AR18

CODE: 18CET313   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, February-2022
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
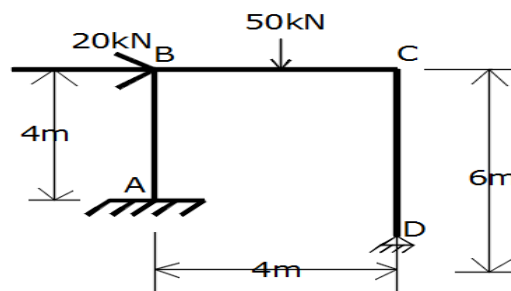
UNIT-I

1. a) Explain in detail   6M
    a) Effects of yielding of supports in arches
    b) Rib shortening and temperature changes in the arches.

    b) A three hinged parabolic arch of span 'l' and ise 'h' carries a udl of w/m over the   6M
    whole span. Show that the arch is not subjected to any bending moment at any
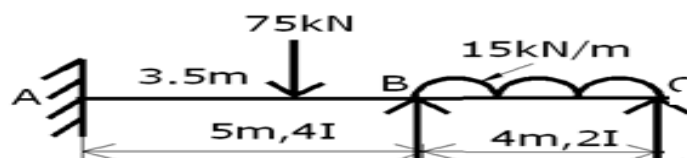   section.

(OR)

2. A three hinged parabolic arch is shown below determine the bending moment,   12M
    normal thrust and radial shear at quarter span & draw bending moment.
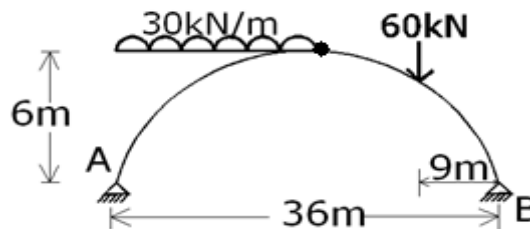
UNIT-II

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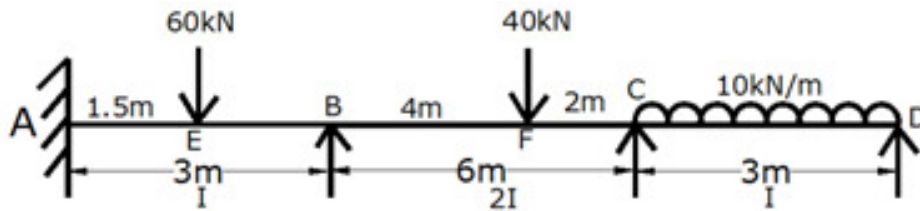

(OR)

4. Analyze the given two span continuous beam by moment distribution method.   12M
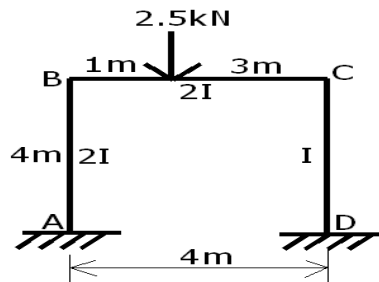
UNIT-III

5. Analyse the given continuous beam by Kani's method. If the supports B & C sinks by 2 mm & 7 mm respectively. Take $E = 200$ kN/mm^2 and $I = 2.5$ x 10^7 mm^4.   12M
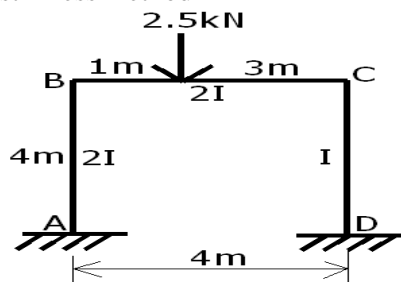

(OR)

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

UNIT-IV

7. Analyse the portal frame by stiffness method   12M

(OR)

8. Analysis the continuous beam shown below by stiffness method. Find the reactions. Sketch SFD & BMD.   12M
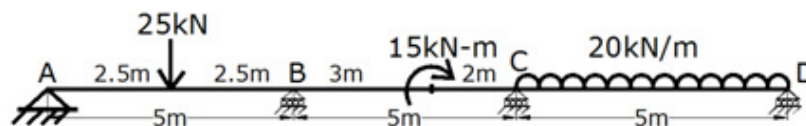
UNIT-V

9. Draw the influence line diagram of maximum shear force and bending moment of the simply supported beam carrying rolling W.   12M

(OR)

10. A train of wheel loads as shown in fig.4 crosses a girder of 25m span with 120 kN load leading. Determine the value of i) Maximum bending moment at a section 8 m from the left end of the girder, ii) Absolute maximum bending moment on the girder.   12M

AR18

CODE: 18EET313   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, February,2022
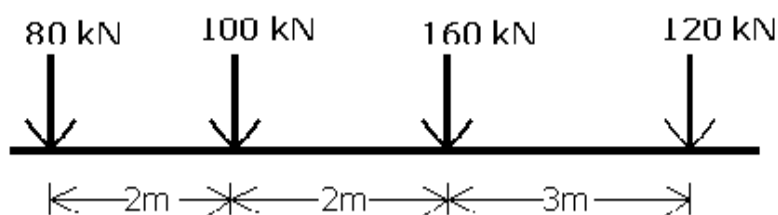## POWER SYSTEMS – II
(Electrical and Electronics Engineering)

