Hall Ticket No | | | | | | | | | | | Question Paper Code: ACE012

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech VI Semester End Examinations (Regular), November – 2020

Regulation: IARE–R16

DESIGN OF STEEL STRUCTURES AND DRAWING

Time: 2 Hours **(CE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Write the advantages and disadvantages of welded connections. **[5M]**
2. What is erection loads and erection tolerance? **[5M]**
3. Why does buckling of web occur in beams? **[5M]**
4. Write the assumptions of connections in the design of pinned truss joint system. **[5M]**
5. Explain Tension field action and associated I.S code provisions in the design of plate girders. **[5M]**
6. Explain the possible modes of failures in an axially loaded column. **[5M]**
7. What is slenderness ratio? State the relation between elastic critical stress and slenderness ratio. **[5M]**
8. Explain the design procedure for unstiffened seat connection. **[5M]**

PART – B

9. Write the classification of structural steel sections and its suitability based on elastic and plastic behaviour. **[10M]**
10. Two flats (Fe410 grade steel), each 210mmX8mm, are to be jointed 20mm diameter, 4.6 grade bolts, to form a lap joint. The joint is supported to transfer a factored load of 250kN. Design the joint and determine the suitable pitch for the bolts. **[10M]**
11. Design a slab base for a column ISHB 300 @ 630 N/m to carry an axial factored load of 1250 kN. Assume Fe410 grade steel and M20 grade concrete is used. Provide welded connection between column and base plate. **[10M]**
12. Why is it better to choose plastic or compact sections for columns? **[10M]**
13. Write the design steps of Purlin of roof truss and mention the I.S code provisions for design of members. **[10M]**
14. Determine the design bending strength of ISLB 350 @ 486 N/m considering the beam to be laterally supported. The design shear force V is less than the design shear strength. The unsupported lengthy of the beam is 3.0 M assume steel of grade Fe410. **[10M]**
15. Neatly sketch and show the un-stiffened and stiffened seat angle connection of beam column joint using bolted connection. **[10M]**
16. In a framed connection an ISLB 350 485.6 N/m transmits an end reaction of 220 KN and moment of 22 KN/m. under factored loads to a column ISHB 300 576.8 N/m Design the connection. **[10M]**
17. Neatly sketch and locate the arrangement of various structural elements in stiffened plate girder with thin web. Also explain the functionality of the elements. **[10M]**
18. A plate girder with Fe415 steel plates is having 12 X 1500 mm web pate and 56X500mm flange plates. Determine the design flexural strength, if the compression flange is supported laterally. **[10M]**

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