AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, March,2021
STRUCTURAL ANALYSIS-II
(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 three- hinged parabolic arch has a span of 25mm and a rise of 5m. **12M**
   It is subjected to a UDL of 10kN/m over the left 5m. Both supports
   are at the same level. Find the reactions at supports and bending
   moments at 10m and 15m from the left support.

(OR)

2. Evaluate the horizontal thrust in a two hinged parabolic arch of span **12M**
   10m and rise 25m carrying a UDL of 24kN/m over the left half of the
   span, assuming secant variation of its sectional moment of area. Also
   calculate the bending moment at the crown and draw the BMD.

UNIT-II

3. Analyse the below portal frame by slope deflection method.   **12M**

(OR)
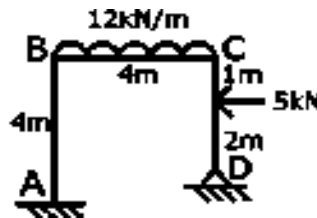
4. A continuous beam ABCD, 28m long is continuous over three **12M**
   spans of 10m, 10m and 8m. There is a udl of 3kN/m over each of
   10m span and 6kN/m over the 8m span. The ends are freely
   supported and during loading support B sinks by 1cm. find the end
   moments and draw BMD for the beam. Analyze the problem by
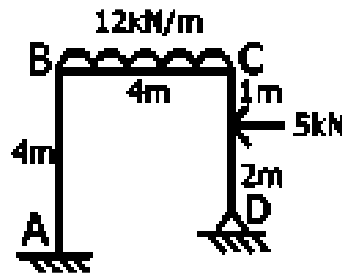   moment distribution method. Take E=2x10^{6}N/cm^2, I=30000 cm^4

UNIT-III

5. Analyse the continuous beam by Kani's method.   **12M**

6. Analyse the below portal frame by Kani's method. 12M

12kN/m

B C
4m 1m
5kN

4m
2m
D

A

UNIT-IV

7. Calculate the support moments for the given continuous beam Draw BMD. Take $E=200kN/mm^2$, $I=3.5x10^7 mm^4$ by stiffness method. 12M

60kN

30kN/m
B
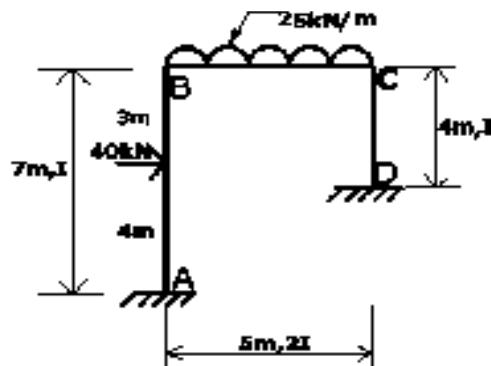A 2m 3m C
4m 5m

(OR)

8. Analyse the given portal frame shown below by stiffness method. Draw the bending moment diagram. 12M

25kN/m

B C
3m 4m,I
40kN
7m,I
D

4m

A
5m,2I

UNIT-V

9. A UDL of intensity 12kN/m and length more than 7m moves across a girder of span of 7m. Find the maximum positive and negative shear force at a section 3m from left support as well as its absolute value. Similarly, determine the maximum bending moment at the same section and the absolute value. 12M

(OR)

10. Draw the influence lines for reactions, shear force and bending moment for simply supported beam. 12M

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CODE: 18MET311　　　　　　　　　　　　　　　　　　**SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, March,2021

MANUFACTURING TECHNOLOGY - II
(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. a) Describe with a sketch the mechanism of chip formation in machining ductile materials. **6M**
   b) Explain types of chips in metal cutting with neat sketches and specify the conditions favouring those chip forms. **6M**

(OR)

2. a) what are the various forms of wear found in cutting tools? Show with neat sketch. **6M**
   b) Explain terms in Taylor's tool life equation. While machining a mild steel work piece with a HSS tool the following data was recorded. Cutting speed is 32 m/min and tool life 50 minutes. If the cutting speed is increased by 50%, how the tool life will be affected? Assume exponent 'n' of Taylor's equation is 0.2 **6M**

UNIT-II

3. a) Draw a neat sketch of taper turning by taper turning attachment method. **6M**
   b) Explain turret indexing mechanism with a neat sketch. **6M**

(OR)

4. a) Differentiate between capston and turret lathe. **4M**
   b) What are machining operations that can be performed on a centre lathe? Explain them with sketches. **8M**

UNIT-III

5. a) Explain working of shaping machine with neat diagram? **6M**
   b) With the help of a neat sketch, explain the working of a surface broaching machine and continuous broaching machine. **6M**

(OR)

6. a) Explain the following drilling operations briefly **6M**
      i) Drilling
      ii) Reaming
      iii) boring
   b) List the advantages, limitations and applications of broaching **6M**

UNIT-IV

7.	a)	Give neat sketch of abrasive jet machining and describe the main parts.	8M
	b)	Describe the centre less grinding process. What are the various feeding methods used in centre less grinding.	4M

