



Work sheet(Unit wise Objective)

UNIT-I: Two Hinged Arches & Moment Distribution Method

Part A: Multiple Choice Questions (MCQs)

1. A two-hinged arch is statically:
 - a) Determinate
 - b) Indeterminate to degree 1
 - c) Indeterminate to degree 2
 - d) Indeterminate to degree 3**Answer: b**
2. The horizontal reaction in a two-hinged arch is called:
 - a) Shear force
 - b) Arch thrust
 - c) Bending moment
 - d) Torque**Answer: b**
3. The highest point of an arch is known as:
 - a) Springing
 - b) Crown
 - c) Rib
 - d) Hinge**Answer: b**
4. A parabolic arch carrying UDL over the entire span develops:
 - a) Maximum BM at crown
 - b) Constant BM
 - c) Zero BM throughout
 - d) Maximum BM at supports**Answer: c**
5. The analysis of two-hinged arches is generally based on:
 - a) Equilibrium only
 - b) Compatibility condition
 - c) Virtual work only
 - d) Graphical method**Answer: b**
6. Increase in temperature causes:
 - a) No effect
 - b) Secondary stresses
 - c) Shear failure
 - d) Buckling**Answer: b**
7. Elastic shortening of the arch rib results in:
 - a) Primary stresses
 - b) Secondary stresses
 - c) Torsional stresses
 - d) No stresses**Answer: b**
8. Moment Distribution Method was developed by:
 - a) Castigliano
 - b) Hardy Cross
 - c) Kani
 - d) Muller-Breslau**Answer: b**

9. Carry-over factor for a prismatic member is:

- a) 0
- b) 1
- c) $1/2$
- d) 2

Answer: c

10. Sum of distribution factors at a joint equals:

- a) 0
- b) 1
- c) 2
- d) Infinity

Answer: b

11. Fixed-end moment for a fixed beam carrying UDL is:

- a) $wL^2/8$
- b) $wL^2/12$
- c) $wL^2/24$
- d) $wL^2/2$

Answer: b

12. Side sway occurs mainly due to:

- a) Symmetrical loading
- b) Unsymmetrical loading
- c) Temperature effects
- d) Settlement only

Answer: b

13. A hinge can resist:

- a) Moment
- b) Shear and axial force
- c) Torsion
- d) None

Answer: b

14. Bending moment at a hinge is:

- a) Maximum
- b) Minimum
- c) Zero
- d) Constant

Answer: c

15. Moment distribution is an:

- a) Exact method
- b) Iterative method
- c) Graphical method
- d) Approximate method

Answer: b

16. The stiffness of a member fixed at far end is:

- a) EI/L
- b) $2EI/L$
- c) $3EI/L$
- d) $4EI/L$

Answer: d

17. Portal frames consist of:

- a) Beams only
- b) Columns only
- c) Beams and columns
- d) Truss members only

Answer: c

18. Elastic curve represents:

- a) Shear force diagram
- b) Bending moment diagram
- c) Deflected shape
- d) Load diagram

Answer: c

19. Distribution factor depends on:

- a) Load intensity
- b) Member stiffness
- c) Span only
- d) Support reaction

Answer: b

20. Degree of static indeterminacy of a two-hinged arch is:

- a) 0
- b) 1
- c) 2
- d) 3

Answer: b

Part B: Fill in the Blanks

- 1. A two-hinged arch is statically **indeterminate**.
- 2. The highest point of an arch is called the **crown**.
- 3. Horizontal reaction in an arch is called **thrust**.
- 4. A parabolic arch under full UDL develops **zero** bending moment.
- 5. Temperature changes induce **secondary** stresses.
- 6. Elastic shortening affects the **rib** of an arch.
- 7. Moment Distribution Method was proposed by **Hardy Cross**.
- 8. Carry-over factor for a prismatic member is **1/2**.
- 9. Sum of distribution factors at a joint is **1**.
- 10. Fixed-end moments are calculated for **fixed** members.
- 11. Side sway generally occurs under **unsymmetrical** loading.
- 12. Elastic curve shows the **deflected** shape.
- 13. Bending moment at a hinge is **zero**.
- 14. A portal frame consists of beams and **columns**.
- 15. Member stiffness is proportional to **EI/L**.
- 16. Arch ribs mainly carry **compression**.
- 17. Compatibility condition is used to determine **horizontal thrust**.
- 18. SFD stands for **Shear Force Diagram**.
- 19. BMD stands for **Bending Moment Diagram**.
- 20. Two-hinged arch has one degree of **indeterminacy**.