

EXAM SLOT : A

06CE7111

Reg. No _____

Name _____

A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY

M.TECH DEGREE EXAMINATION, DECEMBER 2016

THIRD SEMESTER

Branch: Civil Engineering

ADVANCED METAL STRUCTURES

Time: 3 Hours

Max. Marks: 60

Any data, if required may be suitably assumed and clearly indicated.

Use of relevant codes are permitted

PART A

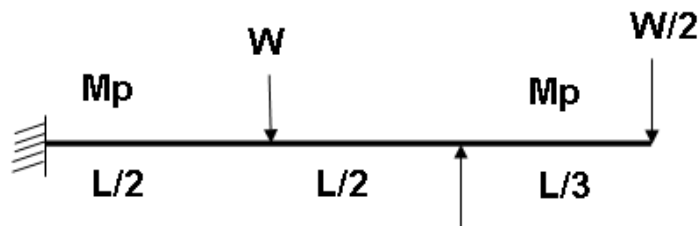
Answer ALL questions

1.
 - a. Write short note on theorems of plastic collapse
 - b. Explain general requirements of plastic design
2.
 - a. Describe classification of joints according to rigidity
 - b. Discuss the advantages of welding over bolting
3. Explain with neat sketch layout of roof truss
4. Discuss the advantages of steel concrete composite design.

(4 x 5 marks =20 marks)

PART B

5.
 - a. Determine the plastic moment capacity and shape factor of an ISMB400 section. Assume $f_y=250$ MPa
 - b. Find the collapse load of the beam shown in figure



OR

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- 6.
- Determine the collapse load of a propped cantilever beam carrying uniformly distributed load
 - Determine the shape factor for a triangular section of base 'b' and height 'h'

- 7.
- Explain the behaviour of bolted joints
 - A beam ISMB300 transmits an end shear of 120kN and a moment of 20kNm to the flange of a column ISHB200@577N/m. Design suitable end connection. Use M20 bolts

OR

- 8.
- Explain the design procedure for a stiffened welded seat connection
 - An ISMB 400 transfers an end reaction of 160kN to the flange of an ISHB 300 @ 577N/m. Design an unstiffened welded seat connection.
9. Design a channel section purlin for a truss of span 20m and height 5 m spaced at 4.5 m. $LL=0.4kNm^2$ wind load= $1.2kN/m^2$.Spacing of purlin=1.5m

OR

- 10.
- Explain the design procedure for an angular roof truss.
 - Explain the advantages of knee braced trusses
11. Explain in detail behaviour of composite sections under positive and negative bending

OR

12. Explain various types of shear connectors and degree of shear connections.

(4 x 10 marks =40 marks)