

Total No. of Printed Pages:5

SUBJECT CODE NO: H-273
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil)
Theory of Structure-I
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q.no 1 and Q.no 6 are compulsory.
 - ii. Attempt any two questions from remaining question from each section.
 - iii. Assume suitable data wherever necessary.

Section A

- Q.1 Attempt any five 10
1. State castiglione's theorem.
 2. What are the different types of welded connections?
 3. Write down fixed end moment for a fixed beam with a point load at the center of the span.
 4. Define determinate and indeterminate structures.
 5. Define rivet value and pitch.
 6. What are the disadvantages of welded connection?
 7. Give the strength of rivet in bearing and tearing.
- Q.2 a) Find the size of fillet weld required to connect the backed plate to the column as shown in 07
below fig.1 the permissible stresses in weld is 110 N/mm^2 .

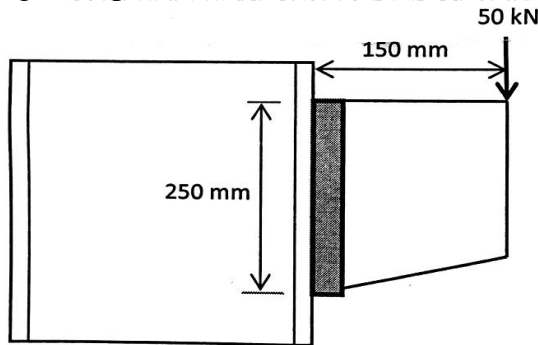


Fig.(1)

- b) Find the maximum resistance offered by any rivet for the riveted connection as shown in fig.2 08

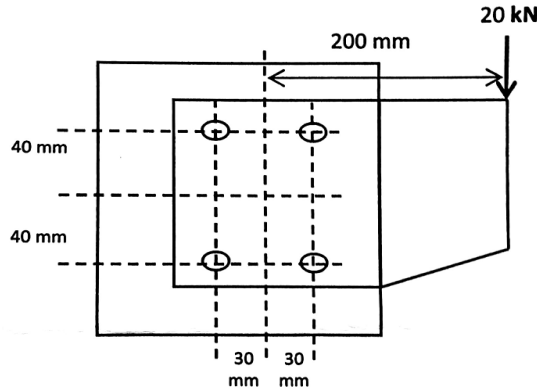


Fig. (2)

- Q.3 A beam of length 7m is simply supported at its ends as shown in fig.3. Determine the position and magnitude of the maximum deflection. Using Macaulay's method. 15
 Take $E = 200 \text{ GPa}$ and $I = 8500 \times 10^4 \text{ mm}^4$.

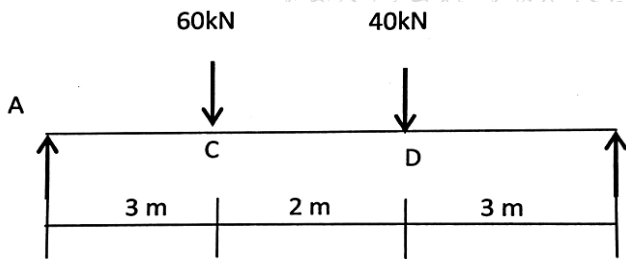


Fig. 3

- Q.4 Find vertical and horizontal deflection of joint C of the truss shown in fig 4. The area of inclined tie is 2000 mm^2 , while the area of horizontal member is 1600 mm^2 . Take $E = 200 \text{ kN/mm}^2$. 15

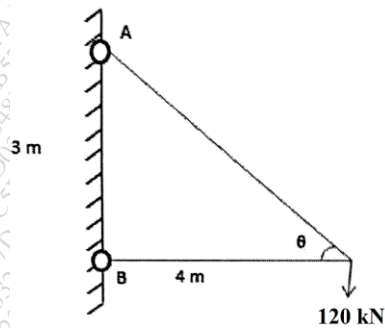


Fig. 4

Q.5 Determine fixed end moment for the loaded beam as shown in fig.5 also draw BMD and SFD for beam. 15

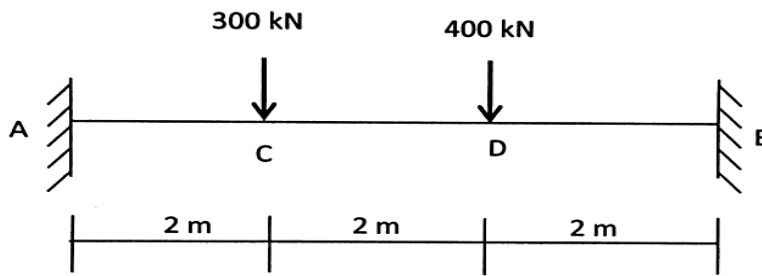


Fig.5

Section B

Q.6 Attempt any five 10

1. Define radial shear and normal thrust.
2. What is clapeyron's theorem for three moments?
3. What are the stiffening girders?
4. What are the uses of influence lines?
5. A three hinged parabolic arch of span 30m and central rise of 5m is loaded with point load of 12kN at 12m from left end. Calculate horizontal and normal thrust of the arch.
6. What are rolling loads?
7. What are the advantages of three hinged arches?

