AR20

CODE: 20CET308 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January, 2023

DESIGN OF CONCRETE STRUCTURES

(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Discuss the distribution & combination of loads.	3	CO1	Understand
	b)	Find the steel reinforcement required to resist bending moment 58kN-m of rectangular simply supported R.C beam 250x400mm. Use M25 grade concrete and Fe415 steel HYSD. Steel clear cover=40mm	7	CO1	Analysis
		(OR)			
2.	a)	Explain the stress-strain relationship for mild steel with a neat sketch.	3	CO1	Understand
	b)	Derive from fundamentals the expression for the area of stress block $0.36f_{ck}$ and depth of the centre of compressive force from the extreme fibre in compression $0.42x_u$.	7	CO1	Analysis
		UNIT-II			
3.	a)	Explain the double reinforced beam with a sketch.	3	CO2	Understand
	b)	A T beam with a flange width of 1400 mm, flange thickness of 90 mm, effective depth of 500 mm, and rib width of 300 mm has to be designed as a balanced section to determine the area of the steel required and the limiting moment of resistance use M25 concrete and Fe415 steel.	7	CO2	Analysis
		(OR)			
4.	a)	Discuss the concept of limiting the moment of Resistance	3	CO2	Understand
	b)	A doubly reinforced concrete beam having a rectangular section of 300 mm × 500 mm is reinforced with 2-12 mm diameter in compression 4-20 mm diameter in tension. Effective cover 40 mm, Effective span 5 m. Find M_u. Adopt M25 concrete and Fe415 steel.	7	CO2	Analysis
		UNIT-III			
5.	a)	Discuss the procedure for the design of the section for shear with a suitable example.	3	CO3	Understand
	b)	Calculate the Development length of a 20mm diameter HYSD bar in M20 concrete with maximum bond stress.	7	CO3	Analysis
		(OR)			

6.	a)	Briefly discuss the concept of bond and anchorage.	3	CO3	Understand
	b)	A simply supported RC beam of size 230mm x 400mm supports a service load of 20 kN/m over a clear span of 4 m.with percentage of steel 0.5%. Using M20 grade concrete and Fe415 steel. Design the beam for shear. Sketch the reinforcement details.	7	CO3	Design

UNIT-IV

7.	a)	Explain the classification of slabs	3	CO4	Understand
	b)	Design a two-way slab for a hall of size 4 m × 5 m. The slab is supported all around on walls of width 230 mm. The slab has to carry a live load of 3 kN/m^2 and the floor finish is 0.6 kN/m^2. All the edges are discontinuous, and corners are held down. Use M20 concrete and Fe415 steel. Also, sketch the details of reinforcement.	7	CO4	Design

(OR)

8.	a)	Discuss the concept of two-way slab?	3	CO4	Understand
	b)	Design a slab for a classroom of dimension 4 m × 6 m with all edges discontinuous. Live load = 2.5 kN/m^2, Floor finish = 1 kN/m^2; Bearing = 300 mm. Use M25 grade concrete and Fe500 grade steel. If any additional data assume it suitably.	7	CO4	Design

UNIT-V

9.	a)	List the observations by the strength interaction diagram of an RC column?	3	CO5	Understand
	b)	A rectangular column of size 250 mm × 450 mm is subjected to a design load of 1300 kN and a design moment of 40 kN-m acting about an axis bisecting the depth of the column. Effective cover = 50 mm. Calculate the necessary reinforcement adopting M20 grade concrete and Fe415 steel. Sketch the reinforcement details.	7	CO5	Analysis

(OR)

10.	a)	How do you find the effective length of a column?	3	CO5	Understand
	b)	Calculate the load carrying capacity of a column of size 250mmx400mm, reinforced with 5 bars of 20mm diameter. Use M20 concrete and Fe415 steel.	7	CO5	Analysis

UNIT-VI

11.	a)	Draw the diagrams of pressure distribution under a footing.	3	CO6	Understand
	b)	Design a rectangular footing for a column 400mm x 600mm carries a live load of 800kN. The soil baring capacity 150kN for m^2 Use M20 concrete and Fe415 steel.	7	CO6	Design

(OR)

12.	a)	Define footing and list the different types of footing?	3	CO6	Understand
	b)	A column of size 500 mm × 500 mm to carry a design dead load of 1000 kN and a live load of 1000 kN without any moment. The safe bearing capacity of soil is 180 kN/m^2. Adopt M25 grade concrete and Fe500 grade steel. Sketch the footing showing the details of reinforcement. Design a square footing.	7	CO6	Design

AR20

CODE: 20EET308 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January,2023

ELECTROMAGNETICFIELDTHEORY

(Electrical and Electronics Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	State and Prove Coloumbs Law?	5M	CO1	Remember
	b)	Derive the expression for Electric field intensity due to Infinite length line Charge along the Z-axis.	5M	CO1	Understand
		(OR)			
2.	a)	Derive the expression for Electric field strength due to infinite sheet of Charge along the Z- axis.	5M	CO1	Understand
	b)	Laplace's Transform $A = \rho\cos\theta\, a_\rho + \rho z^2 \sin\Phi a_z$ into spherical system and calculate its magnitude at point (3, -4, 0).	5M	CO1	Apply
		UNIT-II			
3.	a)	Write the boundary conditions on **E** and **D** on Conductor- Dielectric surface?	5M	CO2	Remember
	b)	Point charges of 1 μC and -1 μC are located at (0,0,1) m and (0,0,-1) m respectively in free space. (i) Find the potential at (0,3,4) m. and (ii) the potential at (0,2,6).	5M	CO2	Apply
		(OR)			
4.	a)	Derive the expression for energy density in electrostatic fields.	5M	CO2	Understand
	b)	Derive the conditions which $\overline{D}$ and $\overline{E}$ should satisfy at the charge free interface between two dielectric media.	5M	CO2	Understand
		UNIT-III			
5.	a)	Derive the continuity equation and write its physical significance?	5M	CO3	Understand
	b)	A square parallel plate capacitor 200 mm on side with a plate spacing of 25mm is filled with a dielectric slap (ε_r =240 of the same dimensions if 100 V is applied to the capacitor). Find the energy stored by the capacitor?	5M	CO3	Apply
		(OR)			