(OR)

8.	a)	State the merits and demerits of honing and give some applications of this process	3M
	b)	Explain how to specify the grinding wheel and discuss in detail about each parameter?	9M

UNIT-V

9.	a)	List the advantages of interchangeable assembly.	6M
	b)	Explain GO gauge and NO-GO gauge briefly.	6M

(OR)

10.	a)	Explain the different types of fits used in engineering practice with neat Sketches	9M
	b)	Explain the following terms i) Tolerance (ii) hole basis and shaft basis system (iii) Upper deviation, Lower deviation and Fundamental deviation	3M

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CODE: 18ECT314 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, March,2021

LINEAR AND DIGITAL IC APPLICATIONS
(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. Derive the expression for Q point, A, R_I, and R_O for a Dual input balanced output differential amplifier. [12M]

(OR)

2. a) Explain about Dominant-pole Frequency Compensation Technique? [5M]
   b) Draw and explain the ideal differentiator circuit using Op-Amp. Mention its drawbacks and explain the operation of practical differentiator using frequency response. [7M]

UNIT-II

3. a) Explain the operation of Schmitt Trigger using Op-Amp. [6M]
   b) Discuss about operation of the Asatble Multivibrator using IC 555 timer. [6M]

(OR)

4. a) With the help of circuit diagram and waveform, explain the working of Monostable multivibrator using 555 Timer. [6M]
   b) Explain the working of Non-Inverting Comparator using Op-Amp. [6M]

UNIT-III

5. a) Explain the working of All Pass Filter using Op-Amp. [6M]
   b) Design a second order Low pass filter using Op-Amp with upper cut off frequency 2KHz. Assume pass Band gain is 3. [6M]

(OR)

6. a) Explain about dual slope type ADC with the help of circuit diagram and example? [6M]
   b) Explain the operation of 3-bit Binary weighted Resistor D/A converter with the help of circuit diagram and derive the expression for output voltage. [6M]

UNIT-IV

7. a) Explain about CMOS study state electrical behaviour. [7M]
   b) Compare CMOS, TTL and ECL in terms of Power Dissipation, Speed. [5M]

(OR)

8. a) Design a 4x16 decoder using 74x138. [6M]
   b) Explain the working of 8x3 Encoder using logic gates? [6M]

UNIT-V

9. a) Explain the working of IC74x74. [6M]
   b) Design a Mod-6 counter using T Flip-Flop. [6M]

(OR)

10. a) Design a 4 bit binary up / down using relevant ICs [8M]
    b) Differentiate between Latches and Flip-Flops. [4M]

1 of 1
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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, March,2021

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
(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) Define problem as a state space search. Explain Water Jug problem in detail. 6M
   b) Explain the algorithm of Hill Climbing. Define local maximum, plateau and ridge. 6M

(OR)

2. a) List and explain the applications of Artificial Intelligence. 6M
   b) Explain the heuristic function in Best-First search 6M

UNIT-II

3. a) Explain the minimax algorithm with an example and diagram. 6M
   b) Prove that John likes peanuts using Resolution from the following sentences: 6M
      - John likes all kinds of food.
      - Apples are food.
      - Chicken is food.
      - Anything anyone eats and isn't killed by is food.
      - Bill eats peanuts and is still alive.
      - Sue eats everything Bill eats.

(OR)

4. a) Write in detail about the constraint satisfaction procedure with map coloring example? 6M
   b) Explain Unification algorithm. 6M

UNIT-III

5. a) Explain about partitioned semantic net. Draw the partitioned semantic net for the sentence. " Ram is eating an apple" 6M
   b) Explain about Rule based systems. 6M

(OR)

6. a) Explain the following 6M
      i.   Frame
      ii. Is-A and instance relationship
      iii. Inherited attributes
      iv. Multivalued attributes
      Describe ML-Baseball Player with a Frame system
   b) Write a short notes on semantic web and ontology. 6M

7. a) Write the steps associated with machine learning.   6M
    For 'A Tic-Tac-Toe learning problem' discuss the following
        i.   Choosing the training experience
        ii.   Choosing the target function
        iii. Choosing a function approximation algorithm.

   b) Discuss Concept learning as search with respect to General to specific ordering of hypothesis.   6M

(OR)

8. a) Describe in detail all the steps involved in designing a learning system.   6M
   b) Illustrate Find-S Algorithm over EnjoySport concept.   6M
   Training instances given below.

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

UNIT-V

9. a) Explain the following with examples: 6M
      i.   Decision Tree,
      ii.   Decision Tree Learning
      iii. Naive Bayes Classifier

   b) Discuss inductive bias in Decision tree Learning.   6M

(OR)

10. a) What are the characteristics of the problems suited for decision tree learning?   6M
   b) What is the procedure of building Decision tree using ID3 with Gain and Entropy. Illustrate with example.   6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular/Supplementary Examinations, March-2021
STRUCTURAL ANALYSIS – II
(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 three-hinged parabolic arch hinged at the supports and at the crown **14M** has a span of 24 m and a central rise of 4 m. It carries a concentrated load of 50 kN at 18 m from left support and a uniformly distributed load of 30 kN/m over the left half portion. Determine the moment, thrust and radial shear at a section 6 m from the left support.

