

Total No. of Printed Pages:04

**SUBJECT CODE NO:- E-169**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(CIVIL) Examination Nov/Dec 2017**  
**Theory of Structure-I**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

N.B Please check whether you have got the right question paper.

- N.B
- (i) Attempt any three questions from each section.
  - (ii) Assume suitable data, If any.
  - (iii) Figures to right indicate the maximum marks.
  - (iv) Non-programmable Calculator is allowed.

**Section - A**

Q.1 Draw the SFD & BMD for the fixed beam as shown in figure 1.

14

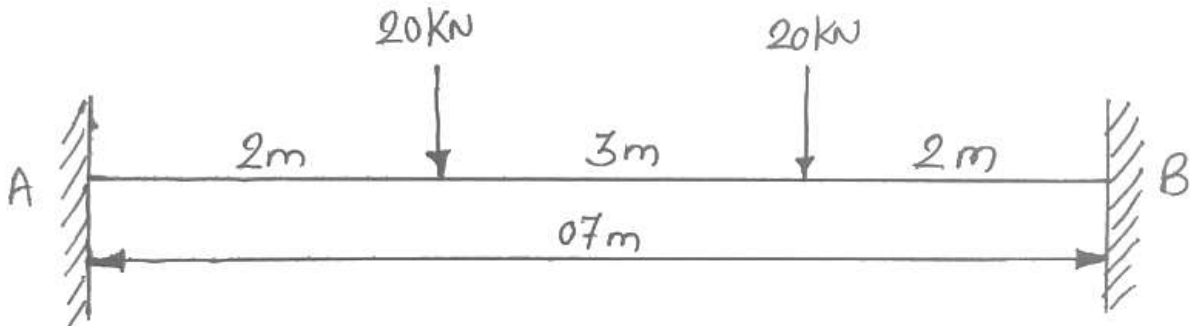


Figure No ①

- Q.2 A beam of length 6m is simply supported at its ends as shown in following figure 2. Determine the deflection of the beam at its midpoint and also the position of maximum deflection. Take  $E = 200 \times 10^3 \text{ N/mm}^2$  and  $I = 4.3 \times 10^8 \text{ mm}^4$ . 13

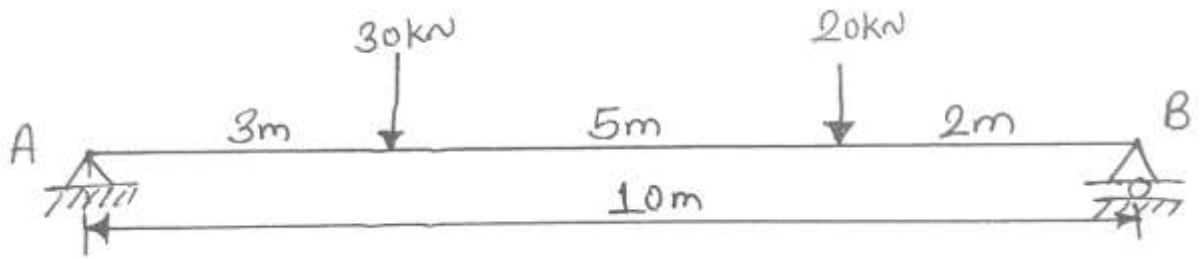


Figure No. (2)

- Q.3 Two rod AC & BC are hinged at C and carrying a load of 60 kN at C as shown in fig. 3. Determine vertical & horizontal deflection at joint C. area of AC =  $800 \text{ mm}^2$  & of BC =  $1000 \text{ mm}^2$   $E = 200 \text{ GPa}$ . 13

