

School of Engineering
B.TECH Civil Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem II - G3UB201T - Engineering Mechanics

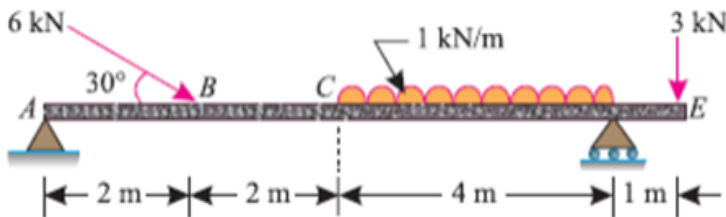
General Instructions

Answer to the specific question asked

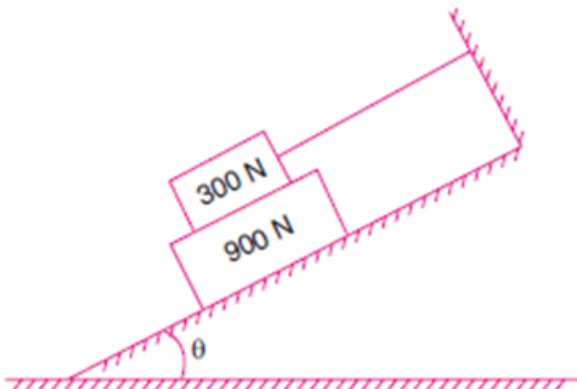
Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

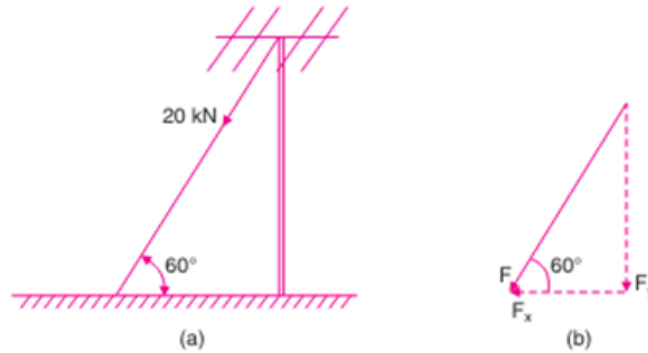
- 1) Write the conditions of equilibrium of a system of parallel forces acting in a plane K2 (2)
- 2) Apply and explain the Law of Parallelogram of Forces to solve the given problem . From this derive triangle and polygonal laws of forces. K1 (3)
- 3) Explain radius of gyration. K2 (4)
- 4) A beam ABCDE hinged at A and supported on rollers at D, is loaded as shown in fig. Find the reactions at A and D. K2 (6)



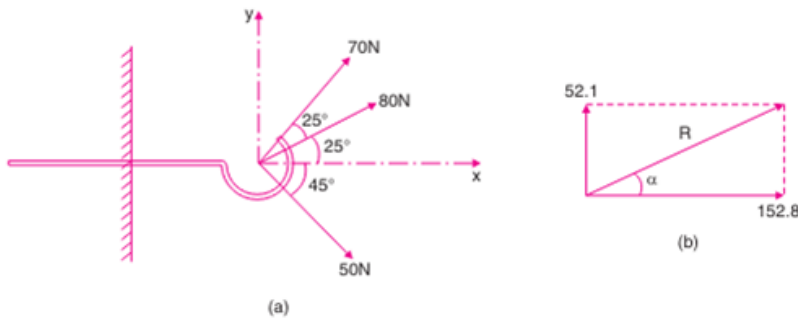
- 5) Explain steps to find centroid of an arbitrary body. K3 (6)
- 6) What should be the value of θ in fig that will make the motion of 900 N block down the plane to impend ? The coefficient of friction for all contact surfaces is $1/3$. K3 (9)



- 7) The resultant of two forces, one of which is double the other is 260 N. If the direction of the larger force is reversed and the other remains unaltered, the resultant reduces to 180 N. Determine the magnitude of the forces and the angle between the forces K4 (8)



- 8) Determine the resultant of the three forces acting on a hook as shown in Fig. K4 (12)



OR

- The frictionless pulley A shown in fig. is supported by two bars AB and AC which are hinged at B and C to a vertical wall. The flexible cable hinged at D, goes over the pulley and supports a load of 20kN at G. The angle made by various members of the system are as shown in the figure. Determine the forces in the bars AB and AC. Neglect the size of the pulley. K4 (12)