(OR)

2. Derive an expression for horizontal thrust in a two hinged arch?   14M

UNIT-II

3. Draw the influence lines for reactions, shear force and bending   14M moment for simply supported beam.

(OR)

4. A continuous beam ABC is simply resting on supports A and C, and   14M continuous over the support B. The span AB is 6 m and the span BC is 8 m. Draw the influence line diagram for bending moment at B. Assume Flexural rigidity is constant throughout and calculate the influence line ordinates at 2 m intervals.

UNIT-III

5. A continuous beam ABC is shown figure . Calculate the moments   14M induced at the ends if support B settles by 30 mm. Draw the bending moment diagram and the deflected shape of the beam. Take E=2 x 10^5 N/mm^2 and I = 3 x 10^6 mm^4 constant for the whole beam. Use Moment distribution method
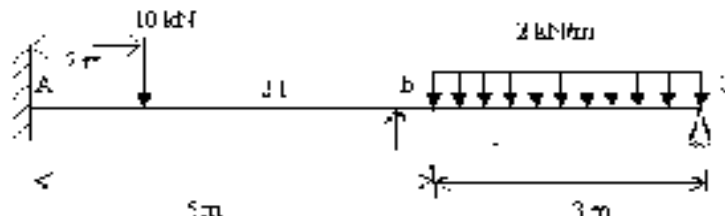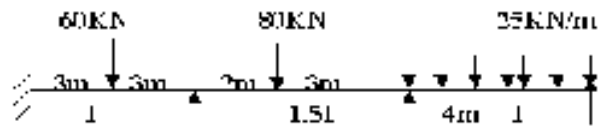
(OR)

6. By using slope deflection method, determine the support moments at all the joints of the Portal frame shown in figure. 14M
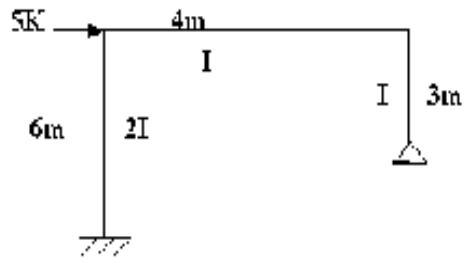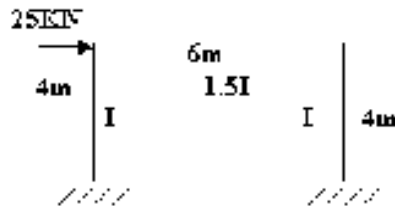

UNIT-IV

7. Analyse the Continuous beam shown in figure using Kani's method. Sketch the BMD & SFD. E is constant. 14M
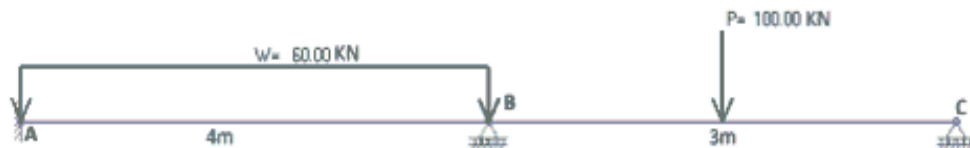

(OR)

8. Analyse the portal frame shown in figure and Sketch the BMD by using kani's method. 14M
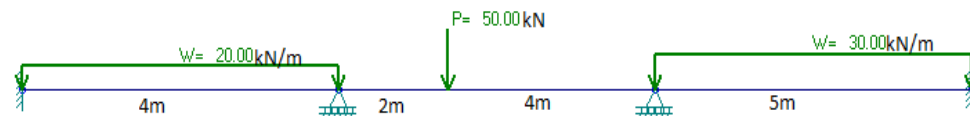

UNIT-V

9. Analyze the beam as shown in figure by using Stiffness method. 14M

(OR)

10. Analyze the beam as shown in figure by using Stiffness method. When support B sinks by 10mm and take EI as 600 kNm^2 . 14M

AR16

CODE: 16EE3014   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular/Supplementary Examinations, March-2021
POWER SYSTEMS-III
(Electrical and Electronics 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) Compare the arc rupture in oil and air blast circuit breakers and summarize the relative advantages and disadvantages of these types of switch gear   7M
   b) Explain the operating duty of a circuit breaker   7M

(OR)

2. a) Draw a neat sketch of SF6 circuit breaker and explain its operation   7M
   b) For a 132KV system, the reactance and capacitance upto the location of the circuit breaker is 3ohms and 0.015 µF respectively. Calculate the following: i) The frequency of transient oscillation   ii) The maximum value of restriking voltage across the contacts of the circuit breaker   iii) The maximum value of RRRV   7M