6.	a)	Determine the solution of Laplace's equation in one variable form?	5M	CO3	Understand
	b)	In a certain region, the expression for potential is given by $V=3x^2y-4y^2z+9$. Find the intensity of electric field in general form and at point, P (-1, 2, -3) m.	5M	CO3	Apply

UNIT-IV

7.	a)	State and prove Biot-savarts Law? And Give its Significance?	5M	CO4	Understand
	b)	A current filament of 5 A in the $\overline{a}_Z$ direction calculate magnetic field intensity at origin from point (2,-2,0) .	5M	CO4	Apply

(OR)

8.	a)	Write in detail about Ampere's Circuit law?	5M	CO4	Remember
	b)	Derive the expression for Energy density in Magnetic field?	5M	CO4	Understand

UNIT-V

9.	a	Derive the expression for inductance of a solenoid?	5M	CO5	Understand
	b	Find the mutual inductance between two toroidal windings which are closely wound on iron core of relative permeability 300? The mean radius of the core is 7cm and radius of its cross-section is 3 cm.The winding has 400 and 600 turns for windings 1 and 2 respectively.	5M	CO5	Apply

(OR)

10.	a)	Derive the expression for inductance of toroid	5M	CO5	Understand
	b)	Write short notes i) magnetic flux density and ii) mutual inductance.	5M	CO5	Remember

UNIT-VI

11.	a)	State and Explain Faraday laws of electromagnetic induction?	5M	CO6	Understand
	b	A conducting circular loop of radius 20 cm lies in the z=0 plane in a magnetic field B =10 Cos 377t az mWb/m2 in the loop. Calculate the induced voltage in the loop?	5M	CO6	Apply

(OR)

12.	a)	State and Explain Poynting theorem?	5M	CO6	Understand
	b)	Derive the expression for displacement current equation.	5M	CO6	Understand

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CODE: 20MET308 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January, 2023

MACHINE DESIGN

(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

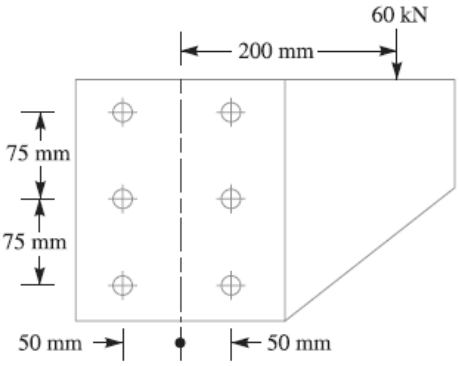
			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	What are the design considerations in machine design?	4M	CO1	BL2
	b)	The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5 kN. Find the diameter of bolt required according to 1. Maximum principal stress theory; 2. Maximum shear stress theory; Take permissible tensile stress at elastic limit = 100 MPa and poisson's ratio = 0.3.	6M	CO1	BL3
		(OR)			
2.	a)	A hollow shaft is required to transmit 600 kW at 110 r.p.m., the maximum torque being 20% greater than the mean. The shear stress is not to exceed 63 MPa and twist in a length of 3 metres not to exceed 1.4 degrees. Find the external diameter of the shaft, if the internal diameter to the external diameter is 3/8. Take modulus of rigidity as 84 GPa.	7M	CO1	BL3
	b)	List out various mechanical properties of materials	3M	CO1	BL2
		UNIT-II			
3.	a)	Illustrate how the stress concentration in a component can be reduced.	4M	CO2	BL3
	b)	A circular cross section cantilever beam having length 130 mm. subjected to a cyclic transverse load of varying form -150 N to 350 N, FOS is 2, theoretical stress concentration factor is 1.4, notch sensitivity factor is 0.9, ultimate strength is 540 MPa, yield strength is 320 MPa. Size correction factor is 0.85. Endurance limit is 275 MPa, surface correction factor is 0.9 and notch sensitivity factor is 0.9. Determine the diameter of the beam by (i) Goodman method and (ii) Soderberg method.	6M	CO2	BL3

(OR)

4.	a)	It is required to design a rigid type of flange coupling to connect two shafts. The input shaft transmits 37.5 KW power at 180rpm to the output shaft through the coupling. The service factor for the application is 1.5, i,e the design troque is 1.5 times of rated torque. Selecte suitable materials for various parts of the coupling, design the coupling and specify the dimensions of its components.	10M	CO2	BL3

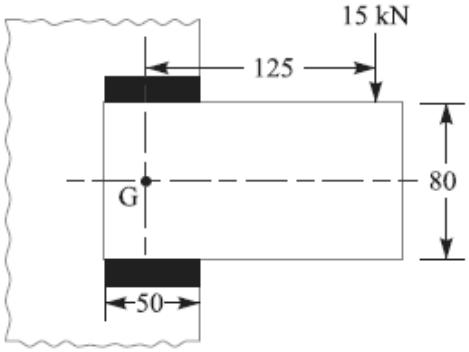
UNIT-III

5.		A bracket is bolted to a column by 6 bolts of equal size as shown in Fig. It carries a load of 60 kN at a distance of 200 mm from the centre of the column. If the maximum shear stress in the bolt is limited to 150 MPa, determine the diameter of the bolt.	10M	CO3	BL3



(OR)

6.		A bracket carrying a load of 15 kN is to be welded as shown in Figure. Find the size of weld required if the allowable shear stress is not to exceed 80 MPa.	10M	CO3	BL3



UNIT-IV

7.	a)	Explain the different types of flat belt drives?	3M	CO4	BL2
	b)	The bore of a cylinder of the four¬ stroke diesel engine is 150 mm. The maximum gas pressure inside the cylinder is limited to 3.5 MPa. The cylinder head is made of grey cast iron FG 200 (S_{ut} = 200 N/mm2) and the factor of safety is 5. Determine the thickness of the cylinder head. Studs are used to fix the cylinder head to the cylinder and obtain a leak proof joint. They are made of steel FeE 250 (S_{yt} = 250 N/mm2) and the factor of safety is 5. Calculate. (i) number of studs (ii) nominal diameter of studs (iii) pitch of studs	7M	CO4	BL3

(OR)