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

UNIT-I

1. a) Derive an expression for the capacitance per phase of a 3-phase single circuit line with unsymmetrical spacing. Assume the conductors to be regularly transposed. **6M**
   b) Calculate the inductance per phase of a three-phase, double circuit line as shown in below figure. The diameter of each conductor is 1.5 cm. **6M**
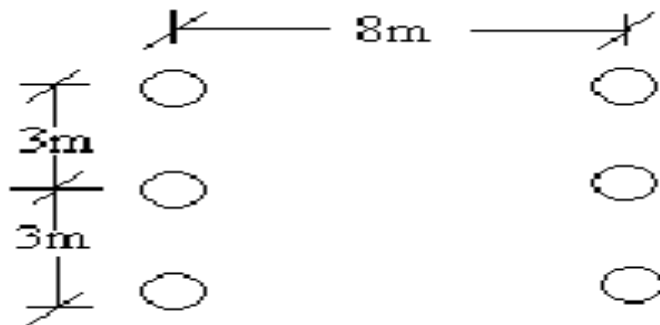
(OR)

2. a) Explain the different types of conductors used for over head transmission lines. **6M**
   b) Three conductors of a three phase line are arranged at the corners of a triangle of sides 2m, 3 m and 4m. The diameter of the conductor is 1.5cm. Calculate the inductance and capacitance of the line. **6M**

UNIT-II

3. a) What do you understand by medium transmission lines? How capacitance effects are taken into account in such lines? **6M**

   b) A 3-phase, 50 Hz, overhead transmission line delivers 20 MW at $0·8$ p.f. lagging and at 66 kV. The resistance and inductive reactance of the line per phase are 10 Ω and 20 Ω respectively while capacitive admittance is 4×10^{-4} Siemens. Calculate (i) the sending end current (ii) sending end voltage (line-to-line) (iii) sending end power factor using nominal-T method **6M**

(OR)

4. a) Deduce an expression for the efficiency and voltage regulation of a short transmission line with the help of a vector diagram. **6M**
   b) A 3-phase, 50 Hz overhead transmission line, 80 km long, 110 kV between the lines at the receiving end has the following constants : Resistance per km per phase = $0·153$ Ω, Inductance per km per phase = $1·21$ mH, Capacitance per km per phase = $0·00958$ μF. The line supplies a load of 20,000 kW at $0·9$ power factor lagging. Calculate the sending end voltage, current of the line using nominal -π model. **6M**

UNIT-III

5.   Derive equations which represent the performance of a long transmission line with it Electrical parameters uniformly distributed along its length.   **12M**

(OR)

6. a) Derive the equivalent- T network of the long transmission line.   **6M**
    b) The per-unit-length parameters of a 220kV, 400km, 50Hz, three phase long transmission line are y= j3.2 x 10^{-6} mhos per km per phase and z = (0.2 + j 0.5) ohm/km. The line supplies a 200 MW load at unity power factor. Determine
(i) the ABCD parameters of the line (ii) sending end voltage.   **6M**

UNIT-IV

7. a) Explain various factors affecting corona loss in transmission lines .   **6M**
    b) A surge of 100 kV travelling in a line of natural impedance of 600 ohms arrives at a junction with two lines of impedances 800 ohms and 200 ohms respectively. Find the surge voltages and currents transmitted into each branch line   **6M**

(OR)

8. a) What are skin and proximity effects on transmission lines?   **6M**
    b) Find the critical disruptive voltage and the critical voltages for local and general corona on a 3-Ø overhead transmission line, consisting of 3-stranded copper conductors spaced 2.5 m apart at the corners of an equilateral triangle. Air temperature and pressure are 210^{0} and 73.6 cm of Hg respectively. Take conductor diameter 10.4 mm, irregularity factor 0.85, local and general surface factors 0.7 and0.8 respectively.   **6M**

UNIT-V

9. a) Deduce an approximate expression for sag in overhead lines when the supports are at unequal levels   **6M**
    b) A string of 3 insulators is connected across a100kV line. If the capacitance of each disc to earth is 0.1 of the capacitance of the insulator, calculate (i) the distribution of voltage on the insulator discs and (ii) the string efficiency   **6M**

(OR)

10. a) Explain different types of insulators used in transmission and distribution systems   **6M**
    b) A transmission line has a span of 250 m between level supports. The conductor has a cross- sectional area of 2 cm^{2}. The tension in the conductor is 3000 kg. If the specific gravity of the conductor material is 9.6 g/cm^{3} and wind pressure is 1.8 kg/m length, calculate the sag and vertical sag.   **6M**

