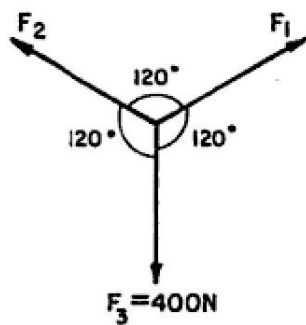
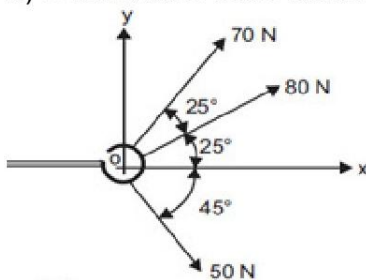


RGM COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)**13th January-2020****I B.Tech I Semester (R19) End Examinations (Regular)****BASIC ENGINEERING MECHANICS****MECH****Time: 3 Hrs****Total Marks: 70***Note 1: Answer Question No.1 (Compulsory) and 4 from the remaining**2: All Questions Carry Equal Marks*

- 1a Draw a sketch of a hinged supports beam and shows reactions.
- b Locate the centroid of a semicircle of radius r .
- c What is radius of gyration?
- d Discuss about limiting friction.
- e Three forces F_1, F_2 and F_3 are acting on a body as shown in Figure and the body is in equilibrium, if the magnitude of force F_3 is 400 N, find the magnitudes of force F_1 and F_2 .

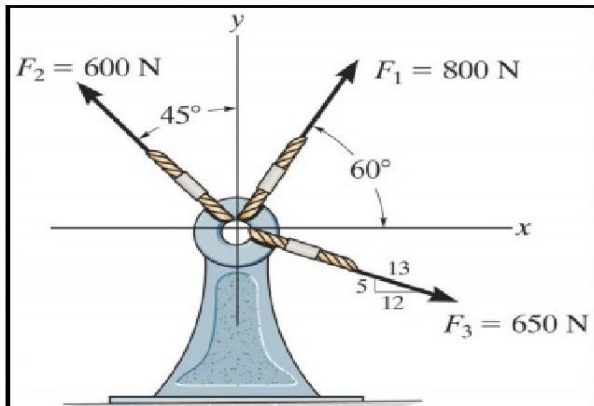


- f Define the term moment of a force.
- g State the direction of support reactions in the case of roller supported end.
- 2 a) State and explain Lami's theorem. (7)
- b) Determine the resultant of the three forces acting on a hook as shown in Figure.

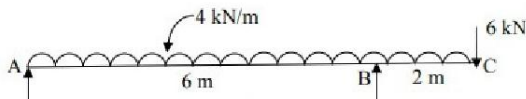


(7)

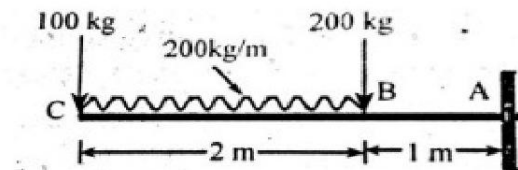
- 3 a) The resultant of two forces acting at a point is 65 kN. It is observed that one force is double than that of the other and if the direction of one of them is reversed the resultant becomes 45 kN. Find the magnitudes of forces and the angle between them. (7)
- b) Three forces are acting on a hook as shown in figure, find the magnitude and direction of the resultant force. (7)



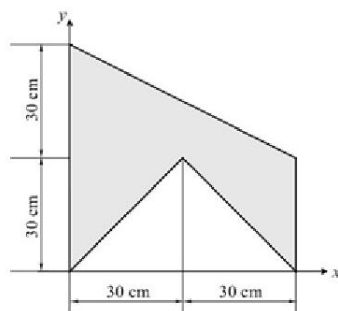
- 4 a) An overhanging beam is shown in figure; find the reactions at supports A and B. (7)



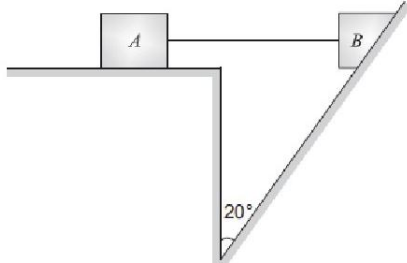
- b) Determine the reactions at fixed support A of a cantilever beam as shown in figure. (7)



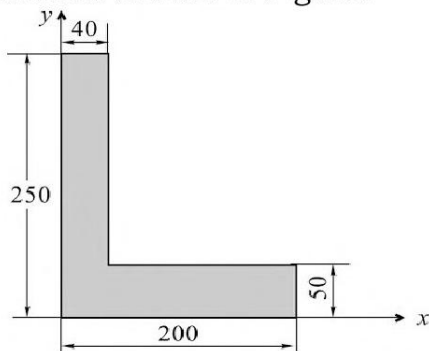
- 5 a) Define center of gravity and centroid. (7)
- b) Find the centroid of shaded area about x and y axes as shown in Figure. (7)



- 6 a) What do you mean by angle of repose? Prove that angle of repose is equal to the angle of friction. (6)
- b) Two blocks connected by a horizontal link AB are supported on two rough planes as shown in figure. The coefficient of friction on the horizontal plane is 0.4. The limiting angle of friction for block B on the inclined plane is 20° . What is the smallest weight W of the block A for which equilibrium of the system can exist if weight of block B is 5 kN? (8)



- 7 Determine the area moment of inertia about both centroidal axes for the composite area as shown in Figure.



- xxx -