

**SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,  
NANDED**

**MCQ QUESTION PAPER SET 1**

**SUBJECT: PHYSICS**

**CLASS: B.Sc. SECOND YEAR**

**SEM -III**

**PAPER-VI**

**MAX.MARKS:40**

**TIME DURATION:1 HR.**

**TITLE: WAVES AND OSCILLATIONS**

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1. Relation between wave velocity(  $v$ ), frequency (n) and wavelength ( $\lambda$ ) is:

a)  $v = n\lambda$

b)  $v = \frac{n}{\lambda}$

c)  $v = \frac{\lambda}{n}$

d)  $v = n^2\lambda$

2. The general equation of simple harmonic progressive wave is :

a)  $y = a \sin \frac{\pi}{\lambda}(vt - x)$

b)  $y = a \sin \frac{2\pi}{\lambda}(vt - x)$

c)  $y = a \sin \frac{\pi}{2\lambda}(vt - x)$

d)  $y = a \sin \frac{3\pi}{\lambda}(vt - x)$

3. Differential equation of wave motion is:

a)  $\frac{d^2y}{dx^2} = v^2 \frac{d^2y}{dt^2}$

b)  $\frac{d^2y}{dt^2} = v^2 \frac{d^2y}{dx^2}$

c)  $\frac{d^2y}{dx^2} = v \frac{dy}{dt}$

d)  $\frac{d^2y}{dt^2} = v \frac{d^2y}{dx^2}$

4. The energy of progressive wave is :

a) Partly kinetic

b) Partly potential

c) Partly kinetic and partly potential

d) Neither kinetic nor potential

5. Velocity of transverse waves along stretched string is:

a)  $v = \frac{T}{m}$

b)  $v = \frac{m}{T}$

c)  $v = \sqrt{\frac{m}{T}}$

d)  $v = \sqrt{\frac{T}{m}}$

6. When a simple harmonic progressive wave is propagated through medium, the displacement of a particle in cm at any instant is given by

$y = 10 \sin \frac{2\pi}{100} (36000t - 20)$  Then amplitude of wave is:

a) 100cm

b) 20 cm

c) 36000cm

d) 10cm

7. The fundamental frequency of vibration of stretched string is:

a)  $n = \frac{1}{2l} \sqrt{\frac{T}{m}}$

b)  $n = \frac{1}{l} \sqrt{\frac{T}{m}}$

c)  $n = \frac{1}{3l} \sqrt{\frac{T}{m}}$

d)  $n = \frac{1}{4l} \sqrt{\frac{T}{m}}$

8. Progressive wave can transfer:

a) Only matter

b) Only energy

c) Both energy and matter

d) Neither energy nor matter

9. The period of vibration of stretched string is:

a)  $T = l \sqrt{\frac{m}{T}}$

b)  $T = 2l \sqrt{\frac{m}{T}}$

c)  $T = 3l \sqrt{\frac{m}{T}}$

d)  $T = 4l \sqrt{\frac{m}{T}}$

10. The relation between particle velocity ( $U$ ) and wave velocity ( $v$ ) is:

a)  $U = -v \left( \frac{dy}{dt} \right)$

b)  $U = -v^2 \left( \frac{dy}{dx} \right)$

c)  $U = -v \left( \frac{dy}{dx} \right)$

d) None of above is correct

11. In stationary waves the distance between two adjacent nodes is:
- a)  $\lambda$
  - b)  $\frac{\lambda}{4}$
  - c)  $\frac{\lambda}{2}$
  - d)  $\frac{\lambda}{3}$
12. In stationary waves, nodes are the points of ...
- a) Maximum displacement
  - b) Adequate displacement
  - c) Moderate displacement
  - d) Zero displacement
13. In stationary waves, amplitude of vibration gradually .....from  
Node to antinode
- a) Decreases
  - b) Increases
  - c) Remains same
  - d) None of above is correct
14. When waves are setup in a fluid, the excess of pressure is given by:
- a)  $p = -E \frac{dy}{dx}$
  - b)  $p = -E \frac{dy}{dt}$
  - c)  $p = -E \frac{d^2y}{dt^2}$
  - d)  $p = -E \frac{d^2y}{dx^2}$