UNIT-II

3. a) Explain the operation of Induction cup type relay with neat diagram   7M
   b) Using universal torque equation explain the operation of impedance relay.   7M

(OR)

4. Discuss about various types of over current relays by showing the characteristics   14M

UNIT-III

5. An alternator rated at 10kv protected by the balanced circulating system has its neutral grounded through a resistance of 10 ohms. The protective relay is set to operate when there is an out of balance current of 1.8 amps in th pilot wires, which are connected to the secondary windings of 1000/5 ratio current transformers. Determine i) the percent winding which remains unprotected, ii)the minimum resistance required to protect 80% of the winding?   14M

(OR)

6. a) Explain different faults occurs in a generator.   7M
   b) Explain the buchholtz relay protection of a transformer.   7M

UNIT-IV

7. a) What is meant by three zone protection?   7M
    b) Draw a connection diagram of the translay system for the protection of 3   7M
       phase feeder and explain its working operation.
                                        (OR)
8.   Discuss how the bus bars are protected by differential protection   14M

UNIT-V

9. a) Why neutral grounding is necessary ?   7M
    b) Explain the operation of zinc oxide arresters.   7M
                                        (OR)
10. a) Write short notes on reactance grounding?   7M
    b) With a neat diagram describe the operation of valve type arresters?   7M

CODE: 16ME3016   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2021

AUTOMOBILE ENGINEERING
(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.	a)	Give the classification of Automobiles.	7 M
	b)	Explain centrifugal type oil filter with a neat sketch.	7 M
		(OR)	
2.	a)	Explain a 3–way catalytic converter with a neat sketch.	7 M
	b)	Draw the layout of a 4- wheel drive. Explain the importance of transfer case	7 M

UNIT-II

3.	a)	Explain how fuel is regulated in CI engine with a neat diagram.	7 M
	b)	Explain TBI and MPFI with a neat sketches.	7 M
		(OR)	
4.	a)	What are the different types of fuel injection systems for CI engines? Explain one with a neat sketch.	7 M
	b)	Define carburetion? What are the defects of the simple carburettor and how are they rectified by modern carburettor?	7 M

UNIT-III

5.	a)	Explain radiator cooling system with a simple sketch.	7 M
	b)	Explain electronic ignition system with a neat sketch.	7 M
		(OR)	
6.	a)	What is heat balance sheet? Discuss in detail.	7 M
	b)	Define engine balancing. Explain how the ignition timing effect engine balancing.	7 M

UNIT-IV

7.	a)	Explain horn with a circuit diagram.	7 M
	b)	Explain the construction of a tyre .	7 M
		(OR)	
8.	a)	What is the need of a gear box? Explain the multi plate clutch with a diagram.	7 M
	b)	Explain 4- speed constant mesh gear box with a neat sketch.	7 M

UNIT-V

9.		Explain Ackermann steering mechanism with neat sketch.	14M
		(OR)	
10.	a)	Explain a damper with a neat sketch.	7 M
	b)	Define the importance of braking. Explain the vacuum booster with a neat sketch.	7 M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular/Supplementary Examinations, March-2021
LINEAR IC APPLICATIONS
(Electronics and Communication 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. Calculate the Q Point, A, R_I , R_O of a Dual Input, Balanced Output Differential   [14M]
   Amplifier

(OR)

2. a) Explain about various package types of an Integrating Circuit.   [8M]
   b) Draw the circuit diagram of Single Input, Unbalanced Output Differential   [6M]
      Amplifier and write the expressions for A, R_I and R_O.

UNIT-II

3. a) What is the need for frequency compensation and explain about Pole-Zero   [7M]
      Compensation Technique?
   b) What is Input bias current and explain how it can be reduced?   [7M]

(OR)

4. a) Draw the block diagram of Op-Amp and explain briefly about each block.   [8M]
   b) Define the following terms   [6M]
      i.   CMRR   ii. PSRR   iii. Output Offset Voltage

UNIT-III

5. a) With the help of circuit diagram, explain the working of Schmitt trigger.   [8M]
   b) Explain the working of mono stable multi vibrator using op-amp.   [6M]

(OR)

6. a) Explain the working of Log Amplifier?   [8M]
   b) Design a Practical differentiator that will differentiate an input signal at 4KHz.   [6M]

UNIT-IV

7. a) With the help of example, explain the working of dual slope Converter Type ADC.   [8M]
   b) Design a second order high Pass Filter using Op-Amp with cut off frequency 2   [6M]
      KHz and pass band gain is 4. (Assume necessary data).

(OR)

8. a) Explain the working of All Pass Filter using Op-Amp.   [7M]
   b) Draw the circuit diagram of 4 Bit Binary Weighted Resistor DAC and obtain the   [7M]
      expression for output voltage and draw its transfer characteristics.

