Resonance®
Educating for better tomorrow
TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
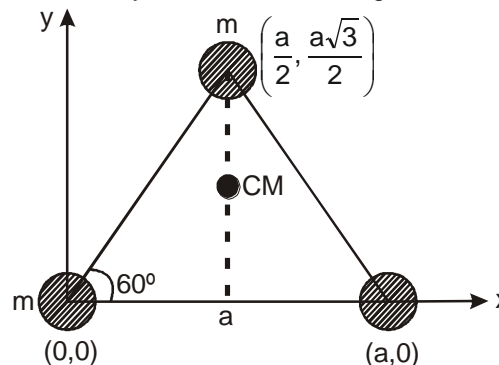DAILY PRACTICE PROBLEMS
DPP NO. 2

PHYSICS: CENTER OF MASS

DPP No. : 2

1. When two bodies collide elastically, then :
(1) Kinetic energy of the system alone is conserved
(2) Only momentum is conserved
(3) Both energy and momentum are conserved
(4) Neither energy nor momentum is conserved

2. Three identical spheres, each of mass 1 kg are kept as shown in figure, touching each other, with their centres on a straight line. If their centres are marked P, Q, R respectively, the distance of centre of mass of the system from P (origin) is
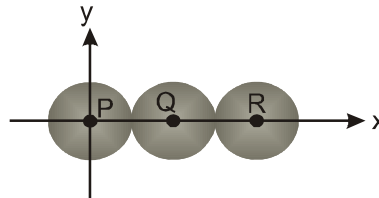
(1) $\dfrac{PQ + PR + QR}{3}$ (2) $\dfrac{PQ + PR}{3}$ (3) $\dfrac{PQ + QR}{3}$ (4) PR + QR

3. A non–uniform thin rod of length L is placed along x-axis as such its one of ends at the origin. The linear mass density of rod is $\lambda = \lambda_0 x$. The distance of centre of mass of rod from the origin is :
(1) L/2   (2) 2L/3   (3) L/4   (4) L/5

4. The coordinate of the centre of mass of a system as shown in figure : -

(1) $\dfrac{a\sqrt{3}}{2}, \dfrac{a}{2}$ (2) $\dfrac{a}{2}, \dfrac{a}{6}\sqrt{3}$ (3) $\dfrac{a}{4}, \dfrac{a}{4}\sqrt{3}$ (4) $\dfrac{a}{2}, \dfrac{a}{\sqrt{3}}$

Resonance®
Educating for better tomorrow
Growing in Pre-Medical Since 2011...

Pre Medical Division: **CG Tower-2, A-51(A) IPIA, Behind City Mall, Jhalawar Road, Kota (Raj.)-324005**
Website: **www.resonance.ac.in | E-mail: contact@resonance.ac.in**
Toll Free : | **1800 258 5555** | CIN: U80302RJ2007PLC024029
PAGE NO.-1

5. Two bodies of mass 1 kg and 3 kg have position vector $\hat{i}+2\hat{j}+\hat{k}$ and $-3\hat{i}-2\hat{j}+\hat{k}$ respectively. The centre of mass of this system has a position vector.

(1) $-2\hat{i}+2\hat{k}$ (2) $-2\hat{i}-\hat{j}+\hat{k}$

(3) $2\hat{i}-\hat{j}-2\hat{k}$ (4) $-\hat{i}+\hat{j}+\hat{k}$

6. The kinetic energies of a lighter body and a heavier body are same. Then the value of momentum is-
(1) Higher for lighter body
(2) Higher for heavier body
(3) Same for both
(4) Additional information is needed for replying this question

7. A man is in a moving train, then wrt train :
(1) his momentum must not be zero
(2) his kinetic energy is zero
(3) his kinetic energy is not zero
(4) his kinetic energy may be zero

8. A bomb dropped from an aeroplane explodes in air. Its total :
(1) momentum decreases
(2) momentum increases
(3) kinetic energy increases
(4) kinetic energy decreases

9. A ball of mass 0.15 kg is dropped from a height 10 m, strikes the ground and rebounds to the same height. The magnitude of impulse imparted to the ball is ($g = 10$ m/s^2) nearly
(1) 4.2 kg m/s   (2) 2.1 kg m/s
(3) 1.4 kg m/s   (4) 0 kg m/s

10. Three masses are placed on the x-axis : 300 g at origin, 500g at x = 40 cm and 400g at x = 70 cm. The distance of the centre of mass from the origin is :
(1) 40 cm   (2) 45 cm
(3) 50 cm   (4) 30 cm