Code No: 09A60101

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B. Tech III Year II Semester Examinations, November/December-2013
DESIGN OF STEEL STRUCTURES
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks
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Note: Use of IS800:2007 and steel tables is allowed

1.a) How does limit state method differ from working stress method? Explain in detail.
 b) Explain why serviceability limit state is considered as important as failure limit states?
 c) Discuss the importance of structural integrity? How can it be achieved?   [15]

2.a) Where are the slotted holes used in bolted connections?
 b) With neat sketches explain crip connections.
 c) Explain five basic types of welded joints.   [15]

3.a) Explain the factors affecting the strength of tension members.
 b) Explain about splices to tension members and design procedure.   [15]

4.a) What are the clauses for the design of lacing system?
 b) Design battening for a column consisting of the ISLC 300 placed face to face over a width of 300 mm? The length of column is 4 m with both ends hinged.   [15]

5.a) What is the difference between banding and buckling of beam members?
 b) Compute the moment carrying capacity and shear strength of a laterally unrestricted member ISMB 500, whose length is 6 m. $f_y = 250$ MPa.   [15]

6.a) Explain about eccentric connections?
 b) With neat sketches explain in detail about seated connections?   [15]

7.a) List out various steps involved in the design of plate girders.
 b) A plate girder is made of 500 mm × 30 mm flanges with 10 mm thick web. The overall depth is 1560 mm. The girder has to carry a factored shear of 1500kN. Assuming that tension field action is not utilized in the design, determine whether intermediate stiffness are necessary? If intermediate stiffeners are to be provided, what should be the thickness of the web? $f_y = 250$ N/mm^2.   [15]

8.a) Explain different load combinations to be considered in the design of roof trusses?
 b) What are risk coefficient, terrain factor and topography factors?
 c) The basic wind pressure at a place is 50 m/s. If the risk coefficient $K_1=1$; the terrain factor $K_2 = 1.07$ and topography factor is 1.25, find the design speed of the wind and design wind pressure?   [15]

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