UNIT-V

9. a) With the help of circuit diagrams and waveforms, explain the working of Astable   [8M]
      multivibrator using 555 timer and derive an expression for gate width.
   b) Explain the working of Three Terminal Voltage Regulator?   [6M]

(OR)

10. a) Explain the generation of Frequency Shift Keying using IC555?   [7M]
    b) Explain the working of IC566.   [7M]

AR16

CODE: 16CS3014   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular / Supplementary Examinations, March-2021
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 do you mean by performance analysis of an algorithm? Explain   6M
    b) Explain case analysis and amortized analysis with an example.   8M
                                    (OR)
2. a) Discuss the various pseudo-code conventions to express algorithms   8M
    b) Describe each with an example about various Asymptotic Notations   6M

UNIT-II

3. a) Explain the general method of divide and conquer. Solve the recursive   6M
        relation using substitution method:
        $T(n)=\{$ 2 if $n=1$ $\{$ $2T(n/2) + n$ if $n>1$
    b) Write merge sort algorithm and develop computing time of a recursive   8M
        relation to find $T(n)$
                                    (OR)
4. a) What is knapsack problem? Find an optimal solution to the knapsack   7M
        instance $n=7$ & $m=15$,(p1 to p7)={10,5,15,7,6,18,3} and
        (w1tow7)={2,3,5,7,1,4,1}
    b) What is a single source shortest path problem? Give greedy algorithm to   7M
        generate shortest paths?

UNIT-III

5. a) construct the Optimal Binary search Tree with identifier   14M
        set(a1,a2,a3,a4)=(cout,float,if,while) with
        (p1 to p4)=(1/20,1/5,1/10,1/20) and (q0 to q4)=(1/5,1/10,1/5,1/20,1/20) and
        also compute the cost of tree
                                    (OR)

6. a) Solve the Travelling salesperson problem as shown in cost matrix for   8M
        optimal tour using dynamic programming

        | 0   8   16 18 |
        | 10 0   19 20 |
        | 9   31 0   12 |
        | 16 12 7   0 |

    b) Generate the sets Si,0<=i<=4 when (w1 to w4)=(10,15,6,9) and (p1 to   6M
        p4)=(2,5,8,1).find the optimal solution when m=30.

UNIT-IV

7. a) Explain the properties of strongly connected components?   7M
    b) Write an recursive backtracking algorithm for Hamiltonian cycles problem?   7M

(OR)

8. a) Draw the portion state space tree for 4-Queens. Write an algorithm for N-   7M
       queens problem and explain
    b) Describe the Graph coloring problem & its time complexity?   7M

UNIT-V

9. a) Find the solution to the 0/1 knapsack instance using FIFOBB algorithm   9M
       n=4, m=15 (p1-p4)= (10,10,12,18) and (w1-w4)= (2,4,6,9)
    b) Write comparative note on solving the knapsack problem by   5M
           i) LCBB   ii) FIFOBB

(OR)

10. a) Write short notes on classes NP-hard and NP-complete?   5M
    b) State and Explain cook's theorem.   9M

AR13

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Calculate degree of static indeterminacy for 2 hinged and 3 hinged arches.
   b) What do you mean by rib shortening?
   c) Write down the cases for the suitability of portal and cantilever method.
   d) Draw any two sway and non-sway frames.
   e) Carry over factor for cantilever and propped cantilever beams when free end and prop support subjected to moment 'M'.
   f) The ratio of the stiffness of the beam at near end when far end is hinged to the stiffness when far end is fixed is
   g) Define rotation factor in Kani's method?
   h) A fixed beam subjected to udl "w" over entire span "L" during loading, support B is sinks downward by $wL^4/72EI$. What is the fixed end moment at B.
   i) Why flexibility matrix method is called force method?
   j) How can you relate stiffness and flexibility?

PART-B

**Answer one question from each unit**   **[5x12=60M]**

UNIT-I

2. a) A two hinged parabolic arch is loaded as shown in figure. Determine the Horizontal thrust, maximum positive and negative moments. (Assume $I = I_o \, Sec\Theta$ where I_o is the moment of inertia at the crown and Θ is the slope at the section under consideration). **(230)**   8M
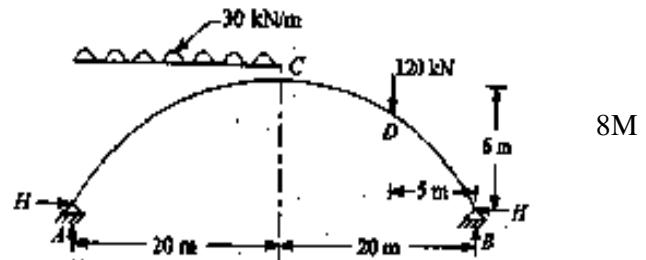
   b) Find shear force and normal thrust at 10m from the left support for above problem.   4M
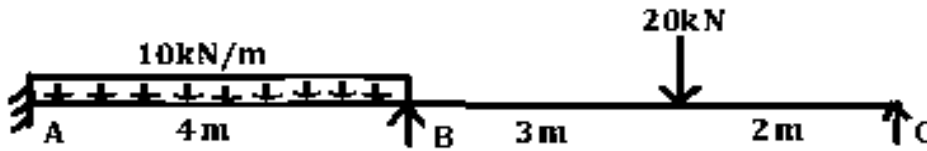
   (OR)

