Examination Nov/Dec 2019

H-273

Total No. of Printed Pages:4

SUBJECT CODE NO:- H-273
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Civil) (Sem-II)
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 from section A and Q.No.6 from section B are compulsory.
ii) Solve any two questions from remaining from section A and B each.
iii) Use of non-programmable calculator is permitted.
iv) Assume suitable additional data if required and state it clearly.

Section A

Q.1   Attempt any five of the below: 10
a) Draw and explain different types of riveted joints.
b) Draw and explain effective throat thickness in case of Fillet welds.
c) State different geometric methods for analysis of slope and deflection.
d) Draw conjugate beam of a cantilever beam fixed at left end and free at right end subjected to udl 'w' over entire span of 'l'.
e) Draw deflected shape of simply supported beam over span 'l' subjected to point load 'w' at mid span. Show the points where slope and deflection are maximum.
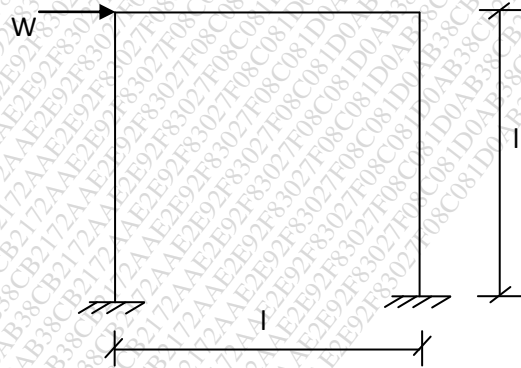f) Draw deflected shape of the structure as shown in figure -1

Figure 1

H-273

Q.2 Determine the maximum load which can be applied to the fillet welds as shown in figure 2.   15
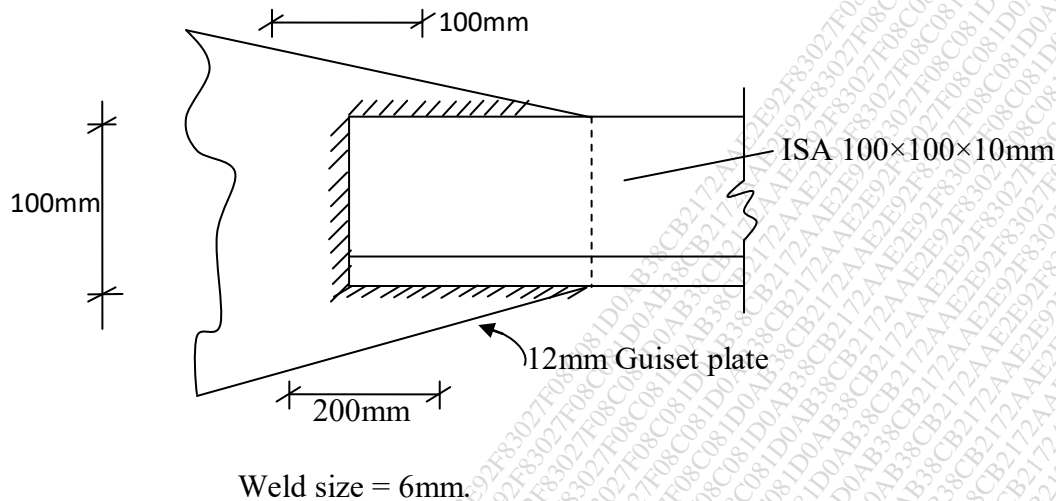Allowable shear stress in $108N/mm^2$.

100mm

100mm

ISA 100×100×10mm

12mm Guiset plate

200mm

Weld size = 6mm.

Figure 2

Q.3 Analyze the beam as shown in figure 3 and draw BMD.   15
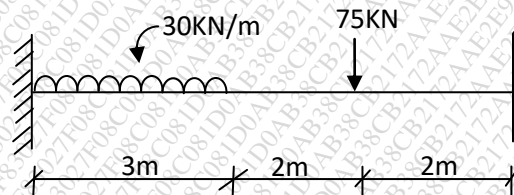
30KN/m   75KN

3m   2m   2m

Figure 3

Q.4 Analyse the beam as shown in fig.4 method using Macaulay's methodand find maximum slope   15
and deflection. E = 200GPa, $I = 80×10^{-6}$ m^4.

