PVP 14

Code: CE4T6

II B.Tech - II Semester – Regular / Supplementary Examinations
April 2019

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 M

1.

a) Explain a pin-jointed frame with a sketch.
b) Define Compatibility condition.
c) What do you understand by an influence line for bending moment?
d) Name the type of rolling load for which the absolute maximum bending moment occurs at the mid span of the beam.
e) What is an arch? Explain.
f) What is the advantage of arch action over the beam action?
g) 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.
h) What is the nature of forces in the cables.
i) Draw bending moment and shear force diagram for a fixed beam subjected to central concentrated load.

j) Explain the basic principle in the analysis of propped cantilevers.

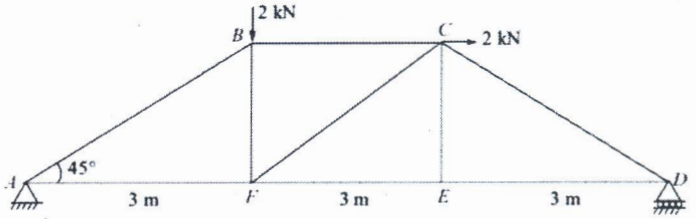
k) A two span continuous beam is subjected to udl over both the span. Both the span are equal. Draw the qualitative a picture of B.M diagram.

PART – B

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

3 x 16 = 48 M

2. Find the forces in the members of the truss shown in figure. The axial rigidities are same for all the members. 16 M



3. A system of four loads 80, 120, 160 and 120 kN crosses a simply supported beam of span 25m with the 120 kN load leading. The loads are equally spaced at 2m. Determine the values of the following using influence lines.
   i. Absolute Maximum bending moment and shear force.
   ii. Maximum bending moment at 10m from the left support.

16 M

4. A three hinged parabolic arch of span 30m and rise 5m carries a uniformly distributed load of 50 kN per meter on the whole span and a point load of 200 kN at a distance of 5m from the right end. Find and examine the horizontal thrust, resultant reaction, bending moment and normal thrust at a section 5m from the left end. 16 M

5. A fixed beam AB of span 6 m carries a uniformly distributed load of 25 kN/m over the left half and 30 kN/m over the right half and a concentrated load of 50 kN at the centre of the span. Calculate the fixed end moments. Assume uniform flexural rigidity. Draw BMD. 16 M

6. Analyse the continuous beam shown in Figure using Clapeyron's theorem of three moments. Draw SFD and BMD. 16 M