5TH SEM ./ CIVIL / 2023(W) NEW

Th-2 STRUCTURAL DESIGN-II

Full Marks: 80 **Time- 3 Hrs**

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks
(Steel table, IS 800, SP20, IS1161 and IS806 are allowed in exam)

1. Answer **All** questions 2 x 10

   a. Define gauge.
   b. For bolts of property class 4.6, what do the number 4 and 6 indicate.
   c. State the types of welds.
   d. What are the types of mortar?
   e. Where do you recommend HSFG bolts?
   f. What is web crippling?
   g. For what type of structures, tubular steel sections are suitable?
   h. What do you mean by partial safety factor in limit state of design?
   i. What is load bearing masonry wall?
   j. Define net section area of a tension member.

2. Answer **Any Six** Questions 5 x 6

   a. Write down the special consideration in steel design.
   b. Mention the advantages of welded connection over bolted connection.
   c. Two plates 8mm and 12mm thickness are to be joined using longitudinal fillet weld. Suggest a suitable size of weld and length of the end returns.
   d. Explain block shear failure in tension members.
   e. Calculate the design compressive load for an ISHB 350@ 710.2 N/m, 3.5m high. The column is restrained in direction and position at both the ends. It is to be used as a column in a single storey building. Use steel of grade Fe410. Use table of IS code for calculation of fcd.
   f. What are classification based on cross section for steel beams?
   g Write down the codal provision of design consideration of masonry walls.

3 A tension member consists of a flat 120mm X 8mm is connected to a gusset plate of 12mm thick of 02numbers of M20 bolts of property class 4.6. Determine the strength of tension member. Use steel of grade Fe410. 10

4 Design a column to support a factored load of 1050kN. The column has an effective length of 7.0m w.r.t. z-axis and 5m w.r.t. y-axis. Use steel of grade Fe410. 10

5 Design a simply supported beam of effective span 1.5m carrying a factored concentrated load of 360kN at mid span. 10

6 Describe the factors affecting the strength of a tubular section. 10

7 Design a brick masonry column of height 3m, tied effectively, fixed at top and bottom. The load from slab is 100kN, including self weight of the brick pillar. 10