Roll No.

Total No. of Pages: 02

Total No. of Questions: 08

M.Tech. Structural Design (2016 & Onwards) (Sem.-2)

## ADVANCE STEEL DESIGN

Subject Code: MTSD-203

M.Code: 74292

Time: 3 Hrs. Max. Marks: 100

## **INSTRUCTIONS TO CANDIDATES:**

- 1. Attempt any FIVE questions.
- 2. Each question carries TWENTY marks.
- 3. Any missing data may be assumed appropriately.
- 1. a) Explain in detail the design procedure for compression members.
  - b) A beam ISMB 250 is connected to the flange of the column ISMB 600 and transmits end reaction of 80 kN. Design unstiffened seat connection.
- 2. Design a plate girder of a deck type railway bridge for broad gauge main line loading. Assume  $F_b=147 \text{ N/mm}^2$  and wind pressure as 1.5 kN/m<sup>2</sup>.

Clear span =20 m

Overall length = 21m

Effective span = 20.5 m

Centre of piers = 21.25 m

3. Ten storey building is to be constructed at Delhi. The foundation to be provided is raft over the medium soil. Determine the earthquake forces at bottom three floors, if the structural framing system consists of moment resisting frames with steel bracing members designed for ductility. The dimensions are:

Height of each storey = 3.2 m

Spacing of column c/c in each direction = 4 m

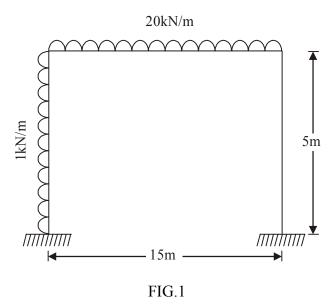
Live load on each floor =  $4000 \text{ N/m}^2$ 

Live load on roof=  $1500 \text{ N/m}^2$ 

Dead load on roof finish, slab and beam =  $3000 \text{ N/m}^2$ 

1 | M-74292 (S9)-1305

- 4. Discuss the Indian Standard method of determine the vertical pressure and horizontal pressure in a bin.
- 5. Design the elevated portion of a cylindrical steel tank with hemispherical bottom for 1, 60,000 liters capacity. The tank has conical roof. Take  $F_y = 250 \text{ N/mm}^2$ .
- 6. a) Give an overview of bridge development from the early wooden bridges to the current pre-stressed and steel bridges.
  - b) What are the factors to be considered in the selection of a suitable bridge site?
- 7. Write a short note on following:
  - a) Lateral Bracing
  - b) Different types of Trusses
- 8. Design the frame using plastic method. Loads shown are working loads.



NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

**2** M-74292 (S9)-1305