

**BHARATI VIDYAPEETH INSTITUTE OF  
TECHNOLOGY**  
**Question Bank (I-Scheme)**

**Name of subject: Theory of Structure  
22402 Course: CE Semester: IV**

**Unit Test: II Subject code:**

**Unit 3 (Fixed Beam )**

**2 Marks**

1. Explain the principle of superposition and state the application of it.
2. Write the formulae of fixed end moments for a fixed beam carrying eccentric point load 'W', also draw the beam.
3. A Uniform beam AB of span 6 m is fixed at A and B. it is loaded with a UDL of 3 KN/m over the entire span. Calculate the fixed end moments.
4. A Uniform beam of 6 m span is fixed at A and B it carries UDL of 5 kN/m over the entire span and a concentrated point load of 3kN at 3m from left end support. Calculate the fixed and moments.
5. A Uniform beam of 5m span is fixed at A and B it carries point load of 10KN at 2m from left support. Calculate the fixed and moments.

**4 Marks**

1. A fixed beam of span 6 m carries a UDL of 25 kN/m over the entire span and a central point load of 40 kN. Calculate the support moments ,draw BMD.
2. A fixed beam of span 8m carries a UDL of 25 kN/m over the entire span and a point load of 20 kN at 3m from left support. Calculate the support moments ,draw BMD.
3. A fixed beam of span 7 m carries a point load of 50KN at 4 m from left support. Calculate the fixed end moments by using first principle. Draw BM diagrams.
4. A fixed beam of span 6 m carries two point loads 40 kN and 'W' kN at 2 m and 4 m from left support respectively. Find 'W' such that fixed end moments at both ends are of same magnitude.
5. A fixed beam of span 6 m carries two point loads 40 kN and 50 kN at 1 m and 5m from left support respectively. Find fixed end moments and draw BM diagrams.

**Unit 4(Continuous Beam)**

**2 Marks**

1. Define Continuous beam and draw its diagram.
2. How to solve continuous beam having fixed ends.

3. State and explain clapeyron's theorem of three moments having same MI.
4. Explain the concept of deflected shape in continuous beams.

#### 4 Marks

1. A continuous beam ABCD is simply supported at A,B,C and D such that AB=6m,BC=8m and CD=6m.Span AB carries a UDL of 40KN/m from A to B.Span BC carries a central point load of 30KN and span CD carries a point load of 15KN at 2m from support D.Draw bending moment diagram.Use Clapeyron's theorem of three moments.
2. A continuous beam ABC consists of two spans AB and BC of 6m and 8m respectively.The end supports are simple.The span AB carries a central point load and span BC carries a point load of 20KN at 5m from right support.Draw BM diagrams using Clapeyron's theorem.
3. A continuous beam ABC is simply supported at A,B and C such that AB=BC=4m.Span AB carries a UDL of 40KN/m from A to B.Span BC carries a central point load of 30KN.Draw bending moment diagram.Use Clapeyron's theorem of three moments.
4. Calculate the support moments  $M_a, M_b$  and  $M_c$  in case of a continuous beam fixed at A and C and continuous over support B.AB=6m,AC=9m.Span AB carries UDL of 15KN/m from A to B and Span BC carries central point load of 10KN.Use Clapeyron's theorem.
5. A continuous beam ABCD is simply supported at A,B and C with CD as overhang.Span AB is loaded with UDL of 4KN/m and span BC is loaded with a central point load of 10KN.A point load of 5 KN is acting at D.Find out the support moments and dram BMD.  
Consider AB=6m,BC=8m and CD=2m.Use Clapeyron's theorem of three moments.
6. A beam ABCD is fixed at A and simply supported at B and C.CD is overhang.AB=BC=5m,CD=2m.Span AB carries a UDL of 7KN/m on AB,a central point load of 30Kn on BC and a point load of 10Kn at D. Find the support moments and draw bending moment diagrams.

#### Unit 5 (Moment Distribution Method)

#### 2 Marks

1. Define Stiffness factor and write the values of Stiffness factor for beams:-
  - a)Simply supported at both ends
  - b)Fixed at one end and simply supported at other end.
2. Draw a neat sketch of symmetrical and un symmetrical portal frame.
3. Explain about carry over factor and give the value of carry over factor for following cases:-
  - a)Two ends simply supported
  - b)Both end fixed

4. Define Distribution factor and write the formula of it.

**4 Marks**

1. A continuous beam ABC is supported at A, B and C.  $AB=6\text{m}$ ,  $BC=5\text{m}$ . AB carries a UDL of  $35\text{KN/m}$  and BC carries a UDL of  $30\text{KN/m}$ . Calculate the support moments and draw Bending moment diagrams. Use moment distribution method.
2. A continuous beam ABC is supported at A, B and C.  $AB=8\text{m}$ ,  $BC=6\text{m}$ . AB carries a UDL of  $10\text{KN/m}$  and BC carries a point load of  $15\text{KN}$  at centre. Calculate the support moments and draw Bending moment diagrams. Use moment distribution method.
3. A continuous beam ABC is fixed at A and supported on B and C. Span  $AB=5\text{m}$  and  $BC=4\text{m}$ . AB carries a UDL of  $20\text{KN/m}$  and BC carries a point load of  $35\text{KN}$  at its centre. Calculate the support moments and draw Bending moment diagrams. Use moment distribution method.
4. A continuous beam ABC is fixed at A and B and continuous over support C.  $AB=4\text{m}$ ,  $BC=5\text{m}$ . AB carries a UDL of  $5\text{KN/m}$  and BC carries a point load of  $8\text{KN}$  at  $2\text{m}$  from support C. Calculate the support moments and draw Bending moment diagrams. Use moment distribution method.