P111 - 214 (Re-Exam)

Total No. of Questions – [06]

Total No. of Printed Pages: 02

G.R. No.	

~~APRIL~~ May 2022 / ~~IN SEM+END SEM~~ Re-Exam

F. Y. M. TECH. (Civil-Structures) (SEMESTER – I)

COURSE NAME: PLASTIC ANALYSIS OF STEEL STRUCTURES

COURSE CODE: CVPB11204A

(PATTERN 2020)

Time: [3 Hours] [Max. Marks: 60]

Instructions to candidates:

1) **All Questions are compulsory**
2) **Figures to the right indicate full marks**
3) **Use of scientific calculator is allowed**
4) **Use suitable data wherever required**
5) **Use of IS 800: 2007 and Steel Table is allowed**

Q. 1) a) Explain the behaviour of rectangular cross section under plastic deformation and determine the shape factor of ISMC 125 @ 12.7 kg/m. **[06 marks]**

b) State the assumption made in plastic analysis and draw the idealized stress-strain curve used in plastic analysis. **[04 marks]**

Q. 2) Calculate maximum plastic moment for a single bay single story frame ABCD having 6 m height and 4 m span subjected to udl of 40 kN/m on beam BC and point load of 60 kN on column AB at the end B. Take plastic moment for beam as 2Mp & for column as 3Mp. **[10 marks]**

Q. 3) Determine the governing collapse mechanism for the multi-storey frame given below. Take constant Mp throughout the frame. **[10 marks]**

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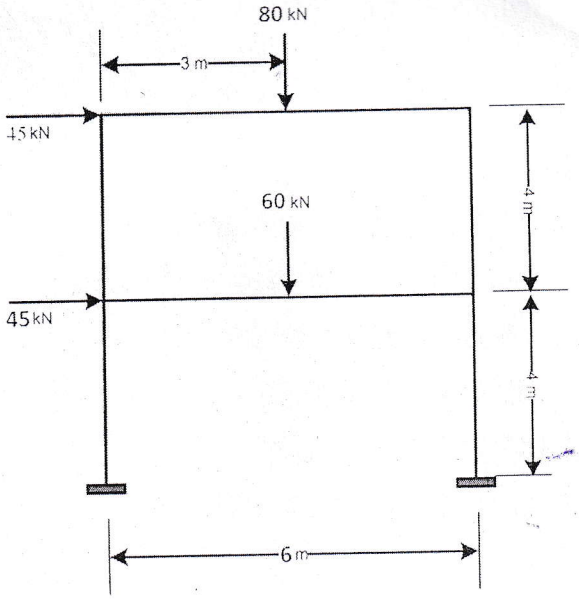
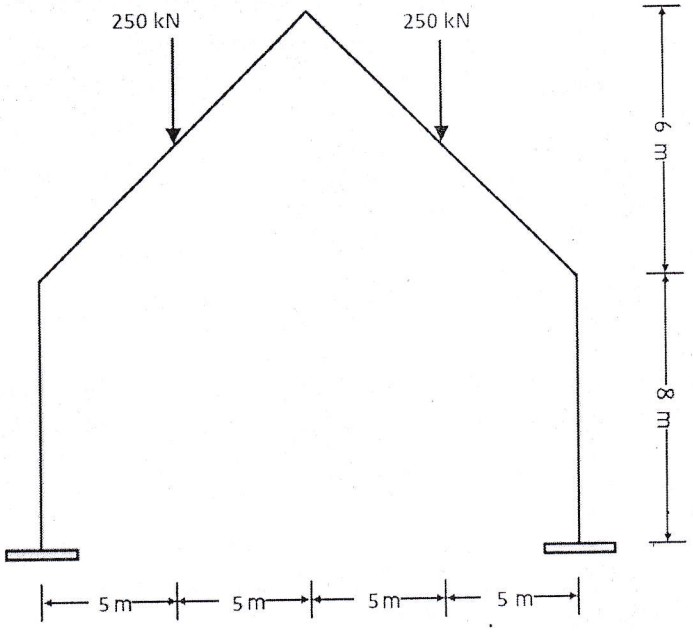


Q. 4) Determine the governing collapse mechanism for the gable portal frame given below. Take constant Mp throughout the frame. **[10 marks]**



Q. 5) A column in a building is 8 m in height. Its bottom end is fixed and top end is hinged. The reaction load due to beam is 450 kN at an eccentricity of 200 mm from the major axis of the section. Design the column section with checks for beam column member. **[10 marks]**

Q. 6) A beam ISHB 300 @ 58.8 kg/m transmit an end reaction of 300 kN to the column ISMC 250 @ 30.4 kg/m. Design seated bolted connection using M20 bolts of grade 4.6. **[10 marks]**