

**STRUCTURAL ANALYSIS-II  
(Civil Engineering)****Time: 3 Hours****Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

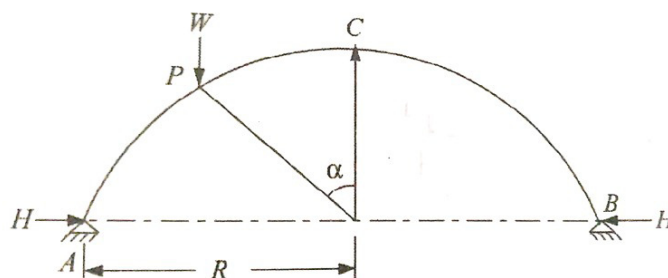
All parts of the Question must be answered at one place

**UNIT-I**

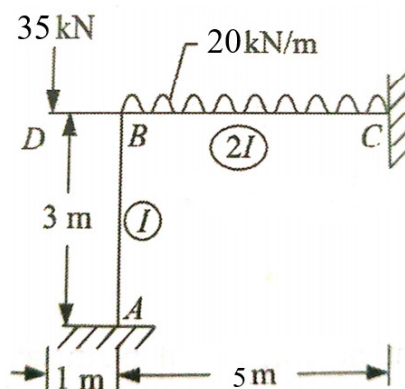
1. A three hinged semi-circular arch of radius  $R$  carries a uniformly distributed load of intensity  $w$ /unit length over its entire horizontal span. Determine the reactions of supports and maximum bending moment in the arch. 12M

**(OR)**

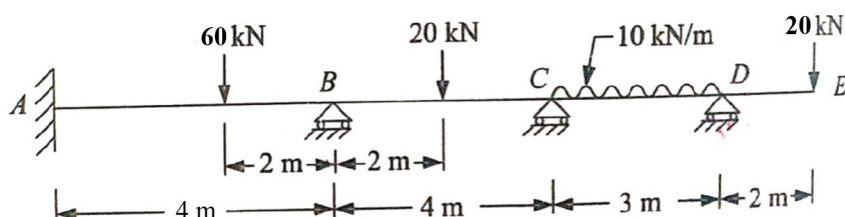
2. a) Explain the First Theorem of Castigliano. 4M  
 b) Determine the horizontal reaction in a semi-circular two-hinged arch when a load  $W$  acts at a point  $P$  as shown in figure. Assume uniform flexural rigidity. 8M

**UNIT-II**

3. Analyse the frame shown in figure by Slope-Deflection method and draw bending moment diagram. 12M

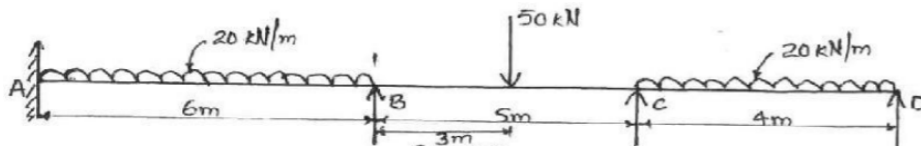
**(OR)**

4. Analyse the continuous beam shown in figure by Moment Distribution method and draw bending moment diagram. Assume  $EI$  is constant throughout. 12M



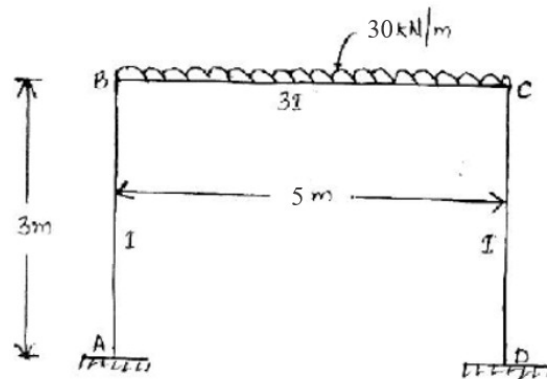
### UNIT-III

5. In a continuous beam shown, the support 'B' sinks by 10mm. Analyse the beam by Kani's Method & Draw Bending Moment Diagram (BMD). 12M



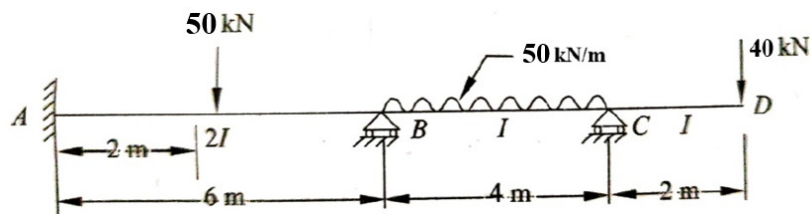
(OR)

