**20CE501**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February,2023** | **Civil Engineering** | | |
| **Fifth Semester** | **Structural Analysis** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X14=56 Marks) |

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| 1. | a) | Sketch the shape of the cable if it applied (i) uniformly distributed loads and (ii) concentrated load at the centre | CO1 | L2 | 1M |
|  | b) | A parabolic three hinged arch of span ‘l’m is subjected to an UDL of w/m over entire span. Write the expression for normal thrust and radial shear at any section. | CO1 | L2 | 1M |
|  | c) | Explain the effect of temperature rise on the horizontal thrust for a three hinged arch carrying a loading. | CO1 | L3 | 1M |
|  | d) | Name the type of rolling load for which the absolute maximum bending moment occurs at the mid span of the beam. | CO2 | L2 | 1M |
|  | e) | Draw ILD for shear force at any section in a cantilever beam? | CO2 | L2 | 1M |
|  | f) | What are uses of influence lines? | CO2 | L1 | 1M |
|  | g) | A fixed beam of span L rotates by θ anti-clockwise at right support, what will be the reaction at right support? | CO3 | L2 | 1M |
|  | h) | What happens to the horizontal thrust in three hinged arch when there is a sudden rise in the temperature? | CO1 | L2 | 1M |
|  | i) | Explain the basic principle in the analysis of propped cantilevers. | CO3 | L2 | 1M |
|  | j) | What is fixed beam? Is fixed beam determinate or indeterminate give reasons | CO3 | L1 | 1M |
|  | k) | Draw bending moment and shear force diagram for a fixed beam subjected to central concentrated load. | CO3 | L1 | 1M |
|  | l) | Mention slope deflection equations. | CO4 | L1 | 1M |
|  | m) | Define distribution factor. | CO4 | L1 | 1M |
|  | n) | Calculate the fixed end moment for beam carrying UDL of 15KN/m of span 6m. | CO4 | L2 | 1M |
| **Unit -I** | | | | | |
| 2. |  | A three hinged parabolic arch of span 15 m and central rise 3 m is carrying a point load of 120 kN at point P, which is 5m from the left hand support. Find the values of normal thrust and radial shear force under the load. | CO1 | L3 | 14M |
|  |  | **(OR)** |  |  |  |
| 3. |  | A suspension cable of 30 m span and 3 m dip is subjected to 10 kN/m. Determine the maximum and minimum tension in the cable also find the length of the cable. | CO1 | L3 | 14M |
|  |  | **Unit -II** |  |  |  |
| 4. |  | The beam is loaded with two loads of 25kN spaced at 2.5m is travelling on beam having span of 10m from right to left. Find the maximum bending moment at the center of span. Also find the absolute maximum bending moment on the span. | CO2 | L4 | 14M |
|  |  | **(OR)** |  |  |  |
| 5. |  | The beam is loaded with concentrated loads, which are moving from right to left as shown in figure. Compute the maximum shear force and moment at C and draw the influence line diagrams for the same. | CO2 | L3 | 14M |
| **P.T.O**  **20CE501**  **Unit -III** | | | | | |
| 6. |  | Analyze and draw SFD & BMD for the fixed beam shown in Fig. | CO3 | L4 | 14M |
|  |  | **(OR)** |  |  |  |
| 7. |  | Analyze the continuous beam shown in figure using theorem of three moemnts. Find the reactions at supports. And draw the SFD and BMD. | CO3 | L4 | 14M |
|  |  | **Unit –IV** |  |  |  |
| 8. |  | Analyze the continuous beam for the given figure and draw BMD diagram by using moment distribution method. | CO4 | L4 | 14M |
|  |  | **(OR)** |  |  |  |
| 9. |  | Find the support moments at A, B, C, D for the continuous beam shown in Fig using slope deflection method. | CO4 | L3 | 14M |

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