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AR18

CODE: 18MET311　　　　　　　　　　　　　　　　**SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular/Supplementary Examinations, February, 2022
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)	Draw Merchant's force diagram. State the assumptions made in the development of such a diagram.	6M
	b)	What is the use of a chip breaker? Discuss the any two types of chips produced during metal machining process	6M

(OR)

2.	a)	Explain cutting tool geometry of single point cutting tool with neat diagram?	6M
	b)	Explain the difference between orthogonal cutting and oblique cutting.	6M

UNIT-II

3.	a)	Explain what is meant by a Taper. Discuss in detail the taper turning by compound rest swelling method?	6M
	b)	Explain with neat sketches about various Lathe operations	6M

(OR)

4.	a)	Explain thread cutting on lathe machine with neat sketch.	6M
	b)	With a neat sketch explain any one type of automatic lathe machine and its applications.	6M

UNIT-III

5.	a)	Differentiate between up milling and down milling and explain their applications	6M
	b)	Sketch and explain the slotting machine working principle and its parts.	6M

(OR)

6.	a)	With the help of a neat sketch, discuss the working of a surface broaching machine.	6M
	b)	With the help of neat sketch explain the radial drilling machine.	6M

UNIT-IV

7.	a)	Sketch and explain the tool and cutter grinding machine.	6M
	b)	Discuss various types of abrasive materials used in grinding wheel.	6M

(OR)

8.	a)	What are surface grinding machine, explain various surface grinding machines.	6M
	b)	Describe grinding wheel structure with a neat sketch.	6M

UNIT-V

9.	a)	Explain the different types of fits used in engineering practice with neat sketches.	6M
	b)	Explain the terms: Hole based system, shaft based system. Enumerate the differences between them.	6M

(OR)

10.	a)	State and explain the "Taylor's principle of gauge design'. Explain the concept of Gauge maker's tolerance.	6M
	b)	Explain the principle of GO and NOGO gauges. Describe the necessity of Gauge maker's tolerance in gauge design.	6M

AR18

CODE: 18ECT314   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular/Supplementary Examinations, February,2022
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.	a)	Draw the block schematic of an op-amp and explain the functions of each block.	6M
	b)	Describe the working of practical differentiator circuit. Derive the expression for output voltage.	6M

(OR)

2.	a)	Design an Opamp based circuit to produce an output $-(V_1+2V_2-5V_3)$, where V_1, V_2 and V_3 are the input voltages.	6M
	b)	Find R_1 and R_f in the lossy integrator so that the peak gain is 20dB and gain is 3dB down from its peak when $\omega=10,000$ rad/sec. use a capacitance of $0.01\mu F$.	6M

UNIT-II

3.	a)	Draw the block diagram of log Amplifiers and explain its operation in detail.	6M
	b)	Explain the monostable multivibrator operation by using op amp.	6M

(OR)

4.	a)	Explain the Astable multivibrator operation by using op amp.	6M
	b)	Explain the principal of operation of comparator.	6M

UNIT-III

5.	a)	Explain the operation of Narrow band pass filter with a neat diagram.	6M
	b)	Design a first order low pass filter with cutoff frequency of 1KHz and pass band gain of 11. Also draw its frequency response.	6M

(OR)

6.	a)	Find out step size and analog output for 4 -bit R-2R ladder DAC, when input is 0 1 1 1 and 1 1 1 1, assume $V_{ref}=+5V$.	6M
	b)	Draw and explain the circuit operation of Successive approximation ADC.	6M

UNIT-IV

7.	a)	Compare different logic families.	6M
	b)	Explain the 2-input NAND gate operation of TTL logic family.	6M

(OR)

8.	a)	Design 16×1 multiplexer using 4×1 multiplexer.	6M
	b)	Design a full-adder with two half-adders and basic gates.	6M

UNIT-V

9.	a)	Draw the circuit diagram of J-K flip flop with NAND gates with positive edge triggering and explain its operation with the help of truth table.	6M
	b)	Design a 4 bit ring counter using D flip-flops and explain its operation with the help of bit pattern.	6M

(OR)

10.		Design a 4-bit binary synchronous counter using 74XX ICs and explain its working with neat timing waveforms.	12M

AR18

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, February-2022

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 Artificial Intelligence? Mention various problem solving approaches in AI .   6M
   b) Explain about Simulated Annealing in detail with an example   6M

(OR)

2. a) Differentiate BFS , DFS search strategies   6M
   b) Explain Best first search with an example. How the heuristic function plays a role in heuristic search?   6M

UNIT-II

3. a) Write short notes on inference rules of first order logic.   6M
   b) What are the major steps for solving constraint satisfaction problem? Solve 8-queen problem using the constraints.   6M

(OR)

4. a) Consider the following problem.   8M
   - John likes all kinds of food.
   - Apples are food.
   - Chicken is food.
   - Anything any one eats and isn't killed by is food.
   - Bill ate peanuts and still alive.
   - Sue eats everything Bill eats.
     - (a) Convert the formulas into clause form.
     - (b) Prove that "John likes peanuts" using resolution.

   b) Write Minimax algorithm   4M

UNIT-III

5. a) Explain the rule based system with its architecture   6M
   b) Explain about semantic web in detail   6M