6. Analyse the frame shown by Kani's Method. Draw BMD. 12M



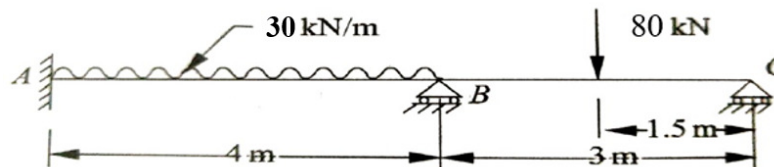
### UNIT-IV

7. Analyse the beam by stiffness matrix method. 12M



(OR)

8. Analyse the beam by stiffness matrix method. Take  $EI$  constant throughout. 12M

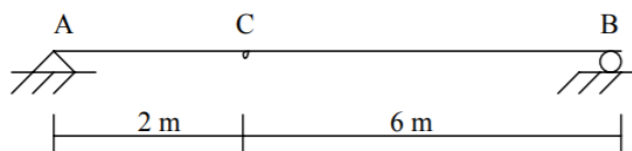


### UNIT-V

9. A Simply Supported Beam has a span of 12m carrying a UDL of 40 kN/m of 5m long crosses the girder from left to right. Construct the Influence Line Diagram (ILD) for Shear Force and Bending Moment at a section of 6m from left end. Calculate the Maximum Shear Force and Bending Moment at this Section? 12M

(OR)

10. Construct the Influence lines for  $R_A$ ,  $R_B$ ,  $V_C$ , and  $M_C$ . A point load 10kN is acting at a distance of 1mtr from support A 12M



# AR18

**CODE: 18EET313**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B. Tech I Semester Supplementary Examinations, June-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 inductance per phase for a 3-phase overhead transmission line when conductors are unsymmetrically spaced and transposed at regular intervals. **6M**
- b) The three conductors of a 3- $\phi$  line are arranged at the corners of a triangle of sides 2.5m, 3m and 3.5m. Calculate the inductance per km of the line when the conductors are regularly transposed. The diameter of each conductor is 1.24 cm. **6M**

**(OR)**

2. a) Explain different types of conductors used for over head transmission lines. **6M**
- b) A 3-phase, 50Hz, 132KV Overhead line has conductors placed in a horizontal plane 4m apart. Conductor diameter is 2cm. Determine the charging current per phase assuming complete transposition. **6M**

### **UNIT-II**

3. a) Derive an expression for the regulation and efficiency of a short transmission line with the help of a phasor diagram. **6M**
- b) A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0.8 p.f. lagging and at 66 kV. The resistance and inductive reactance of the line per phase are  $10 \Omega$  and  $20 \Omega$  respectively while capacitance admittance is  $4 \times 10^{-4}$  Siemens. Calculate (i) the sending end current (ii) sending end voltage (line-to-line) (iii) sending end power factor using nominal- II method. **6M**

**(OR)**

4. a) Obtain the ABCD parameters of nominal-T model of a medium transmission lines **6M**
- b) A 3- $\phi$  short transmission line with an impedance of  $(5 + j 20) \Omega$  per phase has sending end and receiving end voltages of 46.85 kV and 33 kV respectively for some receiving end load at a power factor of 0.8 lagging. Determine  
(i) power output (ii) sending end power factor. **6M**

### UNIT-III

5. Derive expressions for sending end voltage and current for a long transmission line using rigorous method. **12M**

(OR)

6. a) Derive the equivalent  $\pi$  network of the long transmission line. **6M**  
b) Calculate A, B, C and D constants of a 3-phase, 50 Hz transmission line 160 km long having the following distributed parameters :  $R = 0.15 \Omega/\text{km}$  ;  $L = 1.20 \times 10^{-3} \text{ H/km}$  ;  $C = 8 \times 10^{-9} \text{ F/km}$  ;  $G = 0$  **6M**

### UNIT-IV

7. a) Explain skin and proximity effects on transmission lines. **6M**  
b) A 3-phase, 220 kV, 50 Hz transmission line consists of 1.5 cm radius conductor spaced 2 meters apart in equilateral triangular formation. If the temperature is  $40^\circ\text{C}$  and atmospheric pressure is 76 cm, calculate the corona loss per km of the line. Take  $m_o = 0.85$  **6M**

(OR)

8. a) Explain various factors affecting corona loss in transmission lines . **6M**  
b) An overhead transmission line having a surge impedance of 450 ohms runs between two substations A and B; at B it branches into two lines C and D, of surge impedances 400 and 50 ohms respectively. If a travelling wave of vertical front and magnitude 25 kV travels along the line AB, calculate the magnitude of the voltage and current waves which enter the branches at C and D **6M**

