Find the mean and auto correlation function of a random process X(t)=A , where A is continuous random variable with uniform distribution over (0,1).	6M	CO4	L4

(OR)

8.	(a)	State and prove any four properties of cross correlation function.	6M	CO4	L1
	(b)	State the properties of cross power spectral density and prove any two of them.	6M	CO4	L4

UNIT – V

9.	(a)	Derive an expression for mean square value of LTI system response.	6M	CO5	L2
	(b)	A wide sense stationary random process X(t) with power spectral density	6M	CO5	L3

$$S_{XX}(f) = \begin{cases} 10^{-4}; & |f| < 100 \\ 0; & \text{otherwise} \end{cases}$$

is the input to an RC filter with frequency response $H(f) = \frac{1}{100\pi + j2\pi f}$. the filter output is the stochastic process Y(t),
Find, (i) $E[X^2(t)]$ and (ii) $S_{xy}(f)$.

(OR)

10.	(a)	Discuss the properties of band limited processes.	6M	CO5	L4
	(b)	Distinguish between band pass and narrow band processes.	6M	CO5	L2

Q.P. Code: 2004403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Microprocessors and Microcontrollers (ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.		Using a block diagram, describe the internal design of an 8086 microprocessor.	12M	CO1	L1
		(OR)			
2.		Explain the operation of minimum mode of 8086 system with block diagram and timing diagram.	12M	CO1	L2
		UNIT – II			
3.	(a)	Write an 8086 Assembly language program to arrange given set of numbers in ascending order.	6M	CO2	L4
	(b)	Describe the process of interfacing two 32KB ROMs and two 64KB SRAMs with 8086 microprocessor.	6M	CO2	L4
		(OR)			
4.	(a)	Explain SEGMENT, END, EVEN, PROC assembler directives.	6M	CO2	L2
	(b)	Describe different data transfer schemes.	6M	CO2	L3
		UNIT – III			
5.	(a)	Use 8255 ports to interface the ADC0808 with the 8086 microprocessor. To transport the digital data output from the ADC to the microprocessor, use port A of the 8255. To link the A, B, and C lines of the ADC, use PB3, PB2, and PB1, respectively. PC0 is connected to the EOC, while PC7 is connected to the SOC. Assume that the ADC's I/P6 is where the analog input is accessible. Suppose that the ADC is given a sufficient clock frequency. Draw the schematic and write the necessary ALP.	8M	CO3	L5
	(b)	Draw the I/O mode CWR format in 8255.	4M	CO3	L1
		(OR)			
6.	(a)	Create a program in assembly language for the 8086 that uses DAC to create a triangle waveform.	6M	CO3	L5
	(b)	Explain the 8255 PPI with a block diagram.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Describe the addressing modes of 8051 microcontroller.	6M	CO4	L3
	(b)	Describe the process of interfacing 16Kbytes of ROM and 8Kbytes of RAM to the 8051 microcontroller, such that the starting address of ROM is C000H and RAM is 8000H.	6M	CO4	L4
		(OR)			
8.	(a)	Give a thorough explanation of the 8051 logical commands.	6M	CO4	L2
	(b)	Write 8051 program to find number of zeros with in a byte.	6M	CO4	L4
		UNIT – V			
9.	(a)	Describe the Branching instructions of ARM?	6M	CO5	L2
	(b)	Explicate the instructions used for implementing Stack operations in ARM?	6M	CO5	L2
		(OR)			
10.	(a)	What are the main guidelines for adopting the ARM and RISC design principles?	6M	CO5	L3
	(b)	Explain the PSR.	6M	CO5	L2