8.	a)	Explain the different types of belt joints?	3M	CO4	BL2
	b)	A four stroke internal combustion engine has the following specifications: Brake power = 7.5 kW; Speed = 1000 r.p.m.; Indicated mean effective pressure = 0.35 N/mm2;Maximum gas pressure = 3.5 N/mm2; Mechanical efficiency = 80 %. Determine: 1. The dimesions of the cylinder, if the length of stroke is 1.4 times the bore of the cylinder; 2. Wall thickness of the cylinder, if the hoop stress is 35 MPa; 3. Thickness of the cylinder head and the size of studs when the permissible stresses for the cylinder head and stud materials are 45 MPa and 65 MPa respectively.	7M	CO4	BL3

UNIT-V

9.		Design a connecting rod for an I.C. engine running at 1800 r.p.m. and developing a maximum pressure of 3.15 N/mm^2. The diameter of the piston is 100 mm ; mass of the reciprocating parts per cylinder 2.25 kg; length of connecting rod 380 mm; stroke of piston 190 mm and compression ratio 6 : 1. Take a factor of safety of 6 for the design. Take length to diameter ratio for big end bearing as 1.3 and small end bearing as 2 and the corresponding bearing pressures as 10 N/mm^2 and 15 N/mm^2. The density of material of the rod may be taken as 8000 kg/m^3 and the allowable stress in the bolts as 60 N/mm^2 and in cap as 80 N/mm^2. The rod is to be of I-section for which you can choose your own proportions.	10M	CO5	BL4

(OR)

10.	Design an overhung crankshaft for a 300 × 350 mm single cylinder vertical engine using the following data: Maximum gas pressure = 2.5 MPa; (L/r) ratio = 4.5; Weight of flywheel cum belt pulley = 10 kN; Total belt pull = 5 kN; Width of hub for flywheel cum belt pulley = 150 mm. The torque on the crankshaft is maximum when the crank turns through 35° from the top dead centre and at this position the gas pressure inside the cylinder is 1 MPa. The belts are in the horizontal direction. Assume suitable data and state the assumptions you make.	10M	CO5	BL4

UNIT-VI

11.	A gear drive is required to transmit a maximum power of 22.5 kW. The velocity ratio is 1:2 and r.p.m. of the pinion is 200. The approximate centre distance between the shafts may be taken as 600 mm. The teeth has 20° stub involute profiles. The static stress for the gear material (which is cast iron) may be taken as 60 MPa and face width as 10 times the module. Find the module, face width and number of teeth on each gear. Check the design for dynamic and wear loads. The deformation or dynamic factor in the Buckingham equation may be taken as 80 and the material combination factor for the wear as 1.4.	10M	CO6	BL4

(OR)

12.	A pair of helical gears with 20° full-depth involute teeth consists of a 20 teeth pinion meshing with a 41 teeth gear. The module is 3 mm while the face width is 40 mm. The material for pinion as well as gear is steel with an ultimate tensile strength of 600 N/mm^2. The gears are heat┐ treated to a surface hardness of 400 BHN. The pinion rotates at 1450 rpm and the service factor for the application is 1.75. Assume that velocity factor accounts for the dynamic load and the factor of safety is 1.5. Determine the rated power that the gears can transmit.	10M	CO6	BL4

AR20

CODE: 20ECT308 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January, 2023

DIGITAL COMMUNICATIONS

(Electronics and Communication Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Draw the block diagram of PCM and explain each block in detail.	6	1	K2
	b)	Compare various digitization techniques.	4	1	K2
		(OR)			
2.	a)	Explain quantization error and derive an expression for maximum SNR in PCM system that uses linear quantization.	6	1	K2
	b)	Describe the μ-Law and A-Law in PCM.	4	1	K2
		UNIT-II			
3.	a)	Compare binary signalling schemes and M-ary Signalling Schemes.	5	2	K2
	b)	With neat sketch, explain the modulation and detection of FSK.	5	2	K2
		(OR)			
4.	a)	With a neat sketch, explain the modulation and detection of QPSK.	5	2	K2
	b)	Discuss the ASK system in detail.	5	2	K2
		UNIT-III			
5.	a)	Find the Probability of error of Optimum Filter.	5	3	K3
	b)	With a neat sketch explain the Base band signal receiver?	5	3	K2
		(OR)			
6.	a)	Calculate the error probability of BPSK.	5	3	K3
	b)	What is the need for synchronization in digital communication system?	5	3	K2
		UNIT-IV			
7.	a)	If X represents the outcome of a single roll of a fair die. What is the entropy of X?	5	4	K3
	b)	State and prove the properties of mutual information.	5	4	K2
		(OR)			
8.	a)	Explain the concept of entropy and its properties.	5	4	K2
	b)	A message source generates one of four messages randomly every microsecond. The probabilities of these messages are 0.4, 0.3, 0.2, and 0.1. Each emitted message is independent of the other messages in the sequence. Find the rate of information generated by this source (in bits per second).	5	4	K3
		UNIT-V			
9.	a)	One of five possible message Q1 to Q5 having probabilities 1/4, 1/2, 1/8, 1/16, 1/16 respectively are transmitted. Generate Huffman code and calculate the coding efficiency.	5	5	K3
	b)	Construct a systematic (7,4) cyclic code using the generator polynomial $g(x)=x^3+x^2+1$.	5	5	K1
		(OR)			
10.	a)	Apply Shannon-Fano coding for the 5 messages with probabilities 0.4, 0.15, 0.15, 0.15, 0.15 and find the coding efficiency.	5	5	K3
	b)	Explain the Huffman coding in detail along with example.	5	5	K2
		UNIT-VI			
11.	a)	Compare linear block codes and convolutional codes.	5	6	K3
	b)	Explain the Viterbi algorithm for the decoding of convolutional codes.	5	6	K3
		(OR)			
12.		The convolutional code is described by the following generator sequences g(1) = [111] and g(2) = [101]. Develop code tree, state diagram and Trellis diagram.	10	6	K3

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CODE: 20CST308 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January, 2023

