AR19

CODE: 19MCS1001   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, April, 2022
MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
(Computer Science and Engineering)
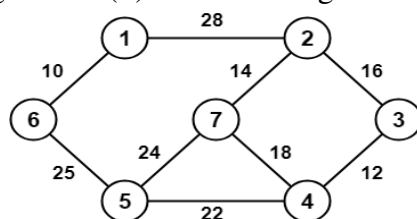
Time: 3 Hours   Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Derive $P \rightarrow (Q \rightarrow S)$ using rule CP. If necessary premises   6M
   $P \rightarrow (Q \rightarrow R) \; Q \rightarrow (R \rightarrow S)$

   b) Practice tauteology contingency and checking validity an argument using truth table method (take any example)   6M

2. a) Show that the following premises are inconsistent: 6M
   $P \rightarrow Q, \; Q \rightarrow S, \; R \rightarrow \neg S$ and $P \wedge R$

   b) Show that S logically follows the premises: $P, \; P \rightarrow Q, \; S \vee R, \; R \rightarrow \neg Q$ 6M

3. a) Find converse, inverse and contropositive of the following   6M
   $(x) \; [(x>3) \rightarrow (x^2>9)]$

   b) Find PDNF and PCNF using truth tables methods (take any example)   6M

4. a) If $L=\{1,2,3,5,30\}$ and R is the divisibility relation, verify that whether (L,R) is a lattice or not. Justify your answer.   6M

   b) If $h(x)=(1+2x)/(7+x)$. Find $h^{-1}(x)$. Also verify that $h \circ h^{-1}$ is identity function or not.   6M

5. a) A graph contains 21 edges, 3 vertices of degree 4 and all other vertices of degree 2. Find the total number of vertices.   6M

   b) Define Hamilton path and Hamilton cycle. Find Hamilton path and Hamilton cycle from the following graph, if exists   6M
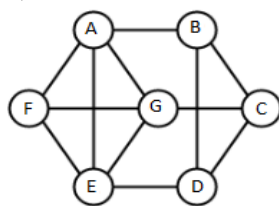
6. a) Find the chromatic number of a cyclic graph with   6M
   (i) odd number of vertices   (ii) even number of vertices

   b) Let a graph G is a 4-regular connected planar graph having 16 edges. Find the number of regions of G.   6M

7 Construct the minimum spanning tree (MST) for the given graph using   12M
   (i) Prim's algorithm   (ii) Kruskal's algorithm

8. a) i) solve $D_n = bD_{n-1} - b^2 D_{n-2}, n \geq 2$ given D1=b>0 and D2 =0.   6M

b) Find a generating function for the recurrence relation a_(n+1)-a_n=n^2   ,n≥0   6M
a0=1.Hence solve it.

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, April, 2022
DIGITAL DESIGN THROUGH HDL
(VLSI System Design)

Time: 3 Hours   Max Marks:60

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Explain in Detail about the ASIC Design Flow	6M
	b)	Write short notes on the following terms	6M
		i) Key words ii) Identifies iii) Numbers	
2.	a)	Explain the System Tasks in VerilogHDL with Suitable Example	6M
	b)	Write short notes on the following terms	6M
		i) Logic values ii) Strengths iii) Strings	
3.	a)	Write a Verilog HDL Code for 2-4 Decoder and its Test bench in Gate Level Modelling	6M
	b)	Write a Verilog HDL Code for 4x1 multiplexer and its Test bench in Gate Level Modelling	6M
4.	a)	Explain the following terms in detail with example	6M
		i) Wait Statement ii) Case Statement	
	b)	Write a Verilog HDL Code for Up Counter Module and its Test bench in Behavioural Modelling	6M
5.	a)	Explain the following terms in detail with example	6M
		i) For Loop ii) repeat construct iii) Conditional & Case Statement	
	b)	Write a Verilog HDL Code for D-Flip Flop and its Testbench in Behavioural Modelling	6M
6.	a)	Describe any six Operators with suitable syntax's	6M
	b)	Write a Verilog HDL Code for 4-bit BCD Adder and its Test bench in Data Flow Modelling	6M
7.	a)	Explain the following terms in detail with example in VHDL	6M
		i) Process Statement ii) If Statement	
	b)	Write a VHDL Code for 8-to-1 Multiplexor in Behavioural Modelling with Diagram	6M
8.	a)	Write a VHDL Code for Decade Counter in Structural Modelling with Diagram	6M
	b)	Explain the following terms in detail in VHDL	6M
		i) Generics ii) Configuration Declaration	