3. a) List the assumptions made in portal method?   2M
   b) Analyse the frame shown below by cantilever method
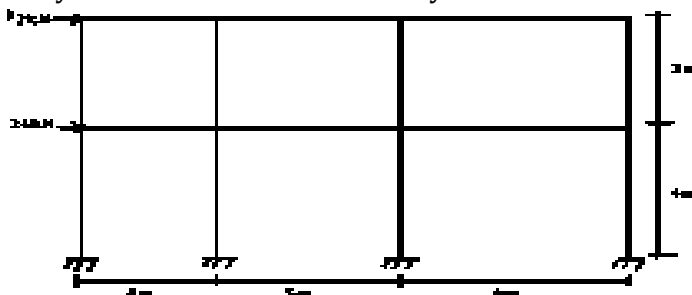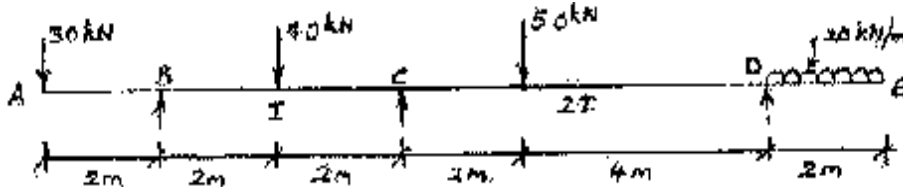

        10M

UNIT-II

4. Analyse the continuous beam shown in figure by slope deflection method when support B is settled down by 10mm. ($EI = 100$ kN-m^2)
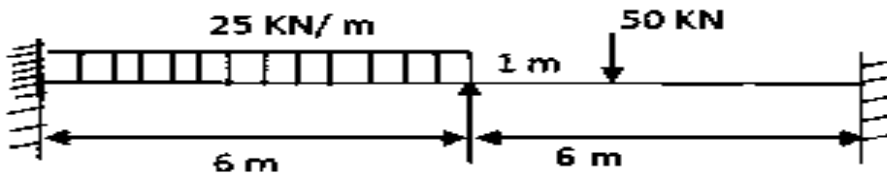
12M

20k N

10kN/m

A   4 m   B   3 m   2 m   C

(OR)

5. Analyse the continuous beam shown in figure by slope deflection method.

12M

30 kN   40 kN   50 kN   20 kN/m

A   B   C   D   E
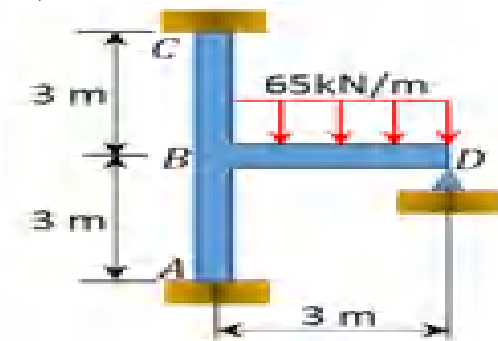
I   2T.

2m   2m   2m   2M.   4m   2m

UNIT-III

6. Analyse the beam by using Moment Distribution method if support B yields by 10mm. Take $EI = 1\times10^{12}$ Nmm^2 throughout. Draw SFD and BMD.

12M

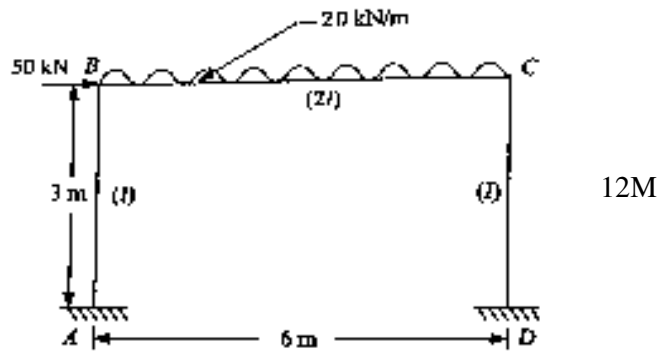**25 KN/ m**   **50 KN**

1 m

6 m   6 m

(OR)