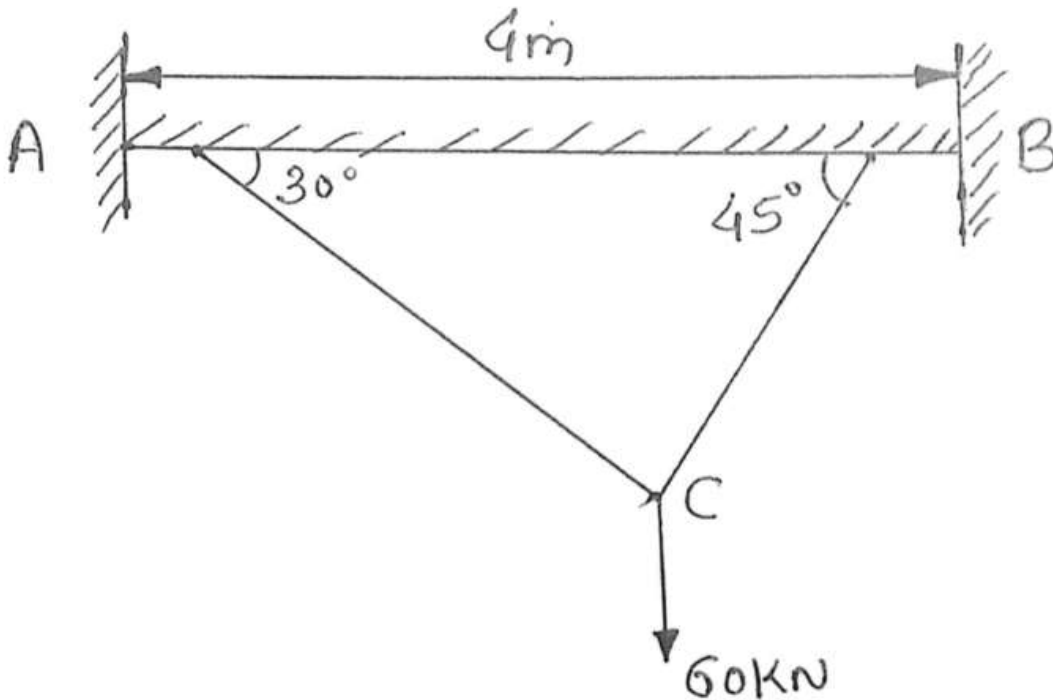


Figure No. (03)

- Q.4 (a) Explain different types of welded joints with sketches. 05
- (b) Find the size of the fillet weld required to connect the back d plate to the column as shown in fig: 04. The permissible stresses in weld is  $110 \text{ N/mm}^2$ . 08