Q.P. Code: 2004404 | **SET - 1**

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Electro Magnetic Waves and Transmission Lines (ECE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	State and prove Gauss's law.	6M	CO1	L2
	(b)	Apply the Gauss's law to find the electric field intensity at any ofinterest due to uniformly charged sphere of radius 'a' and with uniform charge distribution ρ0 C/m2	6M	CO1	L3
		(OR)			
2.	(a)	Derive expressions for continuity equation and relaxation time.	6M	CO1	L2
	(b)	Write Poisson's and Laplacian equation on Cartesian, cylindrical and spherical Coordinates?	6M	CO1	L2
		UNIT – II			
3.	(a)	State and explain the Biot-Savart's Law.	6M	CO2	L2
	(b)	Obtain the expression for magnetic field intensity at any point in free space due to a long currentcarrying conductor using Biot-Savart's law.	6M	CO2	L2
		(OR)			
4.		Planes z=0 and z=4 carry current K=-10axA/m and K=10axA/m, respectively. Determine H at (i) (1,1,1) (ii) (0,-3,10)	12M	CO2	L3
		UNIT – III			
5.	(a)	Why the ampere's circuit law is not applicable for time varying fields and how can overcomethis situation using displacement current?	6M	CO3	L2
	(b)	Derive the expression of Maxwell's first equation for time varying fields using Faraday'slaw.	6M	CO3	L4
		(OR)			
6.	(a)	With neat diagrams explain the boundary conditions for (i) Dielectric-Conductor (ii) Dielectric-Dielectric	8M	CO3	L3
	(b)	Tabulate Maxwell's equations in both point form and integral form.	4M	CO3	L3
		UNIT – IV			
7.	(a)	Derive the Wave Equations for Free Space.	6M	CO4	L3
	(b)	Discuss about Boundary Conditions on E, D, H and B	6M	CO4	L3
		(OR)			
8.	(a)	Deduce the wave equations applicable in a lossy medium	6M	CO4	L3
	(b)	A plane wave in a nonmagnetic medium has E = 50 sin (108 t + 2z) ay V/m. Find the direction of propagation, wavelength, εr and the H field	6M	CO4	L3
		UNIT – V			
9.	(a)	Discuss about the primary and Secondary constants of a Transmission Line	6M	CO5	L6
	(b)	Describe the Conditions on Lossless and distortion less transmission lines	6M	CO5	L1
		(OR)			
10.	(a)	What is Smith chart and give the Applications of Smith chart	6M	CO5	L2
	(b)	What is Stub Matching and explain about single stub matching.	6M	CO5	L3

Q.P. Code: 2004405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Linear and Digital IC Applications (ECE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Explain how CMRR of a differential amplifier can be improved.	6M	CO1	L1
	(b)	Why level translating stage is required in op-amp? Explain the operation of level shifting circuit with current mirror.	6M	CO1	L2
		(OR)			
2.	(a)	Explain in detail about input bias current and their compensation technique.	6M	CO1	L1
	(b)	Explain about Pole-Zero Compensation Technique and explain its advantages.	6M	CO1	L2
		UNIT – II			
3.	(a)	Draw a circuit using op-amp that generates a square wave output, without any triggering given to it. Also derive expression for frequency of output waveform.	6M	CO2	L4
	(b)	Explain about non-inverting comparator with neat circuit diagram and specify its applications.	6M	CO2	L2
		(OR)			
4.	(a)	Design a circuit, deploying an opamp that gives an output equal to sum of given inputs V_1, V_2, V_3.	6M	CO2	L6
	(b)	Draw the circuit of a Full Wave Rectifier using op-amp and explain the operation.	6M	CO2	L2
		UNIT – III			
5.	(a)	Draw the Astable Multivibrator circuit using 555 timer and derive the expression for Free running frequency of operation.	6M	CO3	L5
	(b)	Draw the block diagram of 565 PLL and explain its salient features and applications.	6M	CO3	L2
		(OR)			
6.	(a)	Design and draw the waveforms of 1KHz square wave form generator using 555 timer for duty cycle, D=25% and D=50%.	6M	CO3	L3
	(b)	With neat functional diagram, explain the concept of Successive approximation ADC.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Draw the circuits of CMOS using AOI and OAI gates and explain.	6M	CO4	L1
	(b)	Explain about CMOS transmission gate.	6M	CO4	L2
		(OR)			
8.	(a)	Explain about CMOS steady state condition and its dynamic electrical behavior.	6M	CO4	L2
	(b)	Explain about specifications and applications of CMOS.	6M	CO4	L4
		UNIT – V			
9.	(a)	Discuss about variables and constants used in Verilog HDL.	6M	CO5	L2
	(b)	Design and verify encoder and decoder using Verilog HDL.	6M	CO5	L6
		(OR)			
10.	(a)	List data flow design elements in HDL design flow.	6M	CO5	L2
	(b)	Design a counter using Verilog HDL.	6M	CO5	L6