FORMAL LANGUAGES AND AUTOMATA THEORY

(Computer Science and Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Sketch the transition diagram of a FA which accepts all strings of 1's and 0's in which both the number of 0's and 1's are even.	6	1	K2
	b)	Differentiate Moore machine with Mealy machine	4	1	K2
		(OR)			
2.		Construct the Moore machine equivalent to the Mealy machine M given in the following in the table	10	1	K3

	a=0		a=1	
→q1	q1	1	q2	0
q2	q4	1	q4	1
q3	q2	1	q3	1
q4	q3	0	q1	1

		UNIT-II			
3.	a)	Construct epsilon NFA equivalent to the regular expression (00+11)*00	8	2	K3
	b)	State pumping lemma for regular languages	2	2	K1
		(OR)			
4.	a)	Show that L ={a^ib^j | i>j} is not regular	6	2	K2
	b)	List the identity rules for regular expressions	4	2	K1
		UNIT-III			
5.	a)	Let Σ = {a,b}. Obtain a grammar G generating set of all palindromes over Σ	5	3	K3
	b)	Show that grammar is ambiguous S→aSbS | bSaS | ε	5	3	K3
		(OR)			
6.		Obtain the leftmost and rightmost derivation for the string aaabbabbba using the following grammar S→aB| bA, A→aS| bAA|a, B→ bS| aBB|b	10	3	K3

UNIT-IV

7.	Obtain the following grammar in CNF $E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E) \mid I$ $I \rightarrow a \mid b \mid Ia \mid Ib \mid I0 \mid I1$	10	4	K3
	(OR)			
8.	Covert the following grammar in to GNF $S \rightarrow AB1 \mid 0$ $A \rightarrow 00A \mid B$ $B \rightarrow 1A1$	10	4	K2

UNIT-V

9.	Design Push Down Automata to accept a string of balanced parentheses. The parentheses to be considered are [,]	10	5	K3
	(OR)			
10.	Let $M = (\{q0,q1\},\{a,b\},\{X, Z_0\},\delta , q_0, Z_0,\phi)$ Where δ is given by $\delta(q_0,a, Z_0) = (q_0,Xz0)$ $\delta (q_1,a,X)=\{(q_0,XX)$ $\delta (q_0, \varepsilon, Z_0)=\{(q_1,Z_0)\}$, $\delta (q_0, \varepsilon, X)=\{(q_1,X)\}$, $\delta(q_1, b ,X)=\{(q_1, \varepsilon)\}$ $\delta (q_1, \varepsilon,Z0)=\{(q_2, \varepsilon)\}$ Construct the CFG for the following PDA	10	5	K3

UNIT-VI

11.	Design a Turing Machine for recognizing the language $L=\{ W W^R / W \text{ in } (a,b)^*\}$	10	6	K3
	(OR)			
12.	Discuss briefly bout the following (a) Recursively Enumerable (REL) & Recursive Languages (RL) (b) Halting Problem: (c) Decidability of PCP.	3+3+4	6	K2

AR20

CODE: 20ITT301 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January, 2023

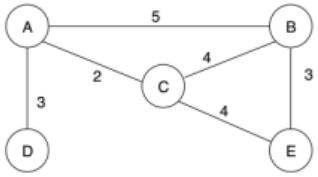
DATA COMMUNICATION AND COMPUTER NETWORKS

(Information Technology)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Why do we need protocols and standards? Explain.	5M	CO1	L2
	b)	Explain about design issues for layers.	5M	CO1	L2
		(OR)			
2.	a)	Enlist four applications of computer network.	5M	CO1	L2
	b)	Explain in detail about star and bus topologies. What are the advantages of star topology over bus topology? Which type of networks use star and bus topologies?	5M	CO1	L2
		UNIT-II			
3.	a)	Give two examples for each of Twisted, coaxial, fiber optic cables.	5M	CO2	L2
	b)	What are different digital encoding techniques available. Explain about it.	5M	CO2	L2
		(OR)			
4.		Explain wireless transmission media with neat sketches.	10M	CO2	L2
		UNIT-III			
5.	a)	What is framing? Discuss various framing methods.	5M	CO3	L2
	b)	Explain in detail about the Simplex protocol for Noisy channel.	5M	CO3	L2
		(OR)			
6.	a)	Describe the working principle of Carrier Sense Multiple Access with Collision Detection (CSMA/CD).	5M	CO3	L3
	b)	Obtain the CRC for the data bit sequence 1010011010 using the polynomial 10111.	5M	CO3	L3
		UNIT-IV			
7.	a)	Explain about the Link State Routing with an example. Discuss about the advantages and disadvantages of link sate routing.	10M	CO4	L3
		(OR)			
8.	a)	What are functions of network layer?	5M	CO4	L2
	b)	Demonstrate the Distance vector routing algorithm for the following example.	5M	CO4	L4



		UNIT-V			
9		Describe the format of TCP segment. Explain about it.	10M	CO5	L2
		(OR)			
10.	a)	Explain three-way handshake protocol used for establishing connection.	5M	CO5	L2
	b)	Discuss about the connectionless and connection-oriented services.	5M	CO5	L2
		UNIT-VI			
11.	a)	Explain the functionality of HTTP.	5M	CO6	L2
	b)	What is the functionality of DNS?	5M	CO6	L2
		(OR)			
12.	a)	Differentiate between fully qualified domain name and partially qualified domain name.	5M	CO6	L3
	b)	Differentiate the functionalities of user agent and message transfer agent.	5M	CO6	L3

AR18

CODE: 18CET314 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

BASIC REINFORCED CONCRETE DESIGN

(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain about any two different design philosophies.	6
	b)	Differentiate balanced, under reinforced and over reinforced sections with neat sketches.	6

(OR)

2.		A rectangular beam of width 250mm is having an effective depth of 327mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. Determine the following and sketch the reinforcement details. a) Position of neutral axis from compression side b) Area of steel in balanced section c) Lever arm in balanced section d) Moment of resistance due to concrete	12

UNIT-II

3.		Design the shear reinforcement in a beam of 300 mm x 600 mm overall dimensions subjected to factored shear of 95 KN. Assume an effective cover of 50 mm and adopt M20 and Fe-415. Sketch the reinforcement details.	12

(OR)

4.	a)	A RCC beam 250mm wide and 450mm deep, is reinforced with 3 nos. of 20mm diameter bars of grade Fe 415, on the tension side with an effective cover of 50mm. If the shear reinforcement of 2 legged 8mm stirrups at a spacing of 160mm c/c is provided at a section, determine the design (ultimate) strength of the section. Assume M20 concrete.	6
	b)	Explain the importance of bond and classify anchorage or bond length and development length.	6

UNIT-III

5. Design a simply supported R.C slab for a roof of a hall 4m x 10m (inside dimensions) with 230mm walls all around. Assume a live load of 4kN/m^2 and floor finishes 1kN/m^2. Use M-20 grade concrete and Fe 415 grade HYSD steel bars. Sketch the reinforcement details. 12