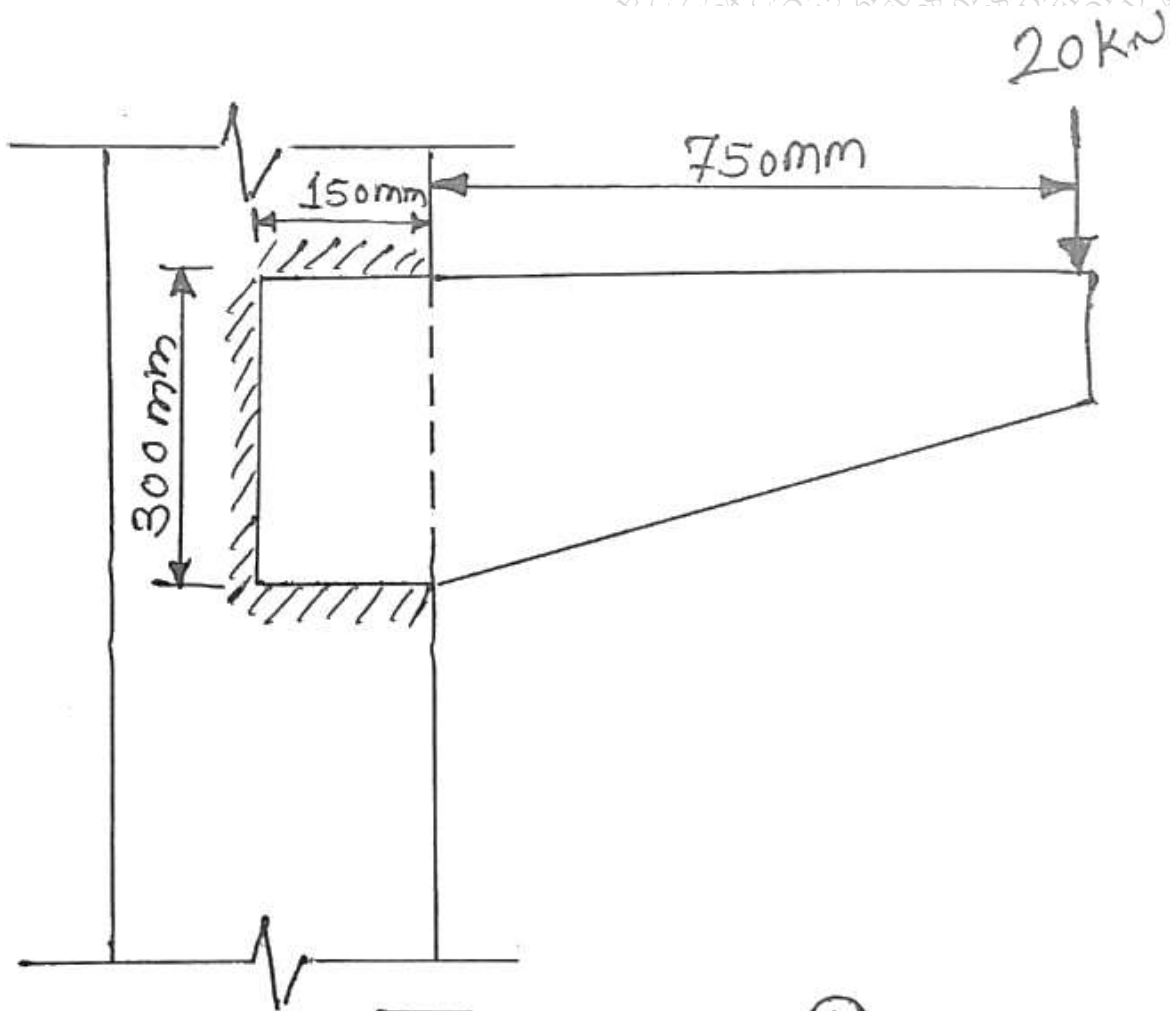


Figure No. (4)

- Q.5 Write a short notes on (Any Four)
- (a) Analysis & Design of Structures. 04
- (b) Castigliano's theorem. 03
- (c) Williot diagram 03
- (d) Advantages and disadvantages of riveted joints. 03
- (e) Difference in between fixed and simply supported beam 03

## SECTION – B

- Q.6 Draw BMD of fixed beam as shown in figure 1 by using three moment theorem. 14
- Q.7 A train of a wheel load as shown in fig. 5 crosses a simply supported beam of span 25m from left to right with point loading. Using influence line diagram, determine the maximum bending moment under central load. 13

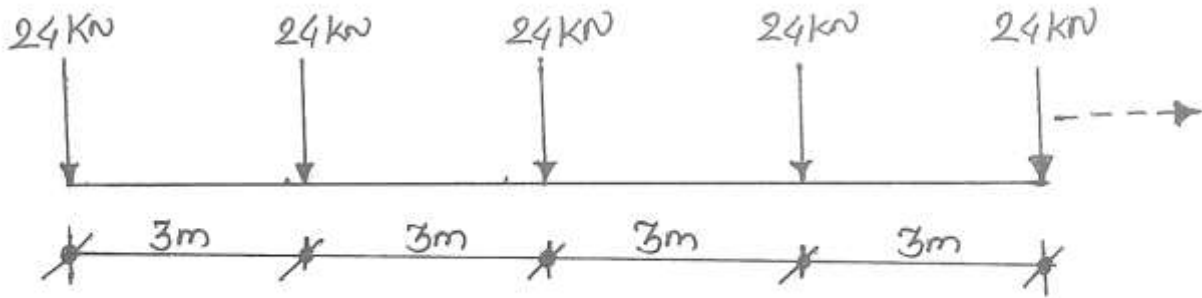


Figure No (5)

- Q.8 A three hinged parabolic arch of span 24m and central rise of 5m carries UDL of 20kN/m over the left half span and a point load of 125 kN at 16m from left support. Find normal thrust, radial shear, & BM at distance of 6m from left support. 13
- Q.9 For a cable suspension bridge with span 300m & central dip of 30m, which is stiffened by three hinged stiffening girder. The girder carries two point load of 50 kN and 75kN at distance of 70m & 250m from left support. Draw the bending moment diagram. 13
- Q.10 Write a short notes on (any Four)
- |  |  |    |
|--|--|----|
|  | (a) Normal thrust and Radial shear.                    | 04 |
|  | (b) Difference between Straight beam and arch beam     | 03 |
|  | (c) Difference between fixed beam and continuous beam. | 03 |
|  | (d) Construction feature of suspension bridge.         | 03 |
|  | (e) Influence line diagram.                            | 03 |