Q.P. Code: 2005401 | **SET - 1**

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Principles of Operating Systems (CSE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	What is system program? List and explain the various categories of system programs	6M	CO1	L1
	(b)	Explain various structures of operating system?	6M	CO1	L1
		(OR)			
2.	(a)	Define operating system. Explain the various functions of operating systems.	6M	CO1	L2
	(b)	List and explain the various services of operating system	6M	CO1	L1
		UNIT – II			
3.		Explain FCFS and Round Robin scheduling algorithms. Find the average waiting time and average turn around time for a process, if the following processes are scheduling using FCFS and round robin scheduling algorithms. Time quantum is 3 msec.	12M	CO2	L3

Process	burst time
P1	8
P2	20
P3	5
P4	1
P5	14

		(OR)			
4.	(a)	Define Process. Explain the states of process with a neat diagram.	6M	CO2	L2
	(b)	What is thread? Explain multithreading in detail.	6M	CO2	L2
		UNIT – III			
5.		Consider the following page-reference string:0,1,2,3,0,1,2,3,0,1,2,3,4,5,6,7. How many page faults occur for the following page replacement algorithms, assuming Frame count=3 (i) FIFO (ii) LRU (iii) OPTIMAL	12M	CO3	L3
		(OR)			
6.	(a)	Explain hieratical & hash page table?	6M	CO3	L2
	(b)	Explain about paging concept.	6M	CO3	L2
		UNIT – IV			
7.	(a)	Explain about resource allocation graph in detail.	6M	CO4	L2
	(b)	Describe Banker's algorithm to avoid a deadlock.	6M	CO4	L2
		(OR)			
8.	(a)	What is file? Explain file system mounting.	6M	CO4	L1
	(b)	What is a directory? Explain different directory structures.	6M	CO4	L1
		UNIT – V			
9.	(a)	What is protection? Explain goals, principles and domain of protection	6M	CO5	L1
	(b)	What is access matrix? Discuss access matrix implementation techniques	6M	CO5	L2
		(OR)			
10.	(a)	Explain Security Problems in detail	6M	CO5	L2
	(b)	Write about User authentication	6M	CO5	L2

Q.P. Code: 2005402

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Computer Organization (CSE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Perform and explain arithmetic addition, subtraction, and overflow detection using fixed point representation.	6M	CO1	L2
	(b)	Discuss the Arithmetic operations on floating point numbers.	6M	CO1	L6
		(OR)			
2.	(a)	What are the design goals of Computer Architecture?	6M	CO1	L5
	(b)	Distinguish between error detection and error correction.	6M	CO1	L4
		UNIT – II			
3.	(a)	List the registers for the basic computer and give their functionality in program execution.	6M	CO2	L1
	(b)	Explain Computer Arithmetic in detail.	6M	CO2	L2
		(OR)			
4.	(a)	Explain about the arithmetic micro operations in detail.	6M	CO2	L2
	(b)	Discuss various different instruction formats of a basic computer.	6M	CO2	L6
		UNIT – III			
5.	(a)	Illustrate the micro-programmed control unit (MCU) with a diagram.	6M	CO3	L2
	(b)	What is the purpose of addressing modes? Explain various addressing mode techniques.	6M	CO3	L5
		(OR)			
6.	(a)	Differentiate between Hard-wired controlled and Microprogrammed controlled microinstructions.	6M	CO3	L5
	(b)	Define micro operation? Explain arithmetic micro operations.	6M	CO3	L1
		UNIT – IV			
7.	(a)	Illustrate the behavior of a pipeline using space-time diagram.	6M	CO4	L2
	(b)	Differentiate CISC and RISC processors.	6M	CO4	L5
		(OR)			
8.	(a)	Explain the relation between address space and memory space in a virtual memory system along with its memory table for mapping?	6M	CO4	L2
	(b)	What is Locality of Reference and explain about Cache memory in detail.	6M	CO4	L4
		UNIT – V			
9.	(a)	With a neat sketch explain the working principle of DMA.	6M	CO5	L3
	(b)	Briefly describe the modes of data transfer in detail.	6M	CO5	L1
		(OR)			
10.	(a)	Compare interrupt driven data transfer scheme and DMA.	6M	CO5	L3
	(b)	How read and write operations are performed in Associative memory	6M	CO5	L1