### UNIT-V

9. a) Derive the expression for Sag and Tension calculations, when the supports are at unequal heights. **6M**  
b) An insulator string consists of three units, each having a safe working voltage of 15kV. The ratio of self-capacitance to shunt capacitance of each unit is 8:1. Find the maximum safe working voltage of the string. Also find the string efficiency. **6M**

(OR)

10. a) Derive an expression for string efficiency of a string consisting of three insulators **6M**  
b) A transmission line has a span of 150 m between level supports. The conductor has a cross-sectional area of  $2\text{cm}^2$ . The tension in the conductor is 2000kg. If the specific gravity of the conductor material is  $9.9 \text{ g/cm}^3$  and wind pressure is  $1.5 \text{ kg/m length}$ , calculate the sag. What is the vertical sag? **6M**

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

Answer ONE Question from each Unit

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**UNIT-I**

1. a) Explain types of chips in metal cutting with neat sketches and specify the conditions favouring those chip forms. 6M
- b) Discuss the various forces encountered in metal cutting. 6M
- (OR)
2. a) What are the types of tool materials used in metal cutting? Discuss their importance. 6M
- b) What is 'Tool Signature'? Explain the importance of various elements of it. 6M

**UNIT-II**

3. a) What are the different types of taper turning methods? Explain any one method with neat sketch. 6M
- b) Explain thread cutting procedure on lathe machine with neat sketch. 6M
- (OR)
4. a) Explain Turret Indexing mechanism of capstan lathe with a neat sketch 6M
- b) Write the differences between the single-spindle and multi-spindle automatic lathes. 6M

**UNIT-III**

5. a) Briefly explain the following operations with help of neat sketches: 6M  
(i) Drilling (ii) Reaming (iii) Boring
- b) Sketch and explain the shaper machine working principle and its parts. 6M
- (OR)
6. a) Sketch and explain the slotting machine working principle and its parts 6M
- b) With the help of neat sketch explain the geometry of milling cutter. 6M

**UNIT-IV**

7. a) Describe the working principle of surface grinders. 6M
- b) Differentiate between lapping, honing and grinding. 6M
- (OR)
8. a) What are types of grinding machine explain two in detail. 6M
- b) What are the advantages and disadvantages of centre less grinding? 6M

**UNIT-V**

9. a) Explain the hole basis and shaft basis system with a neat sketch. 6M
- b) Write the differences between (i) limits (ii) fits and (iii) tolerances. 6M
- (OR)
10. a) Give the advantages and disadvantages of unilateral and bilateral system of gauging. 6M
- b) Explain the principle of GO and NOGO gauges. Describe the necessity of Gauge maker's tolerance in gauge design. 6M

**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) Analyze the dual input balanced output configuration of differential amplifier using DC. 6M
- b) Define i) CMRR ii) PSRR iii) DRIFT iv) Output offset voltage. 6M

**(OR)**

2. a) Explain how an op-amp can be used as integrator? Also derive expression for the output. 6M
- b) Differentiate between ideal and practical op amp specifications. 6M

**UNIT-II**

3. a) Explain the operation of Schmitt trigger circuit. Draw its transfer characteristics, Input and output waveforms. 6M
- b) Draw the circuit diagram of a practical log amplifier and obtain an expression for its output voltage. 6M

**(OR)**

4. a) Explain, how to obtain triangular wave using a square wave generator. 6M
- b) Design an Astable multi vibrator circuit using 741 op-amp for the frequency of 10KHz square wave. Assume necessary data. 6M

**UNIT-III**

5. a) Classify the filters based on range of frequencies, frequency response, type of components used and type of input signal. 6M
- b) Design a first order high pass filter with a cut-off frequency of 1kHz 6M

**(OR)**

6. a) Draw a weighted resistor DAC and obtain the transfer characteristics of a 3 bit DAC. 6M
- b) Determine the output voltages caused by each bit in a 6-bit ladder if the input levels are 0=0v and 1=+16v. Determine the resolution and full-scale output of this circuit. Find out the voltage from the above ladder for a digital input of 101011. 6M

**UNIT-IV**

7. a) Design 2-input NAND gate using CMOS technology 6M
- b) Explain the operation of Bipolar logic family. 6M

**(OR)**

8. a) Explain the operation of encoder with a neat logic diagram. 6M
- b) Perform the realization of full subtractor and full adder using decoders and logic gates. 6M

**UNIT-V**

9. a) Draw the logic diagram of RS flip flop and explain its operation. 6M
- b) Draw the circuit diagram of Johnson counter using D-flip-flops and explain its operation with the help of bit pattern. 6M

