Exam.Code:0905
Sub. Code: 6188

2023
B.E. (Mechanical Engineering)
First Semester
ME-101: Engineering Mechanics - I

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. 1 (Part-A) which is compulsory and selecting two questions each from Part B-C. Assume any missing data suitably. Supplement your answer with neat and labeled sketched wherever required.

x-x-x

Part-A

1. (i) Draw and compare fixed support versus smooth support. (2)

   (ii) Differentiate between brittle versus ductile failure. (2)

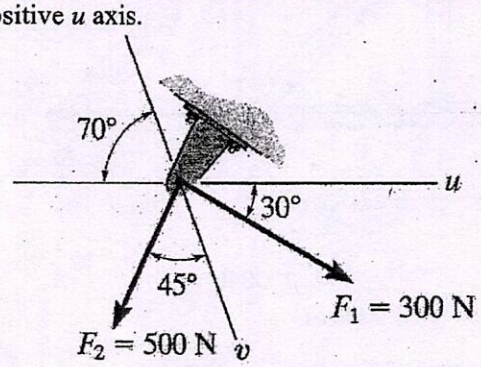
   (iii) Where do we experience dry friction? State two examples. (2)

   (iv) Differentiate between Center of Gravity versus Center of Mass by citing an example. (2)

   (v) Differentiate between work versus virtual work by citing an example. (2)

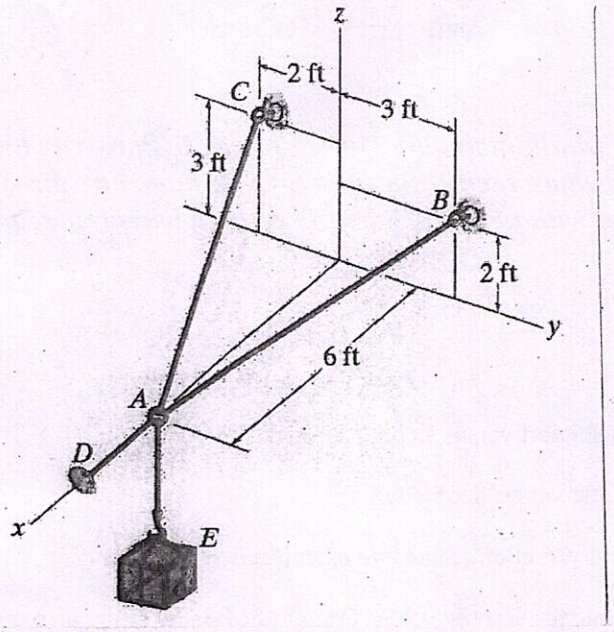
Part-B

2. Determine the magnitude of the resultant force $\mathbf{F}_R$ and its direction, measured clockwise from the positive u axis. (10)

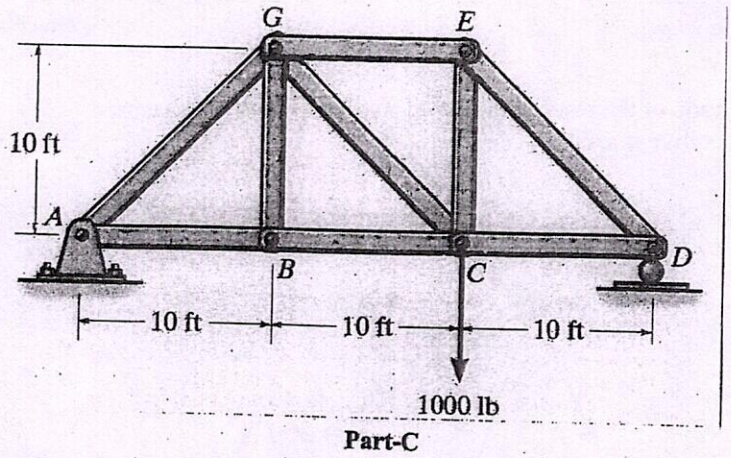


P.T.O.

