

FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI

SCHOOL OF ENVIRONMENTAL TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

RAIN SEMESTER EXAMINATION 2011/2012 SESSION

COURSE: **BDT 222 - STRUCTURAL THEORY AND DESIGN II**

Instruction: Answer any four questions.

Time : 3 hours

QUESTION 1

(a) What is a space framework? State the equation which space structures in statically equilibrium must satisfy.

(b) State the assumptions upon which the analysis of three dimensional space trusses is based.

(c) Fig.Q1 shows a warren type cantilever truss. Determine the forces in all the members, using the method of tension coefficient.

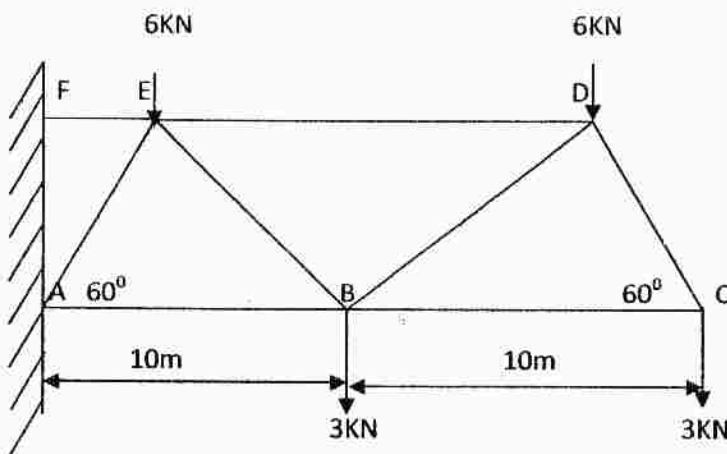


Fig.Q 1

QUESTION 2

(a) Determine the vertical deflection at joint E and horizontal deflection at joint D from the frame shown in Fig. Q2, using the unit load approach. Lengths and cross-sectional areas of members are given as follows:

Member	Length (mm)	Area(mm ²)
AB	6000	750
AE	5000	625
BC	6000	750
BD	5000	625
BE	5000	625
CD	5000	625
DE	6000	750

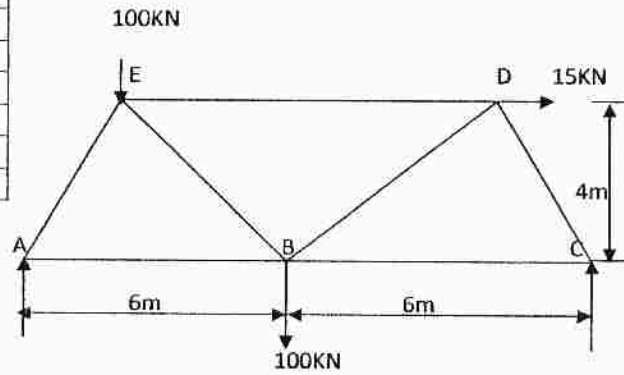


Fig.Q 2

QUESTION 3

- (a). State the advantages that a fixed beam has over a simply supported beam.
- (b). Derive the expression for deflection of a fixed beam carrying a central point load shown in Fig Q3. Obtain the maximum deflection.
- (c). A fixed beam AB of 5m span carries a point load of 2000kg at a distance of 2m from A. Determine the values of fixing moments and the deflection under the load, if the flexural rigidity of the beam is 1.0×10^{10} kg- cm².

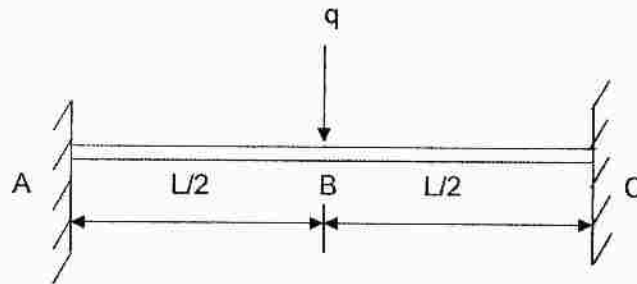


Fig.Q3