PERIODIC TEST - I (2017-18)

Subject – Physics

Class – XIth

Time Duration: 1.30 Hrs   **M. Marks: 50**

Note: All questions are compulsory.

Q. No. from 1 to 5 carry 1 mark each, from 6 to 9 carry 2 marks each, from 10 to 11 carry 3 marks , from 12 to 15 carry 4 marks each, from 16 to 18 carry 5 marks each.

Q. No. 1: Define parsec.

Q. No. 2: Who first discovered radioactivity?

Q. No. 3: State parallelogram law of vector addition.

Q .No. 4: A particle is moving along a circular track of radius 'r '. What is the distance traversed by Particle in half rotation? What is its displacement?

Q. No. 5: What physical quantity does the slope of position time graph indicate?

Q. No. 6: Write the dimensional formula for the following physical quantity.

(a) Power   (b) Gravitational constant

Q. No. 7: The position coordinate of a moving particle is given by $x = 6 + 18t + 9t^2$. (Where x in meters and t in seconds). What is its velocity and acceleration at t = 2 sec.?

Q. No. 8: State the number of significant figures in the following: -

(a) 0.007002 m^2 (b) $2.64 \times 10^{-3} \text{kg}$.

Q. No. 9: A ball is thrown horizontally and at the same time another ball is dropped down from the top of a tower (i) will both the balls reach the ground at the same time? (ii) Will both strike the ground with the same velocity? Write with reason.

Q. No. 10: If n^{th} division of main scale coincides with $(n +1)^{th}$ division of vernierscale, find the least count of the vernier. Given one main scale division is equal to 'a'units.

Q. No. 11: Draw the following graphs (expected nature only) representing motion of an object under free fall. Neglect air resistance.

(i) Variation of position with respect to time.

(ii) Variation of velocity with respect to velocity

(iii) Variation of acceleration with respect to time.

Q. No. 12: The frequency 'v' of vibration of stretched string depends upon

(i) Its length 'l'

(ii) Its mass per unit length 'm' and

(iii) The tension 'T' in the string.

Obtain dimensionally an expression for frequency 'v'.

Q. No. 13: What is a projectile? Show that the path of a projectile is parabolic. Also find the expression for Maximum height attained by projectile if it is thrown with velocity 'u' making an angle 'θ' with horizon.

Q. No. 14: (a) Write the dimensions of a/b in the relation F= $a\sqrt{x}$ + b t ^{2}, Where F is the force, x is the distance and t is the time.

(b) The angular diameter of the sun is 1920''. If the distance of the sun from the earth is 1.5 X 10 ^{11} m, what is the linear diameter of the sun?

Q .No. 15: Two parallel rail tracks run north south. Train A moves north with a speed of 54 kmh $^{-1}$ and train B moves south with a speed of 90 kmh $^{-1}$. What is the

(I) Relative velocity of B with respect to A?

(ii)Relative velocity of ground with respect to B?

(iii) Velocity of monkey running on the roof of the train A against its motion with a velocity of 18 kmh $^{-1}$ with respect to A as observed by a man standing on the ground ?

Q. No. 16: (a) Derive any two equation of motion for constant acceleration by calculus method.

(b)Two equal forces (vectors) have their resultant equal to either. What is the inclination between them?

Q. No.17:(a) A body covers one third of its journey with speed 'u' , next one third with speed 'v' and the last one third with speed 'w' . Calculate the average speed of the body during entire journey.

(b) A physical quantity P is defined to four observations: a, b, c and d asfollow:

P =$\dfrac{a^3\ b^2}{\sqrt{c}\ d}$.

The percentage errors of measurement in a, b, c, and d are 1%, 3%, 4%, and 2% respectively. What is the percentage error in the quantity P?

Q. No. 18: Define centripetal acceleration. Derive an expression for the centripetal acceleration of a body moving with uniform speed v along a circular path of radius r. What is the source of centripetal acceleration for earth to go round the sun?