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B. Tech. 7th Semester (Civil Engineering) Examination – May, 2015

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 : Q. **1** is ***compulsory***. Each question carries equal mark (**20** marks). Students have to attempt *five* questions in total at least ***one*** question from each section. 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) Compare Bolted joint with riveted joint on eight points.

(ii) What is meant by first yield moment ?

(iii) Which section is best suited for a purlin ?

(iv) Calculate the permissible deflection for a truss of 10m span.

(v) Draw a neat sketch of Gusseted base.

SECTION – A

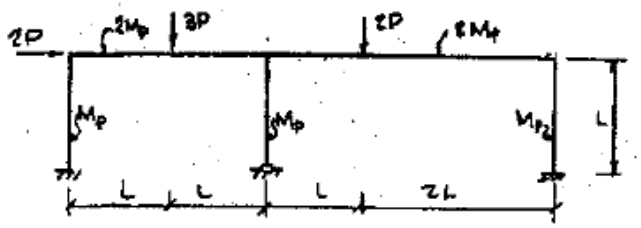
2. (a) Fixed beam of span L carries a uniformly distributed load W on the left half portion. Determine the value of W at collapse. The elastic moment of resistance of the beam is Mp. 10

(b) Calculate the shape factor for the following : 10

(i) circular section

(ii) Triangular section

3. A portal frame is shown in figure. Find the value of W at collapse. 20



SECTION – B

4. Design the angle purlin for the following specifications : 20

Span of truss = 9m c/c.

Pitch = 1/5 of span

Spacing of purlin = 1.4 c/c.

Load from roofing material = 200 N/ m^2.

Wind load = 1200 N/ m^2.

5. Design an overhead rectangular steel tank of 60,000 litres capacity. The 20 height of columns of staging is 12m. take wind intensity of 1.5kN/ m^3. 20

SECTION – C

6. Design for Delhi a self supporting steel stack of height 82 m above the foundation. The diameter of the cylindrical part of the chimney is 2.5m. The foundation has to rest on medium soil having bearing capacity of 190 kN/m^2. The thickness of fire brick work lining is 100mm, and the lining is supported by stack upto 20m. The chimney has one breech opening the topography at the site is almost flat, and the location is of terrain category 2. 20

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

SECTION – D

8. Explain the following terms with neat sketch :

$4 \times 5 = 20$

(i) Multiple Stiffened element

(ii) Types of light gauge section

(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 fy = 235 20 N/m^2. 20