Model Question Paper 2

Kinematics 2

11th Standard

Physics

Reg.No. : | | | | | | |

Answer all the Questions

Time : 01:00:00 Hrs

Total Marks : 40

Part A

5 x 1 = 5

1) Two bulbs are fired at angle θ and $(90-\theta)$ to the horizontal with some speed.the ratio of their times of flight is

   (a) 1:1 (b) $\tan\theta:1$ (c) $1:\tan\theta$ (d) $\tan^2\theta:1$

2) A stone is dropped from the window of a train moving along a horizontal straight track,the path of the stone as observed by an observer on ground is.

   (a) straight line (b) parabola (c) circular (d) hyperbola

3) A gun fired two bullets at with same velocity 60^0 and 30^0 with horizontal.The bullets strike at the same horizontal distance.The ratio of maximum height for the two bullets is in the ratio

   (a) 2:1 (b) 3:1 (c) 4:1 (d) 1:1

4) Newton's first law of motion gives the concept of

   (a) energy (b) work (c) momentum (d) inertia

5) Inertia of a body has direct dependence of

   (a) velocity (b) mass (c) area (d) volume

Part B

5 x 2 = 10

6) Obtain the expression for magnitude and direction of the resultant of two vectors when they are inclined at an angle, $'\theta'$ with each other.

7) State Newton's law of motion.

8) State and prove law of conservation of linear momentum.

9) Define impulse of a force.

10) What is centrifugal reaction?

Part C

5 x 3 = 15

11) The sum of two forces inclined to each other at an angle is 18kgwt and their resultant which is perpendicular to the smaller forces is 12kgwt. Find the forces and the angle between them.

12) A weight of 20kN supported by two cords, one 3m long and the other 4m long with points of support 5m apart. Find the tensions T_1 and T_2 in the cords.

13) The following forces act at a point (i) 20N inclined at 30^0 towards North of East, (ii) 25N towards North, (iii) 30N inclined at 45^0 towards North of West, (iv) 35n inclined at 40^0 towards South of West. Find the magnitude and direction of the resultant force.

14) Find the magnitude of the two forces such that it they are at right angles, their resultant is $\sqrt{10}$. But if they act at 60^0 , their resultant is $\sqrt{13}$ N.

15) At what angle must a railway track with a bend of radius 880m be banked for the safe running of a train at a velocity of $44ms^{-17}$

Part D

2 x 5 = 10

16) Two blocks of mass 300kg and 200kg are moving toward each other along a horizontal frictionless surface with velocities of 50 ms^{-1} and $100ms^{-1}$ respectively.Find the final velocity of each block if the collision is completely elastic.

17) Prove that in the case of one dimensional elastic collision between two bodies of equal masses, they interchange their velocities after collision.

****