EXAM PATTERN QUESTIONS

NEET 2020

PHYSICS

1. The period of oscillation (T) depends upon radius R, density ρ and gravitational constant G. Derive formula for T.

   (a) $k\rho G^{-1/2}$
   (b) $k\rho^{-1/2}G$
   (c) $k(\rho G)^{-1/2}$
   (d) $k(\rho G)^{1/2}$

2. A particle has a velocity $4\hat{i}-3\hat{j}$ at any instant and has an acceleration $\left(-2\hat{i}+a\hat{j}\right)$ ms^{-2}. Find the time when the velocity becomes zero and find the value of a :
   (a) 2 sec, 1.5 ms^{-2}
   (b) 4 sec, 3 ms^{-2}
   (c) 4 sec, 2.5 ms^{-2}
   (d) 2 sec, 3 ms^{-2}

3. A 175 m long train is travelling along a straight track with a velocity of 72 km h^{-1}. A bird is flying parallel to the train in the opposite direction with a speed of 18 km h^{-1}. The time taken by the bird to cross the train is :

   (a) 35 s
   (b) 7 s
   (c) 27 s
   (d) 11.6 s

4. Find a vector parallel to $(3\hat{i} + 4\hat{j})$ and having magnitude equal to 10.

(a) $8\hat{i} + 6\hat{j}$
(b) $6\hat{i} + 8\hat{j}$
(c) $15\hat{i} + 20\hat{j}$
(d) $5\hat{i} + 5\sqrt{3}\,\hat{j}$

5. $\vec{a} + \vec{b} + \vec{c} = 0$, then $\vec{b} \times \vec{c}$ is :

(a) $\vec{c} \times \vec{a}$
(b) $\vec{a} \times \vec{c}$
(c) $\vec{b} \times \vec{c}$
(d) $\vec{c} \times \vec{b}$

6. A boat crosses from A to B, which are just on the opposite banks. The width of the river is D. the speed of water is v_ω and that of boat is v_B relative to still water. Assume $v_B = 2v_\omega$. Time taken by the boat, if it has to cross directly.

(a) $\dfrac{2D}{\sqrt{3}.v_B}$
(b) $\dfrac{\sqrt{3}\,D}{2v_B}$
(c) $\dfrac{D}{v_B\sqrt{2}}$
(d) $\dfrac{D\sqrt{2}}{v_B}$

7. The equation of motion of a projectile is $y = 4x - \dfrac{x^2}{3}$. The horizontal component of velocity is 10 ms^{-1}. Then the range of the projectile is : (g = 10 ms^{-2})

(a) 20 m
(b) 40 m
(c) 80 m
(d) 160 m

8. A projectile is projected with an initial velocity of $(5\hat{i} + 8\hat{j})$ ms^{-1}. If g = 10 ms^{-2}, then the range of the projectile is :

(a) 8 m
(b) 16 m
(c) 24 m
(d) 4 m

9. Two stones are projected with the same speed but making different angles with the horizontal. Their ranges are equal. Angle of projection of one is $\pi/3$ and the maximum height reached by it is 102 metre. Then maximum height reached by the other :

(a) 336
(b) 224
(c) 56
(d) 34