Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : 4]

T.ECivil . 2008 Course

(Structural Analysis-II)

(Semester - I)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***

2) **Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from Section-I**

3) **Answer Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from Section-II**

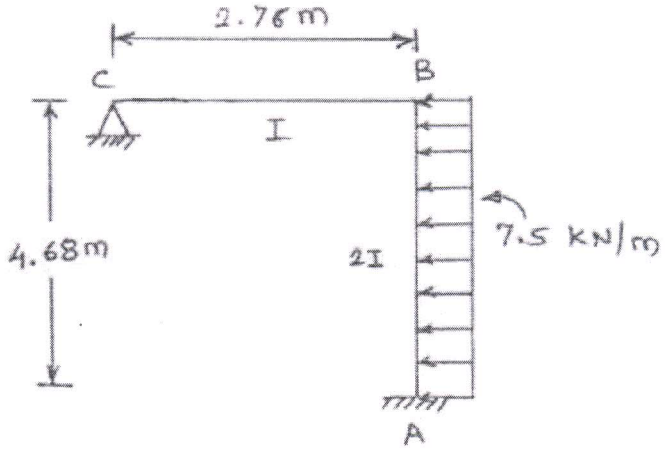
4) ***Neat diagrams must be drawn wherever necessary.***

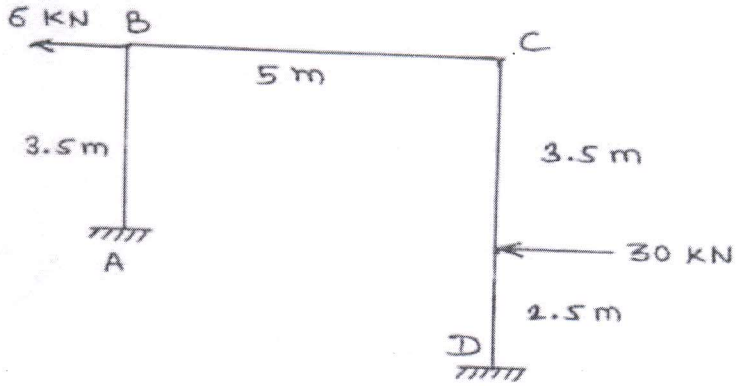
5) ***Figures to the right side indicate full marks.***

2) ***Use of Calculator is allowed.***

3) ***Assume Suitable data if necessary***

SECTION I

1.	a)	Analyze the frame as shown in figure 1 and draw SFD and BMD. Use slope and Deflection method.  Figure 1	[16]
		OR	
2	a)	Using Slope and Deflection method determine the support moments and hence plot BMD on tension side for the beam ABC if beam is loaded and supported as narrated below. Support A is fixed and support B and C are vertical roller .Span AB = 4 m, span BC = 8 m. Downward udl on span AB = 60 kN/ m, Downward concentrated load on of 120 kN at centre of span BC. Take EI constant throughout beam	[8]
	b)	If AD is intermediate span of the continuous beam, derive the slope deflection equations for this beam AB subjected to some arbitrary loading and if support 'B' sinks down by 'ð'. Explain the	[8]

		meaning of each notation that you use in the equation	
		Analyze frame by Moment Distribution Method. Draw SFD and BMD. Refer figure 3.  Figure 3	(18)
		OR	
4		Using Moment Distribution Method method, plot BMD and SFD for 6 m long beam AB , which is fixed at both support A and B. This beam is subjected to udl of 40 kN/m on full span AB whose cross section changes at intermediate point 'C' such that portion AC has flexural rigidity = EI, portion CB has = 2 EI. Partly span AC = CB = 3 m.	(18)
5	a)	A two hinge parabolic arch of span 'L' and rise 'h' carries udl of 'w' per meter run over the whole span. Assuming $I = I_0 \sec \alpha$ .Find expression for horizontal thrust developed.	(8)
	b)	Plot BMD for three hinged parabolic arch, hinged at crown and at the springing level. Arch has horizontal span 25 m, central rise 4 m carries udl, 40 kN/m over the left span.	(8)
		OR	
6		Show that the horizontal thrust developed in a two hinged parabolic arch of span 'L' and rise 'h' subjected to load 'w' at a distance 'a' from the springing is given by, $H = \frac{5}{8}\frac{W}{L^3 h} \cdot a(L-a)(L^2+aL-a^2)$	16

