Register Number: ……

M.E. DEGREE EXAMINATIONS: JUNE 2012

Second Semester

STRUCTURAL ENGINEERING

SEE507: Advanced Steel Structures

Time: Three hours **Maximum Marks: 100**

(Use IS 800:2007; IS 802; IS 804; IS 875 and Steel Tables are permitted)

Answer ALL Questions:

PART A (10 x 2 = 20 Marks)

1. Mention the purpose of sag tie used in a truss.
2. Differentiate between Gable column and Gable wind Girder.
3. How to avoid the shearing and crushing failure of bolted connections?
4. Define “clip angle connection”.
5. How light gauge sections are different from commonly used hot-rolled sections?
6. Define “Form Factor”.
7. What are the factors considered in design of a transmission tower?
8. What are different types of bracing system used in towers?
9. Mention the three theorems of plastic analysis of structures.
10. Define LSM.

PART B (5 x 16 = 80 Marks)

11. a) (i) Determine the design wind pressure for a power plant structure having maximum dimension more than 80m is proposed to be build on down hill side near Dehradun. The height of the hill is 500m with a slope of 1 in 3. if the location is 250m from the crest of the hill on downward slope, and its eves board is at a height of 9m from ground level. (6)

(ii) Determine the design load on the purlins of an industrial building near Visakhapatnam for the following details: Span of the truss=15m; Spacing of the truss=4m; Spacing of the purlins=1.35m; Pitch 1/5; wind pressure 1.44kN/Sq.m; Roof cover AC sheet (200N/ Sq.m. Self weight) (10)

(OR)

b) Define the gable rafter and design the gable rafter for the following details. Span of truss is 18m centre to centre; spacing of truss is 4m centre to centre. No of gable columns used in cable wall is 4nos. Rise of the truss is 4m. Take the wind pressure as1.5 kN/m2.

12. a) Design an unstiffened seated connection for an ISMB 450 is connected to the flange of a column ISHB300. The end reaction by the beam is 120kN. Use 20 black bolts.

(OR)

b) Design a stiffened welded seated connection to connect the ISMB500 beam transfering a load of 260kN to an ISHB300 column.

13. a) (i) Write short notes on types of cold formed steel sections. (8)

(ii) Explain local buckling of thin element. (8)

(OR)

b) Compute the permissible axial load on the column is made with two channels 300 x 90 mm with bent lips are connected with webs. The thickness of plate is 2.5mm. The effective length of column is 4m and 6m. The steel has a yield point of 355N/mm^2 and Modus of Elasticity 2.03x105N/mm^2.

14. a) Compute the suitable configuration and draw a neat sketch of the 60m height and 3.5m top width of microwave antenna lattice tower.

(OR)

b) Explain the commonly used tower foundation with neat sketches.

15. a) (i) compute the collapse load of a fixed beam with a concentrated load at mid span.(8)

(ii) Compute the shape factor for a triangle section of base b and height h. (8)

(OR)

b) Design a continuous beam of spans 4.9m, 6m and 4.9m carrying a UDL of 32.5kN/m over the entire span and the beam is laterally supported.

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