**(OR)**

10. Design Mod-10 Counter using T Flip-Flops. 12M

Answer ONE Question from each Unit

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**UNIT-I**

1. a) What are the pros and cons of AI ? Describe the importance of Turing test in AI. 6M
- b) Define State space search? Explain state space search with an example 6M

**(OR)**

2. a) Explain Breadth First Search algorithm with an example 6M
- b) Explain hill climbing algorithm with its disadvantages. 6M

**UNIT-II**

3. a) Define Game Tree? Explain Minimax algorithm with an example 6M
- b) Explain unification algorithm with an example 6M

**(OR)**

4. a) Explain alpha-Beta pruning algorithm in detail 8M
- b) Convert the following sentences into predicate logic form 4M
  - a) Marcus was a Pompeian
  - b) All Pompeians were romans
  - c) All Romans were either loyal to Ceaser or hated him.
  - d) Everyone loyal to someone

**UNIT-III**

5. a) Represent the following data into the form of Semantic network 8M
  - i) Tom is an instance of dog.
  - ii) Tom caught a cat
  - iii) Tom is owned by rashan.
  - iv) Tom is brown in colour.
  - v) Dogs like bones.
  - vi) The dog sat on the mat.
  - vii) A dog is a mammal.
  - viii) A cat is an instance animal
  - ix) All mammals are animals.
  - x) Mammals have fur.
- b) Explain ontology. Why would someone want to develop ontology? 4M

**(OR)**

6. a) Write short notes on 6M  
     a) Rule Based Systems  
     b) Frames  
 b) Elaborate the procedural design aspects of semantic web. 6M

#### UNIT-IV

7. a) Define Well-posed learning problems. Explain the steps for 6M  
     designing the learning system  
 b) Explain Concept Learning in detail 6M  
     (OR)  
 8. a) Explain about designing a learning system in Machine Learning 6M  
 b) Find a maximally specific hypothesis using FIND-S Algorithm 6M  
     for the training examples given in Table 1.

#### UNIT-V

9. a) Write notes on i) Bayes Theorem, ii) Naïve Bayes classifier. 6M  
 b) Discuss the Decision tree learning algorithm with an example. 6M  
     (OR)  
 10. a) What is a decision tree & discuss the use of decision tree for 6M  
     classification purpose with an example.  
 b) List the issues in Decision Tree Learning. Interpret the algorithm 6M  
     with respect to Overfitting the data.

Table 1

Sl. No	Sky	AirTemp	Humidity	Wind	Water	Forecast	EnloySport
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



III B. Tech I Semester Supplementary Examinations, June-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) Determine the horizontal thrust at the supports and find the normal thrust and radial shear at point D which is 7m from the left end. The given two hinged arch ACB consists of span 36m and height at crown is 8m. It carries a UDL of 5kN/m from left end to the crown 7M
  - b) Derive an expression for normal thrust, radial shear, horizontal thrust for a two hinged circular arch. 7M
- (OR)
2. A 3-hinged arch is circular, 25 m in span with a central rise of 5m. It is loaded with a concentrated load of 10 kN at 7.5m from the left hand hinge. Find the i) Horizontal thrust ii) Reaction at each end hinge 14M

**UNIT-II**

3. Draw the Influence line diagram for reactions of a simply supported beam of 12 m span. Also draw the influence line diagrams for Shear force and bending moments at quarter span and mid-span sections 14M
- (OR)
4. 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

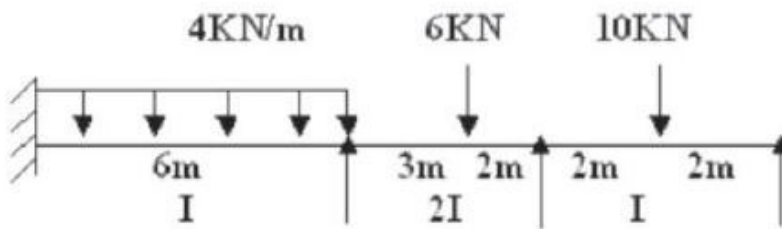
**UNIT-III**

5. A continuous beam ABCD is fixed at A and simply supported at B and C, the beam CD is overhanging. The spans AB = 6 m, BC = 6 m and over hanging CD = 2 m. The moment of inertia of the span BC is 2I and that of span AB and CD is 1.5I. The beam is carrying a uniformly distributed load of 25 kN/m over span AB, a point load of 50 kN in BC at a distance of 3 m from B and point load of 15 kN at the free end. Determine the fixing moments at A, B and C adopting Moment distribution method and draw the bending moment diagram. 14M
- (OR)
6. A continuous beam is built in at A and it is carried over rollers at B and C with spans of AB and BC being 12 m. The beam carries a uniformly distributed load of 25 kN/m over AB and a point load of 60 kN over BC 2.5 m from the support B, which sinks by 20 mm. Values of E and I are  $2 \times 10^5$  N/mm<sup>2</sup> and  $2 \times 10^9$  mm<sup>4</sup>. Calculate the support moments and draw bending moment diagram giving critical values. Use Moment Distribution method. 14M

#### UNIT-IV

7. a) Analyse the Continuous beam shown in figure using Kani's method

7M



- b) Explain Kani's method for frames with side sway.

