Code No: **RT31012**   **R13**   SET - 1

III B. Tech I Semester Supplementary Examinations, October/November-2018
STRUCTURAL ANALYSIS – II
(Civil Engineering)
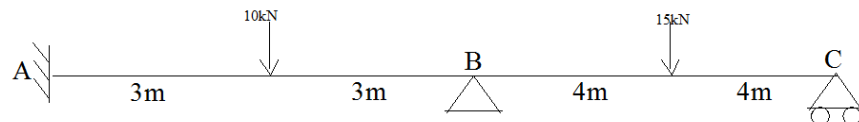
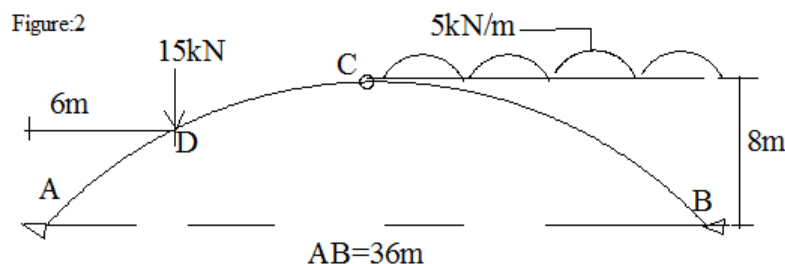Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1 a) What is the effect of Temperature on two hinged arches? Write an expression to find the effect of (rise or fall) temperature in two hinged arch.   [4M]

   b) Differentiate between Portal method and Cantilever method in the analysis of lateral loads acting on the structure.   [3M]

   c) Give an expression to find the effect of Temperature in two hinged stiffened girder of cable stayed suspension bridge.   [4M]

   d) Give any Two Differences between Sway and Non-sway analysis of portal frames. Under what circumstances the above methods are used.   [3M]

   e) Define Static and Kinematic Indeterminacy with an example.   [4M]

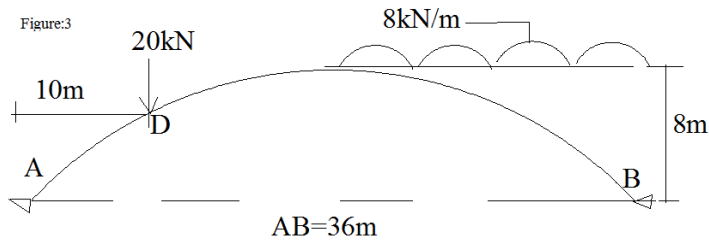   f) Determine support moments (A,B,C) by Kani's method   [4M]

PART -B

2 a) Determine the horizontal thrust and draw bending moment diagram, shear force diagram and find normal thrust at point 'D' of three hinged parabolic arch ACB as shown in figure:2   [10M]
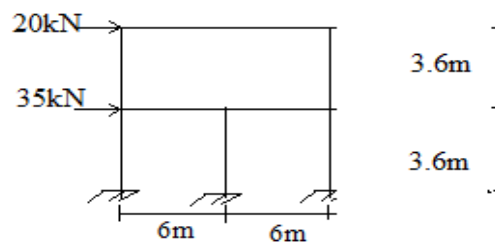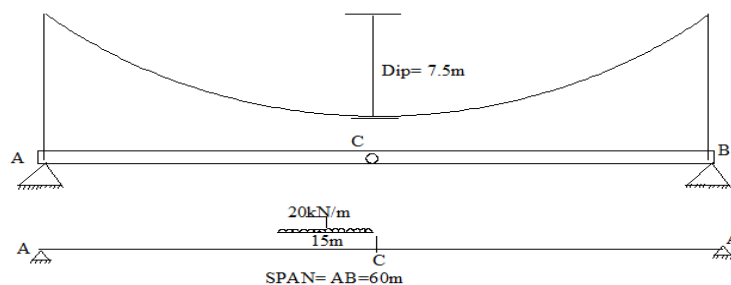
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b) Find the horizontal thrust of two hinged parabolic arch shown Figure :3. Also draw bending moment diagram .Assume the moment of Inertia at any section varies as the secant of slope at the section. Neglect rib shortening effect. **[6M]**

