**14CE705A**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
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| **Jan/Feb, 2021** | **Civil Engineering** | | |
| **Seventh Semester** | **Advanced Structural Analysis** | | |
| **Time:** Three Hours | | **Maximum :** 60 Marks | |
| *Answer* ***All*** *Questions from Part - A.* | | | (1X12 = 12 Marks) |
| *Answer Any FOUR Questions from Part - B.* | | | (4X12=48 Marks) |
| **Part - A** | | | |

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| 1 | Answer all questions | | (1X12=12 Marks) | |
|  | a) | Differentiate a curved beam and a straight beam | |  |
|  | b) | Define Muller’s Breslau principle. | |  |
|  | c) | Draw the Influence Line Diagram for bending moment diagram of the cantilever beam  https://www.sanfoundry.com/wp-content/uploads/2020/08/structural-analysis-questions-answers-influence-line-diagram-numericals-q2.png | |  |
|  | d) | Draw the Stress-Strain curve of mild-steel. | |  |
|  | e) | Define Shape factor. | |  |
|  | f) | What do you understand by the term plastic moment? | |  |
|  | g) | Write the advantages of stiffness method over flexibility method | |  |
|  | h) | Define stiffness influence coefficient. | |  |
|  | i) | Define Flexibility matrix. | |  |
|  | j) | [What is stiffness of a prismatic beam of length](http://10.45.10.12/onlineEXAM/modiq.aspx?id=107266) L [and flexural rigidity EI](http://10.45.10.12/onlineEXAM/modiq.aspx?id=107266)? | |  |
|  | k) | Can the same local coordinates be adopted in both stiffness and flexibility methods of analysis? | |  |
|  | l) | Develop a Stiffness for a single coordinate system | |  |
| **Part - B** | | | | |
| 2 | | Derive an expression for BM and TM at any section for a semi-circular beam supported on three equidistant supports and loaded with an UDL ‘w’ per unit curved length. | | 12M |
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| 3 | | Five wheel loads of 10kN, 20kN, 15kN, 16kN and 24kN spaced at 1m intervals roll on a girder of span 20m,from left to right, with 10 kN load leading.Use Influence lines and determine the maximum shear forces and maximum bending moment | | 12M |
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| 4 | | Find out the collapse load for the continuous beam of uniform section and loaded as shown,in terms of its plastic moment Mp. | | 12M |
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| 5 | | Determine the load factor of the portal frame shown if the plastic moment capacity of all members is 100kN. | | 12M |
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| 6 | | Analyse the beam using flexibility matrix method | | 12M |
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| 7 | | Using the flexibility method analyse the following rigid jointed plane frame and draw bending moment diagram | | 12M |
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| 8 |  | Analyse the continuous beam and find the end moments by stiffness matrix method for the beam shown and draw the bending moment. | | 12M |
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| 9 |  | Analyse the given portal frame as shown in figure by using stiffness matrix method | | 12M |