

Nov-Dec-2012

[4261] – 110



Seat No.	
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F.E. (Semester – II) (Common) Examination, 2012
ENGINEERING MECHANICS
(2008 Pattern)

Time : 2 Hours

Max. Marks : 50

- Instructions :**
- 1) Attempt Q.1 or Q.2, Q.3 or Q.4 and Q.5 or Q.6.
 - 2) **Neat** diagram must be drawn **wherever** necessary.
 - 3) Figure to the **right** indicates **full** marks.
 - 4) Assume suitable data, **if** necessary and clearly state.
 - 5) Use of cell phone is prohibited in the examination Hall.
 - 6) **Use** of electronics pocket calculator is **allowed**.

1. a) Find the magnitude of the resultant and its location of the following forces acting at a point O as shown in Fig. 1.a.

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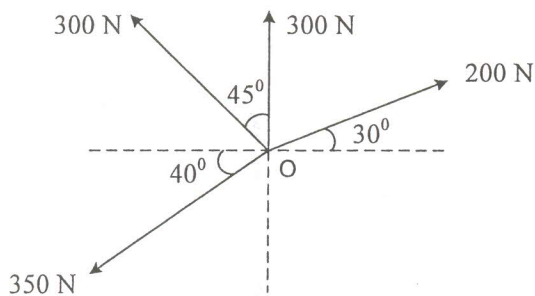
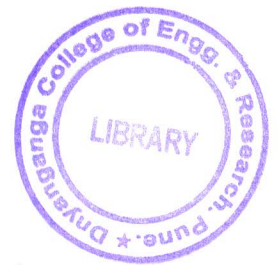


Fig. 1 a



- b) A Particle starts with an initial velocity of 2.5 m/s and uniformly accelerates at the rate 0.5 m/s^2 . Determine the displacement in 2 s, time required to attain the velocity of 7.5 m/s and the distance travelled when it attain a velocity of 7.5 m/s.

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OR

2. a) Determine the position of centroid of the shaded area as shown in Fig. 2a with respect to origin O.

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P.T.O.



- b) Two weights 100 N and 30 N are connected by a string and move along a rough horizontal plane under the action of force 50 N applied to the first weight 100 N as shown in Fig. 2 b. The coefficient of friction between the sliding surfaces of the weights and plane is 0.25. Determine the acceleration of weights and the tension in the string using Newton's second law.

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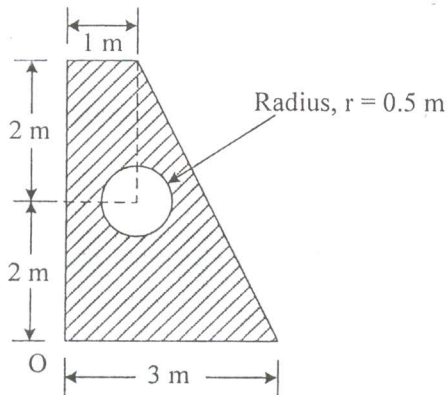


Fig. 2 a

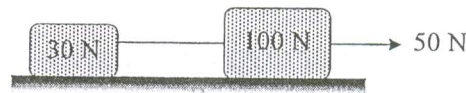


Fig. 2 b

3. a) A square foundation supports four loads as shown in Fig. 3 a. Determine magnitude, direction and point of application of resultant of four forces.

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- b) Two spheres P and Q each of weight 50 N and a radius of 100 mm rest in horizontal channel of width 360 mm as shown in Fig. 3 b. Determine the reaction at the point of contact A, B and C.

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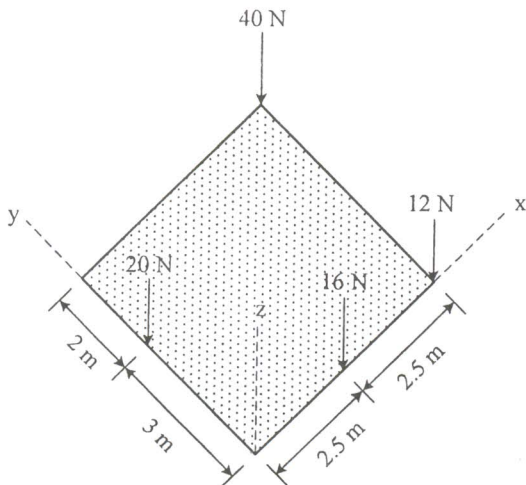


Fig. 3 a

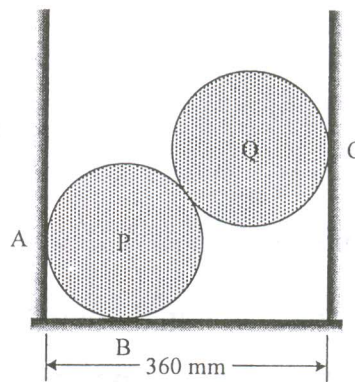


Fig. 3 b

- c) A particle is projected at an angle of 30° to the horizontal with a velocity of 100 m/s. Determine the range of radius of curvature of the path followed by the particle.

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OR

