(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 100504 / 100514 Roll No. | | | | | | | | | | |

B.TECH.

(SEM. V) THEORY EXAMINATION, 2015-16

STRUCTURAL ANALYSIS-2

[Time:3 hours] **[MaximumMarks:100]**

Section-A

1. Attempt **all** parts . All parts carry **equal** marks. Write answer of all part in short . **(2x10=20)**

   (a) What is meant by relative stiffnes of a member?

   (b) Define shape factor.

   (c) State Muller Breslau's Principle for ILD.

   (d) Define flexibility coefficient.

(e) What if the value of stiffness coefficient corresponding to rotation of propped end in Fig.1?

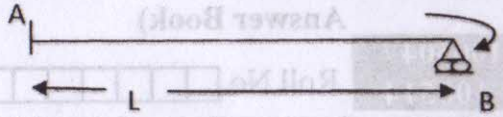

Fig -1

(f) What is distribution factor?

(g) What is degree of static and kinematic indeterminacy in following frame of Fig.2?

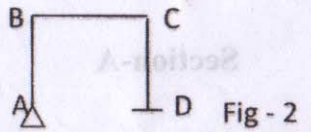

Fig - 2

(h) Name any three force methods for analysis of structure.

(i) What is the expression for computing length of a cable for horizontal span 'I' and central dip 'h' when both supports are at same level?

(j) Draw ILD for BM at a section at x meters from left support of a two hinge parabolic arch of span 'I' and rise 'h'.

Section-B

Attempt any **five** questions from this section. **(10x5=50)**

2. Using the method of consistent deformation determine the reaction of a propped cantilever beam shown in Fig.3 stiffness(k) of spring is 800kN/m and EI of beam is 3×10^{10}kN/mm^2

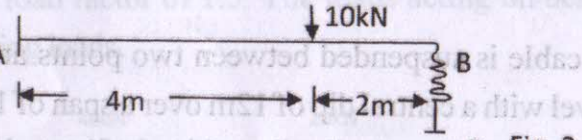

Fig -3

3. Find support moments for the beam shown in Fig. 4 by slope deflection method.

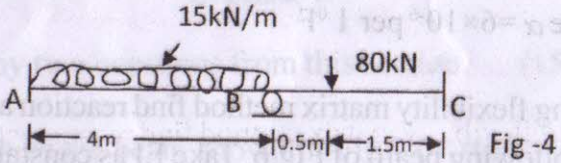

Fig -4

4. Prove that horzontal thrust developed due to a point load W acting at crown in a two hinged semicircular arch of radius 'R' is independent of its radius. Consider EI as constant.

5. Draw the influence line diagram for M_A and M_B for the uniform cross-section rigid joint frame shown in Fig. 5. The unit load crosses the frame from A to B.

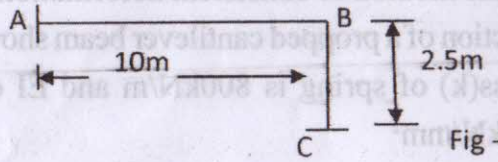

Fig -5

6. A cable is suspended between two points at the same level with a central dip of 12m over a span of 120 m and carries a uniformly distributed load of intensity 2 kN/m of horizontal length. Calculate the change in the horizontal tension if the temperature rises by 20 ^{0}F from the original.

Take $\alpha = 6\times10^{-6}$ per 1 ^{0}F

7. Using flexibility matrix method find reaction at supports in following beam of Fig.6. Take EI as constant.

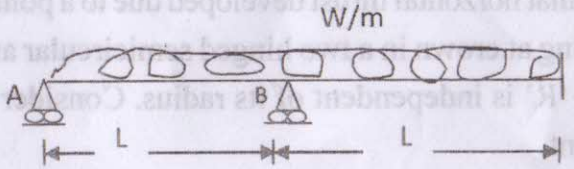

Fig -6

8. Find shape factor of hollow circular section as shown in Fig7.

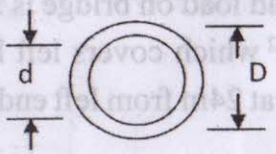

Fig -7

9. Find plastic moment capacity of following beam in Fig.8. Take load factor of 1.5. The loads acting on beam are working loads.

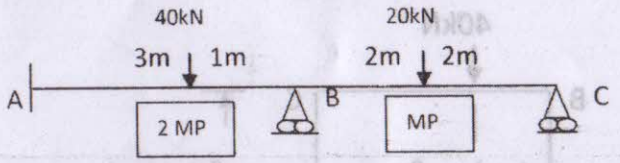

Fig 8

Section-C

Attempt any **two** questions from this section. **(15x2=30)**

10. Analyze the beam shown in Fig.9 by stiffness matrix method. Take EI as constant.

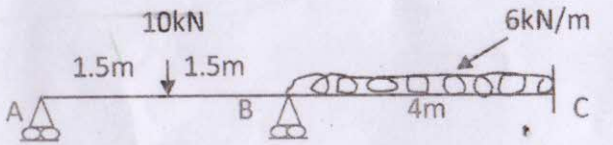

Fig 9

11. A suspension bridge of 100 m span has two three hinged stiffening girder supported by two cables having central dip 10m. The dead load on bridge is 5 kN/m^2 , and live load is 10 kN/m^2 which covers left half of span only. Find SF and BM at 24m from left end if road way is 6m wide.

12. Analyze the frame shown in Fig. 10 by moment distribution method. Take EI as constant.

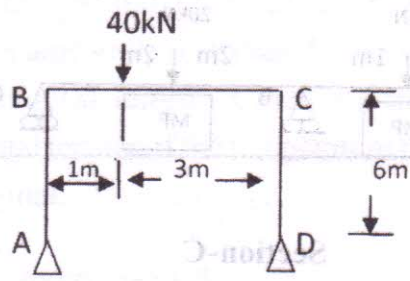

Fig -10

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