

## Examrace

### Competitive Exams: Physics MCQs (Practice\_Test 13 of 35)

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1. Which of the above figures represent damped simple harmonic motion. Select the correct answer using the codes given below:
  - a. Fig 1 alone
  - b. Fig 2 alone
  - c. Fig 4 alone
  - d. Fig 3 and 4
2. A railway engine passes by the platform at a speed of 36 km/hr blowing its whistle having a frequency of 660 Hz. The difference in the frequencies of the whistle heard by a person standing on the platform as the engine goes past the person is equal to
  - a. zero
  - b. 20 Hz
  - c. 40 Hz
  - d. 60 Hz
3. An open pipe of length 33 cm resonates to a frequency of 1000 Hz. The mode of vibration is
  - a. fundamental
  - b. the first harmonic
  - c. the second harmonic
  - d. the fourth harmonic
4. In the case of forced simple harmonic vibrations, the body generally vibrates with
  - a. Its natural frequency of vibration and its amplitude is small
  - b. its natural frequency of vibration but its amplitude is large
  - c. the frequency of the external force with a small amplitude
  - d. the frequency of the external force with a large amplitude
5. A string 1 m long is driven by a 300 Hz vibrator attached to its end. The string vibrates in three segments. The speed of transverse waves in the string is equal to

- a. 100 m/s
- b. 200 m/s
- c. 300 m/s
- d. 400 m/s
6. A string vibrates in 5 segments to a frequency of 480 Hz. The frequency that will cause it to vibrate in 2 segments will be
- a. 96 Hz
- b. 192 Hz
- c. 1200 Hz
- d. 2400 Hz
7. Given that a sound wave is passing through a gaseous medium of density  $\rho$ , pressure  $p$  and having specific heat ratio  $\gamma$ , and if  $P_0$  be the amplitude of the pressure variation of the sound wave, then match List I with List II and select the correct answer using the codes given below:

| List-I (Properly)                       | List-II (Expression)     |
|---|--------------------------|
| A. Velocity of sound wave               | 1. $p \rho \gamma$       |
| B. Intensity of sound wave              | 2. $\rho p$              |
| C. Acoustic impedance of the medium     | 3. $\rho p / \gamma$     |
| D. Bulk modulus for an adiabatic change | 4. $P_0 / 2 \rho \gamma$ |

**A B C D**

- a. 3 4 2 1
- b. 4 1 3 2
- c. 3 4 1 2
- d. 2 3 1 4
8. If the differential equation given by  $d^2y/dt^2 + 2k dy/dt + w^2y = F_0 \sin pt$  describes the oscillatory motion of body in a dissipative medium under the influence of a periodic force, then the state of maximum amplitude of the oscillation is measure of

- a. free vibration
  - b. damped vibration
  - c. forced vibration
  - d. resonance
9. A lens system made up of two thin lenses 1 and 2 of focal lengths  $+f$  and  $-f$  respectively are separated by a distance  $+f$ . Under paraxial approximation, the system matrix for a ray entering from the left of lens 1 and leaving to the right of lens 2 is given by
- a. 1
  - b. 2
  - c. 3
  - d. 4
10. Which of the following combination (s) will reduce spherical aberration of a convergent lens to practically zero?
- a. Convergent lens
  - b. Divergent lens
  - c. Plane mirror
  - d. Spherical mirror

Select the correct answer using the codes given below:

- a. 1 and 3
  - b. 2 alone
  - c. 3 and 4
  - d. 4 alone
11. Two convex lenses made of flint glass and of focal lengths 20 cm and 40 cm will become achromatic if the distance between them is
- a. 10 cm
  - b. 20 cm
  - c. 30cm
  - d. 60cm
12. The 'f' number of a photographic camera with aperture D and focal length F is

- a. (F/D)
  - b. (D/F)
  - c. (FD)
  - d. (FD) 1
13. Which one of the following sets of waves is coherent?
14. With light of wavelength 490 nm in a Newton's rings experiment, the radius of the nth bright ring is R With light of wave-length 640 nm, in the same set up, the corresponding radius will be
- a.  $8 Rn/7$
  - b.  $64 Rn/49$
  - c.  $Rn$
  - d.  $7Rn/8$
15. The intensity of light emerging from one slit in a Young's double-slit interference set up is four times that of the other. The ratio of maximum intensity to minimum intensity in the fringe pattern is
- a. 4: 1
  - b. 2: 1
  - c. 9: 1
  - d. 3: 1