

Roll No. ....

**24511**

**B. Tech. 7th Semester (Civil Engineering)  
Examination – December, 2014**

**DESIGN OF STEEL STRUCTURE - II**

**Paper : CE-401-F**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

---

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

---

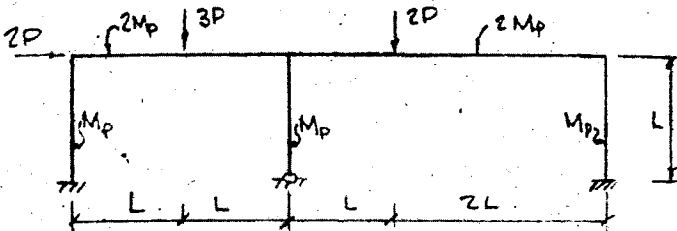
**Note :** Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks. Use of IS 800-1984 or 2007, IS 875-1987 and IS 801-1975 is allowed. Use of Steel Table is allowed. Assume suitable data.

1. Explain the following :  $4 \times 5 = 20$
- (i) What are economical considerations for industrial truss ?
  - (ii) Write about Principles of plastic analysis.

- (iii) Calculate the permissible deflection for a truss of 10 m span.
- (iv) Draw a neat sketch of Gusseted base.
- (v) Compare welded joint with riveted joint on eight points.

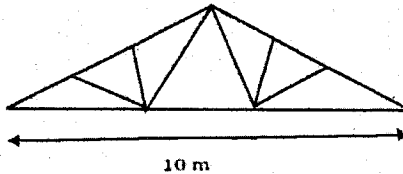
### SECTION - A

2. (a) A beam ABC of span  $L$  is fixed at the ends A and C, and carries a point load at a distance  $L/4$  from the left end. Find the value of the load at collapse if the left half of the beam has a plastic moment of resistance  $2M_p$  and the right half has a plastic moment  $M_p$ . 10
- (b) Calculate the shape factor for the following : 10
  - (i) Rectangular section
  - (ii) Triangular section
3. A portal frame is shown in figure. Find the value of  $W$  at collapse. 20



## SECTION – B

4. A shed is proposed to be constructed at Chennai. The slope of the roof truss is corresponding to a pitch of. The average height of the roof above the ground is 12m. the life of the structure is expected to be about 50 years. The terrain has less obstruction. The cladding length is in between 30m to 40m. the permeability of the truss is assumed to be medium. Calculate the various loads on the truss. The roof covering is GI sheeting. 20



5. Design an elevated cylindrical steel tank with hemispherical bottom for 1,60,000 litres capacity. The tank has conical roof. The ring beam of the tank is at a height of 10m from the ground level. The tank is to be built at Delhi. Take  $f_y = 250 \text{ N/mm}^2$ . 20

## SECTION – C

6. Design for Delhi a self supporting steel stack of height 72m above the foundation. The diameter of the cylindrical part of the chimney is 3m. The foundation has to rest on medium soil having bearing capacity of  $200 \text{ kN/m}^2$ . The thickness of fire brick work lining is 100mm, and the lining is supported by stack throughout the height. The chimney has one breach opening the topography at the site is almost flat, and the location is of terrain category 2. 20

7. What do you mean by Transmission line tower? What are design procedure and specification for the design of Transmission line tower ? 20

### SECTION - D

8. Explain the following terms with neat sketch : 5 × 4 = 20

- (i) Stiffened compression element
- (ii) Flat width ratio
- (iii) Torsional flexural buckling
- (iv) Effective design width
- (v) Local buckling of thin elements

9. Find the allowable load for the rectangular tubular column section shown in fig. the effective length of the column is 3.6m. Take  $f_y = 235 \text{ N/m}^2$ . 20