(OR)

6. a) Give the differences between forward chaining and backward chaining   6M
   b) Explain about different types of knowledge representation techniques in detail   6M

UNIT-IV

7. a) Define machine learning. Write the steps associated with machine learning.   7M
   For 'A checkers learning problem' discuss the following
        i. Choosing the training experience
        ii. Choosing the target function and
        iii. Choosing a function approximation algorithm.
   b) What is concept learning? Explain various issues in machine learning   5M

(OR)

8. a) Write the FIND-S Algorithm with flowchart which finds a maximally specific hypothesis.   6M
   b) Explain five important real life applications of Machine Learning with suitable example.   6M

UNIT-V

9. a) Explain about capabilities and limitations of decision trees   4M
   b) Construct a decision tree using ID3 algorithm considering data given in Table 1   8M

(OR)

10. a) Explain the   7M
         a) concept of inductive bas b)Over fitting in decision trees
    b) Write ID3 decision tree algorithm   5M

Table 1

Day	A1	A2	A3	Classification
1	True	Hot	High	No
2	True	Hot	High	No
3	False	Hot	High	Yes
4	False	Cool	Normal	Yes
5	False	Cool	Normal	Yes
6	True	Cool	High	No
7	True	Hot	High	No
8	True	Hot	Normal	Yes
9	False	Cool	Normal	Yes
10	False	Cool	High	No

AR16

CODE: 16CE3012   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February,2022
STRUCTURAL ANALYSIS – II
(Civil Engineering)
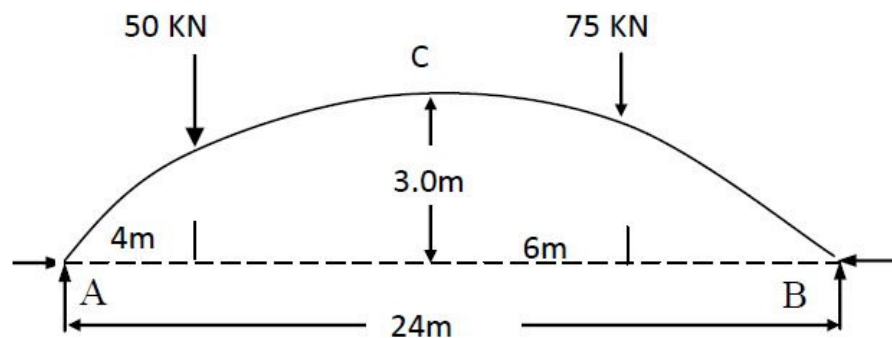
Time: 3 Hours   Max Marks: 70

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) Calculate Horizontal thrust, Reactions at supports and Maximum bending moment on a parabolic three-hinged arch is loaded as shown in figure.   7M

b) State and prove Eddy's theorem?   7M

(OR)

2. a) A two hinged parabolic arch of 20m span and 3m rise is hinged at the abutments and the crown carries a concentrated load of 15kN at 6.5m from the left hinge.   7M
   (a) Calculate the horizontal thrust and bending moment at 6.5m section from the left hinge

b) Differentiate between three hinged arches and two hinged arches   7M

UNIT-II

3. Two-wheel loads 200kN and 80kN spaced at 2m apart move on the span of girder of 16m span. Find the maximum bending moment that can occur at a section 6m from the left end. Any wheel load can lead the other.   14M

(OR)

4. A live load of 50 kN/m, 8m long moves on a simply supported girder of span 10m. Find the maximum B.M which can occur at a section 4m from left end.   14M

5. a) Analyse the continuous beam shown in Figure by the moment distribution method. Draw the bending moment diagram and shear force diagram. The beam is of uniform section   7M
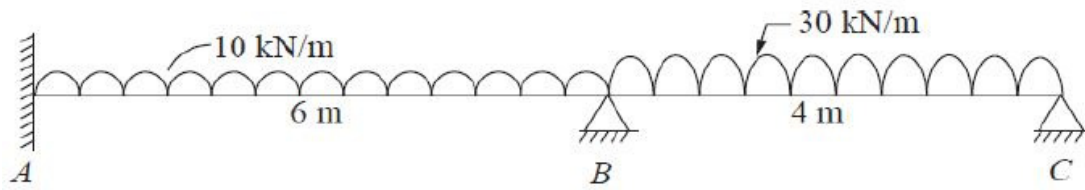
    b) Describe briefly about stiffness and carry over factors of Moment Distribution method   7M

(OR)

