KUMARAGURU college of technology
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Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

Sixth Semester

CIVIL ENGINEERING

CEE118: Structural Analysis-II

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The hinged support has _____ degrees of freedom

   a) 0 b) 2

   c) 1 d) 3

2. The static indeterminacy of a propped cantilever beam is

   a) 3 b) 2

   c) 1 d) 0

3. A steel rod of length 'L', area of cross section 'A' and Young's modulus 'E' is subjected to axial unit load. What is its axial flexibility

   a) L/AE b) AE/L

   c) 2EI/L d) 4EI/L

4. In matrix flexibility method, the compatibility equation is

   a) [F] = [a] [u] b) [F] = [K] [u]

   c) [u] = [a] [F] d) [δ] = [β] [u]

5. What is the size of stiffness matrix when the kinematic indeterminacy is 4?

   a) 1 x 1 b) 1 x 4

   c) 4 x 1 d) 4 x 4

6. The stiffness method is preferred when_____

   a) The static indeterminacy is less than the kinematic indeterminacy b) The kinematic indeterminacy is less than the static indeterminacy

   c) The static indeterminacy is equal to the kinematic indeterminacy d) Static indeterminacy is zero

7. Element aspect ratio is

a) The ratio of the largest dimension of the element to the smallest dimension
b) The ratio of the smallest dimension of the element to the largest dimension
c) The difference between largest dimension to the smallest dimension
d) The product of largest dimension to the smallest dimension

8. In finite element method each node will have _____

a) No displacements
b) Only one displacement
c) Finite displacements
d) Infinite displacements

9. Tension coefficient of a truss member is

a) The tension in that member divided by its area
b) The tension in that member multiplied by its area
c) The tension in that member multiplied by its length
d) The tension in that member divided by its length

10. What decided the height of pylons in a suspension bridge?

a) Length of the cable
b) Central dip of the cable
c) The bending moment at the support
d) The Shear force at the support.

PART B (10 x 2 = 20 Marks)

11. Explain indeterminacy of a structure.
12. State the principle of superposition of forces.
13. Define flexibility coefficient.
14. What is a primary structure?
15. Why stiffness method is also called as displacement method?
16. What is the key equilibrium equation in analyzing structures by matrix stiffness method?
17. Mention the application of beam element.
18. Define beam element.
19. Define a space frame and mention the nature of joint provided.
20. What is the need for cable structures?

PART C (5 x 14 = 70 Marks)

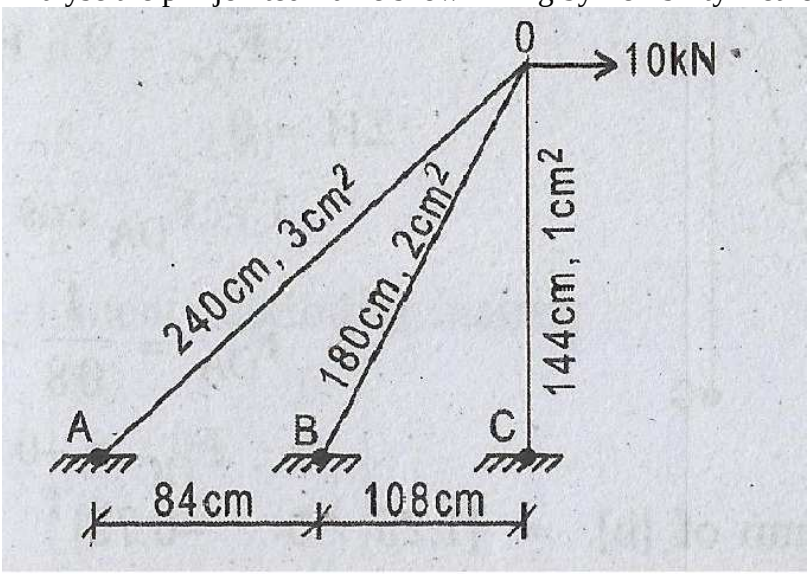
21. a) i) Explain static and kinematic indeterminacy with examples.

