

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SECOND SEMESTER M.TECH. DEGREE EXAMINATION, APRIL 2018

CIVIL ENGINEERING

Computer Aided Structural Engineering

10CE6102: ADVANCED METAL STRUCTURES

Use of IS 800, IS 801, IS 811 and Steel Tables are permitted

Max. Marks: 60

Duration: 3 Hrs

Part A (Modules I - II)

(Answer any two questions: 2 x 9 = 18 Marks)

1. a. Explain the Principle of plastic analysis. 9 Marks
 b. Write a note on classification of sections. 9 Marks

2. Analyse the unsymmetrical portal frame shown in Fig 1 and determine the Plastic moment.

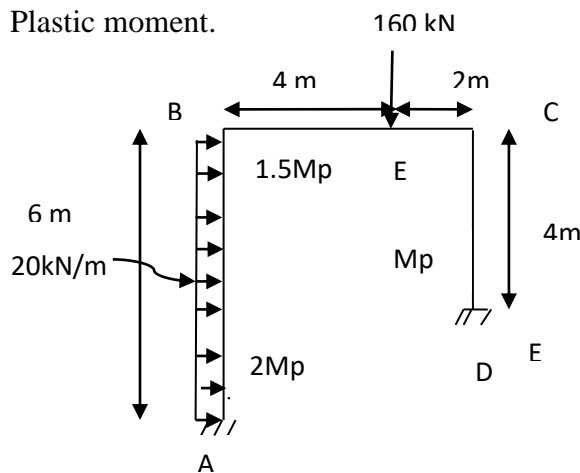


Fig 1

9 Marks

3. Explain the concept of Load Resistance Factor Method of Design in detail. 9 Marks

Part B (Modules III - IV)

(Answer any two questions: 2 x 9 = 18 Marks)

4. Design a seat angle connection for the factored beam end reaction of 140 kN. The beam is ISMB 300 and column is ISHB 250 using bolt M20 bolts. Steel is of grade FE 410 and bolts are of Grade 4.6. 9 Marks

5. a. Explain the design procedure for a stiffened seat angle bolted connection 5 Marks
 b. Explain the difference in design of Bracket Connection Type I and Type I 4 Marks

6. a. Write a note on the welds in tubular connection. 4 Marks
 b. Write in detail about the classification of connections based on their rigidity with suitable examples. 5 Marks

Part C (Modules V & VI)

(Answer any two questions : 2 x 12 = 24 Marks)

7. a. Explain the concept of effective width in light gauge steel sections. 4 Marks
 b. Compute the allowable load for the following data of the light gauge column of cross section as in Fig 2, of length 3.2m, pinned at both ends. Assume Yield Stress $f_y=235\text{N/mm}^2$. 8 Marks

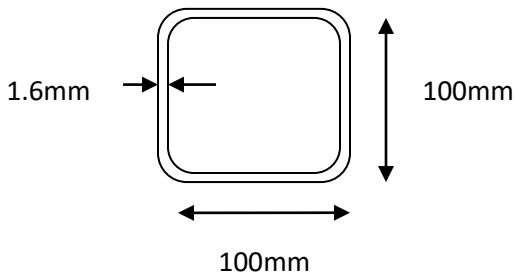


Fig 2

8. a. Explain in detail about Virendeel girders. 6 marks
 b. Write a note on knee braces. 6 marks
9. Write a Portal Frames in industrial buildings. 8 Marks
 b. State the advantages of aluminium over steel for structural applications. 4Marks