6. Evaluate the bending moment and shear force diagrams of beam as shown below by Moment distribution method.   14M
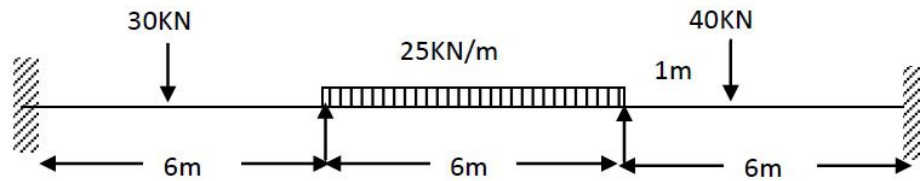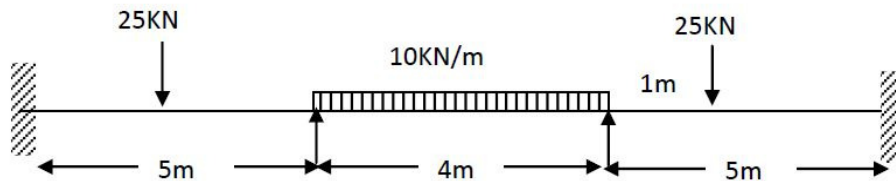

UNIT-IV

7. a) Explain procedural steps of analyzing indeterminate structure using Kani‟s method   7M
   b) Explain significance of stiffness factor and rotation factor in Kani‟s method of analysis. What are advantages and limitations of Kani‟s method   7M

(OR)

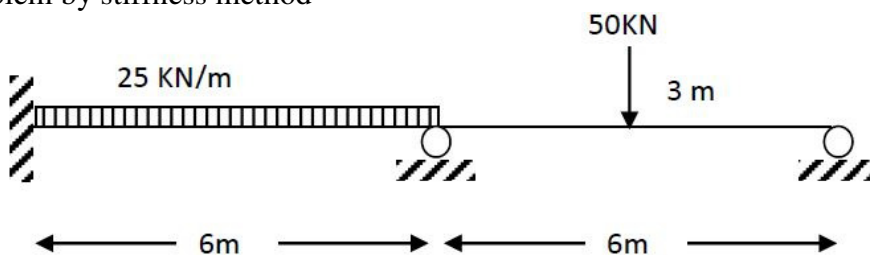8. Analyze continuous beam in figure by Kani‟s method   14M

UNIT-V

9. Explain Procedural steps involved in solving a Continuous beam with settlement of supports using Stiffness method of Analysis.   14M

(OR)

10. A two span continuous beam carries loading as shown below. Solve the problem by stiffness method   14M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February,2022
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) Explain in detail about the current zero method of arc   7M
   interruption of a circuit breaker.
   b) Describe the construction, principle and operation of SF6   7M
   circuit breaker.

(OR)

2. a) With a neat sketch explain minimum oil circuit breaker.   7M
   b) Explain the resistance switching and restriking voltages.   7M

UNIT-II

3. a) Describe the construction and principle of operation of   7M
   induction disc type relay.

   b) What are the advantages of static relays over electromagnetic   7M
   relays?

(OR)

4. a) The current rating of a relay is 5A, PSM=1.5,TSM=0.4,CT   7M
   turns ratio =400/5,fault current=6000 A. Determine the
   operating time of the relay.
   The time current (PSM) characteristics of an over current
   relay for TMS of 1 is given in the below table

PSM	2	4	5	8	10	20
Operating times(sec)	10	6.8	4.4	3.4	2.8	2.5

   b) With a neat sketch explain the principle of operation of   7M
   percentage differential relay.

UNIT-III

5. a) What are the different types of faults for alternator? Explain the stator inter turn
   fault protection of alternators   7M

   b) An 11kV,100MVA generator is grounded through a resistance of 6Ω.The CTs have a ratio of 1000/5.The relay is set to operate when there is an out of balance current of 1A. What percentage of generator winding will be protected by the percentage differential scheme of protection?   7M

(OR)

6. a) Describe the working principle of a Buchholz relay.   7M

   b) What is magnetising inrush current? Explain the protective scheme employed against magnetising inrush current.   7M

UNIT-IV

7. a) What are the essential qualities of feeder protection? Explain.   7M

   b) Explain the Translay scheme of protection of feeder with a neat sketch.   7M

(OR)

8. a) Describe differential protection of bus bars.   7M

   b) Describe three zone protection scheme for bus-bar.   7M

UNIT-V

9. a) Describe the principle of zinc oxide lightning arrester.   7M

   b) Describe the principle of valve type lightning arrester.   7M

(OR)

10. a) Explain about resonant grounding with phasor diagram.   7M

    b) What is insulation coordination? Describe the construction of volt-time curve and terminology associated with impulse testing.   7M

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AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February,2022

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)	Explain how a four wheel drive mechanism offers better power transmission in a automobile.	7 M
	b)	Draw and explain with a simple sketch, pressurized lubrication system with its relative advantages.	7 M

(OR)

2.	a)	Explain briefly the function and arrangement of lubricating oil filters.	7 M
	b)	Explain the factors that limit the extent of supercharging of S.I and C.I engines.	7 M

UNIT-II

3.	a)	What are the different stages in fuel ignition system SI engine	7 M
	b)	Briefly explain the working of fuel pump and nozzle used in CI engines	7 M

(OR)

4.	a)	Write about mechanical feed pump with a neat sketch.	7 M
	b)	Explain how the fuel injected in CI engines.	7 M

UNIT-III

5.	a)	Name different methods of engine cooling. Explain in detail the air cooling method.	7 M
	b)	What are the different types of ignition systems used in automobiles	7 M

