

Roll No.

Total No. of Pages : 02

Total No. of Questions : 08

M.Tech. Structural Design EL-IV (2016 & Onwards) (Sem.-3)

INDUSTRIAL STRUCTURE

Subject Code : MSTD-306

Paper ID : [74808]

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions in all.
2. Each question carry TWENTY marks.
3. Use of IS:800 and IS 875 Part I, II and III are allowed.

- Q.1 a) Enumerate the special consideration required in the design of steel structure. (10)
- b) Draw idealized stress-strain curve for mild steel. (5)
- c) Discuss the effects of residual stresses. (5)
- Q.2 An industrial building is made of 15 portal frames spaced 6m apart. The frame has a span of 15m and 3 m rise with a column height of 5m above the ground level. Assuming the column bases is hinged. Design the frame for the dead and live load only. (20)
- Q.3 A column ISHB350@ 661.2 N/m carries an axial compressive factored load of 1700kN. Design a suitable welded gusset base. The base rests on M15 grade of concrete. (20)
- Q.4 Design a laterally restrained simply supported beam to carry a udl of 44kN/m. The effective span of beam is 8m. A bearing length of 75mm is provided at the supports. (20)
- Q.5 a) Discuss various modes of failure of bolted connection with neat sketches. (10)
- b) How are the building connections classified based on their moment-rotation characteristics? (5)
- c) Discuss the effect of residual stresses. (5)
- Q.6 Design a tension member using two angle section to carry 180 kN when both angles are connected
- a) On both sides of the gusset plate. (10)
- b) On the same side of the gusset plate. (10)

- Q.7 a) A roof truss shed is to be built in Lucknow for an industry. The size of shed is $24\text{m} \times 40\text{m}$. The height of building is 12m at the eaves. Determine the base wind pressure. (10)
- b) Describe various elements of roof truss with neat diagram. (10)
- Q.8 Write short notes on :-
- a) Portal bracing and roller bracing. (10)
- b) Different types of beam-column connections. (10)