6E3034

Roll No. _____ Total No. of Pages : 3

6E3034

B.Tech VI Semester(Main/Back) exam. May, 2012

Civil Engineering

6CE3 Steel Structures-II

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

(i) Attempt four question, selecting one question from each unit .
(ii) All questions carry equal marks.
(iii) Draw neat and schematic diagram where ever necessary.
(iv) Any missing data may suitably be assumed and stated clearly.
(v) Questions of unit I and unit II are to be attempted by limit state method (IS 800-2007) However for questions of unit III and unit IV any method LSM or WSM (IS 800-1984) may be used .

(iv) Use of following supporting material is permitted during examination-

1. I.S. 800-2007
2. I.S. 800-1984
3. I.S. 875 part 3
4. ISI hand book for Structural Engineers Vol I(steel tables)
5. Railway Bridge Rules

Unit-1

1. Design a simply supported gantry girder to be used in a workshop, to carry one E.O.T. crane from following data- 20

(a)	Crane capacity	=150 KN
(b)	Weight of Crane excluding trolley	= 100 KN
(c)	Weight of the trolley	= 40 KN
(d)	Span of crane girder	= 12m
(e)	Span of gantry girder	= 7m
(f)	Wheel base	= 3m
(g)	Minimum approach of hook	= 1m

Or

1. (a) An industrial building located in Kota measures 20m x 16m in plan. There are pitched roof trusses over this at a spacing of 4m c/c . The truss has span of 16m and a pitch of ¼ . The height of eaves above ground level is 12m. Considering normal permeability , determine the wind pressure for which the truss should be designed . 8

(b) Design purlins for a fink type roof truss taking dead loads and wind loads.Ignore line load . Use I section . The datas are – 12

(i)	span of roof truss	= 14m
(ii)	spacing of trusses c/c	= 3.5m
(iii)	rise of truss	= 3.5m
(iv)	spacing of purlins on principal rafter	= 1.96m
(v)	wind load	= 1450 N/m²
(vi)	dead load from sheets etc.	= 220 N/m²

Unit-II

2. A simply supported plate girder of effective span 18m is loaded by 25kN/m u.d.l. throughout. Design the section . Check for shear. Also design welds connection between flange plate and web plate. Assume compression flange is laterally supported . 20

Or

2 (a) Discuss splicing of web plate in plate girders. 5

(b) A welded plate girder of 27m span is simply supported at the ends .It carries a u.d.l. of 20KN/m including self weight, in addition to two point loads,each 150 KN applied at distance 9m from each support . The designed section at the print of maximum B.M. consists of a web plate 1400 mm x 10 mm and flange plates 400 mm x 30mm at top and bottom . Design bearing stiffener under the intermediate point load. 15

Unit-III

3 A deck type plate girder railway bridge for single track, broad gauge main line, has effective span 25m and spacing of main plate girders as 2 m c/c. The section of the girder comprises a web plate 1900 mm x 10 mm with 400 mm x50 mm flange plate welded at top and bottom –

(a) Determine additional stress produced due to overturning effect of wind, in both cases viz bridge unloaded and bridge loaded. 10

(b) Select a suitable configuration for the top lateral bracing and calculate loads acting on it for design purposes . 10

Or

3. (a) Draw I.L.D. for forces in members U_2U_3, L_2,L_3 and U_1L_1 of a Pratt Truss Girder shown in fig. 1 8

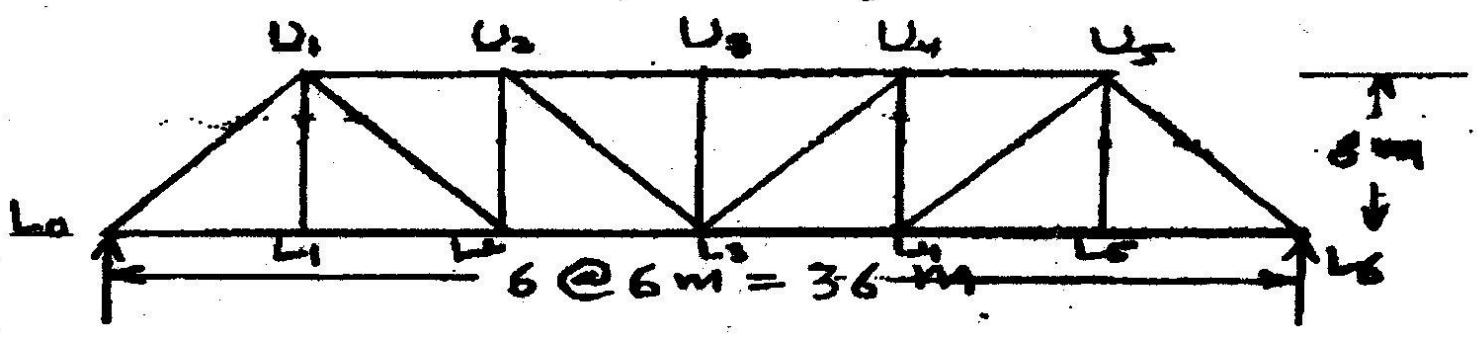

Fig 1

(b) Analyse the A-type portal bracing shown in fig 2. 12

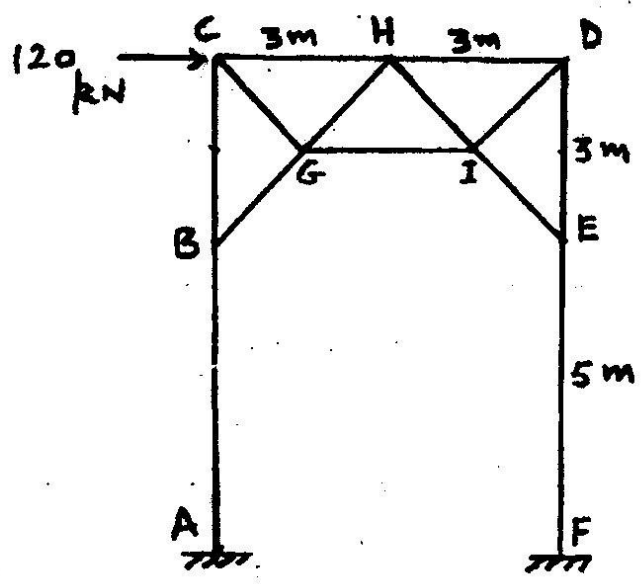

Fig. 2

Unit - IV

4. Design an overhead circular steel tank with hemi-spherical bottom for 150 kiloliters capacity. The tank is supported on 6 columns uniformly spaced along the periphery. 20

Or

4. Design an elevated riveted steal retangular tank, with flat bottom for a capacity of 75,000 litres of water. The tank may be assumed to be supported on 6 numbers of columns. 20