(OR)

6.	a)	Explain the battery ignition system with a neat sketch.	7 M
	b)	Explain briefly about water cooling system.	7 M

UNIT-IV

7.	a)	Name the various electrical components used in an automobile & give their functions?	7 M
	b)	Explain briefly working of cone clutch with a neat sketch	7 M

(OR)

8.	a)	Write about the working of bendix drive mechanism	7 M
	b)	Explain the working of single plate clutch	7 M

UNIT-V

9.	a)	Explain the Davis Steering Mechanism? Write its relative merits?	7 M
	b)	Sketch the arrangement of pneumatic braking system used in automobiles and explain?	7 M

(OR)

10.	a)	Explain caster in steering wheel alignment with a neat sketch.	7 M
	b)	Define camber, castor, king pin rake angles and their significance in steering geometry	7 M

AR16

CODE: 16CS3014   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February,2022
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 Amortized analysis and explain with an example.	7M
	b)	Discuss Space & Time Complexity	7M

(OR)

2.	a)	What are the features of efficient algorithm? Explain with an example.	7M
	b)	Explain the Omega and Theta notations	7M

UNIT-II

3.	a)	Show the result of running Quick sorting technique on the sequence 38,27,43,3,9,82,10	7M
	b)	Discuss Stranssen's Matrix Multiplication and analyze its complexity	7M

(OR)

4.	a)	Explain the Single source shortest path problem with an example.	7M
	b)	What is the need for generating a spanning tree? Explain an algorithm for generating spanning tree.	7M

UNIT-III

5.	a)	How the reliability of a system is determined using dynamic programming? Explain.	7M
	b)	Write the algorithm to compute 0/1 Knapsack problem using dynamic programming and explain it.	7M

(OR)

6.		Describe the Matrix multiplication chains problem. Apply the recursive solution of dynamic programming to determine optimal sequence of pair wise matrix multiplications	14M

UNIT-IV

7.	a)	What are applications of DFS	7M
	b)	Explain articulation point in graph	7M

(OR)

8.		State **n**-queens problem and Explain 8-queens problem using backtracking	14M

UNIT-V

9.	a)	What are the principles of branch and bound algorithms?	7M
	b)	Explain the LC branch and bound algorithm.	7M

(OR)

10.	a)	Discuss NP-hard and NP-complete Problems	7M
	b)	Explain Cook's theorem.	7M

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February-2022
STRUCTURAL ANALYSIS -II
(Civil Engineering)

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

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Explain rib-shortening in the case of arches.
    b) What are the approximate methods for the lateral load analysis of frames.
    c) Define relative stiffness of a member.
    d) Define displacement factor.
    e) Define: Carry over moment and Carry over factor.
    f) When does joint equilibrium condition satisfies?
    g) Define rotation contribution moment.
    h) Define degrees of freedom
    i) Develop stiffness and flexibility matrices for single coordinate system
    j) What is meant by sinking of support?

PART-B

Answer one question from each unit

                                                                   [5x12=60M]

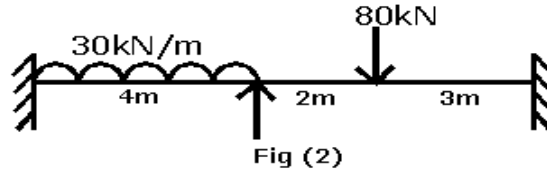### UNIT-I
2. Analyze the given two hinged arch as shown in below   **12M**
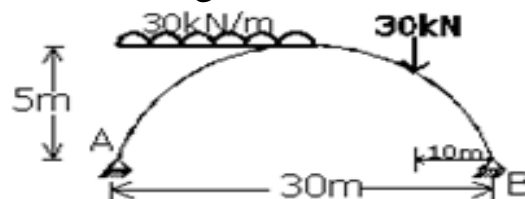
(OR)

3. Analyse the frame using Portal method.   **12M**
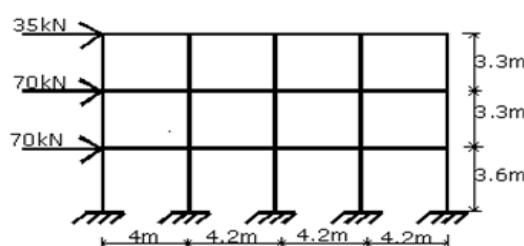
4. Analyze the continuous beam by slope deflection method.   **12M**
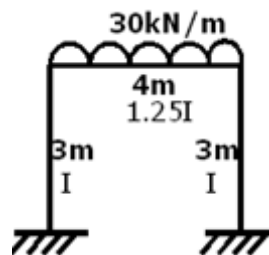

Fig (2)

(OR)

5. Analyse the portal frame using slope deflection method. Also **12M** draw Bending Moment diagram.
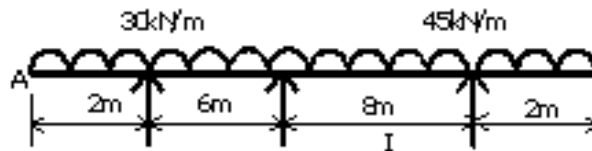

