`15. a) A suspension bridge has a span 60 m with a 15 m wide runway. It is subjected to a load 35 kN/m including self-weight. The bridge is supported by a pair of cables having a central dip of 6 m. Find the cross sectional area of the cable necessary, if the maximum permissible stress in the cable material is not to exceed 650 MPa.

(OR)

b) A semi circular beam of radius 'R' in plan is subjected to UDL and simply supported by three columns spaced equally. Derive the expression for bending moment and torsional moment at x-be a point on the beam making an angle 'α' with axis passing through the base of the circle.

Reg. No. : | | | | | | | | | | | | |

01/11 AN

Question Paper Code : 50294

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Sixth Semester
Civil Engineering
CE 6602 – STRUCTURAL ANALYSIS – II
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. Compare determinate structure with indeterminate structure.
2. Write the general expression for the degree of static indeterminacy of the pin-jointed plane frames.
3. What is transformation matrix ?
4. Write down the element stiffness matrix as applied to 2D plane element.
5. What is the significance of shape function ?
6. What is constant strain triangle ?
7. Define plastic modulus.
8. Define shape factor and load factor.
9. Define tension coefficient.
10. Mention the components of forces acting on the beams curved in plan.

PART – B (5×16=80 Marks)

11. a) Compute the forces in the members of a pin jointed plane frame shown Fig. Q 11(a) by flexibility matrix method. AE is constant for all the members.

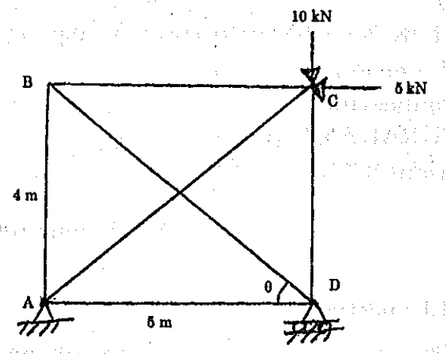

Fig. Q. 11 (a)

(OR)

b) Analyze the continuous beam ABC shown in Fig Q. 11 (b) by flexibility matrix method and sketch the bending moment diagram.

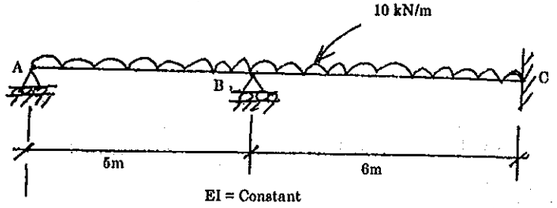

Fig. Q. 11 (b)

12. a) Analyze the continuous beam ABC shown in Fig. Q 12(a) by stiffness matrix method and also draw the shear force diagram.

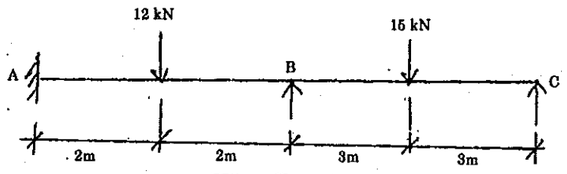

Fig. 12 (a) EI = Constant

(OR)

b) Analyze the portal frame ABCD shown in Fig. Q 12 (b) by stiffness matrix method.

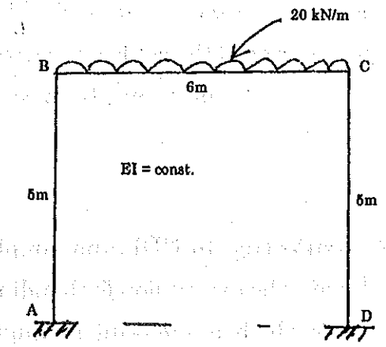

Fig. Q. 12 (b)

13. a) Draw the typical finite elements. Explain with a triangular model for displacement formulation.

(OR)

b) Explain in detail about the 4 nodded rectangular element to arrive the stiffness matrix.

14. a) Analyze a propped cantilever of length 'L' and subjected to a uniformly distributed load of w/m length for the entire span and also find the collapse load.

(OR)

b) A portal frame ABCD shown in Fig. Q. 14(b) has uniform section throughout. Determine the value of the plastic moment of the resistance in terms of the load. Wc at collapse.

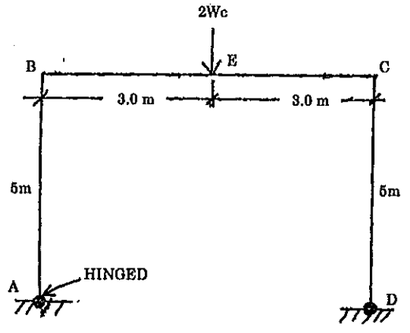

Fig. Q14 (b)