

Model Question Paper 3

Kinematics 3

11th Standard

Physics

Reg.No. :

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Answer all the Questions

Time : 01:00:00 Hrs

Total Marks : 45

5 x 1 = 5

Part A

- 1) A particle moves along a circular path under the action of a force. The work done by the force is
(a) positive and non-zero (b) zero (c) negative and non-zero (d) none of the above
- 2) A cyclist of mass m is taking a circular turn of radius R on a frictional level road with a velocity v . In order that the cyclist does not skid,
(a) $(mv^2/2) > \mu mg$ (b) $(mv^2/r) > \mu mg$ (c) $(mv^2/r) < \mu mg$ (d) $(v/r) = mg$
- 3) If a force F is applied on a body and the body moves with velocity v , the power will be
(a) $F \cdot v$ (b) F/v (c) Fv^2 (d) F/v^2
- 4) For an elastic collision
(a) the kinetic energy first increases and then decreases (b) final kinetic energy never remains constant (c) final kinetic energy is less than the initial kinetic energy
(d) initial kinetic energy is equal to the final kinetic energy
- 5) A bullet hits and gets embedded in a solid resting on a horizontal frictionless table. Which of the following is conserved?
(a) Momentum and kinetic energy (b) Kinetic energy alone (c) Momentum alone (d) Potential energy alone

Part B

5 x 2 = 10

- 6) Define acceleration. Give its unit and dimension
- 7) What is meant by uniform acceleration?
- 8) What is a unit vector?
- 9) What is scalar or product of two vectors?
- 10) What is vector or cross product vector of two vectors?

Part C

5 x 3 = 15

- 11) A body is projected at such an angle that the horizontal range is 3 times the greatest height. Find the angle of projection.
- 12) An elevator is required to lift a body of mass 65 kg. Find the acceleration of the elevator, which could cause a reaction of 800 N on the floor.
- 13) A body whose mass is 6 kg is acted on by a force which changes its velocity from 3 ms^{-1} to 5 ms^{-1} . Find the impulse of the force. If the force is acted for 2 seconds, find the force in newton.
- 14) A cricket ball of mass 150 g moving at 36 ms^{-1} strikes a bat and returns back along the same line at 21 ms^{-1} . What is the change in momentum produced? If the bat remains in contact with the ball for $\frac{1}{20}$ s, what is the average force exerted in newton.
- 15) Two forces of magnitude 12 N and 8 N are acting at a point. If the angle between the two forces is 60° , determine the magnitude of the resultant force?

Part D

3 x 5 = 15

- 16) What is the work done by a man in carrying a suitcase weighing 30 kg over his head, when he travels a distance of 10 m in (i) vertical and (ii) horizontal directions?
- 17) Two masses of 2 kg and 5 kg are moving with equal kinetic energies. Find the ratio of magnitudes of respective linear momenta.
- 18) A man weighing 60 kg runs up a flight of stairs 3 m high in 4 s. Calculate the power developed by him.
