Question Paper

Exam Date & Time: 28-Nov-2018 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

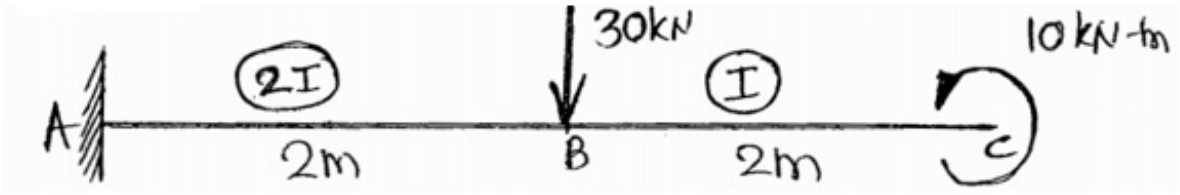
INTERNATIONAL CENTRE FOR APPLIED SCIENCES
IV SEMESTER B.S. ENGG. END SEMESTER EXAMINATION - NOV./ DEC. 2018
Structural Analysis [CE 242]

Marks: 100 **Duration: 180 mins.**

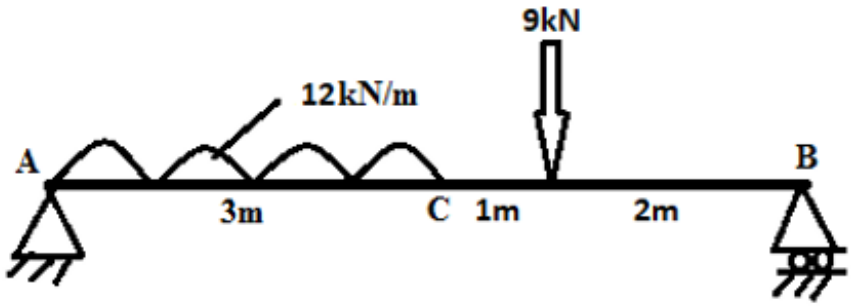
Answer 5 out of 8 questions.

1) For the given beam determine slope and deflection at C. (10)

A)



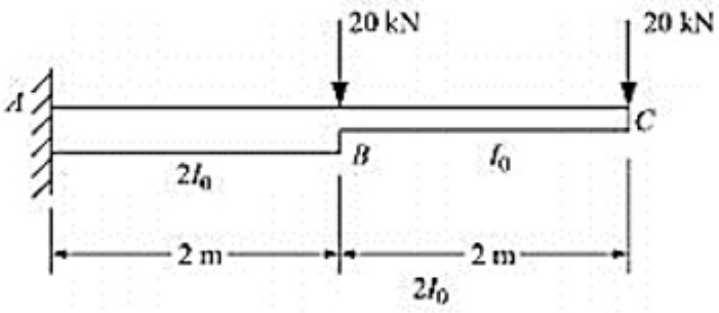
B) For a given simple supported calculate slope at A and deflection at C using moment area method (10)



2) State and derive Castigliano's first and second theorem. (10)

A)

B) Using unit load method, find the deflection and rotation at the free end of the cantilever beam shown in figure. Take E= $2x10^5$ N/mm^2 and I= 12 x 10^6 m^4. (10)

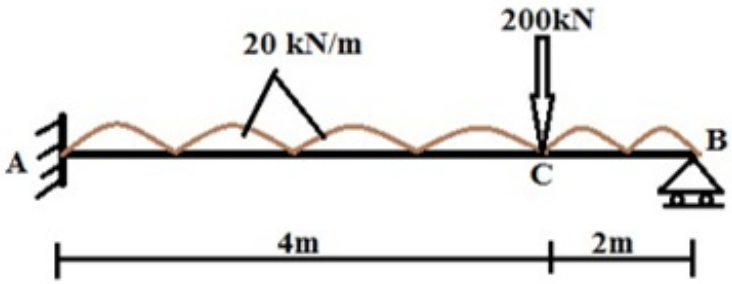


3) A three hinged parabolic arch of 30m span and central rise 5m subjected to a point load of 80kN at 10m from left hinge. Draw BMD and find reaction, radial shear, and normal thrust at 12m from the left support. (20)

4) With the neat sketch derive strain equation due to axial load and due to bending. (10)

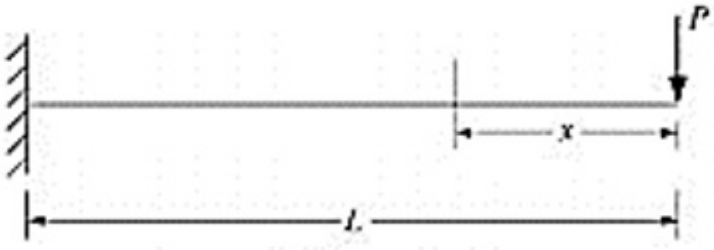
A)

B) Analyse the propped cantilever beam as shown in figure using minimum strain energy method and draw BMD and SFD. Take EI as constant (10)



