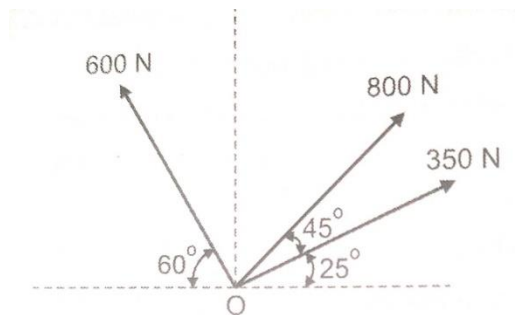
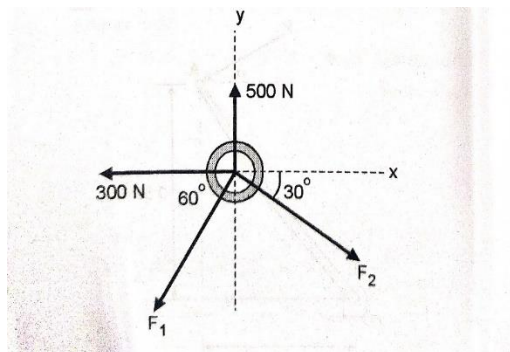


Engineering Mechanics Question Bank

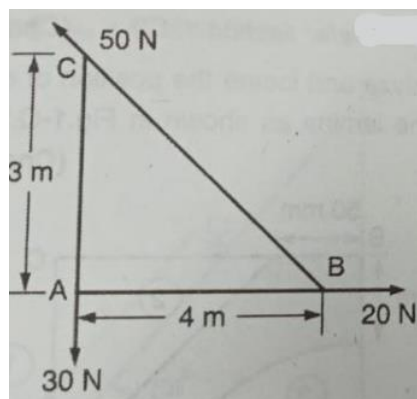
- 1) State triangle and polygon law of forces
- 2) State and Explain Law of Parallelogram of force with Sketch
- 3) State Varignon's theorem and Principle of transmissibility of force.
- 4) Differentiate Moment and Couple with Sketch
- 5) Determine the Magnitude and direction of the resultant of three force acting on the hook as shown in fig.



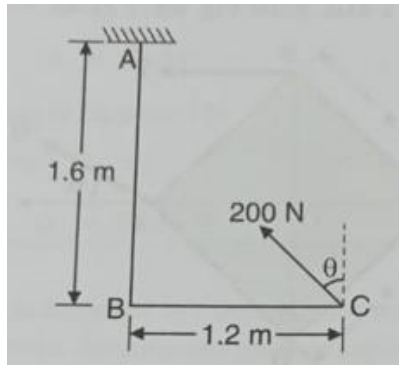
- 6) Resultant of four concurrent forces shown in figure is zero. Calculate F_1 & F_2 .



- 7) Determine resultant of the force system as shown below w.r.to A.



8) The lever ABC fixed at A as shown in fig is subjected to a 200N force at C at $\theta = 30^\circ$. Calculate the moment of this force about A. Also find the value of θ for which the moment about A is zero.

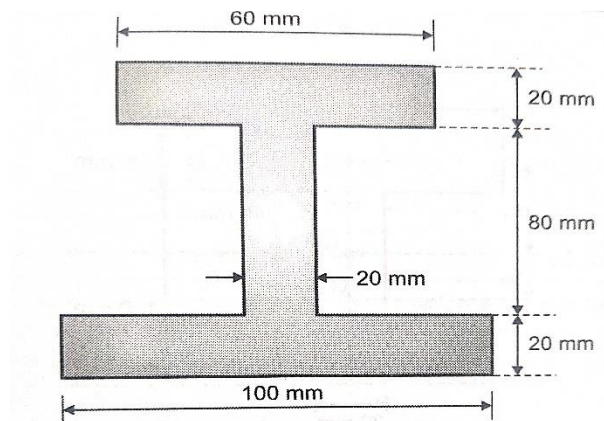


9) State and explain Parallel axis theorem.