(OR)

6. Design a two-way slab for an office floor to suit the following:
Live load= 4 KN/m^2
Load due to finishes: 1.5 KN/m^2
Size of floor: 4m × 6m
Edge conditions: two adjacent edges discontinuous. 12

UNIT-IV

7. Design an axially loaded column 400 mm x 400 mm pined at both ends with an unsupported length of 3m to carry a factored load of 2300kN. Adopt M20 grade concrete and Fe415 grade steel. Sketch the reinforcement details. 12

(OR)

8. Design the reinforcements in a short column 300 mm x 500 mm and unsupported length of 3 m subjected to an ultimate axial load of 1400 kN together with ultimate moments of 130 kN.m about the major axis and 60 kNm about the minor axis. Adopt M-30 grade concrete and Fe-500 HYSD bars. Sketch the reinforcement details. (Hint: Use SP16) 12

UNIT-V

9. Design a suitable footing for a reinforced concrete column of size 300 mm x 500 mm supporting a factored axial load of 1500kN. Assume the safe bearing capacity of the soil as 200kN/m^2. Adopt M25 grade concrete and Fe415 HYSD bars. Sketch the reinforcement details. 12

(OR)

10. Design a square isolated footing for column dimensions of 230mm x 230mm subjected to a service load of 600kN. The safe bearing capacity of soil is 200kN/m^2. Adopt M20 grade concrete and Fe415. Sketch the reinforcement details. 12

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AR18

CODE: 18EET312 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

ELECTRICAL MEASUREMENTS

(Electrical & Electronics Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.		Describe the construction and working principle of PMMC instrument. Derive an expression for the deflecting torque and write advantages of PMMC	12M
		(OR)	
2.	a)	List the errors associated with Moving iron instruments and discuss the methods for minimizing them.	6M
	b)	Explain the method of extending the range of a PMMC meter as volt meter and ammeter.	6M

UNIT-II

3.	a)	Draw the phasor diagram of current transformer (CT) and derive the expressions for ratio and phase angle errors of a CT.	12M
		(OR)	
4.	a)	Explain how the range of a wattmeter can be increased with the help of CT and PT.	6M
	b)	What is the necessity of LPF wattmeter and explain its constructional details.	6M

UNIT-III

5.	a)	What is lag adjustment and what is its requirement in induction type energy meter? Explain.	6M
	b)	What is creeping effect? Explain how it can be eliminated.	6M
		(OR)	
6.	a)	Explain the construction and working of a single phase moving iron type power factor meter.	6M
	b)	Describe in detail the construction and working of trivector meter	6M

UNIT-IV

7.	a)	Explain why Wheatstone bridge cannot be used for measuring low resistance and derive the expression for unknown resistance using Kelvin's double bridge.	6M
	b)	Explain any method for measuring high resistance.	6M
		(OR)	
8.	a)	Derive the expression for balancing condition and draw the phasor diagram at balance for an Anderson's bridge.	6M
	b)	Explain any on method of measuring unknown capacitance using bridge methods.	6M

UNIT-V

9.		Explain the construction and working of Drysdale AC type potentiometer with the help of necessary diagrams	12M
		(OR)	
10.	a)	Explain the construction and working of ballistic galvanometer	6M
	b)	Explain the step-by-step method to obtain B-H curve of a given magnetic material.	6M

AR18

CODE: 18MET309 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

DESIGN OF MACHINE MEMBERS – I

(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

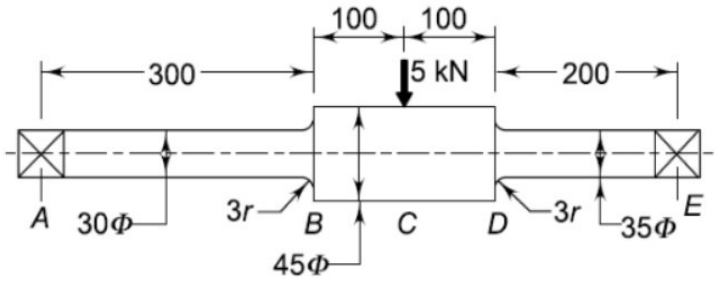
1. The principal stresses induced at a point in a machine component made of steel 50C4 (Syt = 460 N/mm2 are as follows: σ1 = 200 N/mm2, σ2 = 5 N/mm2 and σ3 = 0 N/mm2. Calculate the factor of safety by- [12]
   1. The maximum shear stress theory
   2. The distortion energy theory

(OR)

2. Explain the 5 theories of failure. [12]

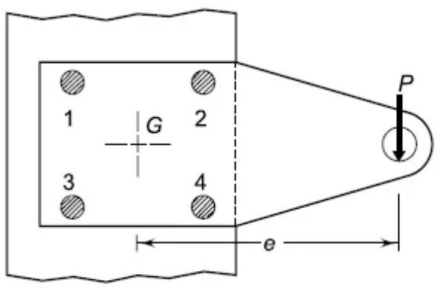
UNIT-II

3. A rotating shaft, subjected to a non-rotating force of 5kN and simply support between two bearings A and E as shown in fig. The shaft is machined from plain carbon steel 30C8 (ultimate strength = 500 N/mm2) and the expected reliability is 90%. The equivalent notch radius at fillet can be taken as 3mm. what is the life of the shaft? [12]



(OR)

4. The structural connection shown in Fig. is subjected to an eccentric force P of 10 kN with an eccentricity of 500 mm from the CG of the bolts. The centre distance between bolts 1 and 2 is 200 mm, and the centre distance between bolts 1 and 3 is 150 mm. All the bolts are identical. The bolts are made from plain carbon steel 30C8 (Syt=400N/mm2) and the factor of safety is 2.5. Determine the size of the bolts. [12]

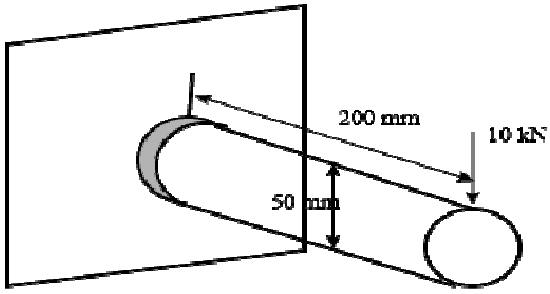


UNIT-III

5. A double riveted lap joint is made between15 mm thick plates. The rivet diameter and pitch are 25 mm and75 mm respectively. If the ultimate stresses are 400 MPa in tension for plate and 320MPa in shear and 640 MPa in crushing for rivet material, find the minimum force per pitch length which will rupture the joint. [12]
If the above joint is subjected to a load such that the factor of safetyis4, find out the actual stresses developed in the plates and the rivets.

