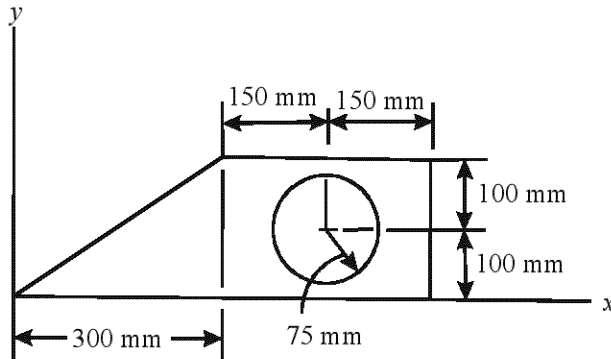
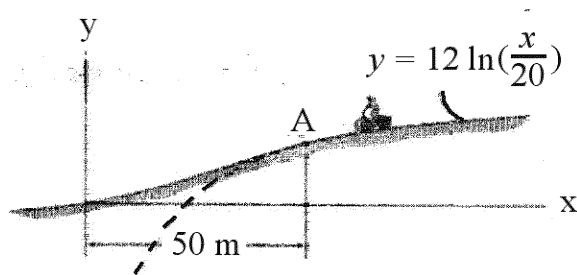


4. What do you understand by inertia tensor ?
Determine moment of inertia of the composite area about y axis. **15**



Section III

5. When the bicycle passes point A, it has a speed of 6 m/s, which is increasing at the rate of $\dot{v} = 0.5 \text{ m/s}^2$, determine the magnitude of its acceleration when it is at point A. **15**



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No. of Printed Pages : 06

Roll No.

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B. Tech. EXAMINATION, Dec. 2018

(Third Semester)

(B. Scheme) (Main & Re-appear)

(ME, AE, AER)

ME205B

ENGINEERING MECHANICS

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

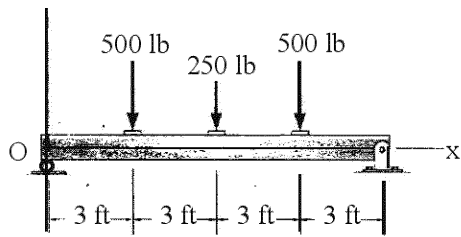
Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

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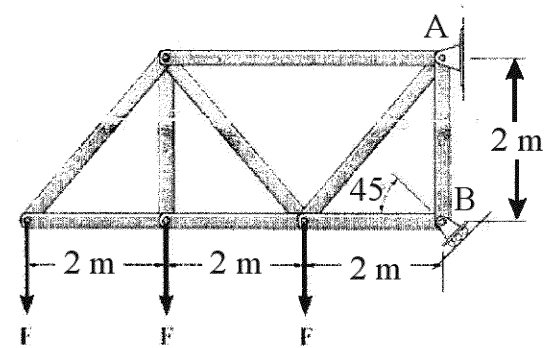
P.T.O.

Section I

1. (a) Define moment of a force about an axis.
How is it different from moment of a couple ? **5**
- (b) Replace the loading system by an equivalent resultant force and specify where the resultant's line of action intersects the member measured from A. **10**

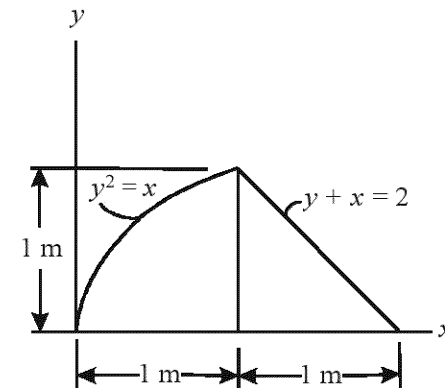


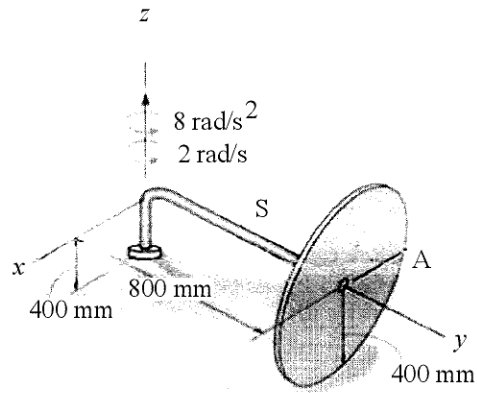
2. If the roller at B can sustain a maximum load of 3 kN, determine the largest magnitude of each of the three forces F that can be supported by the truss. **15**



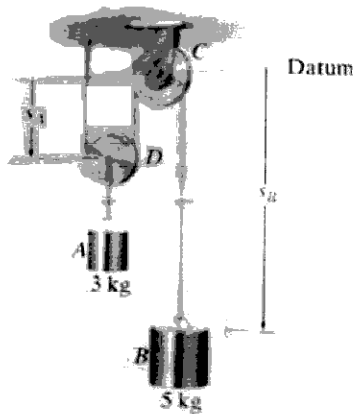
Section II

3. Locate the centroid (\bar{x}, \bar{y}) of the area as shown below : **15**





8. Block A and B shown in figure below have mass 3 kg and 5 kg respectively. If the system is released from rest, determine the velocity of block B in 6s. Neglect the mass of pulley and cord. **15**

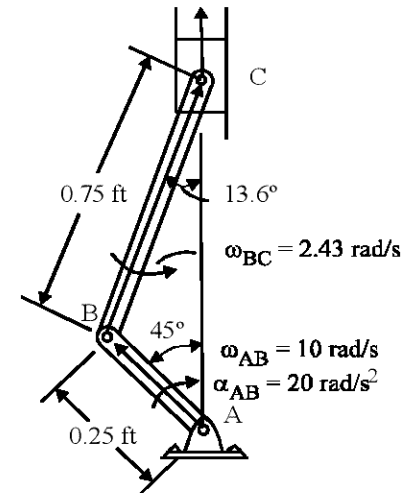


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6. The crankshaft AB turns with a clockwise angular acceleration of 20 rad/s^2 . Determine the acceleration of the piston at the instant AB is in shown position. At this instant $\omega_{AB} = 10 \text{ rad/s}$ and $\omega_{BC} = 2.43 \text{ rad/s}$. **15**



Section IV

7. The disk is free to rotate on the shaft S. If the shaft is turning about Z axis at $\omega_Z = 2 \text{ rad/s}$ while increasing at 8 rad/s^2 , determine the velocity and acceleration of point A at the instant shown. **15**

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P.T.O.