15. In a stationary wave at antinodes:
- a) Change in Pressure and density is greater than normal
  - b) Change in Pressure and density is less than normal
  - c) No change in pressure and density
  - d) All above are correct
16. Which of the following statement about stationary waves is/are correct.?
- a) Stationary waves transfer energy through the medium
  - b) Stationary waves do not transfer energy through the medium
  - c) Stationary waves continuously travel in a specific direction
  - d) Stationary waves are progressive waves
17. The total energy per wavelength in stationary wave is ..... that in progressive wave.
- a) Equal
  - b) Half
  - c) Double
  - d) Quarter
18. Stationary waves are formed in a medium such that the distance between two successive nodes is found to be 0.8cm. What is the distance between two successive antinodes?
- a) 0.8cm
  - b) 0.4cm
  - c) 1.6cm
  - d) 0.2cm

19. In a stationary wave at nodes, the velocity of particle is:
- a) Maximum
  - b) Always Zero
  - c) Never Zero
  - d) Between Zero and maximum
20.  $y = 2a \cos \frac{2\pi x}{\lambda} \sin \frac{2\pi vt}{\lambda}$  is the equation of ...
- a) Stationary waves
  - b) Progressive waves
  - c) Beats
  - d) None of above
21. Resonance is the ....
- a) Special case of free damped vibration
  - b) Special case of free undamped vibration
  - c) Special case of forced vibration
  - d) None of above correct
22. If pendulum is displaced in vacuum, its amplitude of oscillation:
- a) Gradually decreases with time
  - b) Remains constant
  - c) Gradually increases with time
  - d) Initially increases then decreases

23. When a body is maintained in a state of vibration by a periodic force, the type of vibration is:
- a) Forced vibration
  - b) Free damped vibration
  - c) Free undamped vibration
  - d) None of above correct
24. The existence of damping can..
- a) Decreases in amplitude
  - b) Increases in amplitude
  - c) Maintain constant in amplitude
  - d) None of above are correct
25. At resonance amplitude of oscillation is
- a) Zero
  - b) Minimum
  - c) In between zero and maximum
  - d) Maximum
26. The differential equation of free undamped vibration is:
- a)  $\frac{d^2y}{dt^2} - n^2y = 0$
  - b)  $\frac{d^2y}{dt^2} + 2k \frac{dy}{dt} + n^2y = 0$
  - c)  $\frac{d^2y}{dt^2} + n^2y = 0$
  - d)  $\frac{d^2y}{dt^2} + 2k \frac{dy}{dt} = 0$

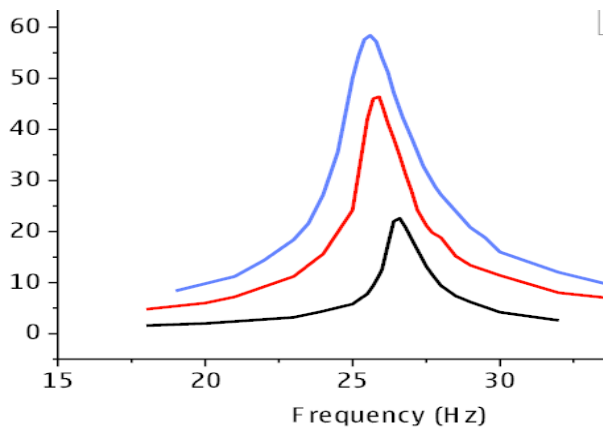
27. Aperiodic motion is also called as:

- a) Dead beat
- b) Critically damped motion
- c) Oscillatory motion
- d) None of above correct