CODE: 19MSE1001   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, April, 2022

ADVANCED STRUCTURAL ANALYSIS
(Structural Engineering)

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

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Write the compatibility equations for single storey single bay portal frame with fixed supports.   4M
    b) Discuss Static Indeterminacy and Kinematic Indeterminacy with an example.   8M

2.   Analyse the frame shown in Figure.1. Members AB & AD is having an area of 8cm^2 and AC has 4 cm^2. Take E = 2.1x10^5 MPa.   12M
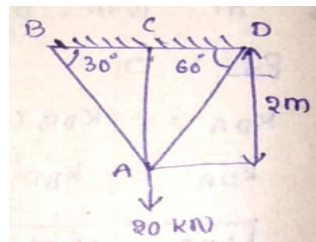

Figure.1

3.   Analyse the Continuous beams as shown in Figure.2 using slope deflection method   12M
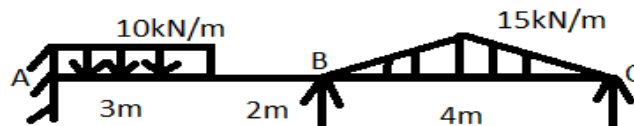

Figure.2

4.   Analyse the Continuous as shown in Figure.3 using moment distribution method   12M
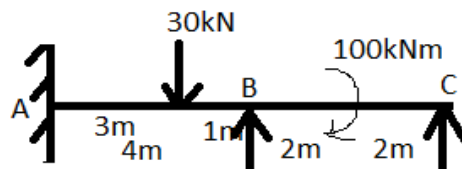

Figure.3

5.   A beam ABC 16 m long fixed at A and C and continuous over support B carries an udl of 3 kN/m over the span AB and a point load of 10 kN at mid span of BC. Span AB = 8m and BC = 8 m. Take EI is constant throughout. Analyse the beam using flexibility matrix method.   12M

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6.   Analyse the Portal frame shown in Figure.4   by Stiffnes matrix method   12M
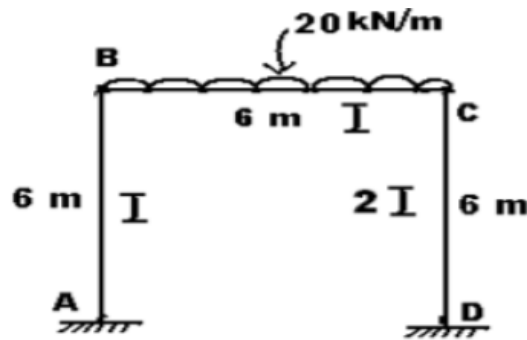

Figure.4

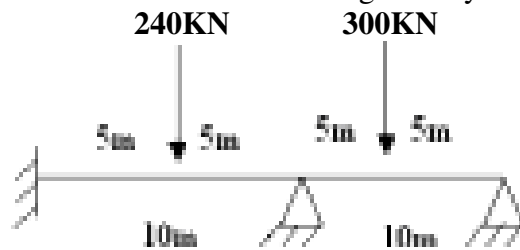7.   Analyse the continuous beam shown in Figure.5 by Stiffness matrix method   12M

Figure.5

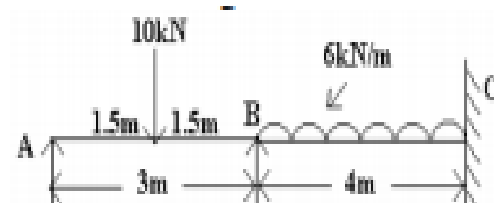8.   Analyse the Continuous beam shown in Figure.6 by flexibility matrix   12M
method

Figure.6