BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

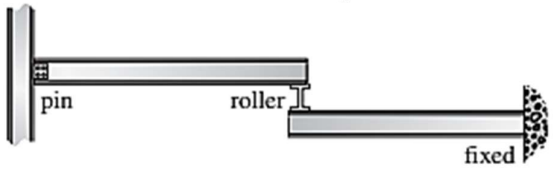
CLASS: B. TECH **SEMESTER : III**
BRANCH: CIVIL ENGINEERING **SESSION : MO/19**

SUBJECT: CE202 STRUCTURAL ANALYSIS I

TIME: 3 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Determine stability and determinateness of the following structure: [5]



Q.1(b) In what scenarios would you use principle of superposition? Explain with an example. [5]

Q.2(a) Analyze the given truss (Figure- Q2(a)) to find forces in member BC: (All members are of equal length) [5]
Q.2(b) Draw shear force and bending moment diagram for the given beam (Figure-Q2(b)): [5]

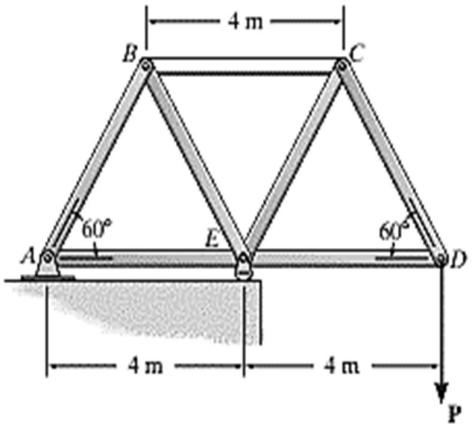


Figure- Q2(a)

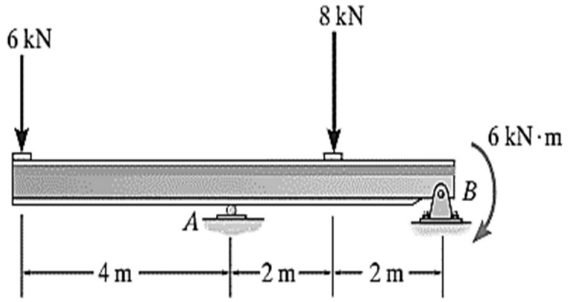
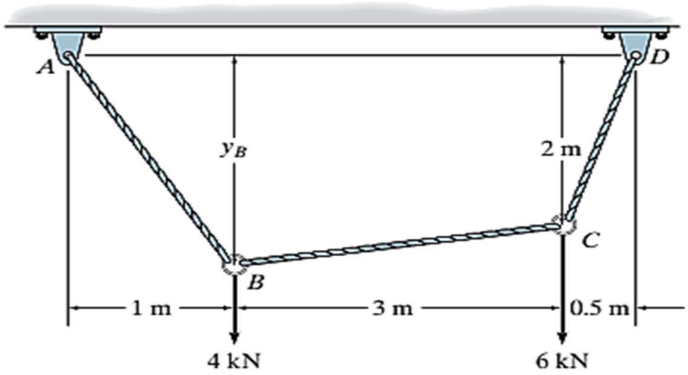


Figure-Q2(b)

Q.3(a) Analyze the given cable to find out y_B. [5]



Q.3(b) A 3 hinged circular arch, hinged at crown and the supports, has a horizontal span of 15m with a central rise of 3m. It carries a UDL of 40 kN per horizontal meter over the left half of the span. Calculate normal thrust, radial shear and bending moment at 5m from left hand hinge. [5]

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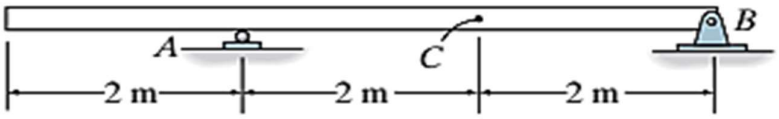
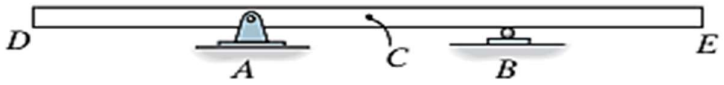
Q.4(a) Draw Influence line diagram for reaction at A for the following beam. [5]



Q.4(b) Draw Influence line diagram for Bending moment at C for the following beam. [5]



Q.5(a) Describe Castigliano's theorems by giving a suitable example. [10]

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