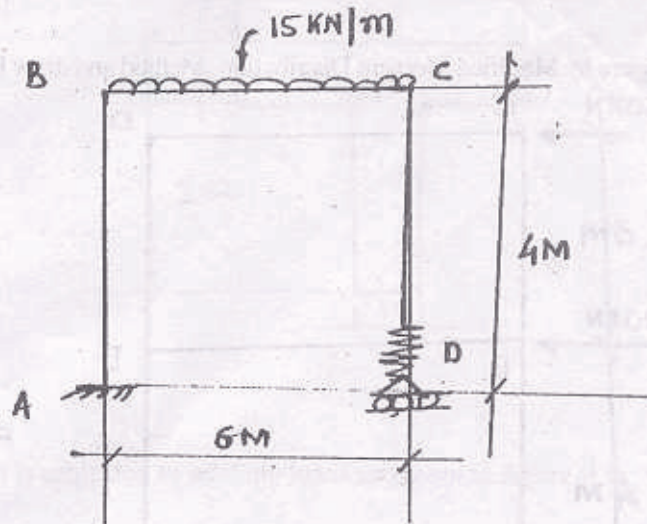


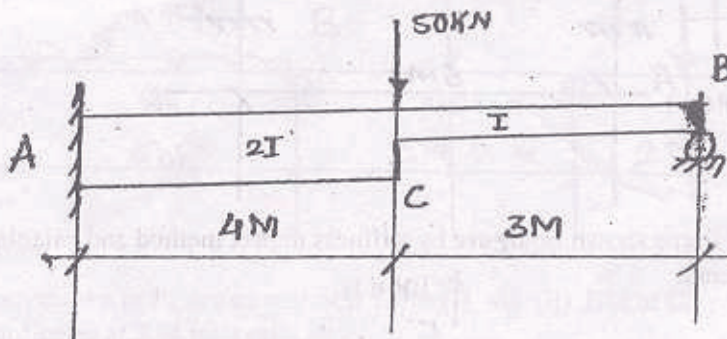
12/6/2  
Mason

- N.B.: (1) Question No. 1 is compulsory.  
 (2) Attempt any four questions out of the remaining six questions.  
 (3) Assume any suitable data if required and state it clearly.  
 (4) Figures to the right indicate full marks.

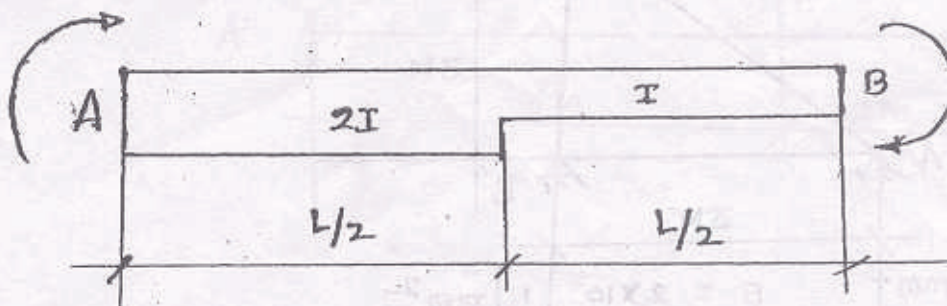
1. (a) Answer the following :— 12  
 (i) Distinguish clearly between flexibility and stiffness method of analysis.  
 (ii) Distinguish between plane rigid jointed frame and plane grid in terms of their structural behaviour, internal stresses, degree of freedom etc.  
 (iii) Define flexibility and stiffness co-efficients.  
 (b) A plane frame shown in figure is fixed at 'A' and simply supported on elastic support at 'D'. 8  
 The support D is free to move horizontally and also free to rotate. Analyse the frame by flexibility method and draw BMD and deflected shape. Take  $EI = 10,000 \text{ kN-m}^2$   $k_s = 1000 \text{ kN/m}$ .



2. (a) Analyse the beam shown in figure by column. Analogy method and draw SFD and BMD. 12