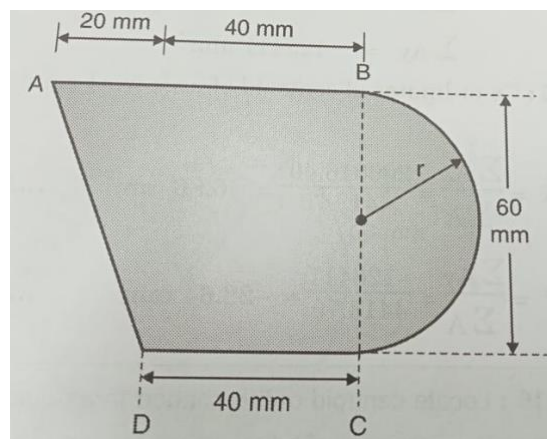
10) State and explain Perpendicular axis theorem.

11) Define Centre of Gravity and Moment of Inertia.

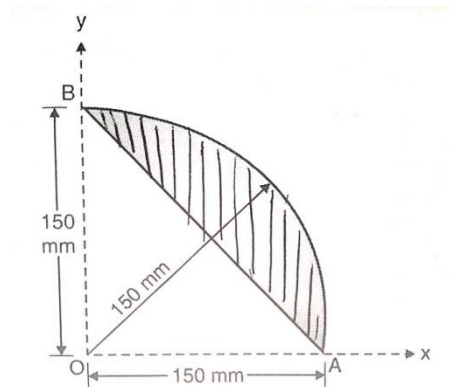
12) Determine the Moment of Inertia of an I section shown in fig about the horizontal axis passing through the center of gravity of the section.



13) Locate the centroid of the plane lamina shown in fig.



14) Determine the position of centroid of the shaded area with respect to origin o.

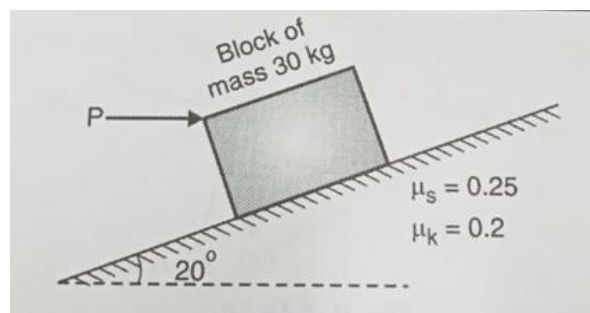


15) Define Friction. Explain with neat sketch any two properties of Friction.

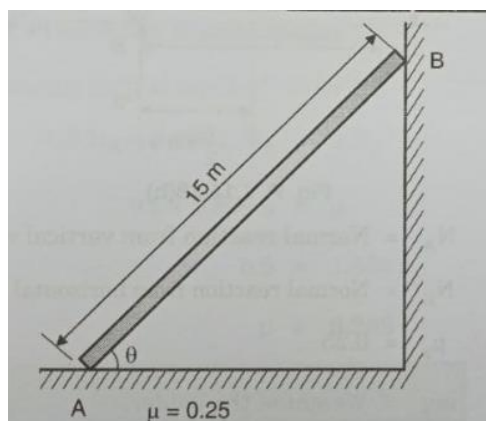
16) Explain Limiting Friction with neat sketch.

17) Define Angle of Friction and Angle of Repose.

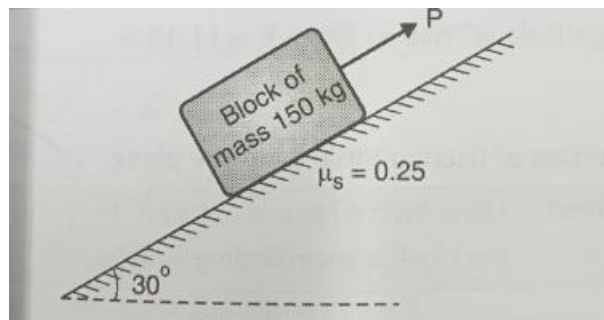
18) Determine the horizontal force P needed to just start moving the 30kg block up the plane as shown in fig. Take $\mu_s = 0.25$ and $\mu_k = 0.2$



