# Competitive Exams: Physics MCQs (Practice_Test 7 of 35)

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1. If a body of mass m (m is the mass in motion) is moving with a velocity u, then the
   kinetic energy of the body of rest mass $m_0$ will be

   a. $\left(\dfrac{1}{2}\right) mu^2$

   b. $m_0 c^2$

   c. $\left(\dfrac{1}{2}\right) (mc^2 - m_0 u^2)$

   d. $(m - m_0) c^2$

2. A particle moving with simple harmonic motion through points P and Q with the
   same velocity. Having taken two seconds in passing from P to Q, it returns to Q after
   another 2 seconds. The period in seconds is

   a. 2

   b. 4

   c. 6

   d. 8

3. Two harmonic vibrations X = a sin (wt + f) and Y = b sin (wt) represent the
   displacement of a particle along X and Y axis, respectively. If the phase difference f p
   = /2, then the trajectory of the particle will be a/an

   a. ellipse

   b. straight line with positive slope

   c. straight line with negative slope

   d. circle

4. It is possible to distinguish between transverse and longitudinal waves by studying
   their

a. reflection

b. polarisation

c. diffraction

d. interference

5. Which one of the following equations represents a stationary wave?

a. $Y = 2a \sin(2p\, t/T) \cos 2p\, (x/l)$

b. $Y = a \sin 2\, pn\, (t-x/)\, l$

c. $Y = a \sin wt$

d. $Y = a \sin2\{ (t/T) - (x/\} )\, l$

6. A tuning fork 'X' of unknown frequency when sounded together with another tuning fork 'Y' of frequency 480 Hz gives 4 beats per second. When it is loaded with wax, if it still gives 4 beats/sec, then the frequency of the tuning fork 'X' is

a. 476 Hz

b. 480 Hz

c. 484 Hz

d. 486 Hz

7. The equations $yl = al \sin w1t$ and $y2 = a2 \sin w2t$ represent two waves. If $w1 - w2$ is small, then the amplitude of the beats heard will vary from

a. zero to $a1 + a2$

b. zero to $a1 - a2$

c. $(al-a2) /2$ to $(al + a2) /2$

d. $al-a2$ to $al + a2$

8. An engine blowing its whistle at a frequency of 1200 Hz approaches a stationary observer with a velocity of 50 ms-1. If the speed of sound is 350 ms-1, then the apparent frequency as heard by the observer is

a. 1400 Hz

b. 1200 Hz

c. 1050 Hz

d. 600 Hz

9. The angular frequency of motion whose equation is $4\, (d2y/dt2) + 9y = 0$ is (y is displacement and $t$ = time)

a. $\dfrac{9}{4}$

b. $\dfrac{4}{9}$

c. $\dfrac{3}{2}$

d. $\dfrac{2}{3}$

10. With symbols having the usual meanings, which one of the following expressions correctly represents forced oscillation?

   a. $(d2y/dt2) + w2y = 0$

   b. $d2y/dt2 = 0$

   c. $d2y/dt2 + 2k (dy/dt) + w2y = 0$

   d. $d2y/dt2 + 2k (dy/dt) + w2y = F \sin pt$

11. Acoustic grating is obtained by

   a. ruling a glass plate

   b. ruling a cellulose plate

   c. sending ultrasonics through a fluid

   d. ruling a plastic sheet

12. If there is no transmission of energy in the medium, then the propagated wave is a/an

   a. electromagnetic wave

   b. longitudinal wave

   c. transverse wave

   d. stationary wave

13. Which one of the following vibrating systems can oscillate under resonance?

   a. Two pendulums of equal length suspended from a rigid support

   b. Two pendulums of equal length suspended from a flexible support

   c. Two pendulums of unequal length suspended from a rigid support

   d. Two pendulums of unequal lengths suspended from a flexible support

14. Match List I with List II and select the correct answer

| List-I (Microphone) | List-II (Principle) |
|---|---|
| | |

| A. Capacitor microphone | 1. Change in resistance |
| B. Crystal microphone | 2. Induced emf |
| C. Carbon microphone | 3. Change in voltage |
| D. Ribbon microphone | 4. Change in electrical energy |

**A B C D**

a.  4 3 2 1

b.  3 4 2 1

c.  3 4 1 2

d.  4 3 1 2

15. Match List I with List II and select the correct answer

| List-I | List-II |
|---|---|
| A. Velocity of sound in air | 1. Kundt's tube |
| B. Analysis of complex sound | 2. Sonometer |
| C. Frequency of a fork | 3. Helmholtz resonator |
| D. Young's modulus of a rod | 4. Resonance column apparatus |

**A B C D**

a.  4 3 2 1

b.  4 3 1 2

c.  3 4 2 1

d.  3 4 1 2