7M

(OR)

8. Analyze the portal frame using Kani's procedure. The two columns of AB and CD of 6m height, Beam BC of span 10m, with EI constant. The column CD carries an udl of 30 kN/m. The supports at A and B fixed

14M

#### UNIT-V

9. a) Discuss the flexibility and stiffness method respect to continuous beam.  
b) Using the stiffness matrix method find the moments at A and B of the given beam AB which is simply supported at A and fixed at B with span of 3m. It carries a concentrated load of 80kN at 1m from A.

7M

7M

(OR)

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

14M

# AR16

**CODE: 16EE3014**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B. Tech I Semester Supplementary Examinations, June-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 about energy balance theory of arc interruption in a circuit breaker. 7M
- b) Explain the necessity of resistance switching in a circuit breaker. Also derive the expression for critical resistance. 7M

**(OR)**

2. a) Explain the construction, working and principle of vacuum circuit breaker. Also mention the application of vacuum circuit breaker. 8M
- b) Explain (i) breaking capacity (ii) making capacity and (iii) short time capacity of circuit breakers 6M

### **UNIT-II**

3. a) Describe the operation of induction cup type relay with a neat diagram. 7M
- b) Compare the time-current characteristics of inverse, IDMT and very inverse over current relays. Discuss their area of applications. 7M

**(OR)**

4. a) Explain the working principle, operation and characteristics of mho relay with neat diagram. 7M
- b) Explain the operation of a directional relay with a neat sketch. 7M

### **UNIT-III**

5. a) Discuss the protection employed for the protection of field winding against ground faults. 7M
- b) What do you understand by field suppression of an alternator? How is it achieved? 7M

**(OR)**

6. a) Explain differential protection of transformers with a neat diagram. 7M
- b) Explain overheating protection scheme of transformer. 7M

### **UNIT-IV**

7. a) Explain the bus bar protection by using differential protection scheme. 7M
- b) Explain about over current protection of feeder. 7M

**(OR)**

8. a) Explain carrier blocking scheme with a neat diagram. 7M
- b) Explain how three zone distance relay protection can be used with impedance relays. 7M

### **UNIT-V**

9. a) What are the causes of over voltages arising on a power system? Explain. 7M
- b) What is BIL? Explain the method of choosing BIL s for different electrical apparatus. 7M

**(OR)**

10. a) What is the effect of ungrounded neutral on system performance? Explain. 7M
- b) What are the methods of protection against lightning? Explain 7M

# AR16

**CODE: 16ME3016**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**III B. Tech I Semester Supplementary Examinations, June-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) With the help of a neat sketch explain Splash Lubrication system? Also discuss its advantages and disadvantages? 7 M
- b) Explain how the power can be transmitted in front wheel drive by using a neat diagram. 7 M
- (OR)
2. a) Why lubrication system is essential in a automobile, explain working of pressurized lubrication system. 7 M
- b) Draw schematic diagram showing the layout of complete transmission system of a four wheeler automobile 7 M

## **UNIT-II**

3. a) What are different types of fuel filters used in SI engines. 7 M
- b) Write the procedure how the fuel injected in CI engines. 7 M
- (OR)
4. a) Write about the fuel inject system in SI engines. 7 M
- b) Explain the different types of air filters used in SI engines. 7 M

## **UNIT-III**

5. a) Explain briefly liquid cooling system 7 M
- b) Give the constructional features of a battery used in automobile vehicles. 7 M
- (OR)
6. a) What are the different types of ignition system used in automobile vehicles. 7 M
- b) Explain the working of radiator and the different types mechanisms used. 7 M

## **UNIT-IV**

7. a) With a neat sketch explain the electrical starting system in an automobile 7 M
- b) Explain the different types of gear boxes used in automobile vehicles. 7 M
- (OR)
8. Write about the oil pressure gauge, fuel gauge and temperature indicator gauges with neat sketches. 14 M

## **UNIT-V**

9. a) Draw the sketch of a mechanical braking system and explain various parts and working of this braking system. 7 M
- b) Explain with a schematic diagram, working of rigid axle front wheel suspension system. 7 M
- (OR)
10. a) Explain the functioning of independent front wheel suspension system with torsion bar in a automobile 7 M
- b) With the help of a schematic diagram, explain Ackerman steering mechanism. 7 M

