Code: CE4T6

## II B.Tech - II Semester – Regular/Supplementary Examinations – April 2017

## STRUCTURAL ANALYSIS-I
### (CIVIL ENGINEERING)

Duration: 3 hours                                      Max. Marks: 70

## PART – A

Answer *all* the questions.    All questions carry equal marks

11 x 2 = 22

1.
   a) Explain the method of joints with one example.
   b) Explain Sinking of supports on fixed beam.
   c) Explain Normal thrust and radial shear.
   d) A Fixed beam subjected to a UDL throughout the span. Write the expressions for fixed end moments.
   e) Find the reaction at the propped end of the cantilever subjected to UVL.
   f) Explain static indeterminacy with one example.
   g) Explain the effect of temperature on three hinged arches.
   h) Define Influence line diagram and give its uses.
   i) Draw ILD for bending moment for maximum shear force at a section.
   j) Difference between the basic action of an arch and a suspension cable.

k) A three-hinged semicircular arch carries a point load of 100 kN at the crown. The radius of the arch is 4m. Find the horizontal reactions at the supports.

## PART – B

Answer any **THREE** questions.   All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2.  In a simply supported girder AB of span 20 m, determine the maximum bending moment and maximum shear force at a section 5m from A, due to the passage of a uniformly distributed load of intensity 20 kN/m, longer than the span.

16 M

3.  A three hinged parabolic arch hinged at the crown and springing has a horizontal span of 12m and a central rise of 2.5m. it carries a UDL of 30 kN/m run over the left hand half of the span. Calculate the resultant at the end hinges

16 M

4.  A propped cantilever AB of span 5.5m is fixed at A and propped at the free end B. It carries a uniformly distributed load of intensity w/unit length on the whole span and central point load. Determine the prop reaction at B and also draw the shear force and bending moment diagrams indicating salient values.

16 M

5. Analyze the Frame shown in figure using method of section and find the forces in member DF, EF and EG. 16 M
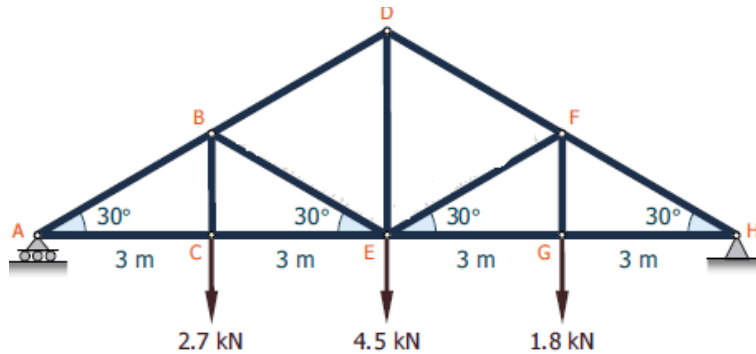


6. Analyze the continuous beam show in Figure by the three moment equation method if support B sinks by an amount of 10 mm. Draw the shear force and bending moment diagram. Take flexural rigidity EI=48000kNm$^2$ 16 M