

M.Tech. Structural Engineering & Construction (CBCS Pattern) Semester-II
PSES25B - Elective-II - Advanced Design of Steel Structures

P. Pages : 1

Time : Three Hours



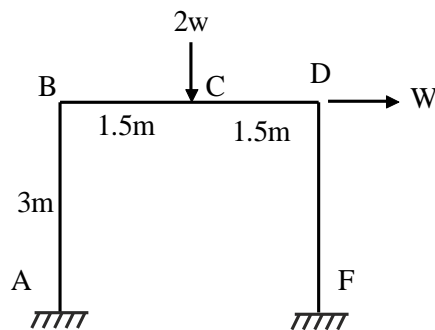
GUG/W/24/11019

Max. Marks : 70

- Notes :
1. All questions carry marks as indicated.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Illustrate your answers wherever necessary with the help of neat sketches.
 4. Q. 1 or Q. 2. Solve **any two** from Q.3, Q.4, Q5.

1. a) Describe and design a simply supported gantry girder to for the following data: **15**
Crane capacity: 160 KN Self weight of crane girder: 200 KN Self weight trolley, electric motor, hooks etc.: 50KN Min. approach of crane hook to the gantry girder: 1.6 m Wheel base : 2.8 m c/c distance between gantry rail: 12 m c/c distance between column: 6m Self weight of rail section : 300 N/m Check the section for maximum bending moment due to vertical forces, lateral forces and longitudinal forces.

- b) Calculate the collapse load for frame as shown in the Figure **15**



OR

2. Design a plate girder for a deck type railway bridge of span 22m for a modified broad gauge loading. **30**
3. A self-supporting steel chimney is 80 m high and its diameter at the top is 3 metres. design breech (flue) opening. Adopt the wind force as per IS: 875. The location of the place is such that the intensity of wind pressure up to 30 m height is 1.50 kN/m^2 . **20**
4. The span of the knee braced roof truss over an industrial building of 36 m long is 16 meters. The spacing of the roof truss is 3.6m. The pitch of the roof is 1 in 4. Basic wind pressure is 1.5 kN/m^2 . The height of the eaves above ground level is 8.6 m. Prepare a suitable type of truss. Also determine the loads at various panel points. **20**
5. A rectangular pressed steel tank is required to store 0.15 million litres of water at a height 15m above ground level. Also design the supporting structures if wind force is 1.5 kN/m^2 . **20**