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B. Tech I Semester Supplementary Examinations, June-2022

STRUCTURAL ANALYSIS -II

(Civil Engineering)

Time: 3 Hours

Max Marks: 70

**PART-A**

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
  - a) Justify which is more economical: beam or an arch.
  - b) What is the necessity and advantages of approximate analysis?
  - c) Write slope deflection equations for with effect of sinking.
  - d) What are the joint equilibrium equations for single bay single story portal frame without sway?
  - e) What are the fixed end moments developed due to the effect of sinking? Show it with neat sketch.
  - f) What is the stiffness factor for intermediate support?
  - g) If distribution factor in moment distribution method is 0.5 then what is rotation factor and displacement factor in kani's method?
  - h) Define stiffness coefficient  $K_{ij}$ .
  - i) Why stiffness matrix method is called displacement method?
  - j) For a two-hinged arch, if one of the supports settles down vertically, then the horizontal thrust will be ..... ?

**PART-B**

Answer one question from each unit

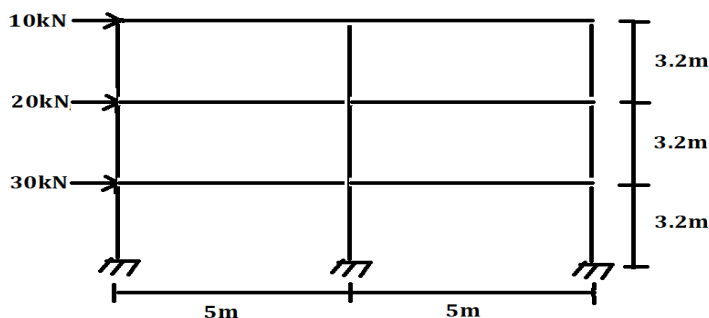
[5x12=60M]

**UNIT-I**

2.
  - a) A two hinged parabolic arch of span 30m and rise 6m carries two points loads each 60kN acting at 7.5m and 15m from the left end respectively. Determine the horizontal thrust and moment at crown point. 6M
  - b) Determine the horizontal thrust in a two hinged parabolic arch subjected to uniformly distributed load of  $w$  per unit length over a length 'a' from the left support. 6M

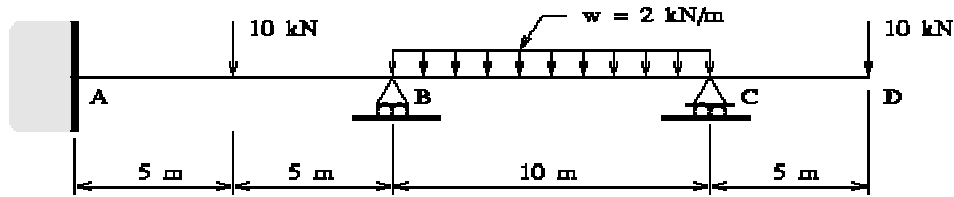
(OR)

3.
  - a) List the assumptions made in cantilever method? 2M
  - b) Analyse the frame shown below by using portal method. 10M



## UNIT-II

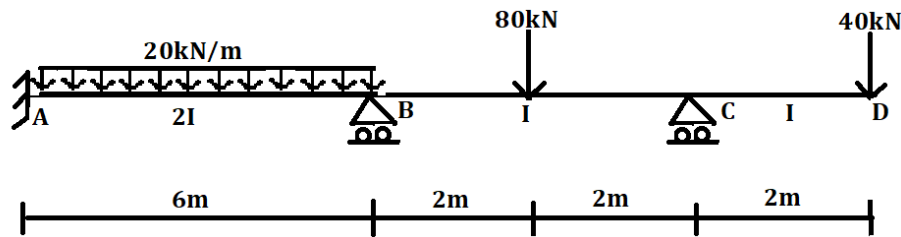
4. Analyse the continuous beam shown in figure by slope deflection method when support B is settled down by 15mm. (Take  $EI = 100\text{kN-m}^2$ )



12M

(OR)

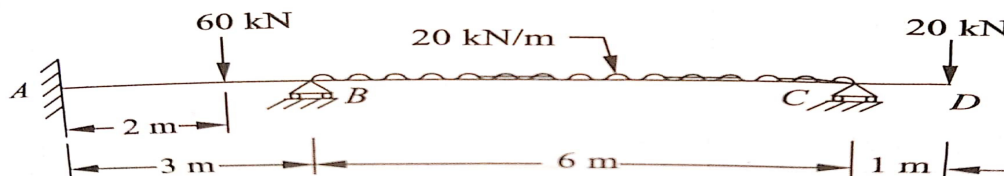
5. Analyse the continuous beam shown in figure by slope deflection method and draw the BMD.



