

Roll No.

23377

**M.Tech 1st Semester (Civil Engg.)
(Specialization in Structural
Engineering) Examination—
May, 2014**

ADVANCED STRUCTURAL ANALYSIS

Paper CE-611/MTSD-102

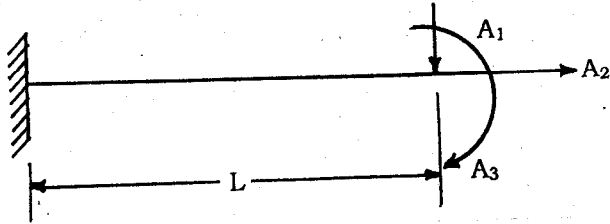
Time : 3 hours

Max. Marks : 100

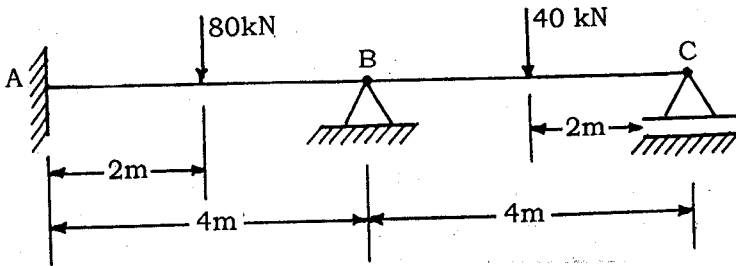
Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** full questions. All questions carry equal marks. Assume suitable data if not provided.

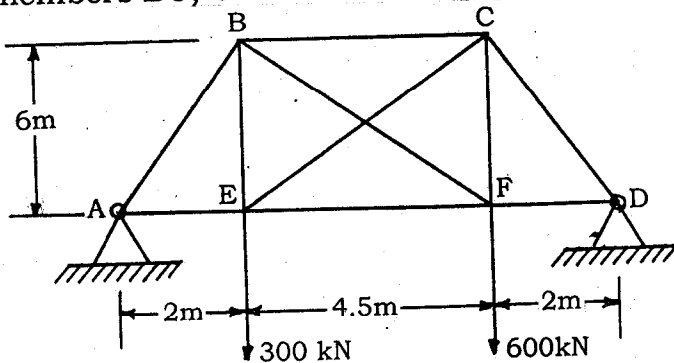
1. (a) Write difference between flexibility matrix method and stiffness matrix method. 10
- (b) For the cantilever beam shown in fig(1), determine the displacement D_{11} , D_{21} and D_3 . Assume beam has constant flexural Rigidity (EZ).



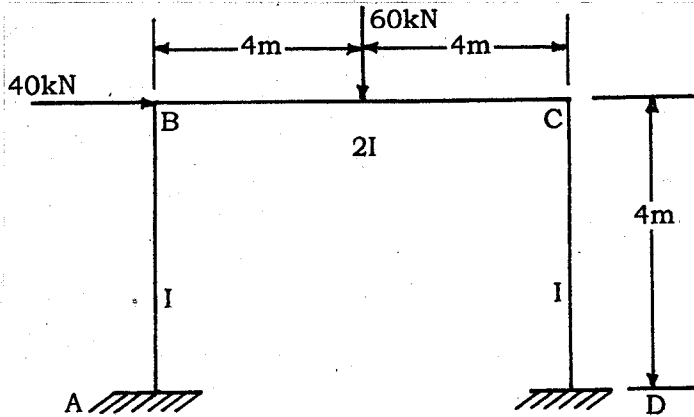
2. Find the moment at B and C, if the downward settlement of supports B and C are 10 mm and 5 mm respectively. Take $EI = 184 \times 10^{11} \text{ Nmm}^2$. Use flexibility matrix Method. 20



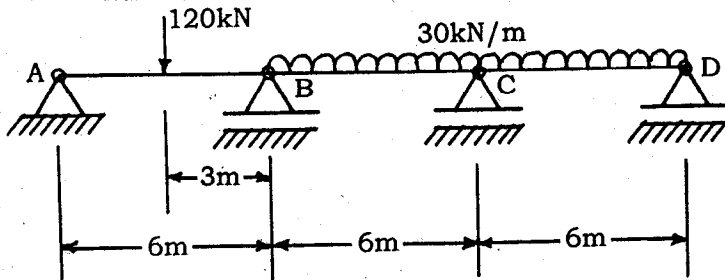
3. Analyse the pin-jointed plane frame shown in fig (3) by flexibility matrix method. All members have same EA. Find forces in members BC, CF and EC. 20



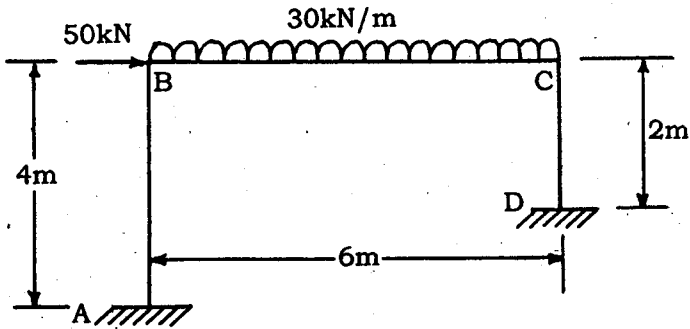
4. Analyse the rigid frame shown in fig. below by flexibility matrix method. 20



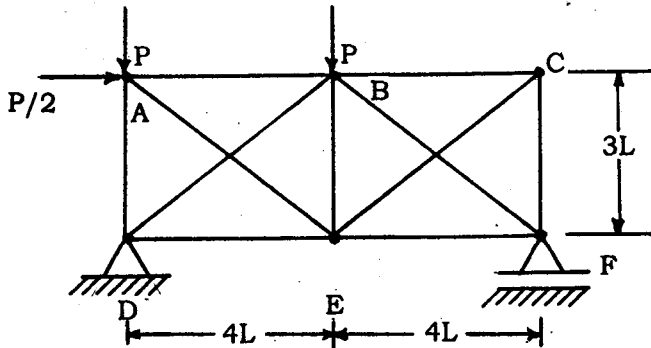
5. Analyse the continuous beam shown in fig. 5 using displacement method. Take EI same. 20



6. Analyse the following frame by stiffness method take EI constant 20



7. Find the forces in members AE and CE of the Truss in fig (7). Using stiffness method, take EA same for all members. 20



8. Derive Relationship between flexibility and stiffness matrixes. Prove that $[I] = [K] [\delta]$ where I \rightarrow Identity matrix, K \rightarrow stiffness matrix $\delta \rightarrow$ flexibility matrix. 20