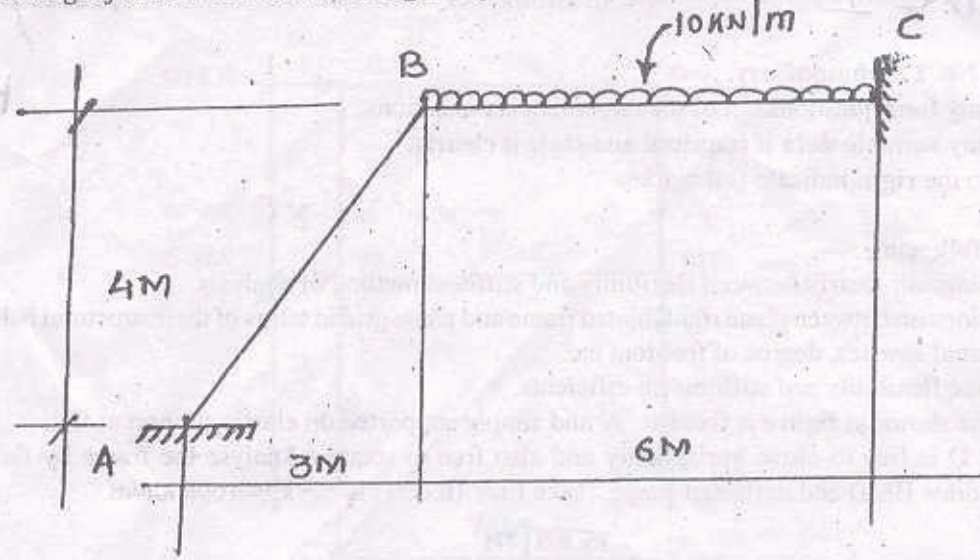


- (b) For the non prismatic beam element shown in figure. Calculate the stiffness co-efficients  $K_{11}$  and  $K_{21}$ . 8  
 Also calculate C.O.F. from B to A.

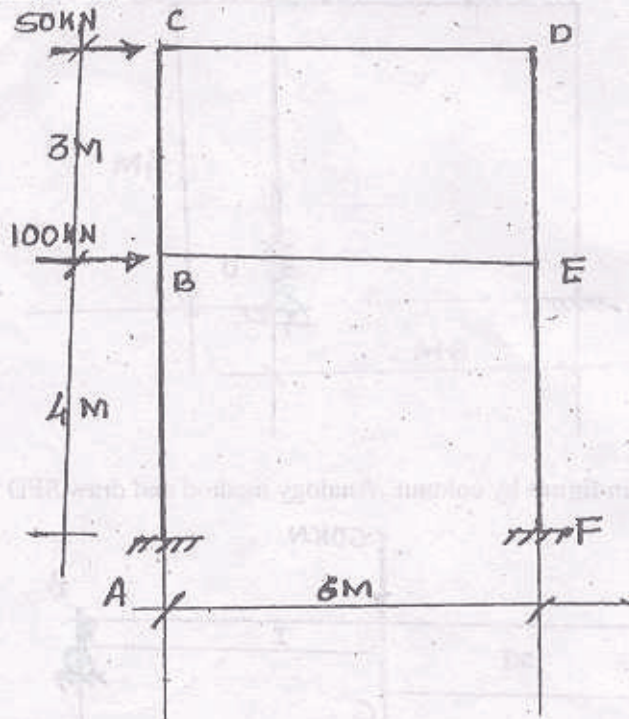




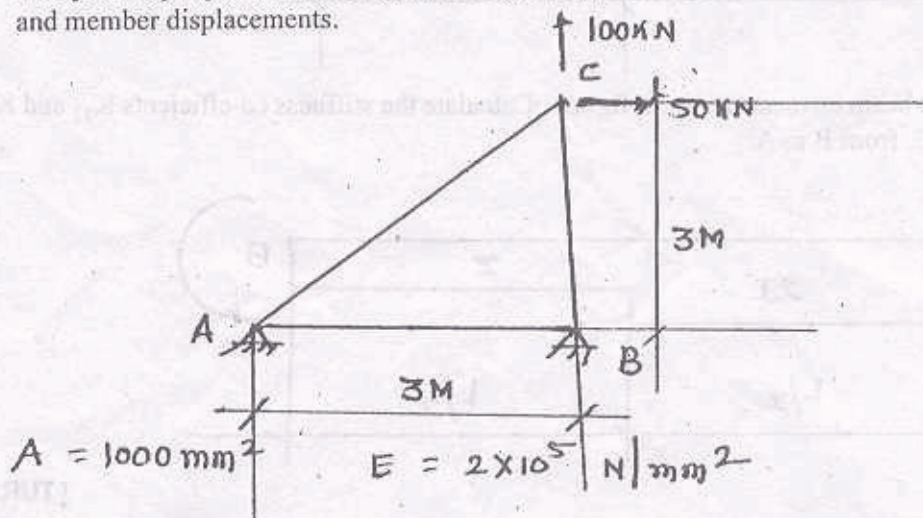
3. Analyse the rigid jointed frame shown in figure by elastic centre method and draw BMD



4. Analyse the frame shown in figure by Modified Moment Distribution Method and draw BMD and deflected shape.

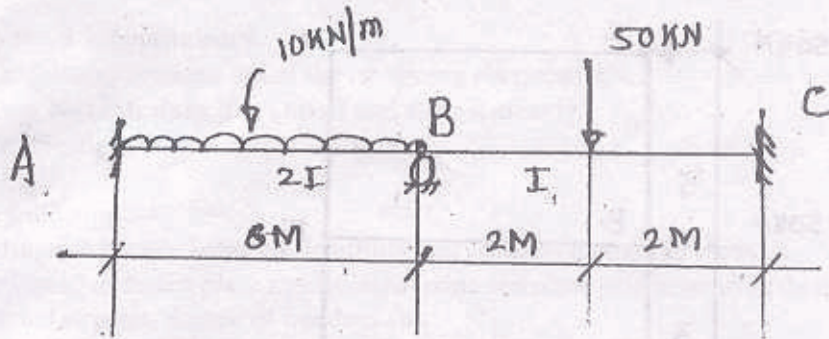


5. (a) Analyse the pin-jointed frame shown in figure by stiffness matrix method and calculate member forces and member displacements.