7. Determine the end moments at the supports shown in figure by moment distribution method. Take EI = constant.

12M

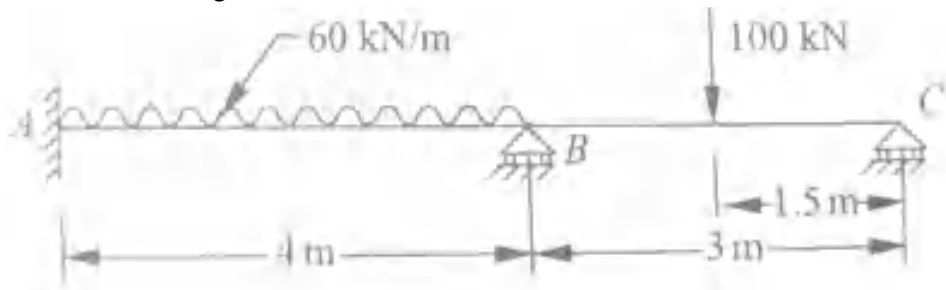C

3 m   65kN/m

B   D

3 m

A

3 m

8. Analyse the rigid jointed frame shown in figure by Kani's method
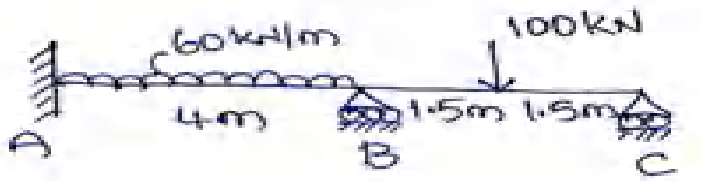

12M

(OR)

9. Find moment at A and B in continuous beam shown in figure, by Kani's method. Take EI constant throughout.
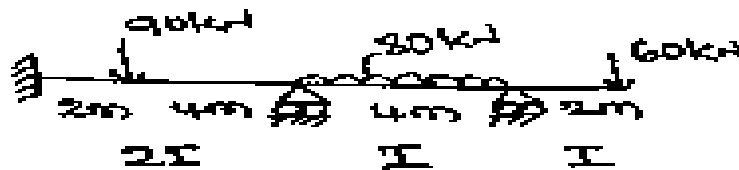

12M

UNIT-V

10. a) Write stiffness matrix for 2D beam element without considering axial deformation   2M
    b) Find rotation at A, B and C for the beam shown by Stiffness matrix method.

10M

(OR)

11. Analyse the beam by Stiffness matrix method.

12M

3 of 3
***

AR13

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Define voltage regulation of a transmission line.
    b) Write down the classification of overhead transmission line
    c) What is mean by Surge impedance?
    d) What is mean by Ferranti effect?
    e) Write the values of A,B,C,D constants of short transmission line .
    f) List different types of insulators.
    g) Define corona phenomena.
    h) What is mean by transposition?
    i) Express sag for equal level of supports.
    j) List any advantages of bundle conductors.

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. Showcase the various properties of good Conductor materials and types of Conductor materials? Describe the Advantages of ACSR usage.   12

(OR)

3. A single circuit, 3-phase, 50Hz transmission line consists of three conductors arranged as triangle and distance between conductors are 5m, 5m and 8m. If the conductors have diameter equal to 0.8cm. find (i) inductance (ii) also calculate capacitance.   12

UNIT-II

4. Derive the Expression for Medium Transmission Line using T-network with Phasor diagram.   12

(OR)

5. A 3-phase, 50Hz, 150 km line has a resistance, inductive reactance and capacitive shunt admittance of $0\cdot1$ Ω, $0\cdot5$ Ω and 3×10^{-6} S per km per phase. If the line delivers 50 MW at 110 kV and $0\cdot8$ p.f. lagging, determine the sending end voltage and current. Assume a nominal π circuit for the line.   12

UNIT-III

6. Derive the Expression for sending end quantities of long transmission line by Rigorous solutions.   12

(OR)

7. a) Starting from the fundamentals determine the equivalent- Π network parameters of a long transmission line.   6
    b) Explain importance of surge impedance and surge impedance loading with respect to an overhead transmission line.   6

UNIT-IV

8.   Explain the Skin and Proximity effects.   12

(OR)

9.   Explain the factors affecting corona and methods to reduce corona.   12

UNIT-V

10. a) A transmission line conductor having a diameter of 19.5mm weighs 0.85   6
kg/m. the span is 275 metres. The wind pressure is 39 kg/m^2 of projected
area with ice coating of 13mm. the ultimate strength of the conductor is
8,000kg. Calculate the minimum sag if the factor of safety is 2 and ice
weighs 910 kg/m^3.

     b) Derive the expression for Sag Calculation when supports are at unequal   6
heights

(OR)

11.   Explain different methods to improve string efficiency.   12

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech. I Semester Supplementary Examinations, March, 2021

CAD/CAM

(MECHANICAL ENGINEERING)

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

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Enlist the applications of Image drawing techniques.   **CO1**
   b) What is the significance of computers in industrial manufacturing?   **CO1**
   c) List any three computer aided manufacturing processes.   **CO1**
   d) What are the control points on the Bezier curve?   **CO2**
   e) What is Boundary representation modelling?   **CO2**
   f) What are the memory devices used in NC, CNC and DNC machines?   **CO3**
   g) Enlist the coding systems used in Group Technology.   **CO4**
   h) What are part families? Write about its significance in group technology.   **CO4**
   i) Write any two differences between generative type and retrieval type CAPP systems.   **CO5**
   j) Enlist the benefits of Flexible Manufacturing System.   **CO5**

