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

Question Paper Code : 80217

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

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. What is the degree of freedom?

2. Write the flexibility matrix for the simply supported beam having coordinates at the ends.

3. Define Kinematic redundancy.

4. What is the relation between flexibility and stiffness matrix?

5. What are the advantages of the Finite Element Analysis?

6. What are properties of shape function?

7. State upper bound theorem.

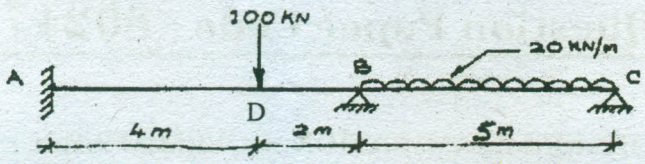
8. Derive the shape factor for the rectangular section of base '*b*' and depth '*d*'.

9. Give any two examples of beams curved in plan.

10. Write the difference between plane truss and space truss.

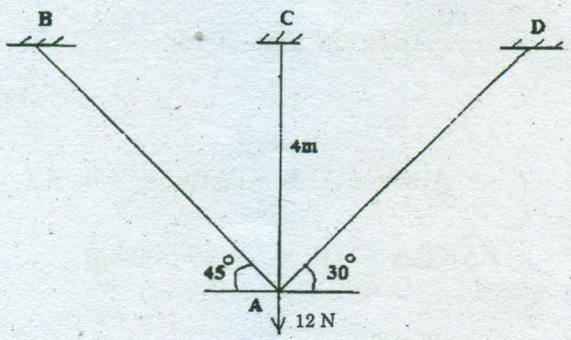
PART B — (5 × 16 = 80 marks)

11. (a) Analyse the given beam by flexibility matrix method.

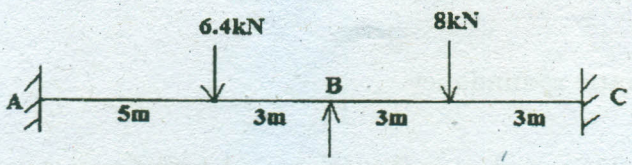


Or

(b) Analyse the given truss by flexibility matrix method. Take *AE* as constant.

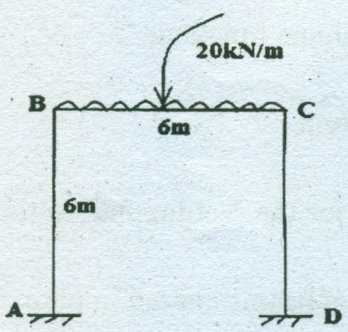


12. (a) Analyse the continuous beam shown in figure using stiffness matrix method.

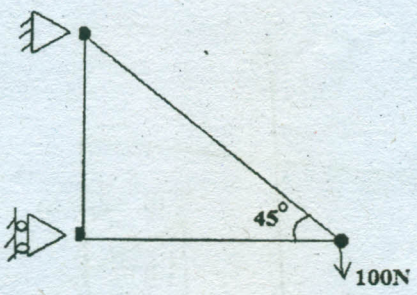


Or

(b) Analyse the given frame by stiffness matrix method.



13. (a) Derive the element stiffness matrix for the given truss and analyse the same using finite element method.



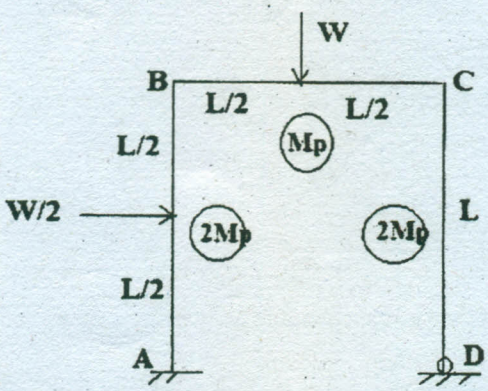
Or

(b) Construct the shape functions for 4 noded beam element.

14. (a) Determine the shape factor of a T-section beam of flange dimension 100 × 10 mm and web dimension 90 × 10 mm thick.

Or

(b) Find the collapse load for the frame shown in figure.



15. (a) A suspension bridge has a span 50 m with a 15 m wide runway. It is subjected to a load of 30 kN/m including self weight. The bridge is supported by a pair of cables having a central dip of 4 m. Find the cross sectional area of the cable necessary if the maximum permissible stress in the cable materials is not to exceed 600 MPa.

Or

(b) A force P is applied at end A of the strut OA which is supported by two wires AB and AC, as shown in figure. O, B, C are in the same plane and OA is normal to this plane. Find the forces in OA, AB and AC.