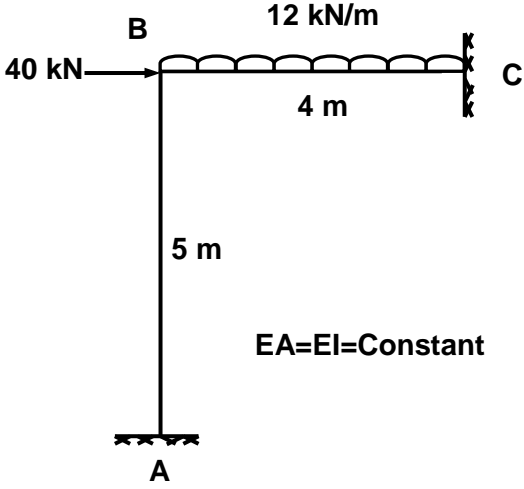
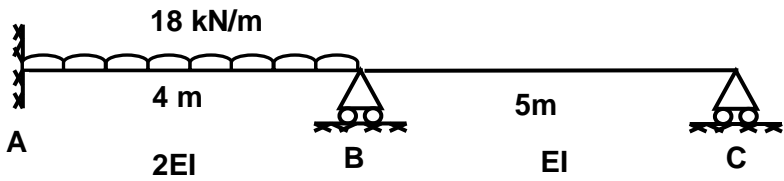
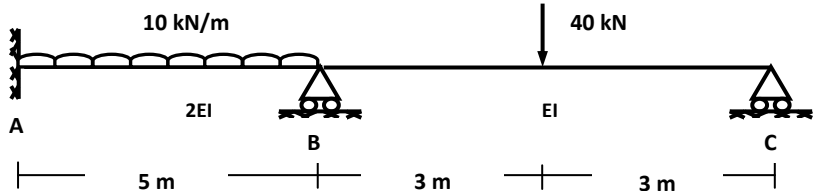
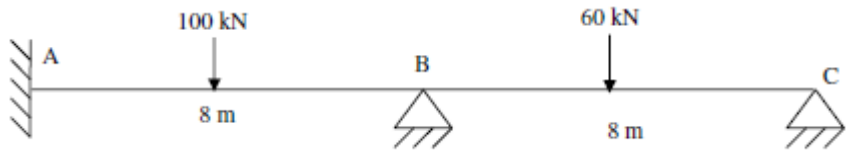
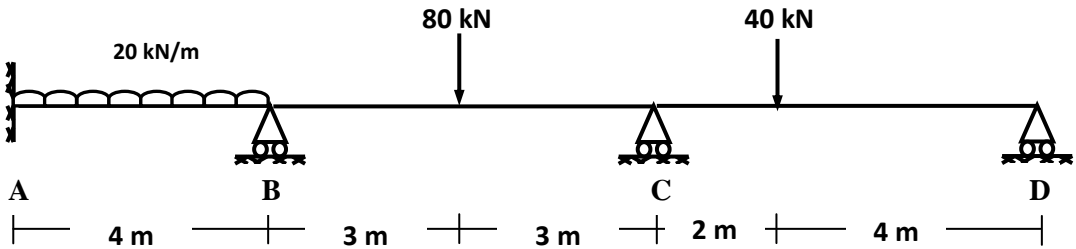
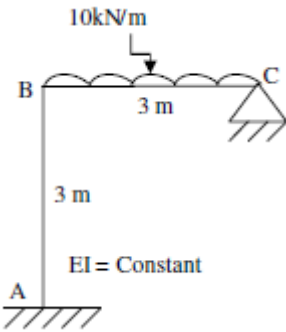
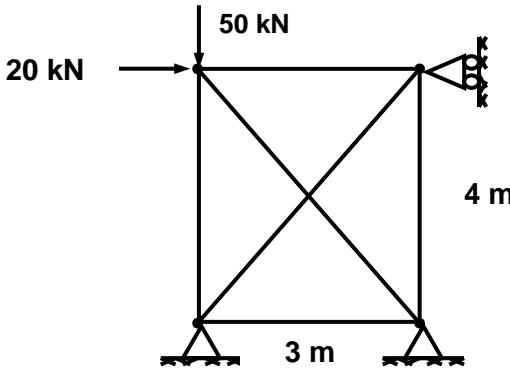
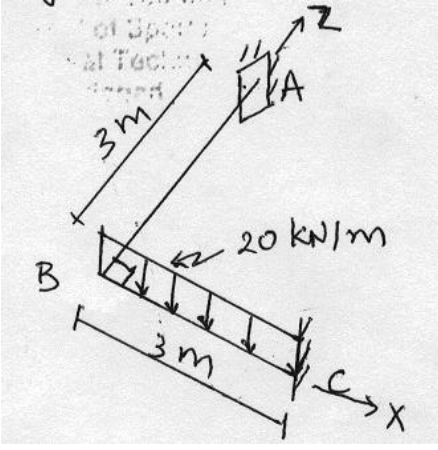