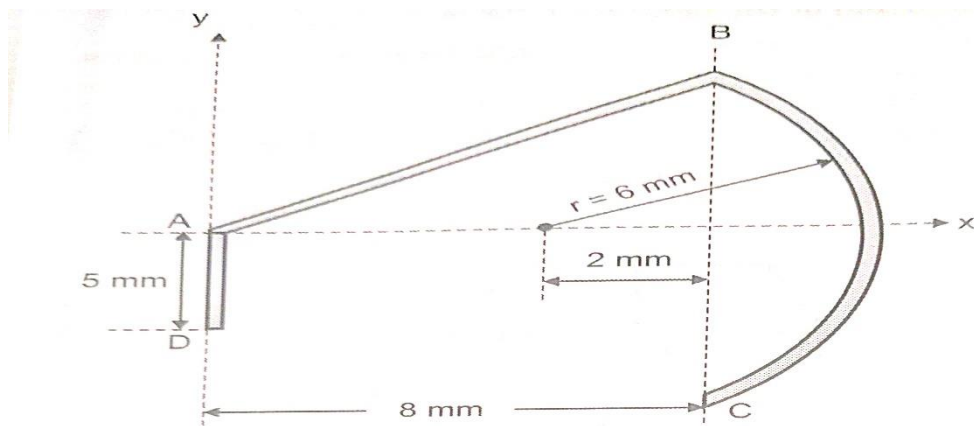
19) Calculate the smallest angle θ at which the ladder shown in fig can be placed against the side of smooth wall without having slip.



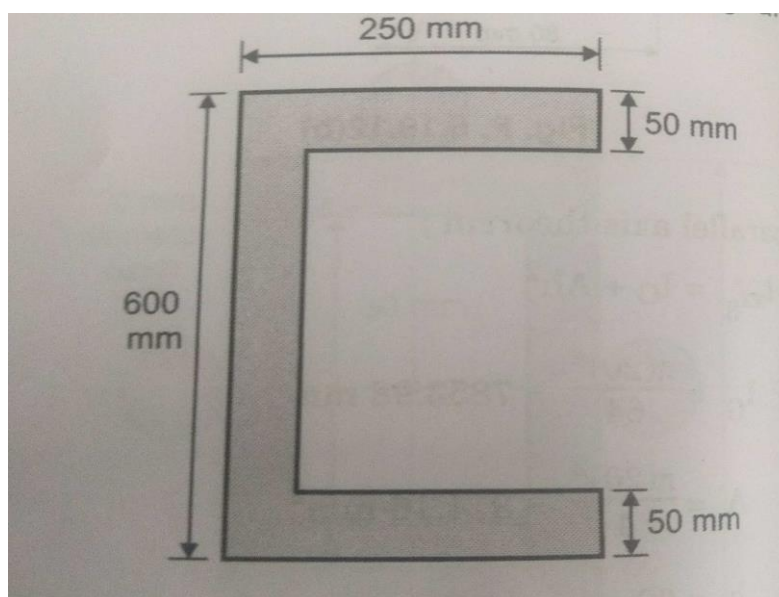
20) A block of mass 150 kg is resting on plane at 30° with horizontal as shown in fig. Determine range of an external force P to maintain equilibrium. Assume $\mu_s = 0.25$.



21) Determine the Centroidal coordinate of the line shown in fig that consist of straight line AB, AD and circular arc BC.



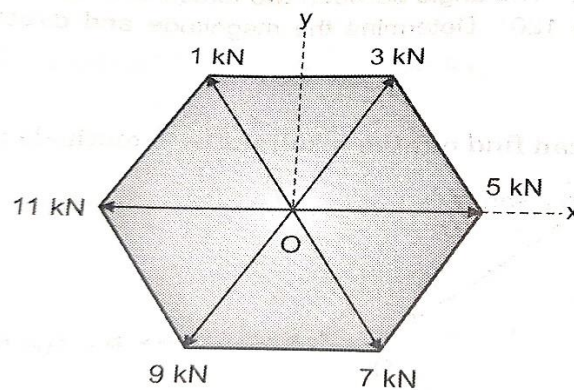
22) Calculate the moment of inertia about the centroidal x and y axis for the section shown in fig.



23) A 400 N block is resting on a rough horizontal surface as shown in fig for which the coefficient of friction is 0.4. Determine the force P required to cause motion if applied to the block horizontally. What minimum force is required to start motion.



24) Concurrent forces of 1, 3, 5, 7, 9 and 11 kN are applied at the centre of a regular hexagon acting toward the vertices as shown in fig. Determine the resultant completely.



25) Determine the magnitude of force P so that the resultant of the force system as shown in fig. is vertical and hence find the magnitude of the resultant force.