SECTION-II

Analyse the truss supported and loaded as shown in fig. Q.7. Assume that the Elastic modulus and area of cross-section for all members are the same. (16)

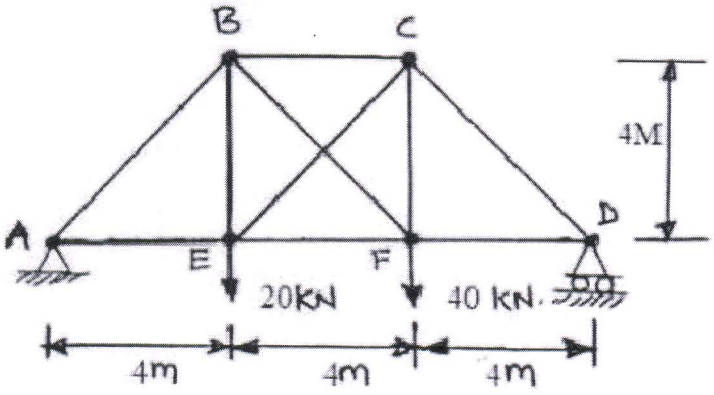
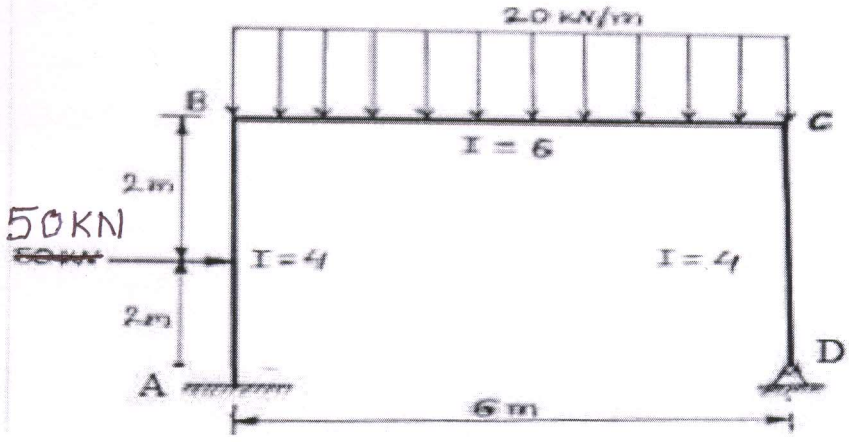


Fig. for Q.7

OR

Q-8 Analyze the rigid jointed plane frame supported and loaded as shown in fig(8) by flexibility method , draw BMD and elastic curve (16)



Fig(8)

Q-9 Analyze the frame shown in fig (9) by stiffness method, Draw BMD and Elastic curve, take EI=Constant. (16)

