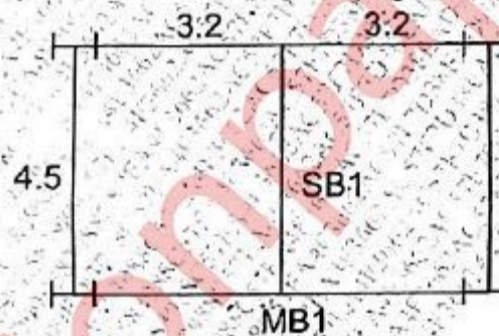


(4 Hr)

Maximum Marks - 80

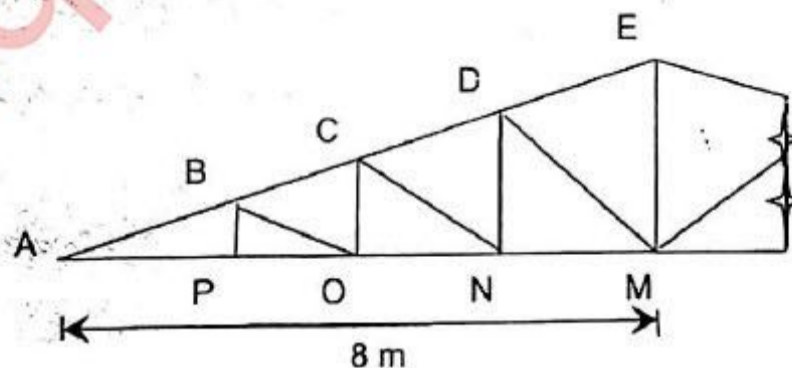
- N.B.**
1. Question No. 01 is compulsory, attempt any three out of remaining three questions
 2. Draw neat and proportionate sketches whenever necessary.
 3. Use of IS 800 and steel table is permitted.
 4. Assume suitable data if necessary and justify the same.
 5. Use steel of Grade Fe410 and bolt of grade 4.6

- Q.1** The flooring system of an industrial shed is planned as shown in fig. 32. Design Beam SB1 and MB1 and a beam to beam connection between them with top flange of beam at same level. Use ISMB-section to design beam assuming beam to be laterally supported throughout. For following data
- Thickness of slab - 15 cm,
 Thickness of wall - 23 cm,
 Height of parapet wall - 1.2 m
 Live Load - 2 kN/m²
 Unit weight of concrete and wall 25kN/m³ and 20kN/m³



OR

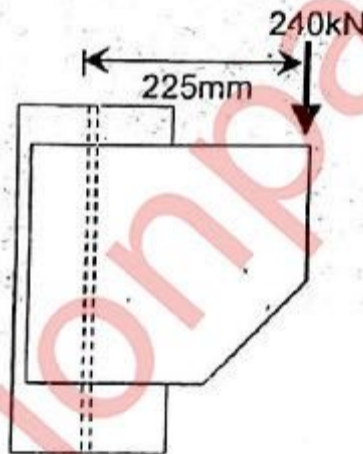
- Q.1** A truss is provide over an industrial building in the vicinity of Mumbai as shown in fig. Calculate Panel point load for DL,LL and WL to design member AB,BC,AP,PO and BP for following data,
- $K_1=1.0$, $K_2=0.98$, $K_3=1.0$ and $(C_{pc}-C_{pi})= -0.8$,
 Rise of truss - 1/4 ,
 Self-weight of purlin- 200 N/m, and weight of AC sheets - 170 N/m²
 Spacing of truss- 3m,
 Span of truss = 16m



TURN OVER

2

- Q.2 a) Determine capacity of two ISMC 300@351.2 N/m which are provided Back to Back with effective height of column as 6200mm, calculate minimum spacing to be provided between two channel and dimensions of lacing flat (Only) assuming single lacing system. 12
- b) Discuss various failure modes of compression member. 04
- Q.3 a) A Column ISHB 350@ 661 N/m carries axial compressive factored load of 1850kN, Design suitable bolted gusseted base to rest on concrete pedestal with bearing capacity 10000kN/m² and bolt diameter - 20mm 12
- b) Determine length of weld required to a tension member of roof truss, single ISA 100x100x8, subjected to a factored axial load of 200 kN, If $C_{xx}=27.6$ and size of weld = 6mm. Draw a sketch showing arrangement of weld. (L_{w1} and L_{w2}) 04
- Q.4 a) Design bolted bracket connection to support an end reaction of 240 kN due to factored load, the column section is ISHB 200 @392.4N/m, and load acts at an eccentricity of 225 mm from web of column, thickness of bracket plate may be taken as 12mm and bolt diameter - 20mm 08



- b) A ISHB. 350 @486N/m used as laterally unsupported beam over a span of 5.3m, calculate lateral torsional buckling moment (M_{cr}) Considering $E=2 \times 10^5$ and $G=76.92 \times 10^3$ N/mm² 08
- Q.5 a) A simply supported welded plate girder of span 12m is subjected to DL of 20 kN/m and LL of 20 kN/m excluding self-weight, it's also subjected to two point load of 600kN at 4m from each support, the compression flange of girder is laterally supported throughout. Assuming the depth of plate girder restricted to 1500mm and NO intermediate stiffeners are provided design,-- 12
- i) Design, give relevant check and draw cross section of plate girder
- ii) Design end stiffeners
- b) Draw stress distribution diagram for Plastic, compact, semi-compact and slender section 04