Class –XI (Physics)

Q.1. Define a coherent system of units .

Q.2. The word Physics comes from a Greek word .Name that word and write their meaning .

Q.3. Name the quantity which has unit but no dimensional formula.

Q.4.If the net force on a body is zero , will the body remain necessarily in rest position ?

Q.5.Is the linear momentum of a ball falling freely conserved ?

Q.6.Can an object have speed but variable velocity ?

Q.7. Is the maximum height attained by projectile is largest when its horizontal range is maximum.?

Q.8. What are minimum number of unequal forces whose vector sum is zero.

Q.9. What is role of physics in society ?

Q.10. State the significant figures in the following :

   (a) 300 m   (b) 0.00564   (c) 60005700   (d) 4.00 *10^4

Q.11. Write the dimension of a*b in the relation E=(b-x^2)/at , Where E=energy ,x is distance and t is time.

Q.12. If the initial velocity of a particle is "u"and collinear acceleration at any time t is "at", calculate the velocity of the particle after time t ?

 Q.13. Rain is falling vertically with a speed of 35 m/s , Winds starts blowing after some time with a speed of 12 m/s in east to west direction . In which direction should a boy waiting at bus stop hold his umbrella?

Q.14. State and prove the law of conservation of momentum .

Q.15. What is angle between two velocity vectors of same magnitude if the resultant velocity has also the same magnitude?

Q.16. An air craft executes a horizontal loop of radius 1 km with a steady speed of 900 km h$^-$^{1} .Compare its centripetal acceleration with the acceleration due to gravity?

Q.17. A force of 5N changes the velocity of a body from 10m/s to 20m/s in 5 sec. How much force is required to bring about the same change in 2 sec?

Q.18. Define the angle of Repose. Derive the relation between coefficient of friction and angle of repose.

Q.19. Prove that: $v^2 = u^2 + 2as$ by calculus method, where symbols have their usual meanings.

Q.20. State the limitations of dimensional analysis.

Q.21.The period of oscillation of a simple Pendulum is $T = 2\pi(l/g)^{1/2}$. Measured value of L is 20.0 cm to known to 1 mm accuracy and time for 100 oscillations of the pendulum is found to be 90 sec. using a wrist watch of 1 sec resolution. What is the accuracy in the determination of g ?

Q.22. An object is thrown vertically upwards with a velocity of 19.6 m/s.Calculate the distance and displacement of the object after 3 seconds.

Q.23.The ceiling of a long hall is 25 m high. What is the maximum horizontal distance that a ball thrown with the speed of 40 ms $^{-1}$ can go without hitting the ceiling of the hall?

Q.24.State the laws of limiting friction.

Q.25.A man weighs 70 kg . He stands on a weighing scale in a lift which is moving:-

(a) upwards with a uniform speed of 10 m/s

(b) Downwards with a uniform acceleration of 5 m/s^2.

(c) upwards with a uniform acceleration of 5 ms$^{-2.}$

What would be the readings on the scale in each case? What would be the reading if the lift mechanism failed and it hurtled down freely under gravity?

Q.25.State the Newton's laws of motion.

Q.26. Two bodies A & B of masses 10 kg and 20 kg respectively kept on a smooth horizontal surface are tied to the ends of the light string. A horizontal force F=600 N is applied to:

(i) A and (ii) B along the direction of string . What is the tension in the string in each case .

Q.27.A batsman deflects a ball by an angle of 45^0 without changing its initial speed which is equal to 54 km/h. What is the impulse imparted to the ball ? Mass of the ball is 0.5 kg.

Q.28.(a) Derive an expression for acceleration of a body down a rough inclined plane .

(b) Define absolute and gravitational unit of force .

Q.29. (a) State the law of parallelogram of vectors . Derive the expression for magnitude and direction of resultant .

(b) If a,b, c, are the distances moved by a particle with constant acceleration during l^{th}, m^{th}, and n^{th} second of its motion respectively, show that :

a (m - n) + b (n - l) +c (l - m) = 0.

Q.30.(a) The refractive index of water is found to have the values 1.29,1.33,1.34,1.35,1.36,1.32,1.30,1.33. Calculate the mean value , absolute error,the relative error and the percentage error.

(b) If $y=f(x^2)$, then what is the relative error in y ?