Figure:3

3 a) Write the limitations in Portal frame method of approximate analysis. **[4M]**

b) Analyze the two storey rigid moment resisting frame shown in figure:4 by Cantilever method. Draw the BMD and SFD. Assume uniform flexural rigidity of beams and columns. **[12M]**
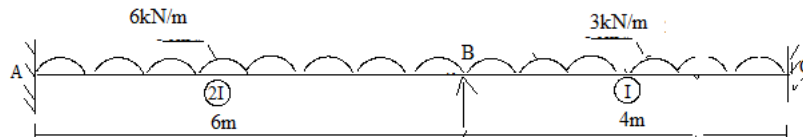

Figure:4

4 a) The cables of suspension bridge have span 60m and central dip 7.5m. Each cable stiffened by girder hinged at ends and also at middle C to maintain parabolic shape of cable. The girder subjected to dead load 10kN/m and live load 20kN/m of 15m long. Find the maximum tension in cable when leading edge of the live load is just at centre C of the girder. Draw SFD and BMD of girder. **[10M]**
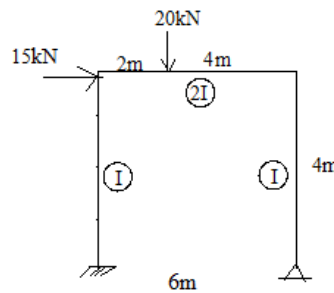

b) A two hinged stiffened girder AB of span 100 m and central dip 10m is subjected to two point loads 250 kN and 350 kN at 30m and 70m from left support respectively. Find Shear force and Bending moment at 35m from left end . **[6M]**

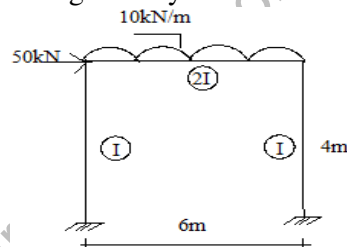**2 of 3**

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5 a) Analyze the continuous beam shown in figure, by moment distribution method. [8M]
Assume $E=2\times10^5$ MPa and $I=8\times10^6 mm^{4+}$ and draw Shear force and Bending moment diagram
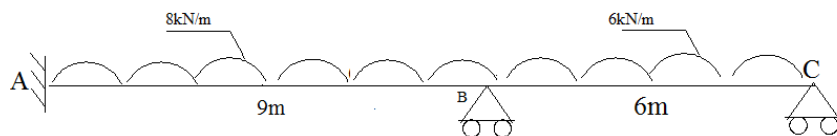

b) Analyze the portal frame as shown in figure by moment distribution method and [8M]
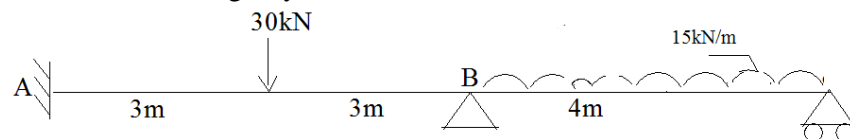draw Bending moment diagraM. (Assume $E=2\times10^5$ MPa and $I=6\times10^6 mm^4$)

6 a) Write the steps involved in Kani's method [4M]
b) Analyze the frame shown in figure:9 by Kani's method [12M]

7 a) Analyze the continuous beam shown in figure by Flexibility method . Assume [8M]
down ward settlement of support B is 30mm.Assume uniform flexural rigidity of
beam ABC , and $EI=14\times10^{11}$ N-mm^2

b) Analyze the continuous beam shown in figure by Stiffness method .Assume [8M]
uniform flexural rigidity of beam AB and BC= $EI=16\times10^{11}$ N-mm^2

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