OCTOBER 2019/ INSEM (T1) paper code: U359-113(T1)

T. Y. B. TECH. (Civil Engg.) (SEMESTER - I)

COURSE NAME: DESIGN OF STRUCTURES - I

COURSE CODE: CVUA31173; (PATTERN 2017)

Solution and Marking Scheme

Q.1)	a)	(i) ISHB 400 @ 77.4 kg/m --- Flange --- compact---------- Web --- Plastic in bending & semi-compact in axial compression; overall class: Plastic (bending) & Semi-compact (axial compression)	01 01 01
		(ii) ISMC 350 @ 42.1 kg/m ---- Flange ---Plastic Web------Plastic; Overall------Plastic	01 02
	b)	**Describe** design philosophies – (i) Working Stress Method, (ii) Limit State Method.	 03 03
	c)	**Explain** – partial safety factors in limit state design characteristic load in limit state design	02 02
Q.2)	a)	Classification of cross section with bending stress distribution diagrams --------- 3 marks for explanation of all four class; 3 marks for all four diagrams	03 03
	b)	**Define** "Shape Factor"---------- calculate shape factor of ISWB 500 for bending about yy axis of cross-section----- Calculate Ze ---------- 1 mark; Calculate Zp ----- 2 marks, calculate Zp/Ze --------- 1 mark	02 04
	c)	Stress-strain curve for mild steel in uniaxial tension ---------- Idealized stress-strain curve for limit state design ----------	02 02
Q.3)	a)	**Design** a bolted connection: Calculate Shear capacity of bolts ---------- Calculate Bearing capacity of bolts ---------- Calculate No. of bolts ----------	 02 03 01
	b)	(i) Shearing failure of bolt - Neat, labeled diagram ---------- (ii) Bearing failure of bolt - Neat, labeled diagram ----------	02 02
	c)	Min. 4 Advantages & 4 Disadvantages of welded connection ----------	2+2
Q.4)	a)	Decide size of weld & throat thickness ---------- Find the strength of weld ---------- Find the forces acting on weld ---------- Find the length of weld ----------	01 02 02 01
	b)	Calculate n_n & n_s ---------- Calculate f_{ub} ---------- Calculate V_{dsb} ----------	01 01 02
	c)	Diagram and the specifications suggested by IS: 800 – 2007 (i) Pitch of bolts, (ii) Edge Distance ---------- 02 marks each	04