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Work sheet(Unit wise Objective)

UNIT–II: Kani's Method & Suspension Cables

Part A: Multiple Choice Questions (MCQs)

Kani's Method

1. Kani's method is also known as:
   a) Flexibility Method
   b) Rotation Contribution Method
   c) Stiffness Method
   d) Force Method
   Answer: b
2. Kani's method is primarily used for:
   a) Determinate structures
   b) Indeterminate structures
   c) Trusses only
   d) Cables only
   Answer: b
3. The main advantage of Kani's method is:
   a) No calculations required
   b) Simplicity in frame analysis
   c) Applicable only to beams
   d) Uses graphical solutions
   Answer: b
4. Kani's method is an:
   a) Exact analytical method
   b) Iterative method
   c) Graphical method
   d) Experimental method
   Answer: b
5. Rotation factor in Kani's method depends on:
   a) Load intensity
   b) Member stiffness
   c) Span length only
   d) Support settlement only
   Answer: b
6. Kani's method is particularly suitable for:
   a) Continuous beams and frames
   b) Trusses
   c) Arches only
   d) Suspension bridges
   Answer: a
7. In Kani's method, the sum of rotation factors at a joint is generally:
   a) 0
   b) 1
   c) –0.5
   d) Depends on stiffness
   Answer: c

8. Side sway in frames occurs mainly due to:
   a) Symmetrical loading
   b) Unsymmetrical loading
   c) Temperature effects
   d) Wind load only
   Answer: b
9. Kani's method eliminates the need for:
   a) Fixed-end moments
   b) Distribution factors
   c) Rotation contributions
   d) Iterative balancing
   Answer: b
10. Kani's method was developed by:
    a) Hardy Cross
    b) Kani
    c) Castigliano
    d) Clapeyron
    Answer: b

Cables and Suspension Bridges

11. A cable can resist:
    a) Compression only
    b) Tension only
    c) Bending only
    d) Shear only
    Answer: b
12. The shape of a cable carrying UDL over the horizontal span is:
    a) Circular
    b) Parabolic
    c) Elliptical
    d) Hyperbolic
    Answer: b
13. The shape of a cable subjected to its own weight is:
    a) Parabola
    b) Circle
    c) Catenary
    d) Ellipse
    Answer: c
14. The lowest point of a suspension cable is called:
    a) Crown
    b) Vertex
    c) Hinge
    d) Saddle
    Answer: b
15. The vertical distance between support level and lowest point of cable is:
    a) Span
    b) Rise
    c) Sag
    d) Camber
    Answer: c
16. Suspension bridge cables are subjected to:
    a) Compression
    b) Bending
    c) Tension
    d) Shear
    Answer: c

17. Stiffening girders in suspension bridges are provided to:
    a) Increase dead load
    b) Reduce deflections
    c) Increase sag
    d) Reduce span
    Answer: b
18. The main cables of a suspension bridge pass over:
    a) Hinges
    b) Saddles
    c) Rollers
    d) Bearings
    Answer: b
19. The horizontal component of cable tension remains:
    a) Variable
    b) Constant
    c) Zero
    d) Infinite
    Answer: b
20. A three-hinged stiffening girder suspension bridge is:
    a) Statically determinate
    b) Indeterminate to degree 1
    c) Indeterminate to degree 2
    d) Indeterminate to degree 3
    Answer: a

Part B: Fill in the Blanks

1. Kani's method is also known as the **Rotation Contribution Method**.
2. Kani's method is used for the analysis of **indeterminate** structures.
3. Kani's method is an **iterative** method.
4. Rotation factor depends on member **stiffness**.
5. Side sway occurs mainly due to **unsymmetrical** loading.
6. Kani's method is suitable for analyzing continuous **beams** and frames.
7. The sum of rotation factors at a joint is generally **–0.5**.
8. Fixed-end moments are used as the starting values in **Kani's** method.
9. A cable can resist only **tension**.
10. The shape of a cable under UDL is a **parabola**.
11. A cable subjected to its own weight forms a **catenary**.
12. The lowest point of a cable is called the **vertex**.
13. The vertical distance between support level and lowest point is called **sag**.
14. Suspension bridge cables are subjected to **tensile** forces.
15. The horizontal component of cable tension remains **constant**.
16. Stiffening girders help reduce **deflections**.
17. Main cables pass over **saddles** mounted on towers.
18. Suspension bridges are economical for **long** spans.
19. The towers of a suspension bridge carry mainly **compressive** forces.
20. A three-hinged stiffening girder suspension bridge is statically **determinate**.