UNIT-III

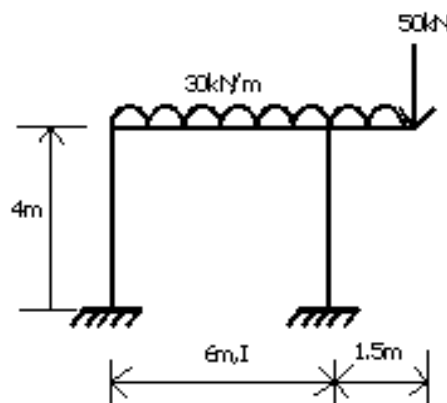6. Find the support moments and draw bending moment diagram by **12M** moment   distribution method

(OR)
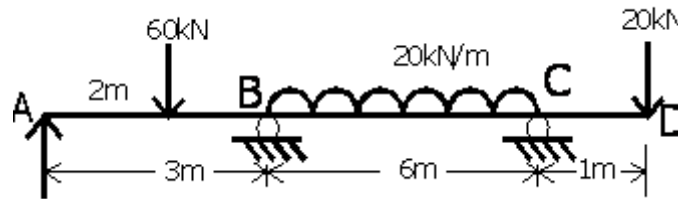
7. Analyse the Portal frame as shown in figure using moment **12M** distribution method Draw B.M.D.

8. Analysis the beam ABCD loaded as shown in Fig. by Kani's **12M** method. If support B yields by 9mm, $EI = 1 \times 10^{12}$ N-mm^2 throughout.

(OR)

9. Analyse the portal frame as shown in below using Kani's method. **12M** Draw bending moment diagram.
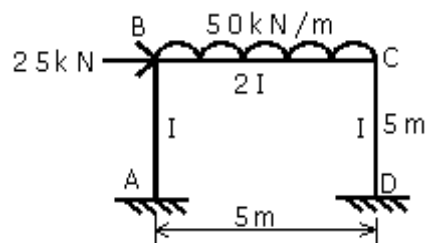
UNIT-V

10. Analyze the continuous beam shown in below fig., using **12M** flexibility matrix method

(OR)

11. Analyze the given continuous beam by stiffness matrix **12M** method

AR13

CODE: 13EE3014   SET-1
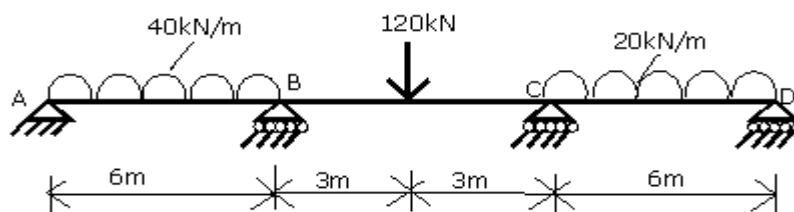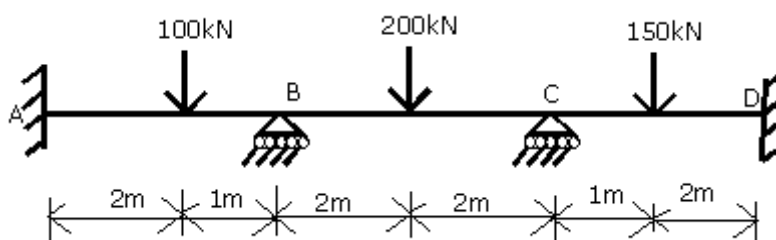
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February-2022

POWER SYSTEMS – II
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

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

1. a)   Define GMD.
    b)   What are the factors that influence skin effect?
    c)   Define voltage regulation of line.
    d)   What is the significance of ABCD parameters?
    e)   Give expression for velocity of propagation
    f)   What is surge impedance loading?
    g)   Define proximity effect?
    h)   Define critical disruptive voltage?
    i)   Define string efficiency?
    j)   What is vertical sag?

PART-B

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

UNIT-I

2. a   Explain the different types of conductors used for over head transmission lines. **4M**
    b   Find the inductance per phase per km of double circuit 3-phase line shown in   **8M**
        below figure. The conductors are transposed and are of radius 0·75 cm each. The
        phase sequence is ABC.
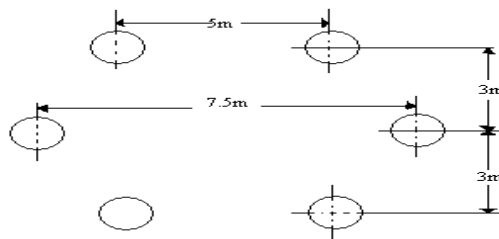
(OR)

3. a   Why do you prefer the stranded composite conductor over the stranded conductor?   **4M**
    b   A 3-phase double circuit line is shown below. Radius of each conductor is 1 cm.   **8M**
        Determine the capacitance and charging current per km assuming the line is
        transposed and operating voltage is 220 KV, 50 Hz
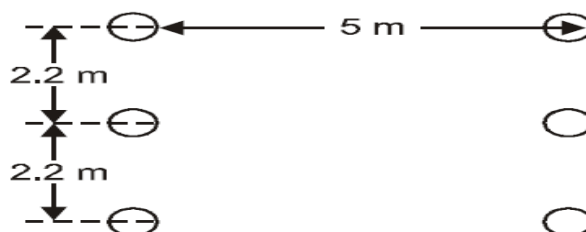
4. a   Classify and explain the transmission lines.   **6M**

    b   Derive the expression for voltage regulation of medium transmission line if the line   **6M**
         is represented by nominal-T.