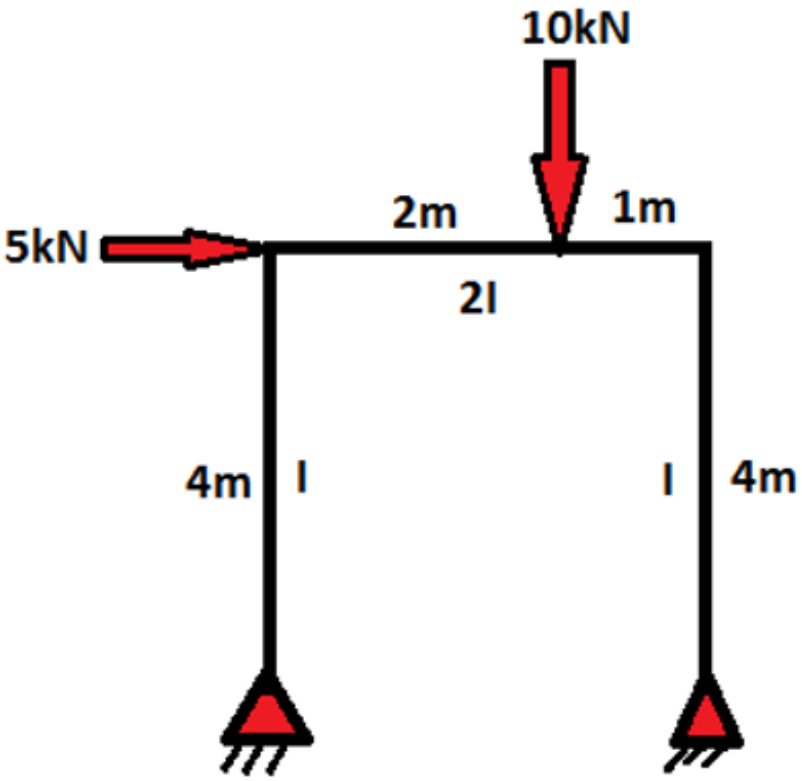
5) Find deflection at free end of the cantilever beam as shown in figure using strain energy method. Take EI as constant (10)

A)

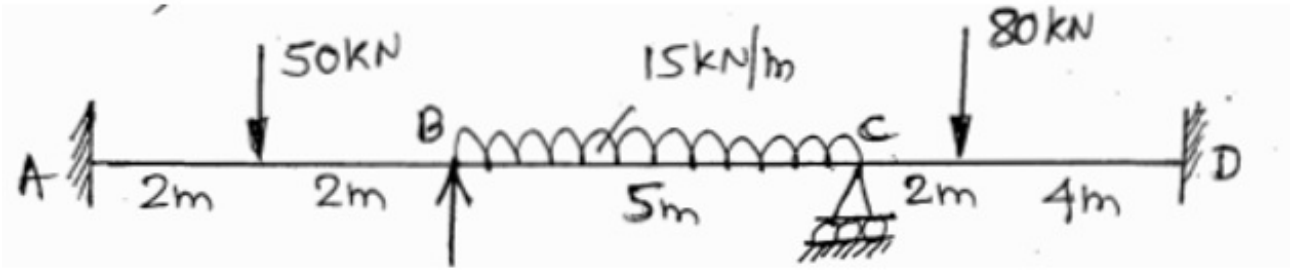


B) Differentiate between determinate and indeterminate structures and give examples. (10)

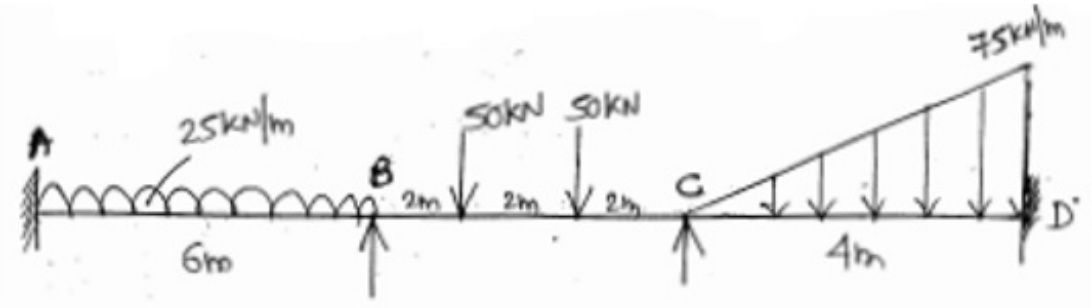
6) Analyse the frame shown in figure using minimum strain energy method. Draw BMD and elastic curve. (20)



7) Analyse the continous beam shown in figure by slope deflection method and Draw BMD, SFD, elastic curve. Take EI=constants. (20)



8) Analyse the beam shown in figure by moment distrubution method.Draw BMD, SFD and elastic curve. Perform minimum four cycles (20)



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