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Internal Examination 2020

Sem - 4 , CC 10

F.M. - 20 Time - 2 hrs.

In the following , there are 10 questions of mark 2 each . Each question has 4 options , out of them only one is correct . Point out the correct options .

1. A particle moves along a straight line , and after a time t , it's distance s from origin O is given by : $s^2 = 6t^2 + 4t + 3$. Then it's acceleration varies as
   (a) $\frac{1}{s^2}$
   (b) $\frac{1}{\sqrt{s}}$
   (c) $\frac{1}{s^3}$
   (d) none of above
2. A man is riding a lift in a building . He will feel zero weight, when the lift
   (a) is moving vertically upwards .
   (b) is moving vertically downwards with acceleration $< g$.
   (c) is stopped .
   (d) is moving vertically downwards with acceleration $= g$.
3. A particle is in S.H.M. such that it's period is 5 *sec.* , and maximum velocity is $9m/s$. Then it's amplitude is
   (a) $= \frac{45}{2\pi}\ m$
   (b) $= same\ as\ frequency\ in\ magnitude$
   (c) $= 2\ times\ frequency\ in\ magnitude$
   (d) $= 3\pi$
4. A particle is projected vertically upwards with a velocity u under uniform gravity only . The maximum height it reaches is
   (a) $\frac{u^2}{2g}$

(b) $\frac{u}{2g}$

(c) $\frac{u^2}{4g}$

(d) none of above

5. In any S.H.M , the Amplitude and Frequency are

   (a) Independent of each other

   (b) Proportional to each other

   (c) Inversely proportional to each other

   (d) They are always same in magnitude

6. A particle is projected vertically upwards under uniform gravity . It reaches a height h in time T_1 , and then come back to the ground in time T_2. Then

   (a) $T_1 = 2T_2$

   (b) $T_1 = \frac{1}{2}T_2$

   (c) $T_1 = T_2$

   (d) none of above .

7. A particle describes the curve :

$$r = ae^{k\theta}$$

   under a central force P to the pole . Then

   (a) $P \propto \frac{1}{r^3}$

   (b) $P \propto \frac{1}{r}$

   (c) $P \propto \frac{1}{r^5}$

   (d) $P \propto \frac{1}{r^9}$

8. In any Central Orbit ,

   (a) $h = p.v$

   (b) $h^2 = p.v$

   (c) $h = p^2.v$

   (d) none of above .

   Where symbols have their usual meanings .

9. A particle of mass m is hanging vertically from a fixed point O by an inextensible string in equilibrium . Then the tension in the string will be

   (a) $2.mg$

   (b) mg

(c) $\frac{1}{2}.mg$

(d) none of above

10. Suppose there is a tunnel through the centre of the Earth , and a ball is fallen through the tunnel . Then

    (a) The ball will leave the Earth

    (b) The ball will never reach the centre of the Earth

    (c) The ball will move in S.H.M.

    (d) The ball cannot reach the other end of the tunnel