(OR)

6. A 50 mm diameter solid shaft is welded to a flat plate as shown in figure.1. If the size of the weld is 15 mm, what is the maximum shear stress in the weld? [12]



UNIT-IV

7. The shaft and the flange of a marine engine are to be designed for flange coupling, in which the flange is forged on the end of the shaft. The following particulars are to be considered in the design: [12]

Power of the engine	= 3 MW
Speed of the engine	= 100 r.p.m
Permissible shear stress in bolts and shaft	= 60 MPa
Number of bolts used	= 8
Pitch circle diameter of bolts	= 1.6 x Dimeter of shaft

Find: 1.diameter of shaft; 2.diameter of bolts; 3.thickness of flange; and 4.diameter of flange.

(OR)

8. Find the diameter of a solid steel shaft to transmit 20 kW at 200 r.p.m. The ultimate shear stress for the steel may be taken as 360 MPa and a factor of safety as 8. If a hollow shaft is to be used in place of the solid shaft, find the inside and outside diameter when the ratio of inside to outside diameters is 0.5. [12]

UNIT-V

9. Design a sleeve and cotter joint to resist a tensile load of 60 kN. All parts of the joint are made of the same material with the following allowable stresses: [12]
σt = 60 MPa, τ = 70MPa and σc = 125 MPa

(OR)

10. Design a close coiled helical compression spring for a service load ranging from 2250 N to 2750 N. The axial deflection of the spring for the load range is 6 mm. Assume a spring index of 5. The permissible shear stress intensity is 420 MPa and modulus of rigidity, G = 84 KN/mm2. Neglect the effect of stress concentration. Draw a fully dimensioned sketch of the spring, showing details of the finish of the end coils. [12]

AR18

CODE: 18ECT313 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

DIITAL COMMUNICATIONS

(Electronics and Communication Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	List the advantages of digital communications and explain.	6M
	b)	Draw the block diagram of Differential PCM system and explain.	6M
		(OR)	
2.	a)	Discuss about companding techniques in detail.	6M
	b)	Explain quantization error and derive an expression for maximum SNR in PCM system that uses linear quantization.	6M

UNIT-II

3.	a)	Explain about non-coherent detection of ASK.	6M
	b)	Explain the process of generating FSK signals.	6M
		(OR)	
4.	a)	Describe the process of detecting DPSK signals.	6M
	b)	Compare binary signalling schemes and M-ary Signalling Schemes.	6M

UNIT-III

5.	a)	Explain how integrator is used to detect the baseband signal.	6M
	b)	Find the probability of error using matched filter.	6M
		(OR)	
6.	a)	Explain the concept of entropy and its properties.	6M
	b)	An analog signal band limited to 10kHz is quantized in 8 levels of a PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Calculate the entropy and the rate of information.	6M

UNIT-IV

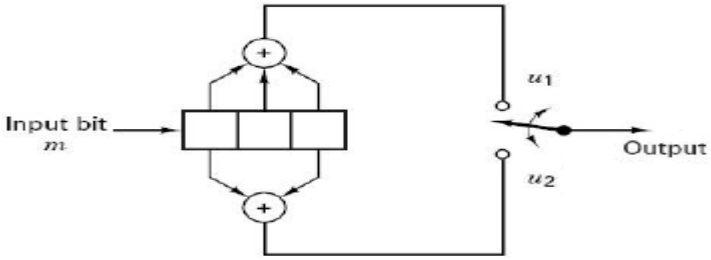
7.	a)	Explain the Shanon-Fano coding with an example.	6M
	b)	A source is transmitting six messages with probability 0.30, 0.25, 0.15, 0.12, 0.10 and 0.08 respectively. i) Find the binary Huffman code. ii) Determine its average word length, efficiency and redundancy.	6M
		(OR)	
8.	a)	Draw the syndrome decoder block diagram and explain.	6M
	b)	Consider a (6,3) linear block code defined by the generator matrix	6M

$$\vec{G} = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$$

Find all possible codewords and minimum distance between the codewords.

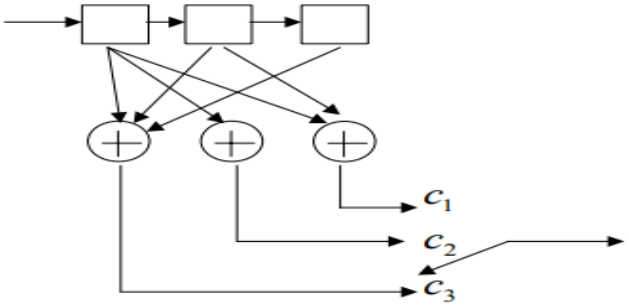
UNIT-V

9. a) Explain the Viterbi decoding algorithm with an example. 6M
   b) For the given convolutional encoder, Draw the state diagram. 6M



(OR)

10. a) Explain encoding of convolution codes using time domain approach. 6M
    b) Consider the convolutional encoder shown in Figure . The message bits are shifted into the encoder two bits at a time. Assume the initial content of the registers to be zero and find the code block for the input message block 110101. 6M



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AR18

CODE: 18CST310 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular & Supplementary Examinations, January, 2023

FORMAL LANGUAGES & AUTOMATA THEORY

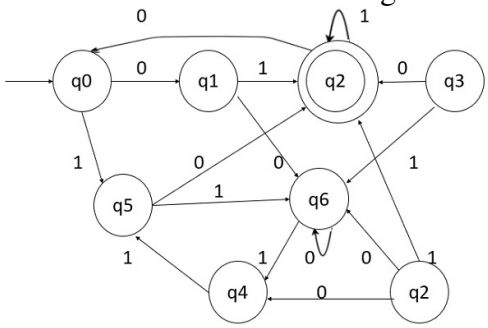
(Common to CSE & IT)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Construct Minimum state Automata for the following DFA? 8M



b) Differentiate between NFA and DFA 4M

(OR)

