B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

◻◻◻◻◻   **December, 2014**

ET-508(B) : STRUCTURAL DESIGN – II

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **four** questions. All question carry equal marks. Use of Steel Table, IS 800 (1984) and calculator is allowed. Assume any missing data suitably.*

1. Design a riveted joint to connect two plates 14 mm thick. Power driven stop rivets of 22 mm diameter may be used for making the connection.   *14*

2. Design a double angle discontinuous strut to carry a load of 90 kN. The length of the strut is 2·0 m between intersections. The two angles are placed back to back (with long leg connected) and are tack riveted.

    (a) Angles are placed on opposite side of 12 mm gusset plate.   *7*

    (b) Angles are placed on same side of 12 mm gusset plate.   *7*

3. Design a suitable base and anchor bolts for a column subjected to an axial load of 500 kN and a wind moment of 175 kNm. The column section is 15 HB 450 @ 925 N/m. The safe bearing pressure of concrete may be assumed to be 4000 k N/m^2. *14*

4. A simply supported steel joist with a 4·0 on effective span carries a uniformly distributed load of 40 kN over its span inclusive of self-weight. The beam is supported catarrhally throughout. Use F_y = 250 N/mm^2. Design a suitable section and check its safety. *14*

5. Design a splice for tension member sections 160 × 10 mm and 250 × 14 mm. The member is subjected to a pull of 200 kN. Assume F_y = 250 N/mm^2. *14*

6. An IS MB 350 @ 524 N/m is to join a column IS HB 300 @ 588 N/m. The bean has to transmit an end reaction of 230 kN. Design a stiffened seat connection. *14*

7. Write steps of design of a single angle purlin for a trussed roof briefly. Discuss how slope of roof truss may affect such a design. *14*

8. Write short notes on any **two** of the following : *2×7=14*

(a) Bending moment on self-supporting steel chimney and Horizontal force

(b) Forces in truss member under dead, live and wind load combinations

(c) Bending of beams and flexural stresses

———