DPP
DAILY PRACTICE PROBLEMS

| CLASS : XITH	SUBJECT : PHYSICS
DATE :	DPP NO. :3

Topic :- WAVES

1. Two wires made up of same material are of equal lengths but their radii are in the ratio 1:2. On stretching each of these two string by the same tension, the ratio between the fundamental frequencies is
   a) 1:2
   b) 2:1
   c) 1:4
   d) 4:1

2. The frequency and velocity of sound wave are 600 Hz and 360 m/s respectively. Phase difference between two particles of medium are 60°, the minimum distance between these two particles will be
   a) 10 cm
   b) 15 cm
   c) 20 cm
   d) 50 cm

3. The beats are produced by two sound sources of same amplitude and of nearly equal frequencies. The maximum intensity of beats will be ... that of one source
   a) Same
   b) Double
   c) Four times
   d) Eight times

4. Which of the following do not require medium for transmission
   a) Cathode ray
   b) Electromagnetic wave
   c) Sound wave
   d) None of the above

5. Two identical flutes produce fundamental notes of frequency $300\ Hz$ at 27℃. If the temperature of air in one flute is increased to 31℃, the number of the beats heard per second will be
   a) 1
   b) 2
   c) 3
   d) 4

6. When beats are produced by two progressive waves of the same amplitude and of nearly the same frequency, the ratio of maximum loudness to the loudness of one of the waves will be n. Where n is
   a) 3
   b) 1
   c) 4
   d) 2

7. The displacement y of a particle in a medium can be expressed as
   $y = 10^{-6} \sin\left(100t + 20x + \frac{\pi}{4}\right)$m, where t is in second and x in metre. The speed of the wave is
   a) 2000 ms^{-1}
   b) 5 ms^{-1}
   c) 20 ms^{-1}
   d) 5π ms^{-1}

8. A whistle giving out 450 Hz approaches a stationary observer at a speed of 33ms^{-1}. The frequency heard by the observer in Hz is [velocity of sound in air=333ms^{-1}]
   a) 409   b) 429   c) 517   d) 500

9. Vibrating tuning fork of frequency n is placed near the open end of a long cylindrical tube. The tube has a side opening and is fitted with a movable reflecting piston. As the piston is moved through $8.75\ cm$, the intensity of sound changes from a maximum to minimum. If the speed of sound is $350\ m/s$. then n is
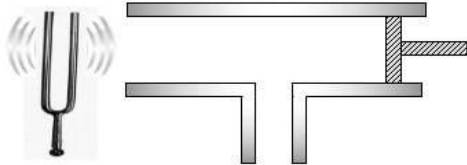
   a) $500\ Hz$ b) $1000\ Hz$ c) $2000\ Hz$ d) $4000\ Hz$

10. The length of a sonometer wire tuned to a frequency of $250\ Hz$ is $0.60\ metre$. The frequency of tuning fork with which the vibrating wire will be in tune when the length is made $0.40\ metre$ is
    a) $250\ Hz$ b) $375\ Hz$ c) $256\ Hz$ d) $384\ Hz$

11. Transverse waves of same frequency are generated in two steel wires A and B. The diameter of A is twice of B and the tension in A is half that in B. The ratio of velocities of wave in A and B is
    a) $1 : 3\sqrt{2}$ b) $1 : 2\sqrt{2}$ c) $1 : 2$ d) $\sqrt{2} : 1$

12. The phase difference between two points separated by $0.8\ m$ in a wave of frequency is $120\ Hz$ is $\pi/2$. The velocity of wave is
    a) $720\ m/s$ b) $384\ m/s$ c) $250\ m/s$ d) $1\ m/s$

13. An engine is moving on a circular track with a constant speed. It is blowing a whistle of frequency $500\ Hz$. The frequency received by an observer standing stationary at the centre of the track is
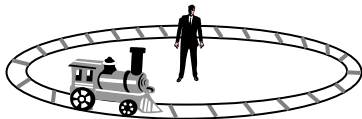
    a) $500\ Hz$
    b) More than $500\ Hz$
    c) Less than $500\ Hz$
    d) More or less than $500\ Hz$ depending on the actual speed of the engine

14. A man sitting in a moving train hears the whistle of the engine. The frequency of the whistle is $600\ Hz$
    a) The apparent frequency as heard by him is smaller than $600\ Hz$
    b) The apparent frequency is larger than $600\ Hz$
    c) The frequency as heard by him is $600\ Hz$
    d) None of the above

15. In a stationary wave, all particles are
    a) At rest at the same time twice in every period of oscillation
    b) At rest at the same time only once in every period of oscillation
    c) Never at rest at the same time
    d) Never at rest at all

16. In a resonance column cist and second resonance are obtained at depths 22.7 cm and 70.2 cm. The third resonance will be obtained at a depth
    a) 117.7 cm   b) 92.9 cm   c) 115.5 cm   d) 113.5 cm

17. Tube A has both ends open while tube B has one end closed. Otherwise they are identical. Their fundamental frequencies are in the ratio
    a) 4:1   b) 2:1   c) 1:4   d) 1:4

18. Equation of a progressive wave is given by
    $$y = 0.2 \cos \pi \left(0.04t + .02x - \frac{\pi}{6} \right)$$
    The distance is expressed in cm and time in second. What will be the minimum distance between two particles having the phase difference of $\pi/2$
    a) $4\ cm$ b) $8\ cm$ c) $25\ cm$ d) $12.5\ cm$

19. If the frequency of human heart beat is 1.25 Hz, the number of heart beats in 1 minute is
    a) 80   b) 65   c) 90   d) 75

20. A tuning fork A produces 4 $beats/sec$ with another tuning fork B of frequency $320\ Hz$. On filing the fork A, 4 $beats/sec$ are again heard. The frequency of fork A, after filing is
    a) $324\ Hz$ b) $320\ Hz$ c) $316\ Hz$ d) $314\ Hz$