

Total No. of Question : [4]

Registration No. :

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Programme Name : Bachelor of Civil Engineering
Regular T.Y.B.Tech. Sem. VI ESE May / June 2023
VI SEMESTER (2020 BATCH)
201CEL321-Design of Steel Structures(TH)

Duration : 2 Hours

Marks : 50

Instructions :

(Q1)

[20.0]

- Attempted all questions
- Figure to the right indicates full marks
- Assume any data suitable whenever necessary
- Use of a Non-programmable calculator and prevalent IS800-2007 and steel table is allowed

(1- a) What are the advantages of steel structures over other type of structures?

[3.0]

CO :- C321.1

Blooms Taxonomy :- Understand

(1 -b) A tension member is subjected to a force of 150 KN. The member consists of a plate 75 mm X 8 mm in size and is connected to 10 mm thick gusset plate. the grade of steel is Fe 410.

[7.0]

Design fillet weld if

(a) The weld is provided on two sides of the plate in the direction of force.

(b) Weld is provided on three sides of the plate.

CO :- C321.2

Blooms Taxonomy :- Analyze

(1 - c) Design angle section to carry a factored load of 200 KN. The member is connected to a gusset plate by five numbers 20 mm dia. bolt of 4.6 grade with 50 mm pitch and 30 mm edge distance. Take $f_y = 250$ MPa and $f_u = 410$ MPa.

[10.0]

CO :- C321.3

Blooms Taxonomy :- Analyze

(Q2) Design double angle discontinues strut to carry a factored load of 175 KN. The length of the strut between the center of intersection is 2.65 m [10.0]

CO :- C321.3

Blooms Taxonomy :- Analyze

(Q3) Determine the load-carrying capacity of a compound column consisting of ISMB 400 @ 61.6 kg/m with cover plates 300 mm X 20 mm on each flange and having a length 4 m. With both ends fixed. assume $f_y = 250$ MPa. Consider the section as semicompact.

[10.0]

OR

The column carries an axial load of 2400 KN. Design slab base for the column which consist of ISHB 350 @ 72.4 kg/m with two flange plates of 450 mm X 20m. The column is supported on a concrete pedestal. The grade of concrete M20

CO :- C321.3

Blooms Taxonomy :- Analyze

- (Q4) The simply supported beam of an effective span of 4 m carries a UDL of 20 KN/m. on the entire span inclusive of self-weight. The compression flange of the beam is laterally supported. Design the section to carry the load and check it for shear and deflection. Use the grade of steel as Fe410. [10.0]

CO :- C321.4

Blooms Taxonomy :- Analyze