28. At resonance amplitude of forced vibration is:

- a)  $A_m = \frac{f^2}{2kn}$
- b)  $A_m = \frac{f^2}{kn}$
- c)  $A_m = \frac{f}{kn}$
- d)  $A_m = \frac{f}{2kn}$

29. In a given figure, sharpness of resonance is maximum for



- a) Red curve (Middle curve)
- b) Black curve (Lower curve)
- c) Blue curve (Upper curve)
- d) All curves have equal sharpness



30. Period of free undamped vibration is :

a)  $T = \pi \sqrt{\frac{m}{\mu}}$

b)  $T = \frac{1}{2\pi} \sqrt{\frac{m}{\mu}}$

c)  $T = 2\pi \sqrt{\frac{m}{\mu}}$

d)  $T = \frac{1}{\pi} \sqrt{\frac{m}{\mu}}$

31. Persistence of sound even after the source has stopped is known as:

- a) Resonance
- b) Absorption coefficient
- c) Ultrasonic
- d) Reverberation

32. Reverberation time should have

- a) Very much lower value
- b) Optimum value
- c) Very high value
- d) None of above correct

33. Sound waves of frequency lower than the audible limit are called:

- a) Infrasonic
- b) Sonic
- c) Audible
- d) Ultrasonic

34. Ultrasonic waves can be produced by:
- Galton Whistle Method
  - Magnetostriction Oscillator
  - Piezoelectric oscillator
  - By all above method
35. The velocity of ultrasonic waves through liquid and gases at various temperature is measured by:
- Acoustic grating
  - Magnetostriction Oscillator
  - Piezoelectric oscillator
  - By all above method
36. Sabine's reverberation time formula is:
- $t_1 = \frac{\sum \alpha A}{0.158V}$
  - $t_1 = \frac{\sum \alpha A}{1.58V}$
  - $t_1 = \frac{0.158V}{\sum \alpha A}$
  - $t_1 = \frac{1.58}{\sum \alpha A}$

37. Acoustics of an auditorium can be improved by:
- a) Hanging heavy curtains
  - b) Having pictures and maps
  - c) Having few open windows
  - d) All above are correct
38. The piezo electric effect is more pronounced found in crystals of:
- a) Quartz
  - b) Tourmaline
  - c) Rochelle salt
  - d) In all above crystals
39. Absorption coefficient of material is:
- a)  $\alpha_2 = \frac{0.158V}{A} \left[ \frac{t_1-t_2}{t_1 t_2} \right]$
  - b)  $\alpha_2 = \frac{1.58V}{A} \left[ \frac{t_1-t_2}{t_1 t_2} \right]$
  - c)  $\alpha_2 = \frac{15.8V}{A} \left[ \frac{t_1-t_2}{t_1 t_2} \right]$
  - d)  $\alpha_2 = \frac{158V}{A} \left[ \frac{t_1-t_2}{t_1 t_2} \right]$

40. The fundamental frequency of vibration of rod in piezo-electric oscillator is:

a)  $n = \frac{2l}{p} \sqrt{\frac{Y}{\rho}}$

b)  $n = \frac{l}{p} \sqrt{\frac{Y}{\rho}}$

c)  $n = \frac{p}{l} \sqrt{\frac{Y}{\rho}}$

d)  $n = \frac{p}{2l} \sqrt{\frac{Y}{\rho}}$

**ANSWER KEYS**  
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Q.NO.	ANS.
1	a
2	b
3	b
4	c
5	d
6	d
7	a
8	b
9	b
10	c

Q.NO.	ANS.
11	c
12	d
13	b
14	a
15	c
16	b
17	c
18	a
19	b
20	a

Q.NO.	ANS.
21	c
22	b
23	a
24	a
25	d
26	c
27	a
28	d
29	c
30	c

Q.NO.	ANS.
31	d
32	b
33	a
34	d
35	a
36	c
37	d
38	d
39	a
40	d

Dr. Bhanudas Narwade  
Chairman

Dr. Fulmanthe

Dr.Nakade