12M

## UNIT-III

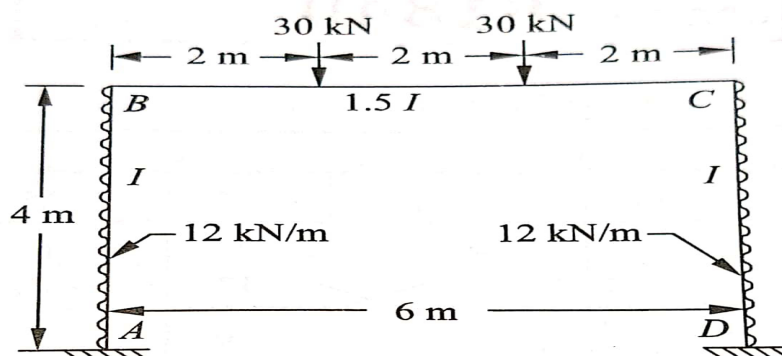
6. Analyse the continuous beam shown in figure by moment distribution method, if support B yields by 9mm. Take  $EI = 1 \times 10^{12} \text{ Nmm}^2$  throughout. Draw BMD



12M

(OR)

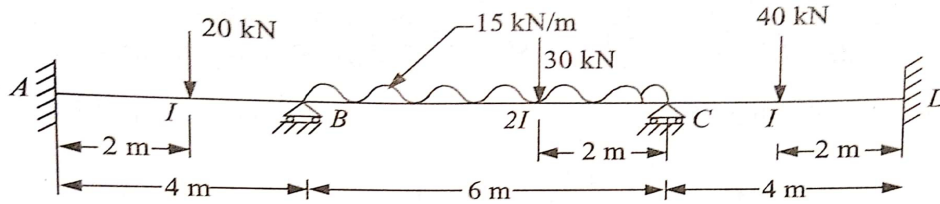
7. Analyse the portal frame shown in figure by moment distribution method.



12M

### UNIT-IV

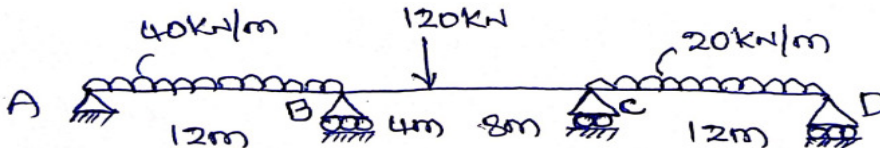
8. Analyse the continuous beam shown in figure by flexibility method.



12M

(OR)

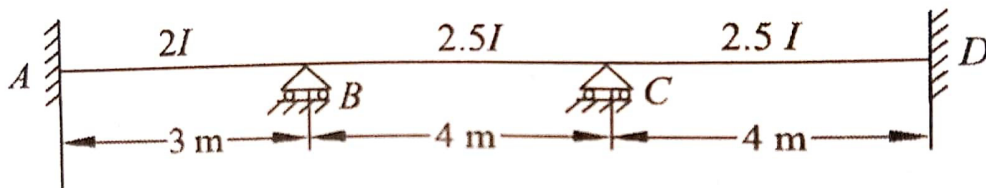
9. Analyse the continuous beam shown in figure, by Kani's method. Take EI constant throughout.



12M

### UNIT-V

10. Analyse the continuous beam shown in figure if the support B sinks by 10mm. Use stiffness matrix method. Take  $EI = 6000 \text{ kN-m}^2$

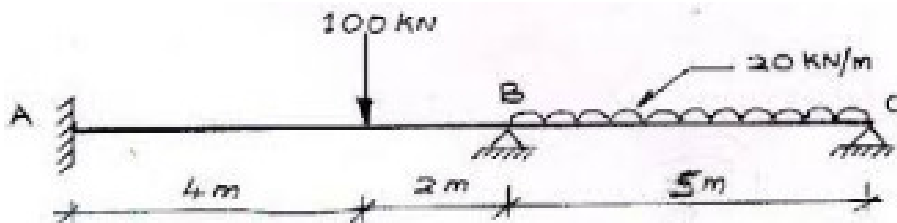


12M

(OR)

11. a) Differentiate between equilibrium and compatibility methods.  
b) Analyse the beam by Stiffness matrix method.

