Examrace

Competitive Exams: Physics MCQs (Practice_Test 6 of 35)

1. If more than three forces are acting on the massive point object, then the object will be in equilibrium if and only if all the forces are

    a. collinear

    b. coplanar

    c. acting in random directions

    d. represented by the sides of a closed polygon

2. A 10 kg mass is connected at one end of a massless spring with force constant k = 1000 N/m, keeping other end fixed in a horizontal plane as shown in the above figure. If the system is displaced by 0.01 m from its equilibrium position A to a point B, then the acceleration of the system is

    a. 10 ms-2

    b. 1 ms-2

    c. -1 ms-2

    d. -10 ms-2

3. A particle has two equal accelerations in two given directions. If one of the accelerations is halved, then the angle which the resultant makes with the other is also halves. The angle between the accelerations is

    a. 1200

    b. 900

    c. 600

    d. 450

4. A particle is projected at an elevation tan-1 ($\frac{4}{3}$) from a point O. The ratio of the range on the horizontal plane through O to the greatest height ascended above O is

    a. 2

    b. 3

    c. 4

d. 5

5. The vertical height y and the horizontal distance x for a body projected in a vertical plane are given by $y = 8t - 5t^2$ and $x = 6t$, then velocity with which body is projected is

   a. 6

   b. 5

   c. 8

   d. 10

6. A solid iron cylinder and sphere of the same material roll and slide respectively down an inclined plane in a frictionless manner. The kinetic energy of the cylinder at the bottom will be

   a. equal to that of the sphere

   b. more than that of the sphere

   c. less than that of the sphere

   d. more or less than that of sphere depending upon angle of the plane

7. The above figure shows the motion of a planet around the sun in an elliptical orbit with sun as the focus. The shaded areas A and B shown in the figure can be assumed to be equal. If t1 and t2 represent the times for the planet to move from 'a' to 'b' and 'd' to 'c' respectively, then

   a. tl < t2

   b. tl > t2

   c. t1 = t2

   d. None of the above

8. The escape velocity of a particle of mass m

   a. varies as m 2

   b. varies as m

   c. varies as m − 1

   d. is independent of mass

9. A body of mass 2 kg is hung on a spring balance mounted vertically in a lift. If the lift descends with an acceleration equal to the acceleration due to gravity 'g' then the reading on the spring balance will be

   a. 6 kg

   b. 4 kg

    c. 2 kg

    d. zero

10. If R is the radius of the earth, p its mean density and G the gravitational constant, then the earth's surface potential will be nearly equal to

    a. $G/R2$

    b. $\left(\dfrac{4}{3}\right) R3G$

    c. $\left(\dfrac{4}{3}\right) R2G$

    d. $\left(\dfrac{4}{3}\right) R/G$

11. In an inelastic collision

    a. momentum is conserved, but energy is not conserved

    b. momentum is not conserved, but energy is conserved

    c. neither momentum nor energy is conserved

    d. both momentum and energy are conserved

12. If a is the coefficient of restitution, then which one of the following gives the condition for perfectly elastic bodies?

    a. $e = 0$

    b. $e = 0.5$

    c. $e = 0.8$

    d. $e = 1.0$

13. Viscosity is a transport phenomenon in which

    a. mass alone is transported

    b. energy alone is transported

    c. mass and energy are transported

    d. momentum is transported

14. Two soap bubbles A and B have radii rl and r2 respectively. If rl < r2, then the excess pressure inside

    a. bubbles A and B will be equal

    b. bubble A will be less than that in bubble B

    c. bubble A will be greater than that in bubble B

d. bubbles A and B will be zero

15. Which one of the following represents the relativistic law of addition of velocities v1 and v2?