

G.R. No.

paper code: U359-113(T1)

OCTOBER 2019/ INSEM (T1)**T. Y. B. TECH. (Civil Engg.) (SEMESTER - I)****COURSE NAME: DESIGN OF STRUCTURES - I****COURSE CODE: CVUA31173****(PATTERN 2017)**

Time: [1.30 Hour]

[Max. Marks: 30]

(*) Instructions to candidates:

- 1) Answer Q.1 OR Q.2 and Q.3 OR Q.4.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Assume suitable data if necessary
- 5) Use of IS: 800- 2007 and Steel Table allowed
- 6) Take Fe 410 grade of steel

- Q.1) a) Find section classification of following sections subjected to bending: (i) ISHB 400 @ 77.4 kg/m , (ii) ISMC 350 @ 42.1 kg/m [6 marks]
- b) Describe design philosophies – (i) Working Stress Method, (ii) Limit State Method. [6 marks]
- c) Explain partial safety factors and characteristic load in limit state design. [4 marks]

OR

- Q.2) a) State and explain classification of cross section with bending stress distribution diagrams. [6 marks]
- b) Define “Shape Factor” and calculate shape factor of ISWB 500 for bending about yy axis of cross-section. [6 marks]
- c) Draw Stress-strain curve for mild steel in uniaxial tension and Idealized stress-strain curve for limit state design. [4 marks]

- Q.3) a) Design a bolted connection for connecting ISA 90 x 60 x 8 mm @ 8.9 kg/m to the gusset plate having thickness 10 mm. The section is subjected to compressive force of 200 kN. [6 marks]
- b) Draw the diagrams explaining – (i) Shearing failure of bolt, (ii) Bearing failure of bolt [4 marks]
- c) Write Advantages and Disadvantages of welded connection. [4 marks]

OR

- Q.4) a) Design a weld to connect single angle section ISA 100 x 65 x 8mm subjected to axial tension of 250 kN. [6 marks]

- b) A 20 mm diameter bolt of grade 4.6 is in double shear. Calculate the shearing capacity of the bolt assuming threads in the shear planes. [4 marks]
- c) Define the following terminologies along with diagram and the specifications suggested by IS: 800 – 2007 [4 marks]
- (i) Pitch of bolts, (ii) Edge Distance