

FACULTY OF ENGINEERING

B. E. I – Year (Backlog) Examination, October 2020

Subject: Engineering Mechanics

Time: 2 Hours

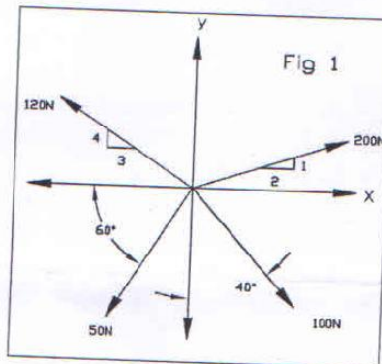
Max. Marks : 75

PART – A**Note : Answer any Seven question****(7x 3 = 21Marks)**

1. The resultant of two forces is 20 KN when they act at 50° . The same forces when they act at 90° produce resultant of 15KN. Determine the magnitude of the two forces.
2. Define resultant and equilibrant.
3. Determine X,Y, and Z component of 100N force passing from origin to a point (3,4,5).
4. Explain the difference between angle of friction and angle of repose.
5. State the pappu's theorem.
6. Differentiate between product of inertia and, mass moment of inertia.
7. Differentiate between kinetic and kinematics.
8. State D'Alembert's principle.
9. Derive the work-energy principle.
10. What is co-efficient of restitution.

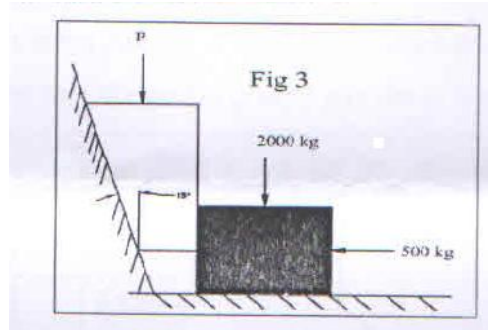
PART – B**Note : Answer any Three question****(3 x 18 = 54 Marks)**

11. (a) Determine the resultant and inclination with respect to horizontal axis of given forces system as shown in Fig. 1

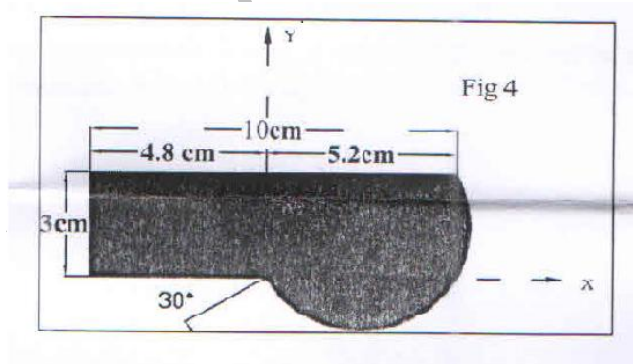


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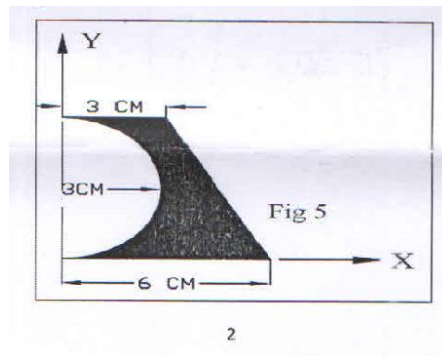
12. Find the magnitude of resultant and direction with inclination of the given concurrent force system. $P=140(3,-6,2)$ $T=260(-12,4,-3)$ $F=90(3,6,-6)$.
13. Determine the force P required to start the wedge shown in fig 3 the angle of friction for all surfaces in contact is 15° .



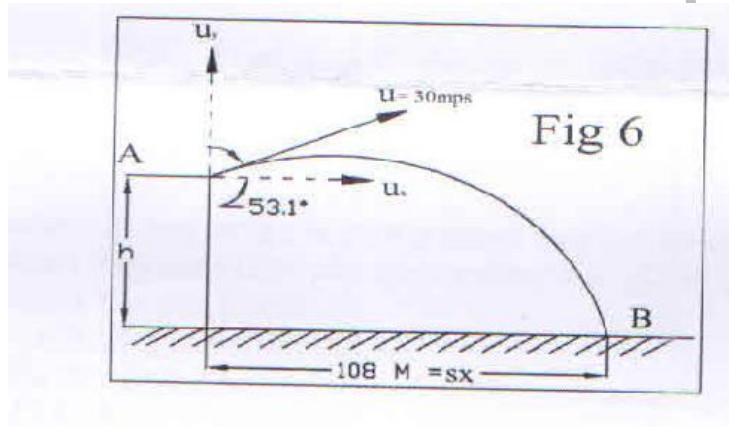
14. Determine the centroid of the shaded area shown in fig4 with respect to the given X-Y axes.



15. Find the product of inertia of the shaded area in fig 5 about the specified X and Y axes.



16. A golf ball is hit from an elevated tee to a green the distance horizontally is 108 mt. if the initial velocity of the ball is 30mps. At 53.1° to the horizontal, how high is the tee above the green? Say tee is h mt above the green.



17. Determine the acceleration of body 'A' shown in fig7 assuming the pulley's to be frictionless and of negligible weight.

