

7005818

7E7062	Roll No. _____	Total No. of Pages : 4
	7E7062	
B.Tech VII Semester (Main/Back) Examination, November - 2019 Civil Engg. 7CE2A Design of Steel Structures - I		

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

- 1. I.S. 800-2007
- 2. Steel Tables

Unit - I

- 1. a) Discuss briefly types of steels used in structures. (4)
- b) How a cross section is classified as per the code? Briefly state their characteristics. (4)
- c) Using kinematical method or otherwise compute the collapse load for the beam shown in fig. 1. (8)

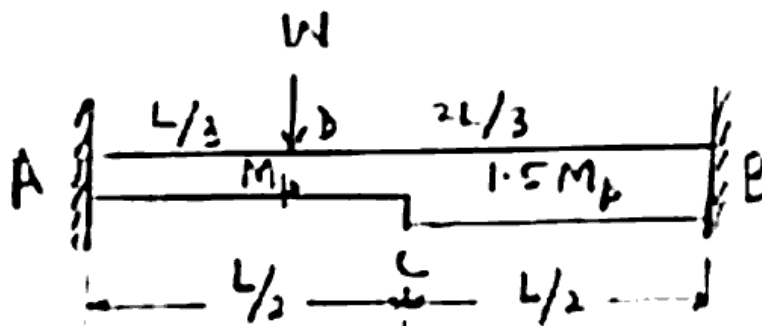
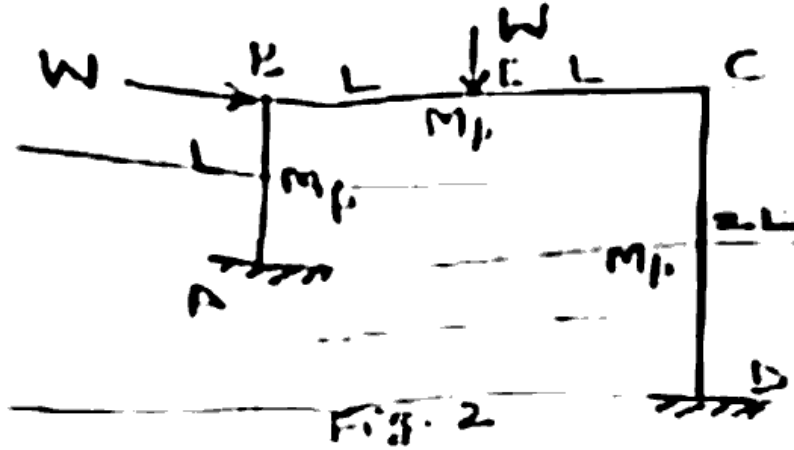


Fig. - 1

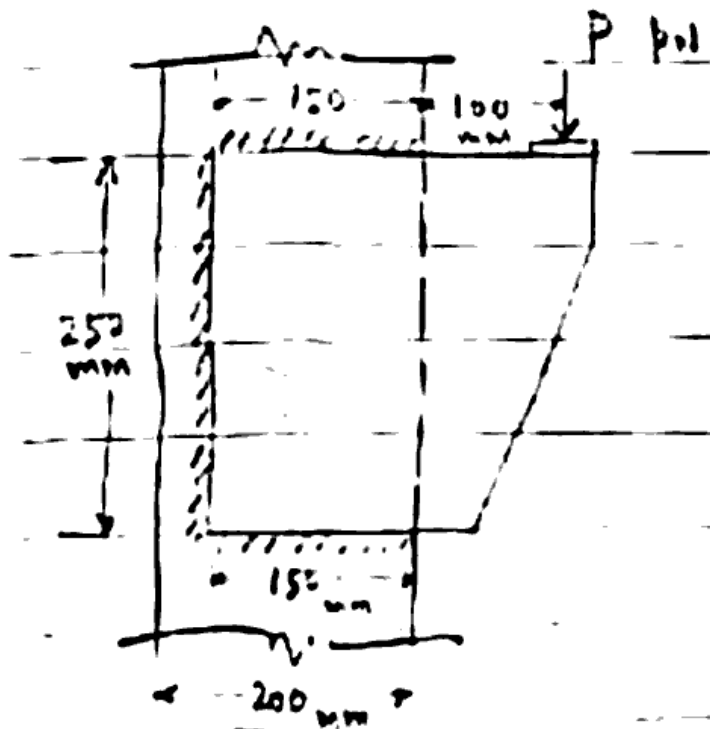
OR

1. a) Calculate the shape factor for a diamond section. (4)
- b) A portal frame is loaded as shown in Fig. 2. Compute the true value of collapse load. (12)



Unit - II

2. a) Calculate the strength of a 20 mm diameter bolt of grade 4.6 to be used in a lap joint. The main plates are 12 mm thick each. (4)
- b) Fig.3 shows an eccentrically loaded fillet weld connection. Calculate the maximum value of factored load P to be applied as shown so that the connection is safe. The weld sized throughout is 6 mm. (12)



OR

2. a) Briefly explain 'prying action' in bolted connection. (4)
- b) Design a single angle section for a tension member to carry a factored axial load of 200 kN. Use unequal angle and 18 mm. bolts. (12)

Unit - III

3. a) What are buckling classes and how do they affect compressive carrying capacity of columns? (6)
- b) An angle section ISA 100-75-10 has been used in a steel roof truss as a strut. Find the maximum factored axial load which it can take safely. The length between centres of connections may be taken as 1.5 m. (10)

OR

3. Design a built up column taking two channels placed face to face, to carry an axial compressive load of 1300 kN. the height of the column is 3.5 m and is hinged at both ends. Also design a single system of lacings for the column. (16)

Unit - IV

4. a) What is 'lateral torsional buckling' with reference to a beam design. (4)
- b) A beam of span 4.0 m is simply supported at the ends. It carries a super imposed load of 20 kN/m over the whole length. Design a suitable I section for the beam if it is laterally supported. (12)

OR

4. a) Differentiate between "web buckling" and "web crippling" in a beam design. (6)
- b) A simply supported beam of span 5 m consists of a section ISI. II 450 @ 65.26 kg/m. The compression flange of the beam is laterally unrestrained. Determine the design moment of the beam. Also calculate maximum u.d.l. which it can carry safely. (10)

Unit - V

5. a) Write a brief note on slab base for a column. (4)
- b) A column ISHB 250 @ 54.72 kg/m has a length 4.0 m. It is subjected to an axial load of 800 kN and a moment of 30 kN · m about x - x axis. Taking $K = 0.85$, determine whether the section is safe? (12)

OR

5. Design a two tier grillage foundation for a column consisting of section ISIB 400 @ 82.16 kg/m, and carrying an axial load of 1600 kN. The column rests symmetrically on a square base plate 700 mm · 700 mm. Take bearing capacity of the soil as 150 kN/m². (16)



<http://www.rtuonline.com>
Whatsapp @ 9300930012
Your old paper & get 10/-
पुराने पेपर्स भेजे और 10 रुपये पायें,
Paytm or Google Pay से