G.R. No.	

P118-113 (ESE)

DECEMBER 2018 / END-SEM

F. Y. M. TECH. (STRUCTURE) (SEMESTER - I)

COURSE NAME: PLASTIC ANALYSIS OF STEEL STRUCTURES

COURSE CODE: CVPB11183A

(PATTERN 2018)

Time: [3 Hour] [Max. Marks: 50]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use of Steel table and IS 800:2007 is allowed**
5) **Assume suitable data where ever required**

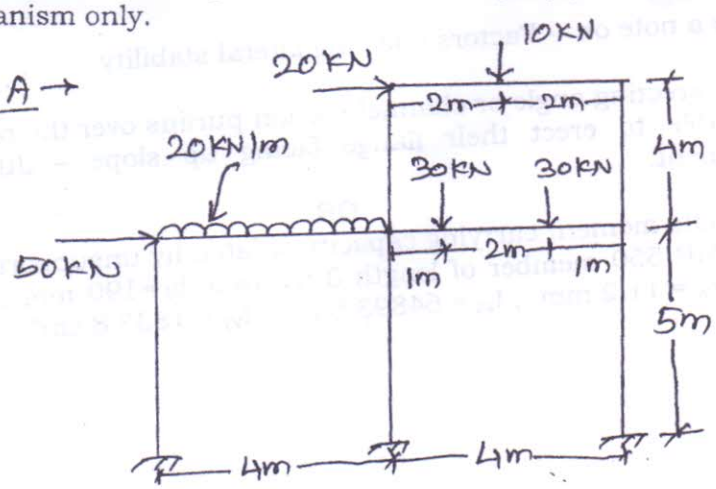
Q.1) a) Define shape factor and calculate the same for ISST 250 section about major. Take b_f=180 mm , t_f=14.1 mm , t_w = 9.2 mm , I_{zz}= 2774.4 cm^4 [03]

OR

b) A single story single bay frame ABCD has a span of 4 m. Height of column AB is 3 m and column CD is 5 m. A horizontal force of 70 kN is applied at joint B whereas beam BC is subjected to udl of 20 kN/m. Plastic moment for beam is twice that of the columns. Calculate the maximum plastic moment considering Sway Mechanism only. [03]

Q.2) a) Calculate maximum plastic moment for single bay two story frame subjected to loading as shown in Fig. (A). Consider Beam Mechanism only. [03]

Fig. A →



Take Mp uniform

OR

b) Calculate maximum plastic moment for single bay two story frame subjected to loading as shown in Fig. (A). Consider Sway Mechanism only. [03]

Q.3) a) Draw the stress distribution diagram for column base plate of size a X b subjected to axial load with eccentricity - 'e', if (1) $e < a/6$, & (2) $a/2 < e < a/3$ [02]

OR

b) Calculate the tension carrying capacity of 4.6 grade anchor bolt having 20 mm nominal diameter as per specifications of IS 800:2007. [02]

Q.4) a) Draw configurations of any three types of eccentric bracings and briefly explain advantages and disadvantages of each. [06]

b) Differentiate between Ordinary Concentrically Braced Frames (OCBF) and Special Concentrically Braced Frames (SCBF) [08]

OR

Q.5) a) Write a short note on, [08]
(1) 'K' type bracing, (2) 'X' type bracing, (3) 'V' type bracing, (4) Diagonal bracing

b) Explain importance and functions of bracing system in steel frames [06]

Q.6) a) Write a note on different methods of analysis. [10]

b) What do you mean by sinking of supports? Explain its effect on portal frames. [04]

OR

Q.7) a) Write short notes on, [06]
1) First order inelastic analysis
2) Second order elastic analysis

b) Write short notes on, [08]
1) First order elastic analysis
2) Second order inelastic analysis

Q.8) a) Write a note on - Factors affecting lateral stability [08]

b) While erecting angle or channel section purlins over the rafter, it is desirable to erect their flange facing up slope – Justify the statement. [06]

OR

Q.9) a) Calculate moment carrying capacity of laterally unsupported beam for ISMB 550 member of length 3 m. Take b_f =190 mm , t_f =19.3 mm , t_w = 11.2 mm , I_{zz} = 64893.6 cm^4, I_{yy} = 1833.8 cm^4 [14]