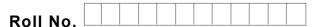
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Total No. of Pages : 02

Total No. of Questions : 09

# B.Tech.(Civil Engineering) (2012 to 2017) (Sem.-5) DESIGN OF STEEL STRUCTURES-I Subject Code : BTCE-501 M.Code : 70512

Time: 3 Hrs.

Max. Marks : 60

## **INSTRUCTION TO CANDIDATES :**

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

### **SECTION-A**

#### Q1) Answer briefly :

- a) List advantages of HSFG bolts.
- b) Write any three advantages of bolted connections.
- c) What do you mean by lug angles?
- d) Differentiate between pitch and gauge for bolted connections.
- e) What are the various checks performed for beam member design?
- f) Show with neat sketches different elements of plate girder.
- g) Write down the expression given in IS code for net section for angle tension members
- h) What are the functions of an eves strut?
- i) Find rivet value for 20 mm dia power driven rivets which are connecting two plates of thickness 14 and 16 mm by lap joint.
- j) Explain Grillage Foundation.

## **SECTION-B**

- Q2) A diagonal member of a roof carries an axial tension of 500 kN. Design the section (Two sections placed back to back are desired)
- Q3) A double cover butt joint is used to connect plates 14mm thick. Design the bolted joints and its efficiency.

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- Q4) Design a compound column to carry an axial load of 650 kN. The column consists of two channels placed back to back and laced together. Take effective length = 5 m.
- Q5) The plates of a tank 8mm thick are connected by a single bolted lap joint with 20mm diameter bolts at 50mm pitch. Calculate the efficiency of the joint. Assume Fe410 plate and grade 4.6 bolts
- Q6) A Column ISHB 350@ 674N/m carries an axial load of 850KN. Design suitable slab base using M20 Conc. mix.

#### **SECTION-C**

- Q7) Design a simply supported beam of 8 m span carrying a reinforced concrete floor capable of providing lateral restraint to the top compression flange. The total u.d.l. is made up of 100 kN dead load including self-weight and 150kN live load. In addition, the beam carries a point load at mid span made up of 50 kN dead load and 50kN imposed load. Assume stiff bearing length of 75 mm
- Q8) Write short notes (any two) :

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- a) Design of Flanges and Web of Plate girder. com
- b) Design of Gusset base.
- c) Economical spacing of Roof Truss
- Q9) Design an I-section Purlin for an industrial building to support a galvanized corrugated Iron sheet given:

Spacing of the trusses : 6m

Inclination of main rafter 30

Spacing of Purlin : 1.5m

Weight of purlin : 1.5m

Weight of corrugated sheeting :  $130 \text{M/m}^2$ 

Live Load =  $0.6 \text{ KN/m}^2$ 

Wind Load =  $1.8 \text{ KN/m}^2$ 

Yield stress of steel = 250MPa

## **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.