

SUBJECT CODE NO:- P-497
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CIVIL) Examination MAY/JUNE-2016
Theory of Structure-I
(Revised)

[Time: Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B

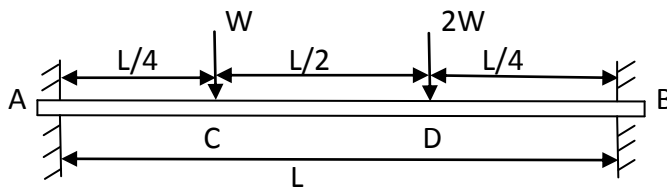
- i) Question No.1 and Question No.6 are compulsory.
- ii) Attempt any two questions from the remaining four questions of each section.
- iii) Assume suitable data, if necessary.

Section A

Q.1 Attempt any five of the following.

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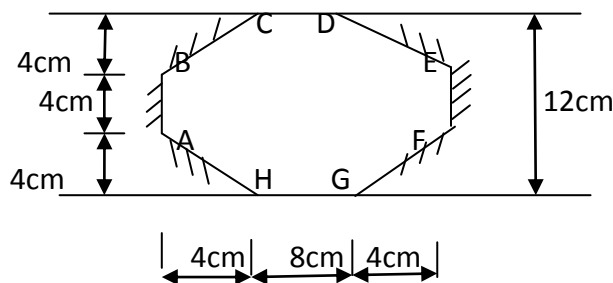
- a) Give the mathematical expression for safe tensile load per pitch length.
- b) What are the disadvantages of filler welds?
- c) Draw plan and elevation for diamond riveted joints.
- d) What is mean by moment area method?
- e) What is criteria for constructing conjugated beam?
- f) Draw B. M. D. for following fig.



- g) What is mean by sinking of supports?

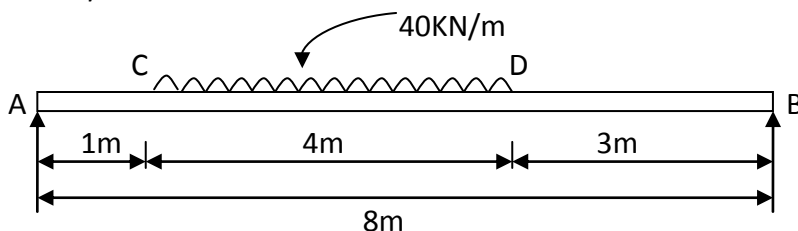
Q.2 A welded Lap joint is provided to connect two tie bar $12\text{cm} \times 1\text{cm}$ as show in fig. The working stress in the bar is 150 N/mm^2 . Investigate the design, if the size of the fillet is 8mm . The safe stress for the end filler weld and diagonal filler weld may be taken as 102.5 N/mm^2 and 80 N/mm^2 respectively.

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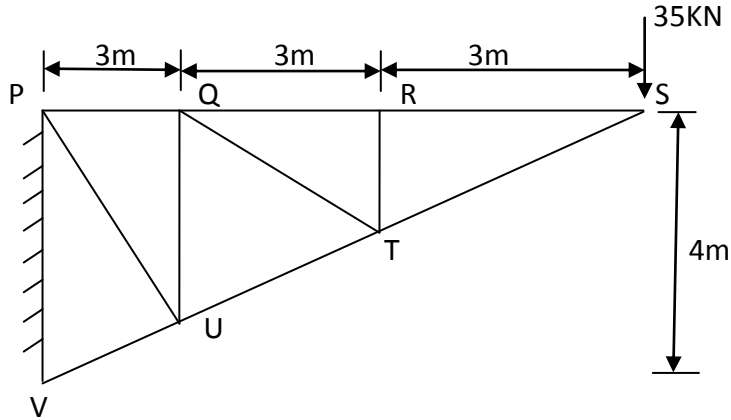
Q.3 A beam of length 8m is simply supported at its ends. It carries a U.D.L of 40 kN/m as shown in following fig. Determine the deflection of the beam at its midpoint and also the position of maximum deflection. Take $E = 2 \times 10^5\text{ N/mm}^2$ and $I = 4.3 \times 10^8\text{ mm}^4$.

15



Q.4 Find the vertical and horizontal deflection of joint D of the truss as shown in following fig. 15

If
 Area of top chord = 1200 mm^2
 Area of bottom chord = 1750 mm^2
 Area of remaining member = 600 mm^2
 $E = 200 \text{ KN/mm}^2$



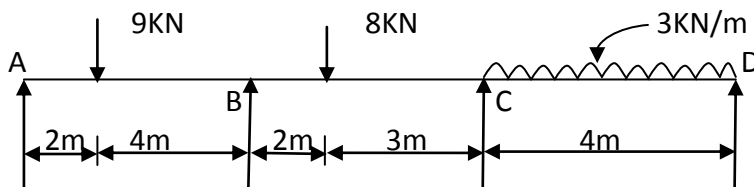
Q.5 A. Give advantages and disadvantages of fixed beam. 07
 B. A fixed beam AB of length 3m is having M.I. $I=3 \times 10^6 \text{ mm}^4$. The support B sinks down by 3mm. 08
 If $E=2 \times 10^5 \text{ N/mm}^2$. Find the fixing moments with neat sketch.

Section B

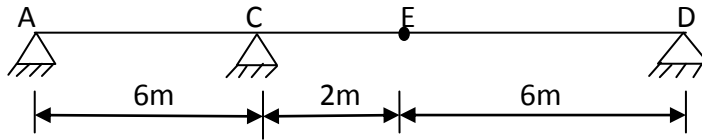
Q.6 Attempt any five. 10

- How will you apply Clapeyron's theorem of three moments to a continuous beam with simply supported ends.
- What are the advantages of continuous beam?
- Draw neat sketch for sinking of supports.
- What is mean by anchor cable and give its uses.
- A three hinged parabolic arch of span 31m and central rise 6m is loaded with point load of 12 KN at 12m from left end. Calculate horizontal and normal thrust of the arch.
- Give the types of stiffening girders.
- What is mean by rolling loads?
- What are the advantages of three hinged arched?

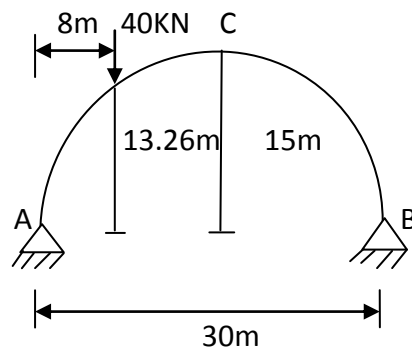
Q.7 A continuous beam ABCD, simply supported at A, B, C and D is loaded as shown in following fig. Find the moments over the beam and draw B.M and S.F. diagram. 15



- Q.8 A compound beam as shown in following fig. Draw I.L.D for reactions at B.C. and moments at C. Find max. value of above element if a load of 70 kN/m runs over the beam and may occupy any position. 15



- Q.9 A three hinged semicircular arch at uniform cross section is loaded as shown in following fig. Calculate the location and magnitude of maximum bending moment in the arch. 15



- Q.10 A cable of uniform cross section is used to support the loading as shown in following fig. determine the reactions at two supports and the unknown say Y_c . 15