3. The 150-lb crate is supported by cables *AB*, *AC*, and *AD*. Determine the tension in these wires. (10)

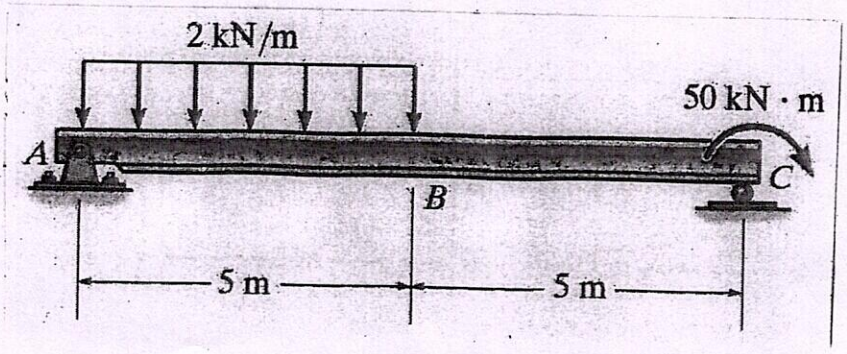


4. Determine the force in each member of the truss and state if the members are in tension or compression. (10)



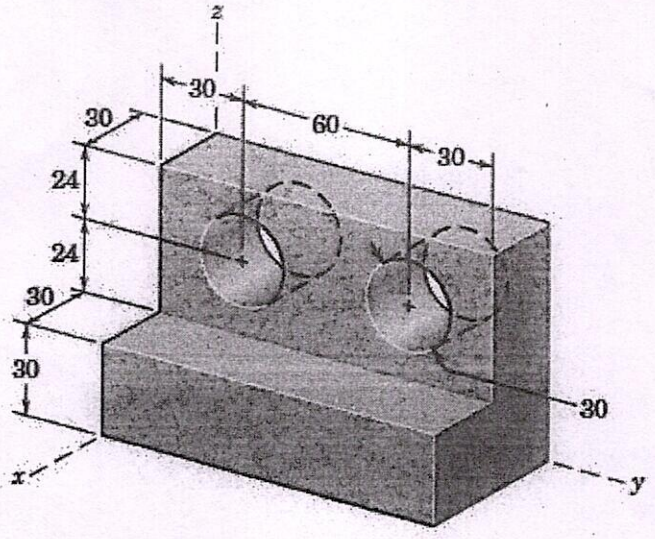
Part-C

5. Draw the shear and moment diagrams for the beam. (10)



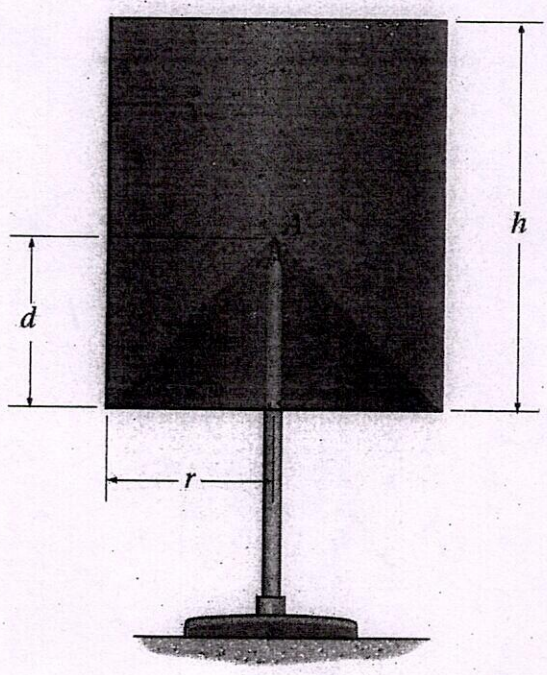
Sub. Code: 6188

6. Determine the mass and the centroid location of the cast-aluminum body. (10)



Dimensions in millimeters

7. A conical hole is drilled into the bottom of the cylinder, which is supported on the fulcrum at A. Determine the minimum distance d in order for it to remain in stable equilibrium. (10)



x-x-x