CBCS Scheme

Sixth Semester B.E. Degree Examinations, _____

Design of Steel Structural Elements

Time: 3hrs.   Max. Marks: 80

Note: 1.Answer and FIVE full questions, choosing one full question from each module.
2. Use of IS800 & steel table is permitted

Module-1

1. a   List the advantages and disadvantages of steel structures.   (10 Marks)

    b   List the loads to be considered for design of steel structures with reference   (06 Marks)
        codes.

OR

2. a   Calculate the shape factor of circular section of diameter D.   (06 Marks)

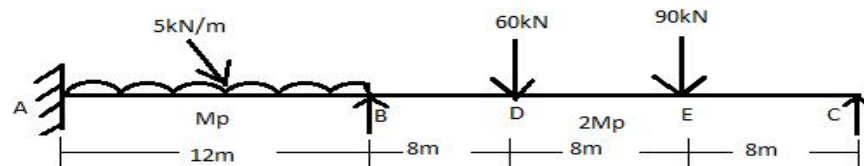   b   Calculate Mp for the continuous beam shown in figure, Q2b if load factor   (10 Marks)
        is3.2.

Fig. Q2b

Module-2

3. a   List the types of failures in bolted connection with sketches.   (06 Marks)

    b   Design the double cover butt joint to be connected by two plates of thickness   (10 Marks)
        10mm and 18mm. Cover plates for butt joint is of 8mm thickness. The load
        transmitted through the joint is 200kN.

OR

4. a. List the type of welded joint with sketches.   (06 Marks)

    b. A tie member of a roof truss consists of 2-ISA 100x75x8 mm. The angles are   (10 Marks)
        connected to either side of a gusset plate and the member subjected to a
        factored load of 450kN. Design the welded connection. Assume the
        connections are made in the workshop.

CBCS Scheme

Module-3

5. a. List the failure modes of compression members. (06 Marks)

    b. A column consisting of ISHB 400 @ 759.3 N/m has length of 4.5m. It is hinged at both ends. Determine the axial load carrying capacity of the column. (10 Marks)

OR

6. a Design a laced column with two channels back to back of length 8m to carry an axial factored load of 1000kN. The column is hinged at both ends. (16 Marks)

Module-4

7. a List the factors affecting the strength of tension members. (06 Marks)

    b Design a tie member consisting of a single angle to carry a tensile force of 200kN. The length of tension member is 3.5m and subjected to reversal of stresses due to wind forces. Use 18mm Diameter bolts. (10 Marks)

OR

8. a. A column section ISHB300 @ 577N/m is carrying a factored load of 600kN, a factored moment 30kNm and a factored shear force of 60kN. Design a suitable column splice. (08 Marks)

    b. Design a slab base for a column ISHB300@577N.m carrying an axial factored load of 1000kN. M20 concrete is used for foundation. Provide welded connection between column and base plate. (08Marks)

Module -5

9. a. List the various factor affecting the lateral stability of a beam. (06 Marks)

    b. Design a cantilever beam which is casted monolithic into concrete wall and carrying a Dead load of 25kN/m and Live load of 10kN/m. Span of the beam is 5.0m (10 Marks)

OR

10 a. Design a purlin on a sloping roof with the Dead load $0.2kN/m^2$, Live load $2kN/m^2$ and wind load of $1kN/m^2$ (suction). The spacing of purlin is 2.5m c/c and span of 4m. Assume the ends are simply supported and slope of 25°. Use channel section as purlin. (16 Marks)

****