Q.P. Code: 2005404 | **SET - 1**

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Digital Logic Circuits and Design (CSE)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Explain about classification of any four binary codes	6M	L2	CO1
	(b)	The Hamming code 101101101 is received, correct it if any errors- four parity bits and odd parity is used.	6M	L2	CO1
		(OR)			
2.	(a)	Explain about numeric and alphanumeric codes (any four) with an example.	6M	L2	CO1
	(b)	Implement AND, OR, NOR and EXOR gates by using NAND gates only.	6M	L4	CO1
		UNIT – II			
3.	(a)	Find the duality and complement for the following Boolean function: F = ABC+A'B'C'+AB'C'+A'BC+AB'C+ABC'	6M	L2	CO2
	(b)	Simply the following Boolean function with minimal SOP form using the K-Map method and implement them with two levels of NAND gate circuit. F(A,B,C,D) = ∑m(0,1,2,3,5,7,8,9,11,14)	6M	L3,L4	CO2
		(OR)			
4.	(a)	Simplify the following Boolean function with the don't conditions using the K-map method f(A, B, C, D) = Σm(1,3,8,10,15) +Σd(0, 2, 9)	6M	L3	CO2
	(b)	Realize the following expressions using NAND and NOR logic separately Y = PQ' + QS + Q'RS	6M	L3,L4	CO2
		UNIT – III			
5.	(a)	Design a circuit that converts given 4-bit gray code to binary code.	6M	L5	CO3
	(b)	with a neat diagram explaining the operation of a 2-bit magnitude comparator	6M	L2, L3	CO3
		(OR)			
6.	(a)	With a neat diagram explain the 4-bit Magnitude comparator.	6M	L2, L3	CO3
	(b)	Implement full adder circuit with one 3 to 8 decoder and two OR gates.	6M	L4	CO3
		UNIT – IV			
7.	(a)	Summarize the SR, JK, D & T flip-flops with a characteristic table.	6M	L4	CO4
	(b)	What is the race-around condition in JK flip flop and how it is eliminated?	6M	L1, L2	CO4
		(OR)			
8.		A sequential circuit with two D flip flops A and B, two inputs X and Y, and one output Z is specified by the following next state and output equations: A(t+1) = X'Y + XA B(t+1) = XA + X'B Z = B i) Draw the logic diagram of the circuit. ii) List the state table for the sequential circuit. iii) Draw the corresponding state diagram.	12M	L4	CO4
		UNIT – V			
9.	(a)	Draw and explain the working of a 3-bit synchronous up/down counter.	6M	L3	CO5
	(b)	Define Register. Explain the different types of registers with examples.	6M	L1, L2	CO5
		(OR)			
10.	(a)	With a neat sketch explain the operation of the Ring counter	6M	L3	CO5
	(b)	Design a combinational circuit using a ROM. The circuit accepts a 3-bit number and generates an output binary number equal to the square of the input number.	6M	L5	CO5

Q.P. Code: 2021405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Probability Theory and Statistical Methods (CSE)

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

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

			M	CO	BL
		UNIT – I			
1.		A random variable X has the following probability distribution.	12M	CO1	L1

x	0	1	2	3	4	5	6	7
f(x)	0	k	2k	2k	3k	K^2	$2k^2$	$7k^2+k$

Determine (i) k value (ii)Evaluate P (X < 6), P (X ≥ 6), P (0< X< 5) (iii) Mean (iv) Variance.

(OR)

