

Roll No.

2521

B. Tech. 7th Semester (Civil Engg.)

Examination – December, 2012

DESIGN OF STEEL STRUCTURES-II

Paper : CE-401-E

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 :**
- (i) Attempt any *five* questions.
 - (ii) Use of relevant 1 : 5 : codes and steel tables are permitted.
 - (iii) Draw Neat Sketches, wherever required.
 - (iv) Choose suitable data if required or missing.

1. Briefly explain any five of the followings :

- (i) Mechanical Properties of steel,
- (ii) Residual stresses,
- (iii) Shape factor,

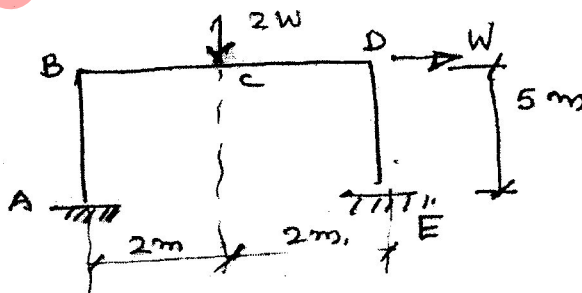
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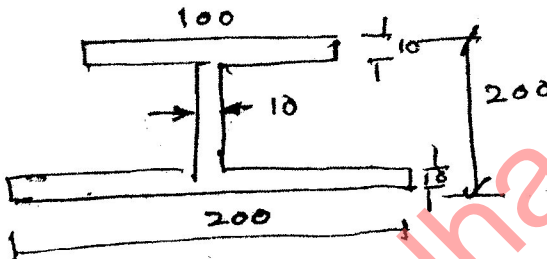
- (iv) Load combination for Design of Industrial Buildings,
- (v) Accessories of elevated circular steel Tank,
- (vi) Fundamental conditions for plastic analysis,
- (vii) Local Buckling,
- (viii) Ryle's empirical formula for calculation of loads on Towers.

$$5 \times 4 = 20$$

2. (a) Distinguish between the elastic and plastic modulus of section. 5
- (b) Determine the design axial load on column section ISMB 400. The height of column is 5.0 m and it is pin ended. Take $f_y = 250$, $f_u = 410$ and $E = 2 \times 10^5 \text{ N/mm}^2$. 15
3. (a) Compute the collapse load for portal frame as shown below. Take $W_u = 72 \text{ KN}$ f_y of steel 250 Mpa. 15



- (b) Show with help of neat sketch graphical representation of different mechanism. 5
4. Determine the plastic moment capacity and plastic modulus of section of an I-Section shown below. 20



5. Design the bottom plate of an overhead Riveted are steel rectangular Flat Bottom tank of capacity 50,000 Ltt. The width of plate is 1.25 m and length 6.0 m. Also find the dimensions of the tank. Normal depth of water may suitably assumed. 20
6. (a) Classify different types of steel chimneys. 5
 (b) Briefly explain various forces acting on steel chimney (self supporting) and how to calculate them? 15
7. Symmetric trusses of span 20m and height 5 m are spaced 4.5 m c/c. Design channel section Purlins, having following data. 20

(i) Wt. of sheeting = 171 KN/m^2 ,

(ii) Live Load = 0.4 KN/m^2 ,

(iii) Wind Load = 1.2 KN/m^2 ,

(iv) Spacing of Purlin = $1 : 4 \text{ m c/c}$.

8. Design a continuous Beam of span 4.9 m, 6m and 4.9 m for carrying a U.D.L. of 32.5 KN/m the Beam is Laterally Supported. 20