2. a) Design DFA for the following over {a,b}. 6M
i) All strings containing not more than three a's.
ii) All strings that has at least two occurrences of b between any two occurrences of a.
b) Construct a DFA accepting the set of all strings ending with 00 6M

UNIT-II

3. a) Convert regular expression (0*1+10) to finite automata. 8M
b) Explain about Pumping Lemma. 4M

(OR)

4. a) Define Regular Expression? Explain about the Properties of Regular Expressio 6M
b) Construct a DFA for the Regular expression (0+1)* (00+11) (0+1)* 6M

UNIT-III

5. a) Explain about Ambiguity in Grammars and Languages with example 6M
b) Discuss in detail about leftmost and right most derivation tree with example 6M

(OR)

6. a) Design context-free grammar for the following cases 6M
L={ 0n1n | n≥1 }
L={aibjck| i≠j or j≠k}
b) Derive left and right most derivations for the input string "bbaababa" for the given Grammar. 6M
S → bB / aA
A → b / bS / aAA
B → a / aS / bBB

UNIT-IV

7. a) Construct a PDA for the following grammar S→AA/a, A→SS/b. 12 M

(OR)

8. a) List out and discuss the closure properties of CFL. 6M
   b) Construct the CFG for the PDA M = ({q0,q1}, {0,1}, {R,Z0}, δ, q0, Z0, Φ) and δ is given by 6M
   δ(q0,1,Z0)=(q0,RZ0)
   δ(q0,1,R)=(q0,RR)
   δ(q0,0,R)=(q1,R)
   δ(q1,0, Z0)=(q0, Z0)
   δ(q0,ε, Z0)=(q0,ε)
   δ(q1,1,R)=(q1,ε).

UNIT-V

9. a) Construct a TM for L={ $a^u b^u c^u$ | u ≥ 1}. Give the graphical representation for the obtained TM. 12 M

(OR)

10. a) Distinguish between class P and class NP Problems. 6M
    b) Discuss in brief about NP Hard problems. 6M

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AR16

CODE: 16CE3013 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

DESIGN OF CONCRETE STRUCTURES

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain briefly mode of failures. 6M
   b) Derive stress block parameters. 8M

(OR)

2. a) A simply supported beam of size 230mmX600mm overall depth is reinforced with 3 no of 16mm diameter bars as a tension reinforcement. Find the moment of resistance. The materials are M20 & Fe415. 10M
   b) Write the assumptions in limit state design. 4M

UNIT-II

3. A rectangular beam of size 230mmX570mm effective depth is subjected to a factored bending moment of 270kN-m. Design the reinforcement for flexure. The materials are M20 & Fe250. Assume effective compression cover as 50mm. Draw the reinforcement details. 14M

(OR)

4. A simply supported beam of span 5m is subjected to a characteristic load of 15 kN/m. Design the beam. The materials are M20 grade concrete and HYSD reinforcement of grade Fe 415. Draw the reinforcement details. 14M

UNIT-III

5. A five span continuous one way slab is to be used for an office floor of size 8mX15m. The centre to centre distance of supporting beams are 3m. Consider live load 3kN/Sqm and floor finish 1kN/Sqm. Design the slab using M20 grade concrete and Fe415 grade steel. Draw the reinforcement details. 14M

(OR)

6. Design a slab for an office floor of size 3.5mX4.5m with four edges are discontinuous. Slab is subjected to a live load of 4 kN/Sqm. Design the slab using M20 grade concrete and Fe415 grade steel. Draw the reinforcement details. 14M

UNIT-IV

7. a) Briefly explain the column reinforcement requirements. 6M
   b) Design a circular column to carry an axial working load 1000kN. Assume e_{min}<0.05D. The materials are M30 grade and HYSD reinforcement of grade Fe500. Use helical reinforcement. Draw the reinforcement details. 8M

(OR)

8. Design column for the following data: Column size: 300mmX450mm;
   Materials Grade :M20 & Fe415;
   Loads: Pu=1000kN;
   Effective length of column is 6m and unsupported length of column is 7m. Draw the reinforcement details. 14M

UNIT-V

9. a) Explain different types of footings with sketches. 7M
   b) Explain the design procedure of the isolated footing. 7M

(OR)

10. Design a rectangular isolated footing to carry a column load of 600 kN & 15 kN -m from a 300mmX450mm column. The safe bearing capacity of the soil is 150 kN/Sqm. Consider base of footing at 1.5m below the ground level. The unit weight of earth is 20 kN/Cum. The materials are M20 grade and HYSD reinforcement of grade Fe415. Draw the reinforcement details. 14M

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AR16

CODE: 16ME3013 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January, 2023

DESIGN OF MACHINE MEMBERS – I

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5 kN. Find the diameter of bolt required according to 1. Maximum principal stress theory 2. Maximum shear stress theory 3. Maximum principal strain theory 4. Maximum strain energy theory and 5. Maximum distortion energy theory. Take permissible tensile stress at elastic limit = 100 MPa and poisson's ratio = 0.3. 14M

(OR)

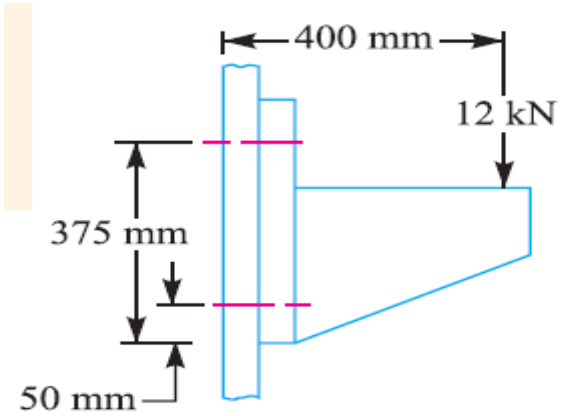
2. a) A circular bar of 500 mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20 kN and a maximum value of 50 kN. Determine the diameter of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by : ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa. 10M

b) Illustrate how the stress concentration in a component can be reduced? 4M

UNIT-II

3. a) Explain the concept of 'Bolts of uniform strength' in screwed joints? 4M

b) For supporting the travelling crane in a workshop, the brackets are fixed on steel columns as shown in Fig. below. The maximum load that comes on the bracket is 12 kN acting vertically at a distance of 400 mm from the face of the column. The vertical face of the bracket is secured to a column by four bolts, in two rows (two in each row) at a distance of 50 mm from the lower edge of the bracket. Determine the size of the bolts, if the permissible value of the tensile stress for the bolt material is 84 MPa. Also find the cross-section of the arm of the bracket which is rectangular 10M



