Class 11 Physics

Instructions

Section A contains 10 questions of 1 mark each
Section B contains 5 questions of 2 marks each.
Section C contains 5 questions of 4 marks each.
Section D contains 6 questions of 5 marks each.

Section A

1. Can a body be at rest as well as in motion simultaneously?
2. Two bodies of different masses m_a and m_b are dropped from same height h. What is the ratio of the times taken by the two bodies to fall through this distance?
3. Mention the value of coefficient of restitution for a perfectly inelastic collision.
4. Give an expression for height of bouncing in terms of coefficient of restitution.
5. A particle revolves uniformly along a circle (on a smooth horizontal table) by means of a string connected to it. Does angular momentum of the particle change from its initial value if string is cut suddenly?
6. State Keppler's second law?
7. Why a cricketer does lower his hand soon after/while catching a cricket ball?
8. Write S.I unit of luminous intensity and temperature?
9. What are fundamental units?
10. What is the work-done by the centripetal force?

Section B

11. Deduce an expression for time of flight of a ground to ground projectile.
12. A bullet P is fired from a gun when the angle of elevation of the gun is 30°. Another bullet Q is fired from the gun when the angle of elevation is 60°. The vertical height attained in the second case is x times the vertical height attained in the first case. What is the value of x?
13. If a light object of mass m_1 collides with a big object m_2 one dimensionally and elastically, estimate the speed of each of these bodies after collision.
14. Two identical particles are projected vertically upward with a speed of 50 ms^{-1} and 40 ms^{-1} from the ground. If the projections are simultaneous, find the maximum height reached by the center of mass.
15. Define power. Give its SI unit.

Section C

16. A ring, a disc and a sphere, all of the same radius and mass roll down an inclined plane from the same height h. Which of the three reaches the bottom (i) earliest (ii) latest?
17. State parallel axes theorem .
18. A bullet of mass m is fired from a gun of mass M. If the muzzle speed of the bullet is V, What is the recoiling speed of the gun?
19. The period of oscillation (T) of a simple pendulum depends on the length (l) and acceleration due to gravity (g). Find the actual formula of this dependence.
20. A lorry and a car with the same kinetic energy are brought to rest by the application of brakes which provides equal retarding forces. Which of them will come to rest in a shorter distance?

Section D

21. A police jeep is moving with velocity 45kmph is chasing a thief who in another jeep is moving with velocity 153kmph. Policeman fires a bullet with muzzle velocity of 180 *m*/*s*. What is the velocity with which it will strike the car of the thief?
22. Derive an expression for the loss in KE in a completely inelastic collision in one dimension.
23. The driver of an automobile moving with a speed of 36kmph sees a child standing in the middle of a road and brings his vehicle to rest in 4s just in time to save the child. What is the average retarding force on vehicle? The mass of the automobile is 1200kg and the mass of the driver is 50 kg.
24. Write about propagation of errors in the following arithmetic calculations of physical measurements.
(a) Sum or difference
(b) Product or quotient
(c) Measured quantity raised to a power.
25. State Work-Kinetic energy theorem. Prove it.
26. Obtain the expression for acceleration due to gravity at a height “h” above the surface of earth.