Total No. of Questions : 6]

SEAT No. :

P4556

[Total No. of Pages :2

[4760] - 45
M.E. (Civil - Structure)
DESIGN OF INDUSTRIAL STEEL STRUCTURES
(2008 Course) (Semester - I) (Elective - II)

Time : 4 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Attempt any two questions from each section.***
2) ***Answer to the two sections should be written in separate answer books.***
3) ***Neat diagram must be drawn wherever necessary.***
4) ***Figures to the right indicates full marks.***
5) ***Assume suitable data, if necessary.***
6) ***Use of cell phone is prohibited in the examination hall.***
7) ***Use of electronic pocket calculator, latest IS codes and steel table is allowed.***

SECTION - I

Q1) The span of knee braced roof trusses over an industrial building 28 m long is 18 m. The spacing of roof trusses is 4 m. The pitch of roof truss is 1 in 4. The galvanized corrugated iron sheet is used for roof covering. The basic wind pressure is 1.5 kN/m^2 and there is no snow fall. The height of eaves above ground level is 8.0 m. Propose a suitable type of roof truss. Determine the load at the various panel points due to dead load, live load and wind load. Also determine the reactions. **[25]**

Q2) Analysis the columns of an industrial building given in Question No. 1 for following conditions and find maximum bending moment. **[25]**

a) Columns hinged at the base.

b) Columns fixed at the base.

c) Columns partially fixed at the base.

Q3) a) Explain in details design of bracket supporting gantry loads. **[10]**

b) Explain in details analysis and design of gable portal frame with and without gantry loads with usual notation. **[15]**

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SECTION - II

Q4) a) State and explain design steps of machine foundation with suitable expression. **[10]**

b) Design an open web or castellated beam for a span of 14 m. The dead load coming on roof is 4.0 kN/m and live load is 5.0 kN/m. Cut the selected I - section at 45° and adjust section such that overall depth of section should not exceed 900 mm. Assume f_y = 250 N/mm^2. **[15]**

Q5) a) Explain in brief the forces acting on mobile gantry girder with suitable sketch. **[10]**

b) Explain design procedure bracing systems in an industrial shed structure in transverse and longitudinal plane. **[15]**

Q6) a) State the functional aspect of various bracing systems in an industrial shed structure. **[5]**

b) Design a trussed purlin to carry a uniformly distributed load 20 kN/m over a simply supported span of 15 m. Use double angles for chord and single angle for web members. Select suitable geometry for truss purlin and draw its cross section of the members. **[20]**