2.		The trouble shooting capability of an I.C chip in a circuit is a random variable X whose distribution function is given by $F(x) = \begin{cases} 0 & \text{for } x \leq 3 \\ 1 - \frac{9}{x^2} & \text{for } x > 3 \end{cases}$ where x denotes the number of years. Estimate the probability that the I.C chip will work properly (i) less than 8 years (ii) beyond 8 years (iii) between 5 to 7 years (iv) anywhere from 2 to 5 years.	12M	CO1	L5
		UNIT – II			
3.	(a)	If x is a Poisson variate such that 3p(x=4) =1/2 p(x=2) + p(x=0), Determine (i) the mean of x (ii) p(x≤2)	6M	CO2	L5
	(b)	Find mean and variance of uniform distribution	6M	CO2	L1
		(OR)			
4.		In a test on 2000 electric bulbs, it was found that the life of a particular make, was normally distributed with an average life of 2040 hours and S.D. of 60 hours. Estimate the number of blubs likely to burn for (i) more than 2150 hours, (ii) less than 1950 hours and (iii) more than 1920 hours and but less than 2160 hours.	12M	CO2	L5
		UNIT – III			
5.	(a)	Explain: (i) Null Hypothesis (ii) Alternative Hypothesis (iii) Critical region (iv) Level of Significance.	6M	CO3	L2
	(b)	Two types of new cars produced in India are tested for petrol mileage, one sample is consisting of 42 cars averaged 15 Kmpl while the other sample consisting of 80 cars averaged 11.5 Kmpl with population variances as $\sigma_1^2 = 2.0$ and $\sigma_2^2 = 1.5$ respectively. Test whether there is any significance difference in the petrol consumption of these two types of cars. (Use $\alpha = 0.01$).	6M	CO3	L4
		(OR)			
6.	(a)	A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Is this consistent with the hypothesis that the die was unbiased? Use LOS 1%.	6M	CO3	L2
	(b)	In a sample of 600 men from a certain city, 450 are found smokers. In another sample of 900 men from another city, 450 are smokers. Identify the data that the cities are significantly different with respect to the habit of smoking among men?	6M	CO3	L3

UNIT – IV

7. 10 Soldiers participated in a shooting competition in the first week. After intensive training they participated in competition in the second week. Their scores before and after training are given as follows. **12M CO4 L4**

Before	67	24	57	55	63	54	56	68	33	43
After	70	38	58	58	56	67	68	75	42	38

Examine the data that the soldiers have been benefited by the training (Use α as 0.05)

(OR)

8. **(a)** A pair of dice are thrown 360 times and the frequency of each sum is indicated below: **7M CO4 L3**

Sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	8	24	35	37	44	65	51	42	26	14	14

Would you say that the dice are fair by apply the Chi-Square test at 0.05 level of significance?

(b) Two samples of sizes 9 and 8 gave the sums of squares of deviations from their respective means equal to 160 and 91 respectively. Can we conclude that this data drawn from the same normal population? **5M CO4 L5**

UNIT – V

9. The following data gives the readings of 10 samples of size 6 each in the production of a certain component. **12M CO5 L3**

	1	2	3	4	5	6	7	8	9	10
Mean-$\bar{X}$	383	508	505	582	557	337	514	614	707	753
Range R	95	128	100	91	68	65	148	28	37	80

Construct $\bar{X}$ and R charts and determine whether the product is under control (for n=6, $A_2 = 0.483$).

(OR)

10. **(a)** Construct a control chart for defectives for the following data: **6M CO5 L3**

Sample No.	1	2	3	4	5	6	7	8	9	10
No. inspected	90	65	85	70	80	80	70	95	90	75
No. of defectives	9	7	3	2	9	5	3	9	6	7

(b) Construct a suitable control chart for the following data and state your conclusions: **6M CO5 L3**

Sample No. (i)	1	2	3	4	5	6	7	8	9	10
No. of defects (c)	12	10	6	8	9	9	7	10	11	8

Q.P. Code: 2039402 | SET – 1

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

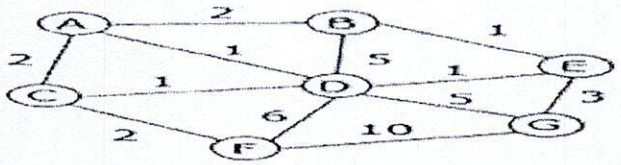
B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Design and Analysis of Algorithms (AI&ML)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Define Algorithm and give the specifications of Algorithm in detail.	6M	CO1	L1
	(b)	Discuss about the performance analysis of an algorithm in detail.	6M	CO1	L2
		(OR)			
2.	(a)	Explain Asymptotic Notations in detail by considering appropriate examples.	6M	CO1	L2
	(b)	Discuss about Elementary Data Structure in detail.	6M	CO1	L2
		UNIT – II			
3.	(a)	Explain the Strassen's matrix multiplication.	6M	CO2	L2
	(b)	State the Job-Sequencing with deadlines problem. Find an optimal sequence to the n= 5 Jobs where profits (P1, P2, P3, P4, P5) = (20, 15, 10, 5, 1) and deadlines (d1, d2, d3, d4, d5) =(2, 2, 1, 3, 3).	6M	CO2	L1
		(OR)			
4.	(a)	Write an algorithm for quick sort. Explain with an appropriate example.	6M	CO2	L2
	(b)	Apply Prim's algorithm on the following graph. Let A be the source vertex.	6M	CO2	L3