(OR)

b) (i) Differentiate the statically determinate structures and statically indeterminate structures? (4)

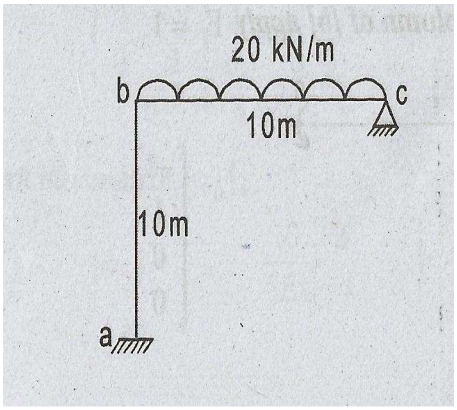
(ii) Explain principle of superposition. (10)

22. a) Analyse the pin-jointed frame shown in fig by flexibility method.

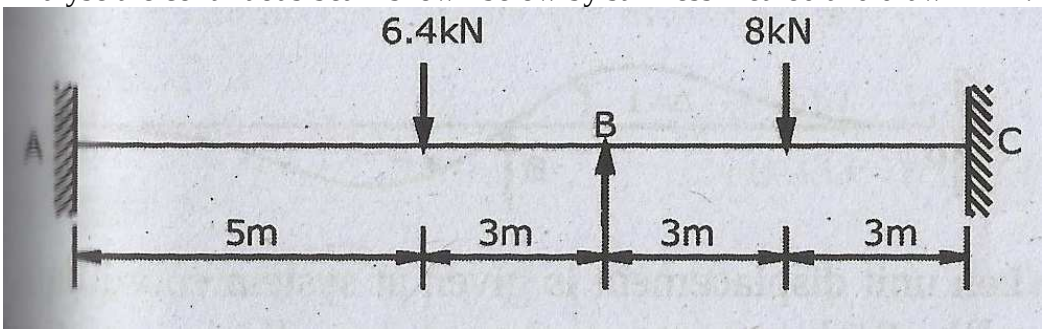


(OR)

b) Analyse the Knee-frame shown in fig by flexibility method and hence draw the BMD. Assume EI-constant.

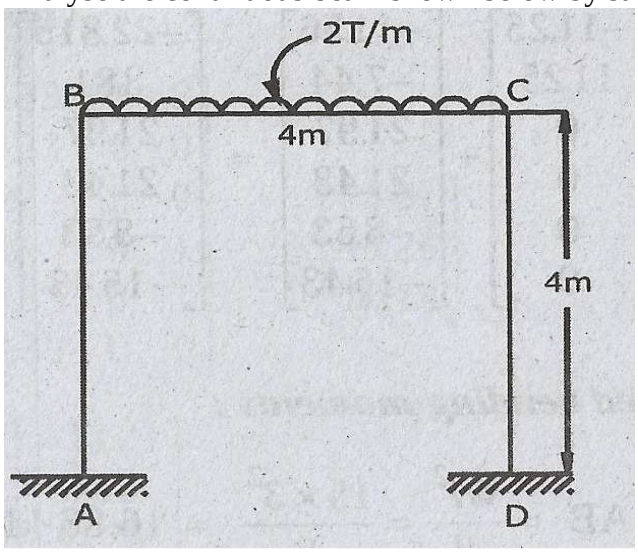


23. a) Analyse the continuous beam shown below by stiffness method and draw BMD.



(OR)

b) Analyse the continuous beam shown below by stiffness method and draw BMD.



24. a) Explain the Discretisation of a structure in detail.

(OR)

b) Explain the types and applications of truss elements in finite element method.

25. a) A light suspension bridge of 25 m span has to support a platform load of 15kN/m. If the cables have a central dip of 2m, calculate the sectional area required for each cable, if the permissible stress is 100 N/mm^2. If the cable is passed over a pulley on the top of the pier and anchored down, the inclination to the horizontal being 30°, find the vertical pressure on the pier and B.M. at its base if the height of the pier is 5m.

(OR)

b) Analyse the beam AB of uniform cross section curved in plan and in the form of a quadrant of a circle of radius 5m. The beam is fixed at A and free at B. A point load of 100kN is acting vertically downward at B, find the shear force, bending moment and torsional moment at A. Draw SFD, BMD and TMD.

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