**BE Semester-VII (Civil Engineering) Question Bank
(Elective Paper- Advanced Structural Analysis)**

- All questions (Que. 1 to 20) carry equal marks (10 marks)
- All questions (Que. 21 to 30) carry equal marks (20 marks)

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| Q.1 | Derive Stiffness matrix for a beam with usual notations. |
| Q.2 | Derive Member stiffness Matrix for plane truss with usual notations. |
| Q.3 | Derive Member stiffness Matrix for plane frame with usual notations. |
| Q.4 | Derive relation between structure axis and member axis for Action Vectors of plane truss. |
| Q.5 | Explain use of Symmetry and Anti-symmetry in analysis of complex structures with suitable example. |
| Q.6 | Enlist various secondary effects. Explain procedure to incorporate these effects in analysis. |
| Q.7 | Explain characteristics of stiffness matrix. |
| Q.8 | Explain any two different loading facilities in the professional software. |
| Q.9 | Write basic steps of F.E.M. and explain any two in detail. |
| Q.10 | Explain advantages of Finite Element Method in detail. |
| Q.11 | Derive Stiffness Matrix for two noded bar element using finite element method. |
| Q.12 | Derive Stiffness Matrix for two noded beam element using finite element method. |
| Q.13 | Explain convergence criteria in detail also explain need of convergence. |
| Q.14 | Explain Pascal's triangle in detail to select appropriate displacement function. |
| Q.15 | Explain Element aspect ratio in F.E.A. |
| Q.16 | Explain plane stress and plane strain problems with proper examples. |
| Q.17 | Explain CST element in detail and derive stiffness matrix for the same. |
| Q.18 | Explain shape function in FEA in detail. |
| Q.19 | Write a programme for Multiplication of matrices. |
| Q.20 | Explain : $[R]$, $[RT]$, $\{AJ\}$, $\{AE\}$, $[SFF]$, $\{AC\}$ |
| Q.21 | <p>Analyse the beam as shown in Figure below and draw BMD. Use Stiffness Member Approach.</p> |

| | |
|------|---|
| Q.22 | <p>Analyse the plane frame as shown in Figure below and draw BMD. Use Stiffness Member Approach. Consider $EI = EA = \text{Constant}$</p>  |
| Q.23 | <p>Analyse the beam as shown in Figure below and draw BMD. Use Stiffness Member Approach.</p>  |
| Q.24 | <p>Analyse the beam as shown in Figure below and draw BMD. Use Stiffness Member Approach.</p>  |
| Q.25 | <p>Analyse the beam as shown in Figure below and draw BMD. Use Stiffness Member Approach.</p>  |

| | |
|------|--|
| Q.26 | <p>Analyse the beam as shown in Figure below and draw BMD. Use Stiffness Member Approach.</p>  |
| Q.27 | <p>Analyse the plane frame as shown in Figure below and draw BMD. Use Stiffness Member Approach. Consider $EI = EA = \text{Constant}$</p>  |
| Q.28 | <p>Analyse the truss as shown in Figure below. Use Stiffness Member Approach.</p>  |
| Q.29 | <p>Analyse the Grid as shown in Figure below and draw SFD, BMD and TMD. Use Stiffness Member Approach. Consider $EI = GJ = \text{Constant}$</p>  |

Q.30 Analyse the plane truss as shown in **Figure** below. Use Stiffness Member Approach.

