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CE - 605

B.E. VI Semester

Examination, June 2014

Structural Design and Drawing-II

Time : Three Hours *Maximum Marks : 70*

Note: Attempt five questions one from each unit.
Use of IS : 800 and steel table is permitted.
Assume suitable value for missing data, if any.

Unit - I

1. a) Discuss partial load factors.

   b) The bottom tie of a roof truss is ISA60 × 60 × 6 and is subjected to a load of 60KN. Design a riveted joint between the tie and gusset plate.

OR

   a) Write a note on structural properties of steel.

   b) Design a lap joint between two plates so as to transmit a factored load of 100 KN. Take thickness of plate as 12mm, M20 bolt of grade 4.8 and plate of grade 410.

Unit - II

2. a) A diagonal member of a roof truss carries an axial tension of 500KN. Design the section.

b) A tie member in a bracing system consists of two angles 90 × 90 × 10 bolted to a 12mm gusset, one on each side using a single row of bolts and tack bolted. Determine the tensile capacity of the member.

OR

a) Design a single angle strut carrying a service load of 150 KN. Length of member is 2.5m.

b) Explain the procedure for calculation of dead load and live load for design of roof truss.

Unit - III

3. Design the gantry girder for the following data

Crane capacity	=	200 KN
Weight of crane bridge	=	180 KN
Weight of crab + motor	=	50 KN
Wheel base	=	3 m
Span of crane bridge	=	16 m
Minimum hook approach	=	1.2 m
C/C distance between gantry columns	=	5 m
Weight of rail	=	250 N/M

OR

Design a plate girder of span 30m which carries a uniformly distributed load of 20KN/m. Top compression flange is restrained and plate girder is unstiffened with thick webs.

Unit - IV

4. Design a laced column 10m long to carry a factored axial load of 1200KN. The column is restrained in position but not in direction at both ends. Take two channels back-to-back with single lacing system and bolted connection.

OR

Design the slab base for the column ISMB 300 subjected to an axial factored load of 800KN and a factored bending moment, at its major axis, of 20KN-m.The base plate rests on concrete of grade M25.

Unit - V

5. An industrial shed with following details is located in Indore-

i.	Permeability	:	Normal
ii.	Spacing of truss	:	3.5 m
iii.	Span of truss	:	15 m
iv.	Central rise	:	3 m
v.	Height of truss at eaves level	:	8 m
vi.	Roofing material	:	Corrugated GI sheets

Recommend suitable shape for roof truss and calculate design

i) Dead load

ii) Live load and

iii) Wind load at panel points

OR

a) Discuss various methods commonly used to analyse a multi storey frame subjected to horizontal loads.

b) Explain structural framing for an Industrial building.