4M



8M

**Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Define Ferranti effect in Transmission line?  
b) Define GMD in transmission lines.  
c) Showcase the effect that is caused by Internal flux linkages in Overhead Transmission Line  
d) In transmission lines  $AD - BC = \underline{\hspace{2cm}}$   
e) List the various factors those affecting Skin Effect?  
f) Explain SAG in Overhead transmission line  
g) List the causes of Insulation failure in Insulators  
h) Utilization of same size of insulators disc is used in Overhead transmission line for a particular voltage level, why?  
i) List any 2 factors that affects corona  
j) List any two types of insulators

**PART-B****Answer one question from each unit****[5x12=60M]****UNIT-I**

2. List the Various Components in Over Head Transmission line 12
- (OR)
3. Derive the expression for Inductance calculation for 1-phase 2 wire system. 12

**UNIT-II**

4. Derive the Expression for Medium Transmission Line using  $\pi$  - network with Phasor diagram. 12
- (OR)
5. 3-phase, 50 Hz transmission line 100 km long delivers 20 MW at 0.9 p.f. lagging and at 110 kV. The resistance and reactance of the line per phase per km are  $0.2 \Omega$  and  $0.4 \Omega$  respectively, while capacitance admittance is  $2.5 \times 10^{-6}$  siemen/km/phase by using nominal T method. Calculate the current and voltage at the sending end. 12

**UNIT-III**

6. A 132 kV, 50 Hz, 3-phase transmission line delivers a load of 50 MW at 0.8 p.f. lagging at the receiving end. The generalised constants of the transmission line are :  $A = D = 0.95 \angle 1.4^\circ$  ;  $B = 96 \angle 78^\circ$  ;  $C = 0.0015 \angle 90^\circ$   
Find the regulation of the line and charging current. 12
- (OR)
7. Derive the Expression for ABCD parameters of long transmission line by Rigorous methods. 12

**UNIT-IV**

8. Define Proximity Effect, Phenomena by neat sketch in Transmission line and list the factor affecting proximity effect. 12

**(OR)**

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

**UNIT-V**

10. Derive the expression for Sag calculation when supports are at equal heights 12
- (OR)
11. Explain the working of Strain Insulator with neat sketch diagram and state the safety factor and derive expression for string efficiency. 12



# AR13

CODE: 13EC3019

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B. Tech I Semester Supplementary Examinations, June-2022

## MICROPROCESSORS & MICRO CONTROLLERS (Information Technology)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 X 10 = 10 M]

1. a) Give an example of indirect addressing mode in 8086.  
b) List the registers associated with ISR.  
c) List out the general purpose registers in 8086.  
d) Give an example of I/O Port addressing.  
e) List out the features of 80386.  
f) How to calculate physical address in 80386.  
g) Write one difference between microprocessor and microcontroller.  
h) Explain PSW in 8051.  
i) Draw pin diagram of 8255.  
j) What is scan and display section of 8279.

### PART-B

Answer one question from  
each unit

[5x12=60M]

### UNIT-I

2. (a) With a neat architectural diagram explain the functioning of 8086. [8M]  
(b) Explain how 8086 provides 1MB memory and space using segment registers. Also, list the addresses of segment registers. [4M]
- (OR)
3. (a) Draw the pin diagram of 8086 and explain of each pin. [8 M]  
(b) Draw timing diagram of READ and WRITE cycles of 8086[maximum models]. [4 M]

## **UNIT-II**

4. (a) Write an ALP to display string 'AITM' on the screen. [2M]  
(b) Write an ALP of 8086 to find minimum number in the array of 10 numbers. [5M]  
(c) Write an ALP to arrange a given set of hexadecimal bytes in increasing order. [5M]
- 5 (a) What is an assembler directive? Explain any four assembler directives. [4M]  
(b) Write an ALP to find LCM of two 16 bit unsigned numbers. [8M]

## **UNIT-III**

- 6 (a) What are the advantages of 80386 over 8086? [2M]  
(b) What is meant by co-processor? List out the features of 80387. [5M]  
(c) Explain register organization in 80386. [5M]
- (OR)**
- 7 (a) Briefly explain the architecture of 80386? [6 M]  
(b) Explain the concept of segmentation in 80386. [6 M]

## **UNIT-IV**

- 8 a) Explain the working of 8259. [6M]  
b) List out features of 8259 microcontrollers. [6M]
- (OR)**
- 9 (a) Explain the need for DMA and discuss DMA transfer method in brief. [6M]  
(b) Explain the following control words of 8251 with suitable examples. [6M]  
(i) MODE word  
(ii) COMMAND word

## **UNIT-V**

- 10 Explain architecture of 8051 with neat block diagram and list all the registers of 8051. [12M]
- (OR)**
- 11 (a) Differentiate PIC and flash microcontrollers. [6M]  
(b) Write a 8051 program to find BCD for the numbers between 0 to 9. [6M]