(OR)

4. Explain the Design procedure of screw Jack? 14M

UNIT-III

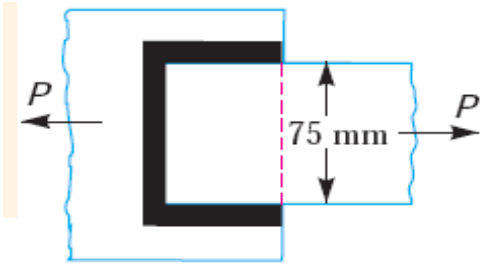
5. a) Explain following terms relating to Riveted Joints: 5M
1. Pitch 2. Back pitch 3.Diagonal pitch and 4.Margin?

b) A double riveted double cover butt joint in plates 20 mm thick is made with 25 mm diameter rivets at 100 mm pitch. The permissible tensile, compressive and shear stresses are: 120 MPa, 100 MPa and 150 MPa. Find the efficiency of joint, 9M

(OR)

6. a) What are the different Lap welded joints? Explain with neat sketches? 5M

b) A plate 75 mm wide and 12.5 mm thick is joined with another plate by a single transverse weld and a double parallel fillet weld as shown in Fig. below. The maximum tensile and shear stresses are 70 MPa and 56 MPa respectively. Find the length of each parallel fillet weld, if the joint is subjected to static loading? 9M



UNIT-IV

7. a) Derive an expression for torsional strength soild shaft? 6M

b) Find the diameter of a solid steel shaft to transmit 20 kW at 200 r.p.m. The ultimate shear stress for the steel may be taken as 360 MPa and a factor of safety as 8.If a hollow shaft is to be used in place of the solid shaft, find the inside and outside diameter when the ratio of inside to outside diameters is 0.5. 8M

(OR)

8. Design and draw a protective type of cast iron flange coupling for a steel shaft transmitting 15 kW at 200 r.p.m. and having an allowable shear stress of 40 MPa. The working stress in the bolts should not exceed 30 MPa. Assume that the same material is used for shaft and key and that the crushing stress is twice the value of its shear stress. The maximum torque is 25% greater than the full load torque. The shear stress for cast iron is 14 MPa. 14M

UNIT-V

9. Design a cotter joint to support a load varying from 30 kN in compression to 30 kN in tension. The material used is carbon steel for which the following allowable stresses may be used. The load is applied statically. Tensile stress = compressive stress = 50 MPa ; shear stress = 35 MPa and crushing stress = 90 MPa. 14M

(OR)

10. A helical compression spring made of oil tempered carbon steel is subjected to a load which varies from 400 N to 1000 N. The spring index is 6 and the design factor of safety is 1.25. If the yield stress in shear is 770 MPa and endurance stress in shear is 350 MPa, find: 1. Size of the spring wire, 2. Diameters of the spring, 3. Number of turns of the spring, and 4. Free length of the spring. The compression of the spring at the maximum load is 30 mm. The modulus of rigidity for the spring material may be taken as 80 kN/mm$^{2.}$ 14M

AR16

CODE: 16CS3014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January,2023

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is an algorithm? Describe the criteria that an algorithm must satisfy — 7 M
   b) The factorial function n! has value 1 when n<=1 and value n*(n-1)! When n > 1. Write both a recursive and iterative algorithm to compute n! — 7 M

(OR)

2. a) What is asymptotic notation? Elaborate on Asymptotic Notations with examples. — 7 M
   b) Write an algorithm to add two m X n matrices. Determine the time complexity of the algorithm in terms of program steps by using the count variable and step count approaches. — 7 M

UNIT-II

3. a) What is divide and conquer strategy? Write control abstraction for it. — 7 M
   b) Explain binary search with suitable example and derive its time complexity. — 7 M

(OR)

4. a) Illustrate merge sort technique by means of relevant example. Calculate the best, average and worst case time complexity for the merge sort. — 7 M
   b) State the Greedy Knapsack. Find an optimal solution to the Knapsack instance: n=3, m=20, (P1, P2, P3) = (25, 24, 15) and (W1, W2, W3) = (18, 15, 10). — 7 M

UNIT-III

5. a) What is principal optimality? Dynamic programming is best compared to the greedy method. Justify the statement. — 7 M
   b) Compare the time complexities of solving the All Pairs Shortest Path problem using Floyds algorithm and using the Dijkstra's algorithm by varying the source node. Justify your answer. — 7 M

(OR)

6. a) Describe the Matrix chain multiplication problem. Apply the recursive solution of dynamic programming to determine optimal sequence of pair wise matrix multiplications. 7 M

   b) Assume that there are 4 cities A,B,C,and D that are to be visited by a salesperson. Following matrix represents the cost of moving from one city to the other. Solve this TSP using dynamic programming approach. 7 M

	A	B	C	D
A	0	2	9	10
B	1	0	6	4
C	15	7	0	8
D	6	3	12	0

UNIT-IV

7. a) What is a bi-connected component? Write the steps of the algorithm for finding bi-connected components in a given graph. 7 M

   b) Write and explain the backtracking algorithm for solving sum of subsets problem using the state space tree corresponding to the fixed tuple size formulation. 7 M

(OR)

8. a) What is graph coloring problem? Describe its solution using backtracking approach. 7 M

   b) Solve sum of subsets problem using back tracking for n = 4 (w1, w2, w3, w4) = (11,13,24,7) & m = 31. Find all possible subsets of w that sum to m using the backtracking algorithm for sum of subsets problem. 7 M

UNIT-V

9. a) Discuss various methodologies of Branch and Bound technique. 7 M

   b) Draw the portion of the state space tree generated by FIFO BB for the knapsack instance: n=5, (p1, p2, ..., p5) = (10, 15, 6, 8, 4), (w1, w2, ..., w5) = (4, 6, 3, 4, 2), and m = 12. 7 M

(OR)

10. Write short notes on the following: 14 M

    i. Dead node ii. Live node iii. E-node
    iv. Bounding function v.Non-deterministic algorithms
    vi. NP-Complete Problems vii. Cook's Theorem

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