**Choose the correct answer with an** **explanation**

**Q1) Easy multiple choice (only 5 points total, 2 mark each)**

1. Which of the following is not a vector quantity?

a) Acceleration b) Velocity c) Force d) Speed

1. Which is not the parameter of motion?

a) Velocity b) Speed c) Atomic structure d) Time

1. The part of mechanics that defines motion without concerning its causes is called-----

a) Statics b) Dynamics c) Kinematics d) None of the options

1. Which are the fundamental dimensions used in mechanics?

a) Time b) Mass c) Length d) All the above options

1. Acceleration of free fall depends on the----------

 a) surface b) weight of object c) size of object d) all of the options

1. As the ball falls towards the ground, its velocity----------

 a) increases b) decreases c) remains constant d) becomes zero

**Q2) Hard multiple choice (only 5 points total, 4 mark each)**

1. Let A = 2i – 2j, B= 2i+2j. What is the angle between them?

 a)30 b) 45 c) 60 d) 90

**explanation**

 $\vec{A}$ **.** $\vec{B}$ = AB cos$θ$ = (2\*2).(-2\*2) = 4-4= 0

 ⇒ cos$θ$ = $\frac{│A.B│}{│A││B│}$ = $\frac{0}{│A││B│}$= 0

 ⸫$θ$ *=* cos **-1** 0 =90°

 A ball travels with a velocity as described by the function v(t)= 5 m/s, what is the ball's acceleration?

 a)5 m / s**2**  b) -5 m / s**2** c) 0 d) 1 m / s**2**

**explanation**

 *a* = $\frac{dv}{dt}$ = $\frac{d5}{dt}$ = 0

1. An object moving along a line has a displacement equation of:  x(t)=5t**2**−40t,

where t is in seconds. What is the value of time t when the body reaches rest?

 a)3sec b) 2sec c) 4sec d) 5sec

**explanation**

 *v* = $\frac{dx}{dt}$ = 10*t* – 40 when the body reaches rest *v*= 0

 ⸫ *v*= 0 = 10*t* – 40 ⇒ *t* = $\frac{40}{10}$ = 4 sec

1. A stone is thrown upwards with initial velocity of 20 m s **-1**, the height that stone will reach would be---------

 a) 20.4 m b)30.4 m c) 40.5 m d) 50 m

**explanation**

 *v*2 = *v*₀2 – 2*gy,* the height that stone will reach means *v =* 0

 0 = (20)2 – 2(9.8) *y* ⸫ y= $\frac{400}{19.6}$ = 20.4 m

1. If initial velocity of an object is zero and acceleration of 9.8 m s **-2**, in time t, then the distance covered by it would be----------.

a) 2.9 t **2** b) 3 t **2** c) 4 t **2** d) 4.9 t **2**

**explanation**

*x* = *v*₀ t + $\frac{1}{2}$ at2 ⇒ *x* = 0 +$\frac{1}{2}$ (9.8) t2

*x* = 4.9 t **2**

1. If a car starting from rest reaches a velocity of 18 m s **-1** after 6.0 s then its acceleration is--------

 a) 1 m s **-2** b) 2 m s **-2** c) 3 m s **-2** d) 4 m s **-2**

**explanation**

*v = v₀ + at*, where *v₀ =* 0, *v* = 18 m s **-1 ,** *t* = 6.0 s

 ⸫18 = 0 + 6 *a ⇒ a* = $\frac{18}{6}$ = 3 m s **-2P**