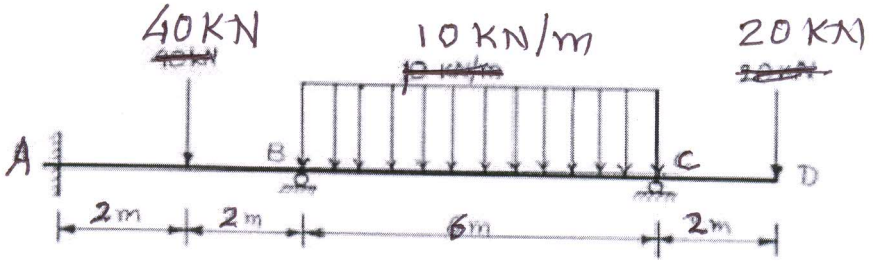
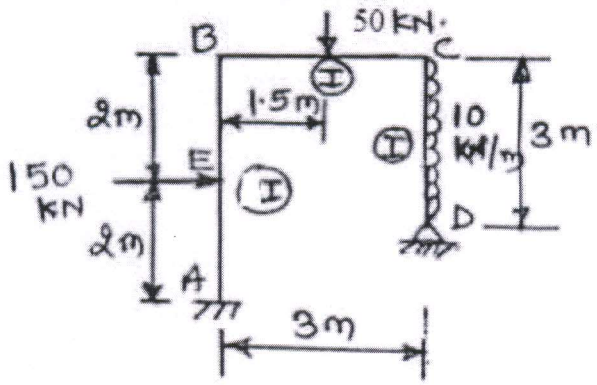
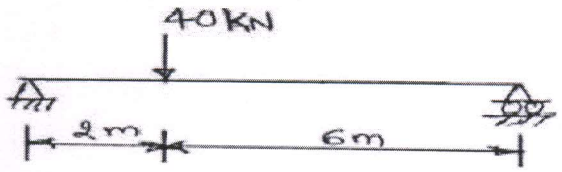
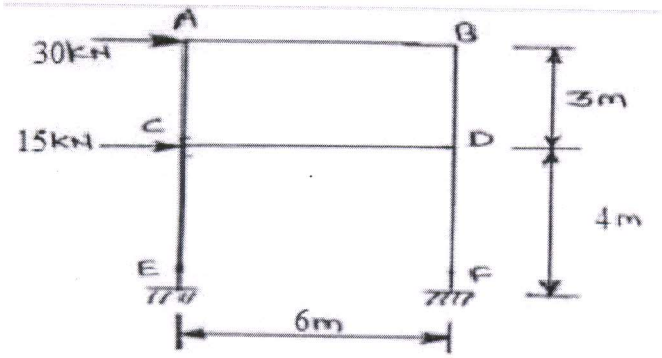
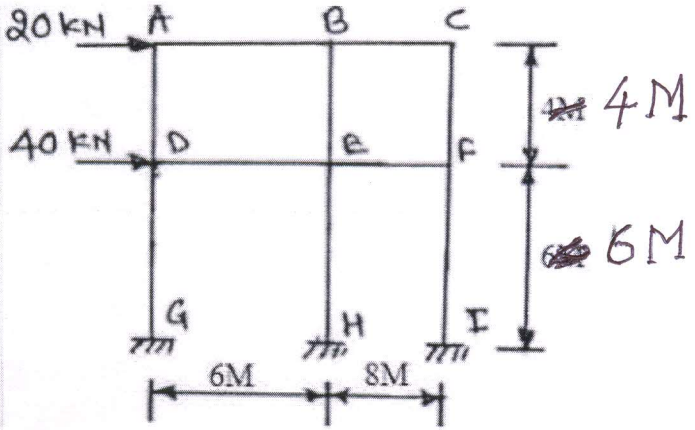


Fig. for Q. 9

OR

		Analyze the rigid jointed plane frame supported and loaded as shown in fig(10) by Stiffness method , draw BMD and elastic curve , take EI=Constant  Fig. for Q. 10	(16)
Q-11	a)	The beam is loaded and supported as shown in fig(11) , determine the deflection of its in terms of its EI under the load , using 5 nodes by finite difference method .  Fig. for Q. 11 (a)	(6)
	b)	Determine the B.M, S.F ,and Axial force of frame loaded as shown in fig (12) using cantilever method ,assume same area for all the columns , draw the BMD  FIG(12)	(12)

	a)	A beam supported at both ends having span 9 m. The beam carries uniformly distributed load of 20 KN/m over its entire span. Determine the central deflection in terms of its EI. Use finite difference method. Use six nodes.	(6)
	b)	Determine the approximate values of moment, shear, and axial force in each member of frame loaded and supported as shown in fig. Q. 12 (B.) Draw B.M.D. Use portal method.  Fig(12) b	(12)