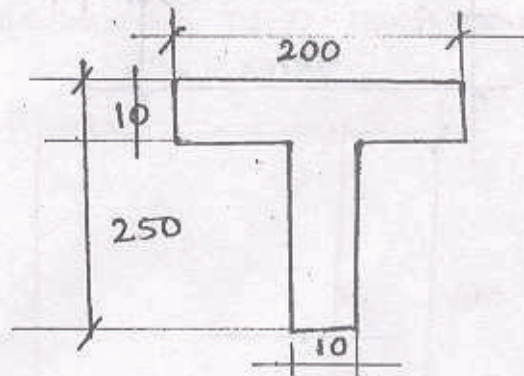




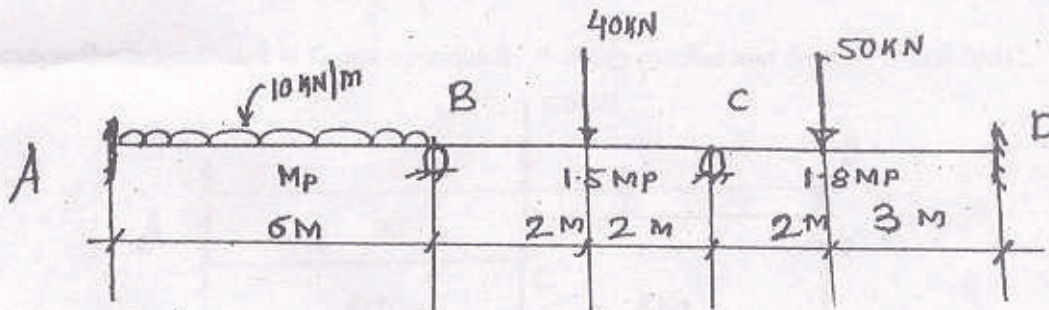
(b) Analyse the beam shown in figure by Matrix stiffness method and draw BMD and deflected shape. 10



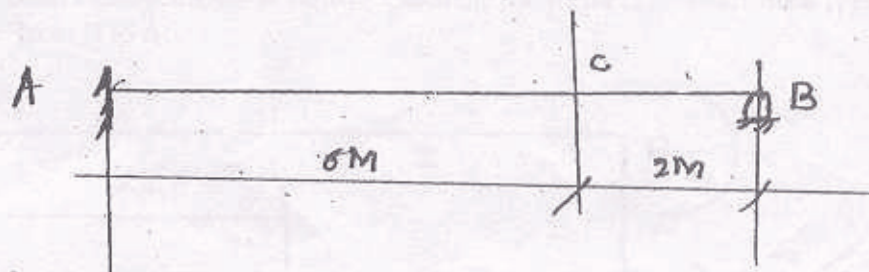
6. (a) Calculate the shape factor for the cross-section shown in figure if  $f_y = 250 \text{ N/mm}^2$ . Calculate  $M_p$  value of the section. 8



(b) A continuous beam is subjected to working loads as shown in figure its  $M_p$  value is 150 kN-m. Calculate load factor. 12

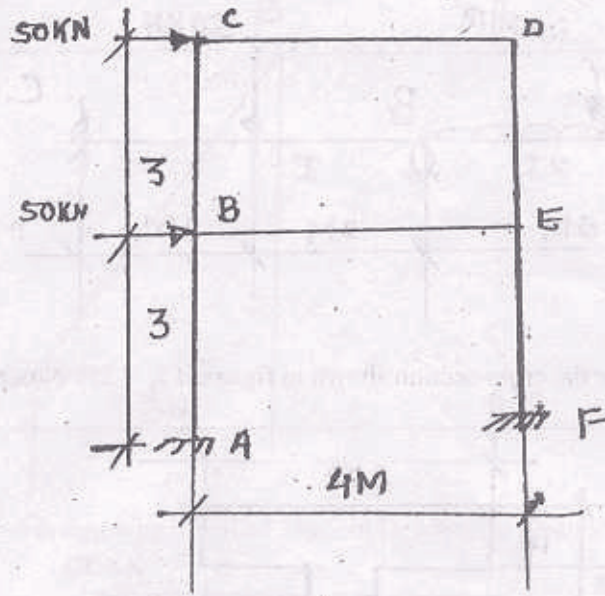


7. (a) For the beam shown in figure construct ILD for (i)  $V_B$  (ii) BM at C. Show the ordinates at 2 M intervals. 10



2/1/08  
12/6/07 10

(b) Determine the end reaction and draw BMD as shown in figure by portal frame method.



v