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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 eave 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.

- 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**) :
- a) Design of Flanges and Web of Plate girder.
 - 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 : 130M/m^2
- Live Load = 0.6 KN/m^2
- Wind Load = 1.8 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.