

Model Question Paper 1

Kinematics 1

11th Standard

Physics

Reg.No. :

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Answer all the Questions

Time : 01:00:00 Hrs

Total Marks : 50

5 x 1 = 5

Part A

- 1) A particle at rest starts moving in a horizontal straight line with uniform acceleration. The ratio of the distance covered during the fourth and the third second is
(a) $\frac{4}{3}$ (b) $\frac{26}{9}$ (c) $\frac{7}{5}$ (d) 2
- 2) The distance travelled by a body, falling freely from rest in first, second and third seconds are in the ratio
(a) 1:2:3 (b) 1:3:5 (c) 1:4:9 (d) 9:4:1
- 3) The displacement of the particle along a straight line at time t is given by, $x = a_0 + a_1 t + a_2 t^2$ where a_0 , a_1 and a_2 are constants. The acceleration of the particle is
(a) a_0 (b) a_1 (c) a_2 (d) $2a_2$
- 4) The acceleration of a moving body can be found from
(a) area under velocity-time graph (b) area under distance-time graph (c) slope of the velocity-time graph (d) slope of the distance-time graph
- 5) Which of the following is a vector quantity?
(a) Distance (b) Temperature (c) Mass (d) Momentum

Part B

5 x 2 = 10

- 6) Compute the (i) distance travelled and (ii) displacement made by the student when he travels of 4Km earthwards and then a further distance of 3 Km northwards.
- 7) What is the (i) distance travelled and (ii) displacement produced by a cyclist when he completes one revolution?
- 8) Differentiate between speed and velocity of a body.
- 9) What meant by retardation?
- 10) Derive the equation of motion for an uniformly accelerated body.

Part C

5 x 3 = 15

- 11) Determine the initial velocity and acceleration of particle travelling with uniform acceleration in a straight line if it travels 55m in the 8th second and 85m in the 13th second of its motion.
- 12) An aeroplane takes off at an angle of 45° to the horizontal. If the vertical component of its velocity is 300 kmph, calculate its actual velocity. What is the horizontal component of velocity?
- 13) A force is inclined at 60° to the horizontal. If the horizontal component of force is 40kg wt, calculate the vertical component.
- 14) A body is projected upwards with a velocity of 30ms^{-1} at an angle of 30° with the horizontal. Determine (a) the time of flight, (b) the range of the body and (c) the maximum height attained by the body.
- 15) The horizontal range of a projectile is $4\sqrt{3}$ times its maximum height. Find the angle of projection.

Part D

4 x 5 = 20

- 16) A railway engine of mass 60 tonnes, is moving in an arc of radius 200m with a velocity of 36 kmph. Find the force exerted on the rails towards the centre of the circle.
- 17) A horse pulling a cart exerts a steady horizontal pull of 300N and walks at the rate of 4.5kmph. How much work is done by the horse in 5 minutes?
- 18) What is meant by banking of tracks?
- 19) Obtain an expression for the angle of lean when a cyclist takes a curved path.