(OR)

5. a Obtain A, B, C and D constants for medium transmission line represented by   **4M**
         nominal-π.

    b   A (medium) single phase transmission line 100km long has the following   **8M**
         constants:
         Resistance/km = 0.25 ohm
         Reactance/km = 0.8 ohm
         Susceptance/km = 14×10−6 mho
         Receiving end line voltage = 66k V
         Assume that the total capacitance of the line is localized at the centre of the line.
         Determine (a) the sending end current (b) the sending end voltage (c) regulation
         and (d) supply power factor. The line is delivering 15000kW at 0.8 power factor
         lagging.

UNIT-III

6. a   Explain the characteristic impedance and surge impedance loading.   **8M**
    b   Given a transmission line described by a total series impedance Z=zl=20+j80 and a   **4M**
         total shunt admittance Y= yl=j0.5 milli mhos.
         Find Zc, γl, e^{γl} , sinh γl and cosh γl and ABCD parameters

(OR)

7. a Derive the equivalent- T network of the long transmission line.   **6M**
    b   A 3-φ transmission line 200 km long has the following constants :   **6M**
         Resistance/phase/km = 0·16 Ω
         Reactance/phase/km = 0·25 Ω
         Shunt admittance/phase/km = 1·5 × 10^{-6} S
         Calculate by rigorous method the sending end voltage and current when the line is
         delivering a load of 20 MW at 0·8 p.f. lagging. The receiving end voltage is kept
         constant at 110 kV.

UNIT-IV

8. a   Calculate the reflection coefficient for a line terminated by i) open circuit ii) short   **6M**
         circuit
    b   Explain various factors affecting corona loss in transmission lines.   **6M**

(OR)

9. a   Describe the phenomenon of corona.   **4M**
    b   Mention the methods of reducing corona effect.   **8M**

UNIT-V

10. a   Give the reason for the sag in the transmission line?   **4M**
    b   Deduce an approximate expression for sag in overhead lines when the supports   **8M**
         are at unequal levels

(OR)

11. a   How do you improve the string efficiency of insulators?   **4M**

    b   Explain different types of insulators in transmission lines.   **8M**

CODE: 13ME3016   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, February-2022

CAD/CAM
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

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

1. a) What are the different CAD tools used in CAD environment?
    b) What is clipping?
    c) What are the applications of a solid model?
    d) Define Geometric modeling.
    e) What is meant by NC
    f) What are the tool positioning methods?
    g) What is Group Technology?
    h) What do the MICLASS system first digit consist of?
    i) Explain AGV
    j) What are the components of FMS?

PART-B

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

UNIT-I

2. a   Write the application of computers for design and Explain?   6M
    b   Mention the different types of graphical coordinate systems.   6M

(OR)

3. a   Discuss 2D and 3D transformations. Explain how 2D and 3D   6M
        transformations are done on a graphics element.
    b   List the advantages of computer aided design.   6M

UNIT-II

4. a   Compare Wire frame Modeling vs Solid Modeling.   6M
    b   Explain Bezier surface with a neat figure and state the advantages. 6M

(OR)

5. a   Describe the techniques for surface modeling.   6M
    b   How a curve can be represented? How the following type of curves can 6M
        be generated? (a) Cubic polynomial curves, and (b) Bezier curves.

AR13

UNIT-III

6.	a	Define a machining centre. How does it differ from a turning centre? Discuss the various parts of a machining centre.	6M
	b	Explain the tape readers and feedback devices used on NC machines.	6M

(OR)

7.	a	Explain the procedure for programming an arc and a circle.	6M
	b	What are the functions of CNC? Explain briefly.	6M

UNIT-IV

8.	a	What are the methods of parts classification and coding.	6M
	b	For the machine-component matrix shown below, find the part families groups.	6M

Machine	Component								
	A	B	C	D	E	F	G	H	I
1		X	X			X			X
2	X				X			X	
3	X			X			X		
4		X	X			X			X
5				X			X		
6	X				X			X	

(OR)

9.	a	What is production flow analysis? List the steps involved in carrying out PFA. Illustrate your answer by an example.	6M
	b	List the benefits and application of group technology.	6M

UNIT-V

10.	a	Bring out the benefits of CAPP systems.	6M
	b	Explain the computer control system for FMS.	6M

(OR)

11.	a	What is computer-aided process planning? Explain the approaches used for CAPP systems.	6M
	b	Describe the various types of FMS workstations.	6M