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) Explain about CAD/CAM hardware.   **CO1**
   b) Discuss the application of various geometric transformation using suitable examples.   **CO1**

(OR)

3. a) Discuss various CAD input devices with suitable diagrams.   **CO1**
   b) Explain with a suitable example, the role of homogeneous coordinate system while carrying out transformations.   **CO1**

UNIT-II

4. a) Define Geometric model. Explain how a 3-D object is represented by a wire frame model.   **CO2**
   b) Enlist and explain different Boolean operations used in solid modelling.   **CO2**

(OR)

5. a) How the line and circle are parametrically represented as Analytic curves?   **CO2**
   b) Define Bezier surface. Explain its characteristics.   **CO2**

UNIT-III

6. a) Explain various steps involved in CNC part programming.   **CO3**
   b) What is meant by the DNC? Discuss how it is different from CNC.   **CO3**

(OR)

7. a) Discuss with a suitable example the CNC & manual part programming methods.   **CO3**
   b) State the advantages and disadvantages of Numerical Control.   **CO3**

AR13

UNIT-IV

8. a) Explain briefly the OPITZ coding system.   **CO4**
   b) What is group technology? When is it appropriate to go for group technology? **CO4** What are its advantages?

(OR)

9. a) Explain the key machine concept in group teleology.   **CO4**
   b) What are the various hierarchical structure used in GT applications?   **CO4**

UNIT-V

10. a) Discuss the principle of material handling. Name and describe the five types of **CO5** material handling devices?
    b) Differentiate the various CAPP systems.   **CO5**

(OR)

11. a) Explain different layout concept of FMS with their benefits.   **CO5**
    b) Discuss the concept and benefits of CAPP and also explain its types.   **CO5**

AR13

CODE: 13CS3013   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech. I Sem. Supplementary Examinations, March, 2021

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & IT)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Define Omega notation
    b) Write the best, average and worst case time complexities of quick sort algorithm?
    c) Write the recurrence relation for divide and conquer problem?
    d) State Job sequence Problem?
    e) Draw the possible binary search trees for the identifier set $(a1,a2,a3)=(do,if,stop)$
    f) Distinguish Greedy method and Dynamic Programming.
    g) Define State space tree?
    h) Define Hamiltonian Cycle?
    i) Write the difference between FIFO and LC branch and bound algorithms
    j) Write the difference between NP Hard and NP Complete Problems?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) What is an algorithm? Explain its characteristics in detail   4M
    b) What do you mean by performance analysis? Derive the run time   8M
        complexity of a non-recursive Fibonacci series algorithm using tabular
        method.

(OR)

3. a) Define disjoint sets? Explain the disjoint operations with examples?   6M
    b) Explain in detail about connected components and bi-connected components   6M

UNIT-II

4. a) Write the Control abstraction of Divide and Conquer Problem?   4M
    b) Apply Merge Sort to sort the list a[1:10]=(31,28,17,65,35,42.,86,25,45,52). 8M
        Draw
        the tree of recursive calls of merge sort, merge functions.

(OR)

5. a) Write the greedy algorithm for solving 0/1 knapsack problem. Give the   6M
        solution for the following instance of the knapsack problem where n=3,
        m=20, (p1,p2,p3)=(25,24,15) and (w1,w2,w3)=(18,15,10)
    b) Write and explain Prism's algorithm for finding minimum cost spanning tree 6M
        of a graph with an example.

6. a) Explain the methodology of Dynamic programming. Mention the   6M
applications of Dynamic programming.
   b) Find the all pairs shortest path solution for the graph represented by below   6M
adjacency matrix:

$$\begin{bmatrix} 0 & 4 & 11 \\ 6 & 0 & 2 \\ 3 & \infty & 0 \end{bmatrix}$$

(OR)

7. a) Construct an optimal binary search tree for the following data: n=4,   8M
(a1,a2,a3,a4)=(do, if, int, while), p(1:4)= (3,3,1,1) and q(0:4)= (2,3,1,1,1).
   b) Define merging and purging rules of 0/1 Knapsack problem.   4M

UNIT-IV

8. a) What is a backtracking? Give the explicit and implicit constraints in 8   6M
queen's problem.
   b) Write an algorithm for finding m-coloring of a graph and explain with an   6M
example.

(OR)

9. a) Write an algorithm to determine the Hamiltonian Cycle in a given graph   6M
using backtracking.
   b) Find all possible subsets of w that sum to m. Let w={5,7,10,12,15,18,20}and   6M
m=35 and draw the portion of the state space tree that is generated using
backtracking.

UNIT-V

10. a) Explain the principles of FIFO Branch and Bound.   6M
    b) Explain the process of solving Travelling Sales Person Problem using   6M
branch and Bound

(OR)

11. a) Briefly Explain the concepts of NP-Hard Problems?   6M
    b) Briefly explain Cooks-theorem.   6M