Q.7 Analyse the continuous beam as shown in figure 6. Find the moments along the beam and support reactions. Also draw BMD. 15

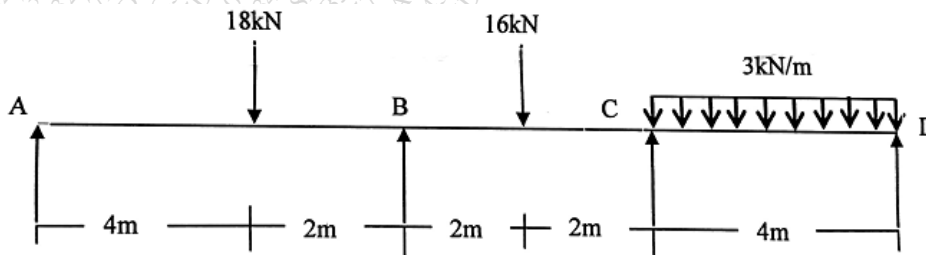


Fig.6

- Q.8 A train of 5 wheel loads as shown in figure 7. Crosses a simply supported beam of span 24.5m. Calculate maximum positive and negative shear force values at center of span and absolute maximum B.M. anywhere in span. 15

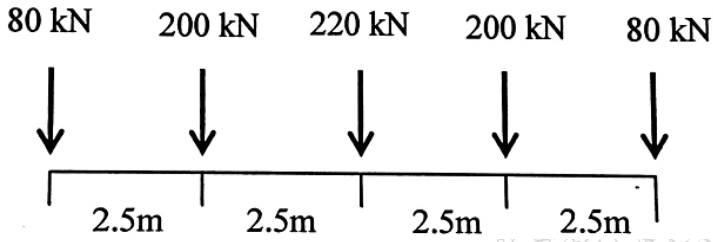


Fig.7

- Q.9 Three hinged arch of span 30m and rise 6m carries a UDL of intensity 40kN/m over the left half span. Determine support reactions, horizontal thrust, normal thrust and radial shear force at left quarter. 15

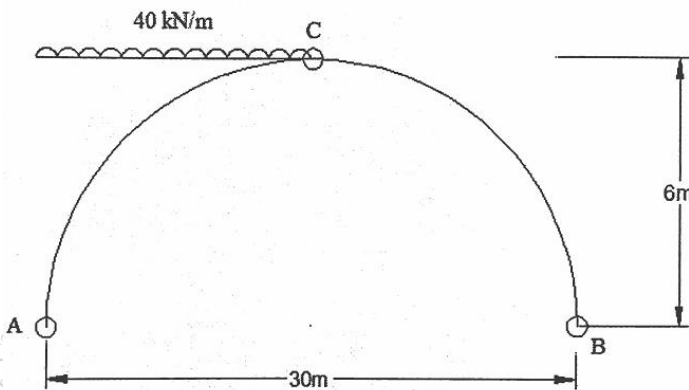


Fig.8

- Q.10 A cable of a suspension bridge has a span of 500m over supports, which are at same level and sag of 40m vertically from line of support to lowest point on cable at mid – span. The three hinged stiffening girders carries 3 loads of 350kN, 450kN and 500kN at 60m, 140m and 300m respectively from left end support. Draw bending moment diagram for the girder. 15

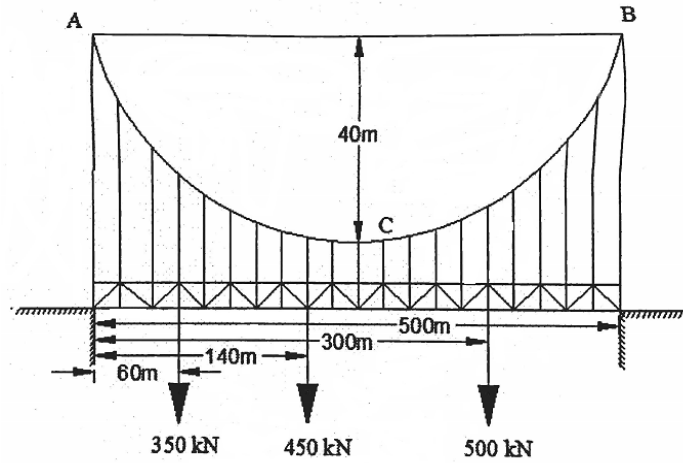


Fig.9