(DCE 325)

B.Tech DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Third Year)

CIVIL ENGINEERING

Paper - V : Design of Steel Structures - II

Time : 3 Hours   **Maximum Marks : 75**

Answer ONE question from each unit

ALL question carry equal marks

Use of IS 800-1984 and steel tables is allowed. Any missed data can be assumed suitably

UNIT – I

1)   Design an overhead rectangular tank of riveted steel, for a capacity of 50,000 litres. The available width of plates is 1.25m. The tank is supported on 4 columns, spaced 5.0m × 3.75m and each of height 10m.   **[15]**

OR

2)   Design a circular elevated water tank for a capacity of 1,40,000 litres. The height of the tank bottom above the ground level is 12m the tank is supported over six columns.   **[15]**

UNIT - II

3)   a)   Discuss the importance of shear connectors in composite beams.   **[15]**

     b)   What are the design requirements of shear connectors for design of composite action of beam?

OR

4)   Design a lintel over opening of 5m. The lintel is in a wall 430 mm thick. It has to support a uniform load of 150 KN in addition to the masonry. The weight of the masonry may be assumed to be 22 KN/m^3 and the height of brick work above the lintel is 3.5m.   **[15]**

UNIT - III

5)   Design a channel section purlin, for an industrial building situated in Hyderabad, to support a iron sheet roof for the following data   **[15]**

Spacing of the truss c/c   =   4.5m

Span of truss   =   12m

Spacing of purlins c/c	=	1.5m
Intensity of wind pressure	=	1.5 kN/m^2
Weight of galvanized sheets	=	120 N/m^2
Yield stress of steel	=	250 MPa

OR

6) Design a Roof Truss of span 20m. The pitch of truss is 1/5. The height of the truss at laves level is 15m. The centre to centre spacing of trusses is 5m. The building is situated in Vishakapatnam. Take fy = 250 N/mm^2 for the steel columns. **[15]**

UNIT - IV

7) The B.M. and S.F. at a particular section of a plate girder are 4500 k.N.m and 1000 kN respectively. Design a plate girder using thin web and end stiffener. **[15]**

OR

8) Design the cross section of a plate girder for the following data. **[15]**

Effective span of the girder = 18m

Superimposed loading = 45 kN/m. Design the connections also.

UNIT - V

9) Design the cross section of a deck type plate girder railway bridge for a broad gauge main line loading over an effective span of 24m. **[15]**

Spacing of plate girders	=	1.8 m c/c
Weight of stock rails	=	0.4 k N/m
Weight of guard rails	=	0.25 kN/m
Weight of fastenings	=	0.25 kN/m of track
Sleepers (Timber)	=	250 × 150mm × 2.8m@ 0.4 c/c
Density of sleepers	=	7.4 kN/m^3

OR

10) The effective span of a plate girder deck type bridge for a single meter gauge track is 30m. The dead load, live load and impact load reaction is 900 kN. The vertical reaction due to overturning effect of wind at each end of the girder is 180 kN. Design a suitable Bearing. **[15]**

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