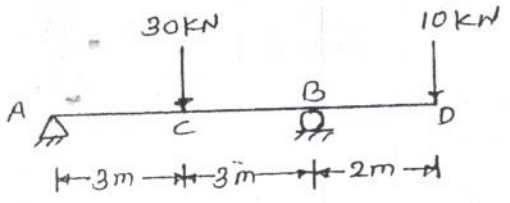


Figure for Q.No 2b

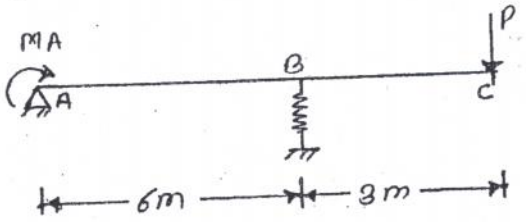


Figure for Q.No 3a

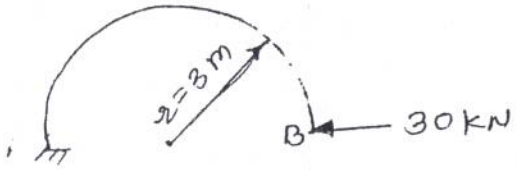


Figure for Q.No 4a

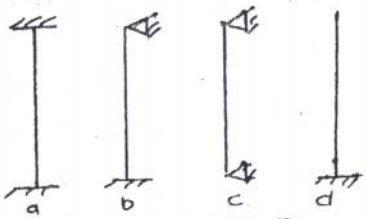


Figure for Q.No 4b

Length of all column = 10 m
A = 200 mm²
Imin for a) 65×10⁴ mm⁴
b) 70×10⁴ mm⁴
c) 60×10⁴ mm⁴
d) 90×10⁴ mm⁴

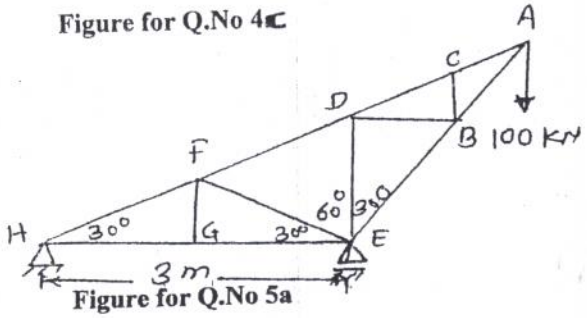


Figure for Q.No 5a

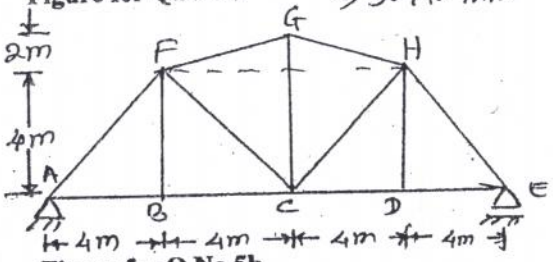


Figure for Q.No 5b

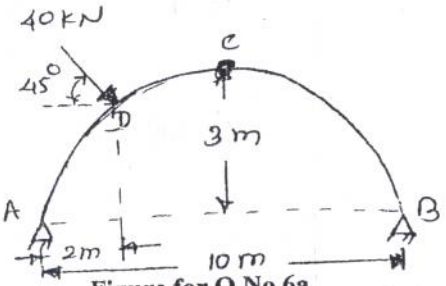


Figure for Q.No 6a

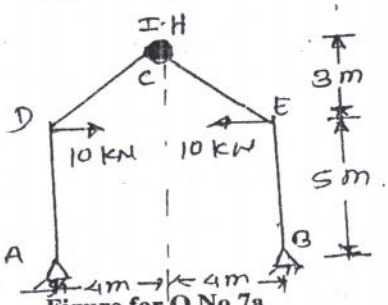
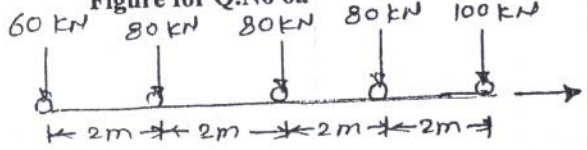


Figure for Q.No 7a



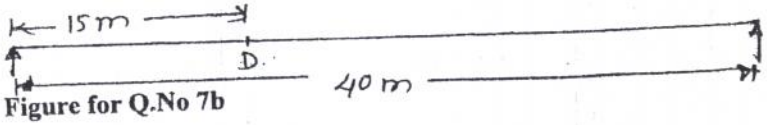


Figure for Q.No 7b

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

[Central Technological Institute, Maharashtra State]

Matunga, Mumbai-400 019

SEMESTER EXAMINATION	*May - 2006*	DATE OF EXAM	*23rd May 2006*
SEMESTER & COURSE	*IV S.Y.B.Tech. (CIVIL)*	TIME	*3.00 p.m. To 6.00 p.m.*
TIME ALLOWED	*3 HRS.*	MARKS	*100*
SUBJECT :	*STRUCTURAL ANALYSIS – I (301101)*		

Note- 1. **Q. No 1** is compulsory.

2. Figure to the right indicate marks.

Q.No 1 a) Explain Maxwell's reciprocal theorem. ------5

b) Discuss the reasons for smaller Bending Moment in arches as compared to beams of the same span and loading. What are the advantages of smaller bending moment? ------5

c) Discuss the limitations of Euler,s Bukling theory, and why other more practical and simple formulae needed. -------5

d) How internal hinge and internal roller or hinge support in real beam is converted in to conjugate beam. Why? ------5

Q.No 2 a) Determine the minimum flexural rigidity of a cantilever beam so that the span to maximum deflection ratio is not less than 250, and the slope does not exceed 0.003 radian, when supporting 10 KN/m over a span of 7.4 m. ------10

b) Find out θA, δD and δC for the beam as shown in figure Q .NO.2b (Use conjugate beam method) ------10

Q.No 3 a) A steel beam is supported and loaded as shown in figure Q.No3a. The force P=50 KN and MA = 150 KN-m with the horizontal line AC as a reference , determine the slope and vertical deflection at end 'C'. For this beam E = 200KN/m^2 and I = 390 x10^6 mm^4. The spring at B has a stiffness of 4 KN/mm (Use Macaulay's Method). ------10

b) Determine the critical length of column with hinged ends comprising 'I' section, and compute the maximum allowable load on a 6,3 m long column . Estimate the Maximum deflection at which the stress in the column reaches the yield values. Assume E =210 GPa Yield stress = 340 Mpa . area of section 6496 mm^2. Ixx = 19.61x10^6 mm^4 and Flanges width 250 mm , Overall depth 250 mm. ------10

Q.No 4 a) Define slenderness ratio of column, Why minimum moment of inertia is required to find buckling load? ------5

b) If critical L/R for steel is 80. Choose all long columns shown in figure Q.No4 b ------5

c) Find out δBH for the semicircular frame as shown in figure Q.No.4 c (Use Strain Energy Method) ------10

[P.T.O]