50KN   50KN

A   B

2m   2m   2m
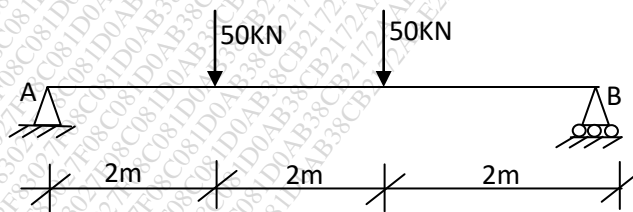
Figure 4

Q.5 Analyse the beam as shown in figure 05. Using conjugate beam method and find maximum slope 15 and deflection.
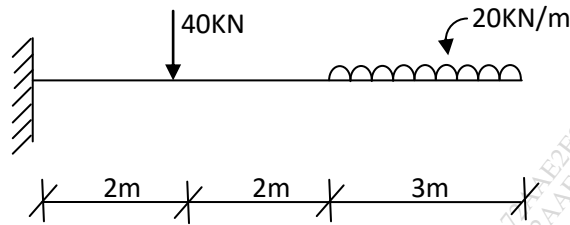

Figure 5

Section B

Q.6 Solve any five questions of the following: 10
   a) Write the three moment equation and explain the terms in the equation.
   b) Draw influence line diagram for vertical reaction due to unit rolling load span of beam is 'l' fixed at A and free at B.
   c) Define radial shear and normal thrust at a section in three hinged arch.
   d) Define influence line.
   e) State the equation to calculate equivalent udl in three hinged stiffening girder subjected to single rolling point load.
   f) A three hinged parabolic arch has 16m span and 4m central rise. It carries a concentrated load of 150 KN at 4m from left support. Evaluate horizontal reactions.

Q.7 Analyse the beam shown in fig.6 using Clapeyron's theorem and find support moments and 15 reactions. Hence draw SFD and BMD. EI = constant
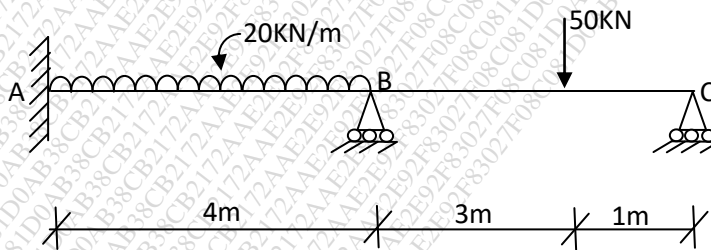

Figure 6

Q.8 The load system shown in figure 7 crosses a girder 24m span. Find the maximum shear force and 15 bending moment at a section 10m from the left support.
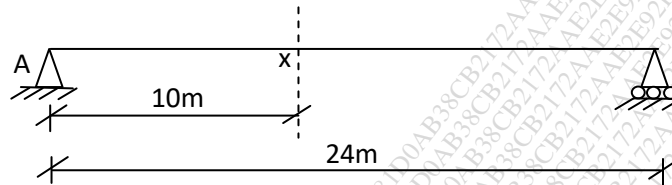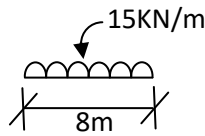
15KN/m

8m

A   x   B

10m

24m

Figure 7

Q.9 A three hinged stiffening girder of a suspension bridge has a span of 70m. the dip of the 15 supporting cable is 7m. it carries two point loads 100kN and 120 kN at 15m and 30m from the left end. Find the shear force and bending moment on the girder at 40m from the left end.

Q.10 A three hinged segmental arch has a span of 60m and rise of 6m. A150KN load is acting at a 15 point of 15m measured horizontally from the right hand support – find horizontal thrust, moment, normal thrust and radial shear at a section 15m from the left support.