Examination Nov/Dec 2019

H-293

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-293
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil) (Sem-I)
Design of Structure - I (Steel)
[Old]

[Time: Three Hours]   **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
    i.   Question No. 1 from section A and Q. No. 6 from section B are compulsory. Attempt any two questions of each Section from the remaining.
    ii.   Assume suitable data it required & mention it clearly.
    iii.   Use of nonprogrammable calculators, IS 800-2007 is permitted

Section A

Q.1   Attempt any five.   10
    a) Enlist types of steel structure.
    b) What is classification of structural members
    c) What is net tensile stress area
    d) What is gauge and end distance
    e) What is shear lag
    f) What is slenderness ratio
    g) What is failure by flexural buckling, local buckling, flexural tortional buckling.

Q.2   Design a joint B of a roof truss as shown in figure. The members are connected with 16 mm 15
diameter bolts of grade 4.6 and steel having $Fu = 410 \ N/mm^2$ to the gusset plate 10 mm thick.
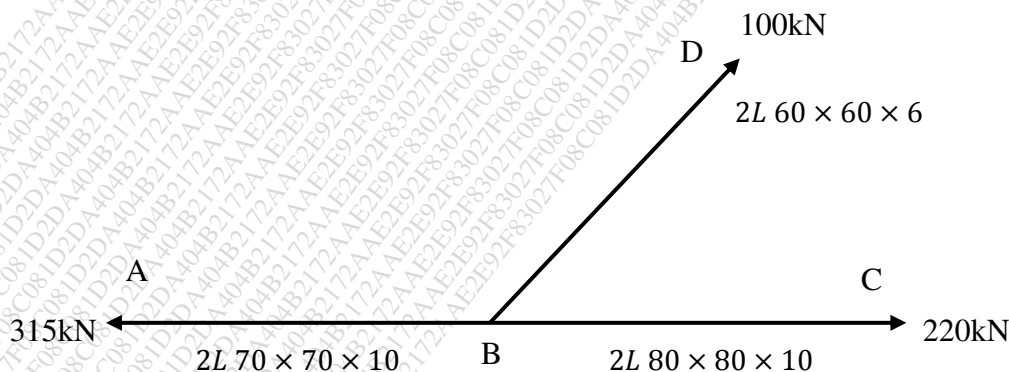
Q.3   An equal angle of a truss is connected to the gusset plate, it carries ultimate tensile of 128 KN. 15
Design the section using bolt connection, Dia of bolt is 10 mm and fy=250 N/mm^2 and Fe 410 for plate.

Q.4   Design a continuous strut to carry a service load of 175 kN. The effective length of strut is 5.8 15
m.

1

H-293

Q.5   A column section ISHB 300@576.8 N/m support a total load of 900 kN. Design a suitable   15

gusset plate base.

Section B

Q.6   Attempt any five.   10
         a) Explain failure modes of beams.
         b) What is effective span for beam
         c) What is roof truss
         d) How is the spacing of purlin fixed
         e) What is bearing stiffeners
         f) Enlist different design load acting on gantry girder

Q.7   A simply supported steel joist of 5 m effective span laterally supported through out. It carries a 15
         total udl of 55 kN/m (Inclusive of self-weight). Determine an appropriate section using steel
         grade of Fe 410.

Q.8   Design a gantry girder to the following particulars: 15
         i.   Capacity of the crane =200 kN
         ii.   Weight of the crane girder excluding crab = 180 kN
         iii.   Weight of crab with motor, hook, etc =35 kN
         iv.   Minimum clearance between center of gantry girder to crane hook =1.20 m
         v.   Distance between gantry girder rails = 15 m
         vi.   Spacing of columns (effective span of gantry girder) =7.50 m
         vii.   Wheel base = 3 m
                 Use steel yield stress 250N/mm^2

Q.9   Design the plate girder for an effective span of 50 m and carrying a udl of 55 KN/m and two   15
         concentrated load of 180 KN each acting at 10 m from both ends. The girder is simply
         supported at ends against lateral buckling throughout span.
         Take Fy=250 N/mm^2.

Q.10   Write short notes on
         a) Explain beams connection   05
         b) What are various section of plate girder   05
         c) Explain procedure of gantry girder   05

2

H-293