

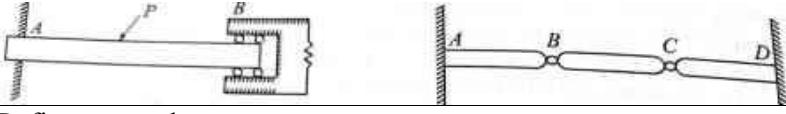


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B.TECH.
(SEM V)THEORY EXAMINATION 2020-21
STRUCTURAL ANALYSIS

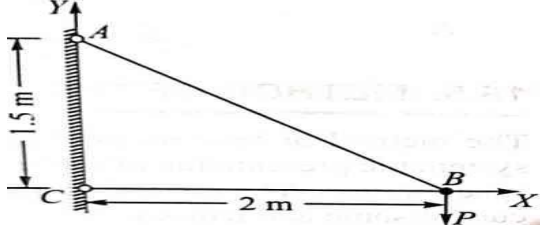
Time: 3 Hours**Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

Qno.	Question	Marks	CO
a.	From the beams shown in below , state whether they are statically determinate or indeterminate 	2	1
b.	Define suspenders.	2	1
c.	What do you know about tension coefficient method?	2	2
d.	Define looped structure.	2	2
e.	What do you understand by strain energy?	2	3
f.	What point to remember while applying Castiglano's theorems?	2	3
g.	Define conjugate beam method.	2	4
h.	What are the basic procedure for constructing influence lines of indeterminate structure?	2	4
i.	What are the uses of arches?	2	5
j.	Define spandrel braces arch.	2	5

SECTION B**2. Attempt any three of the following:**

Qno.	Question	Marks	CO
a.	Find the maximum and minimum tension in cable carrying uniformly distribute load, span of cable L and dip is 'h'.	10	1
b.	Write the procedure of find the forces in truss by method of tension coefficients.	10	2
c.	A continuous beam ABC of uniform section has two equal spans. AB and BC each of length 'l'. During loading support B sinks by δ_1 and support C sinks by δ_2 . Find the reactions at support in terms of δ_1 and δ_2 and l and flexural rigidity EI of the beam by strain energy method.	10	3
d.	How you will be determine which members of a truss do not carry forces?	10	4
e.	A three hinged parabolic arc of a span 20 mtr and rise 4 m , carries a udl of 20 kN/m run on the left half of the span . Find the maximum B.M. for the arch.	10	5

SECTION C**3. Attempt any one part of the following:**

Qno.	Question	Marks	CO
a.	A plane frame consist of two members AB and CB, hinged at A and C to the wall, as shown in figure . Determine the forces in the two members due to vertical force P applied at B. by tension coefficient method. 	10	1



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b.	Determine the forces in all the members of the truss loaded and supported as shown in figure by M.O.J.	10	1
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4. Attempt any one part of the following:

Qno.	Question	Marks	CO
a.	Write the steps of Maxwell's unit load method one degree truss.	10	2
b.	A single load of 100 kN rolls along a girder of 20 m span. Draw the diagrams of maximum bending moment and shear force. What will be absolute maximum positive shear force and bending moment.	10	2

5. Attempt any one part of the following:

Qno.	Question	Marks	CO
a.	A girder having a span of 18 m is simply supported at the ends. It is traversed by a train of loads as shown in fig. The 50 kN load is leading. Find the maximum bending moment which can occur (i) Under the 200 kN (ii) Under 50 kN	10	3

b. Write Muller-Breslau's principal and its application for determinate structures.

10

6. Attempt any one part of the following:

Qno.	Question	Marks	CO
a.	For the beam and loading shown in figure. Determine the slope A, B, C and D and deflection A and D by conjugate beam method.	10	3

b. Explain with neat sketch Arch action. And also define three hinged arch.

10

7. Attempt any one part of the following:

Qno.	Question	Marks	CO
a.	A parabolic three hinged arch of span 'L' is subjected to an u.d.l of w/m run over the entire span. Find the horizontal thrust and bending moment at any section.	10	5
b.	A spandrel braced arch has a varying moment of inertia given by $I = I_G \sec \theta$. It has a span of 40 m and a central rise of 8 m. Calculate the maximum positive and negative bending moment at a section D 12 m from the left support, due to moving point load of 6 kN. Also draw ILD.	10	5