		UNIT – III			
5.	(a)	By considering an appropriate example, examine traveling sales person problem using dynamic programming.	6M	CO3	L4
	(b)	Discuss about Multistage graphs in detail.	6M	CO3	L2
		(OR)			
6.	(a)	Discuss about 0/1 Knapsack problem in detail.	6M	CO3	L2
	(b)	Explain about Optimal Binary Search Trees in detail.	6M	CO3	L5
		UNIT – IV			
7.	(a)	Discuss about Connected Components and Bi-Connected Components in detail.	6M	CO4	L2
	(b)	State and Explain N Queens Problem. Write the backtracking algorithm for solving N Queens problem.	6M	CO4	L4
		(OR)			
8.	(a)	Discuss various technique for graphs in detail.	6M	CO4	L2
	(b)	Explain sum-of-subsets problem? Write a recursive backtracking algorithm for sum of subsets problem.	6M	CO4	L2
		UNIT – V			
9.	(a)	Explain the FIFO BB 0/1 Knapsack problem procedure with the knapsack instance for n=4, m=15, (p1,p2,p3,p4)=(10,10,12,18), (w1,w2,w3,w4) =(2, 4, 6, 9). Draw the portion of the state space tree and find optimal solution.	6M	CO5	L2
	(b)	State the cook's theorem and explain the significance of this theorem?	6M	CO5	L4
		(OR)			
10.	(a)	Explain the process to solve Travelling Salesman Problem using Branch & Bound.	6M	CO5	L2
	(b)	Explain the classes of NP-Hard and NP-Complete and explain about satisfiability problem.	6M	CO5	L2

Q.P. Code: 2039403

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Operating Systems (AI & ML)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Define operating system. Explain the various functions of operating systems.	6M	CO1	L2
	(b)	What is system program? List and explain the various categories of system programs.	6M	CO1	L1
		(OR)			
2.	(a)	Differentiate monolithic kernel and microkernel	6M	CO1	L4
	(b)	Explain Micro Kernel Operating system	6M	CO1	L2
		UNIT – II			
3.	(a)	Define process synchronization in detail	6M	CO2	L1
	(b)	What is critical section problem? Explain with example.	6M	CO2	L1
		(OR)			
4.		Explain FCFS and Round Robin scheduling algorithms. Find the average waiting time and average turnaround time for a process, if the following processes are scheduling using FCFS and round robin scheduling algorithms. Time quantum is 1 msec.	12M	CO2	L3

Process	burst time
P1	10
P2	1
P3	2
P4	1
P5	5

		UNIT – III			
5.		Explain FIFO, OPR and LRU page replacement algorithms. Consider page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 and 3 frames in main memory. Find the number of page faults for the page replacement algorithms FIFO, OPR and LRU.	12M	CO3	L3
		(OR)			
6.	(a)	Explain about paging concept.	6M	CO3	L2
	(b)	Explain about demand paging	6M	CO3	L2
		UNIT – IV			
7.		Explain the deadlock avoidance with example by using Banker's algorithm.	12M	CO4	L2
		(OR)			
8.	(a)	Write about any one allocation method with example	6M	CO4	L3
	(b)	Explain different file accessing methods.	6M	CO4	L1
		UNIT – V			
9.	(a)	Demonstrate goals of protection in the OS	6M	CO5	L2
	(b)	Classify access matrix and its implementation	6M	CO5	L4
		(OR)			
10.		What is user authentication? Explain the various approaches for user authentication.	12M	CO5	L2

Q.P. Code: 2039404

SET - 1

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

B. Tech. IV Semester (R20UG) Regular & Supple. Examinations of July – 2024

SUB: Data Science (AI & ML)

