PHY 113

1) A car of mass 600kg moving with a forward acceleration of $5m/s^2$ is acted upon by a constant resistive force of 1000N. Calculate the force exerted from the engine to maintain this forward acceleration.

ANS. 4kN

2) A car travels 20km due North and then 35km in a direction of 60° West of North. Find the magnitude of the resultant displacement of the car.

ANS. 48.2km.

3) A player hits a ball of mass 0.3kg which was moving eastwards with a velocity of 10m/s, causing it now to move with velocity 15m/s westward. The force of the blow acts on the ball for 0.01s. Calculate the average force exerted on the body by the player.

ANS. 750N.

4) What will be the resultant force on a body of mass 50kg when it moves with a uniform velocity of 10m/s?

ANS. 500N

5) A body is dropped from rest at a height of 80m. How long does it take to reach the ground? ($g = 10m/s^2$)

ANS. 4secs

6) An object falls from a height of 20m. What is its velocity just before hitting the ground? ($g = 10m/s^2$)

ANS. 20m/s

7) What is the dimension of pressure.

ANS. $ML^{-1}T^{-2}$

8) A motor car is uniformly retarded and brought to rest from a velocity 36km/hr in 5s. Find the distance covered in this period.

ANS. 25m.

9) A ball is thrown up vertically with a velocity of 40m/s. Cal the time to return to the ground.

ANS. 8sec

10) The dimension of energy is given as

ANS. ML^2T^{-2}

[11] A body travels from rest with acceleration $8m/s^2$. Find its velocity when it has reached a distance of 100m.

ANS. 40m/s.

[12] An object moves in a straight line, starting from rest. There are two stages in the journey (a) it gains speed uniformly for 2s and attains a speed of 8.0m/s (b) it continues at the speed for a further 3.5s. Find the total distance moved during stages (a) and (b).

ANS. 20m.

(13) A ball thrown vertically upward from ground level hits the ground after 4s. Calculate the maximum height it reached during its journey. ($g = 10m/s^2$)

SIR-LAKE

ANS. 20m.

(14) A car is driven NE for 40km, then NW for 50km and then south for 30km. Determine the resultant displacement of the car.

ANS.

(15) The dimension of density is given by

ANS. ML^{-3}

(16) A particle moving in a straight line with uniform deceleration has a velocity of 40m/s at a point P, 20m/s at a point Q and comes to rest at a point R, where QR = 50m. Calculate the time taken to cover PQ.

ANS. 5s

(17) A particle moving in a straight line with uniform deceleration has a velocity of 40m/s at a point P, 20m/s at a point Q and comes to rest at a point R, where QR = 50m. Calculate the distance PQ.

ANS. 150m

(18) Find the dimension of momentum

ANS. MLT^{-1}

(19) The dimension of force is given by

ANS. MLT^{-2}

20) Calculate the distance of a body moving with a velocity of 108 Km/hr in ½ mins.

ANS. 900m

21) A car starts from rest and accelerate uniformly reaches a velocity of 30m/s after 5secs. It travels with uniform velocity of 30m/s for 15sec and is then brought to rest in 10s with uniform retardation. Determine the acceleration of the car.

ANS. $6m/s^2$

22) A bullet of mass 0.045kg is fired from a gun of mass 9kg. The bullet moving with a initial velocity of 200m/s. Find the initial backward velocity of the gun

ANS: 1m/s

23) A force of 100N acts for 20secs. What is the change in the momentum of the body

ANS. 2000Ns

24) A body of mass 2kg undergoes a constant horizontal acceleration of $5m/s^2$. Calculate the resultant horizontal force acting on the body.

ANS. 10N

25) A body of mass 5kg is to be given an acceleration of $20m/s^2$. Calculate the force required when the acceleration is vertically upward.

ANS. 150N

26) A ball is released from a height of 20m. Calculate the time it takes to hit the ground.

ANS. 2s

27) A body is projected horizontally from the top of a vertical cliff 40m high with a velocity of 20m/s. Calculate the vertical component of the velocity when the body hit the ground.

ANS.

(27) Which of the following quantities represent the rate of change of an object.

ANS. DISPLACEMENT