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

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

			M	CO	BL
		UNIT – I			
1.	(a)	Explain about different exploratory data analysis techniques.	6M	CO1	L4
	(b)	What is the Data Science Process and explain it.	6M	CO1	L3
		(OR)			
2.	(a)	What are the goals of data science? Explain	6M	CO1	L4
	(b)	Compare Big Data with Data Science.	6M	CO1	L2
		UNIT – II			
3.	(a)	Describe theoretically the Naïve Bayes theorem to model a sophisticated spam filter.	6M	CO2	L3
	(b)	Write the formula for Bayes Theorem and explain Naïve Bayes classifier with necessary routine.	6M	CO2	L2
		(OR)			
4.	(a)	What is spam Filters? Explain about different types of spam filters with an example.	6M	CO2	L4
	(b)	Explain the Logistic Regression.	6M	CO2	L3
		UNIT – III			
5.	(a)	What is data science Redux? Explain Data Visualization Project in detail.	6M	CO3	L3
	(b)	Compare Mark's Data Visualization Projects with Data Visualization at Square.	6M	CO3	L4
		(OR)			
6.		Explain the Mark's Data Visualization Projects.	12M	CO3	L3
		UNIT – IV			
7.	(a)	Write installation steps of R-software	6M	CO4	L4
	(b)	Describe about (i) Matrix (ii) Data Frame	6M	CO4	L3
		(OR)			
8.	(a)	Why use R for analytics? Explain	6M	CO4	L4
	(b)	Discuss the R programming structures.	6M	CO4	L3
		UNIT – V			
9.	(a)	What is Social network analysis and explain its in terms of stastical point of view.	6M	CO5	L3
	(b)	Explain about Data Journalism and Technical Journalism.	6M	CO5	L2
		(OR)			
10.	(a)	Explain the background on social Network Analysis from a Statistical Point of View.	6M	CO5	L4
	(b)	How to write a technical Journalism and explain History on Data Journalism.	6M	CO5	L2

Q.P. Code: 2039405

SET - 1

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

B. Tech. IV Semester (R20UG) Regular/Supply Examinations of JULY – 2024

***SUB:* Business Intelligence Analyst (AI&ML)**

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

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

			M	CO	BL
		UNIT - I			
1.	(a)	Explain OLAP with examples?	6M	CO1	L1
	(b)	Explain OLTP with examples?	6M	CO1	L2
		(OR)			
2.	(a)	Explain Business Intelligence?	6M	CO1	L2
	(b)	Illustrate Business Intelligence benefits in various sectors.	6M	CO1	L2
		UNIT – II			
3.	(a)	Define Information Integration with examples.	6M	CO2	L1
	(b)	Explain Query and Reporting in detail.	6M	CO2	L2
		(OR)			
4.	(a)	Define Data Analysis?	6M	CO2	L2
	(b)	Define Data Insights?	6M	CO2	L3
		UNIT – III			
5.	(a)	What are the benefits of Metadata?	6M	CO3	L3
	(b)	Illustrate Metadata with real time examples?	6M	CO3	L3
		(OR)			
6.	(a)	Explain Association detection and Cluster detection in data mining?	6M	CO3	L3
	(b)	Explain Data Transformation, Data Standard, Data Consolidation and its importance in Business.	6M	CO3	L3
		UNIT – IV			
7.	(a)	Define IBM Cognos and its key features?	6M	CO4	L4
	(b)	Explain IBM Cognos Workspace and its features?	6M	CO4	L4
		(OR)			
8.	(a)	Define how Insights utilized in IBM Cognos?	6M	CO4	L3
	(b)	Compare Reports and Dashboard in IBM Cognos and its features.	6M	CO4	L3
		UNIT-V			
9.	(a)	Explain how to create a Report in IBM Cognos, with detailed steps.	6M	CO5	L3
	(b)	Explain how to create a Dashboard in IBM Cognos, with detailed steps.	6M	CO5	L3
		(OR)			
10.	(a)	List out some of the popular Data Visualization tools, compare and point out the benefits of IBM Cognos.	6M	CO5	L2
	(b)	List out different Visualizations available while creating a Dashboard.	6M	CO5	L2