Assignment 1   **Chapter 8**   **Subject: Physics**   **Class: First year**   **Total Marks: 60**

Name _____

Question No. 1. Encircle the correct option

1. When a wave reflects from boundary of the rare medium, the reflected wave, phase change will be
    a. 0^0 b. 60^0 c. 90^0 d. 180^0
2. The distance between the two consecutive nodes is
    a. λ b. 2λ c. $\lambda/2$ d. $\lambda/4$
3. The speed of sound in vacuum is
    a. Zero   b. 300 m/s   c. 332 m/s   d. 340 m/s
4. At what temperature the speed of sound in air becomes double.
    a. 750^0 b. 819^0 c. 719^0 d. 879^0
5. If the tension is made four times, the speed of the transverse waves will become
    a. double   b. three times   c. four times   d. remains constant
6. If the pressure of the gas is doubled, the velocity of sound in it will be
    a. doubled   b. three times   c. four times   d. remains constant
7. Red shift indicates that the stars
    a. is moving towards earth   b. is moving away from earth
    c. is stationary   d. none of these
8. Sound waves travel faster in
    a. solid   b. liquid   c. gasses   d. vacuum
9. Two waves can interfere only if they have
    a. phase coherence   b. same velocity   c. different frequencies   d. all of these
10. The speed of sound is independent of
    a. temperature   b. density   c. pressure   d. medium
11. The error in the value of speed of sound calculated by Newton at STP is about
    a. 14 %   b. 15 %   c. 16 %   d. 18 %
12. The speed of sound is greater in solids due to high
    a. density   b. temperature   c. elasticity   d. pressure
13. The waves of equal frequency traveling in opposite direction give rise to
    a. interference   b. diffraction   c. stationary waves   d. beats
14. At the open end of an organ pipe
    a. nodes is formed   b. anti-node is formed
    c. node or anti-node is formed   d. neither node nor anti-node is formed
15. Fixed ends of a vibrating string are
    a. nodes   b. antinodes   c. overtones   d. neither nodes nor anti-nodes
16. The louder the sound, the greater will be its
    a. amplitude   b. wavelength   c. speed   d. frequency
17. Types of waves used in Sonar are
    a. electromagnetic waves   b. water waves c. matter waves   d. sound waves
18. For each degree rise in Celsius temperature of gas, the speed of sound through it increases by
    a. 0.60 m/s   b. 0.61 m/s   c. 0.60 cm/s   d. 0.60 cm/s
19. The speed of sound has maximum value in
    a. oxygen   b. helium   c. hydrogen   d. air
20. If 20 waves pass through a medium in 1 second with a speed of 20 m/s then wavelength is
    a. 20 m   b. 40 m   c. 400 m   d. 1 m
21. Frequency of the waves for an organ pipe open at one end is
    a. nv/2l   b. nv/4l   c. nv/3l   d. 4l/nv
22. When a wave reflects from the boundary of the denser medium, reflected wave, phase change will be
    a. 0^0 b. 60^0 c. 90^0 d. 180^0
23. If the pressure of the gas is doubled, the velocity of sound in it will be
    a. doubled   b. three times   c. four times   d. remains constant
24. Doppler effect is applicable to
    a. sound waves   b. light waves   c. both a&b   d. none of these
25. Sound waves cannot be
    a. diffracted   b. refracted   c. reflected   d. polarized
26. When source of sound moves away the wavelength of sound waves
    a. increases   b. decreases   c. remains constant   d. none of these
27. Blue shift indicates that the stars
    a. is moving towards earth   b. is moving away from earth   c. is stationary d. none
27. Frequency of the waves for organ pipe open at both ends is
    a. nv/2l   b. nv/4l   c. nv/3l   d. 4l/nv
28. The particles velocity at nodes of the stationary waves is
    a. maximum   b. minimum   c. zero   d. sometimes minimum and sometimes maximum
29. On loading the prong of a tuning fork, its frequency
    a. remains constant   b. increases   c. decreases   d. sometime increases sometime decreases

30. The speed of the waves produced in the stretched string depends upon the
    a. tension in string   b. mass per unit length of string   c. length of string   d. both a&b
31. Two tuning forks having frequencies 512 Hz and 516 Hz are sounded together, the beat frequency is
    a. 1 Hz   b. 2 Hz   c. 3 Hz   d. 4 Hz
32. The distance between two consecutive nodes or two consecutive antinodes in stationary waves is
    a. $\lambda/4$ b. $\lambda/2$ c. λ d. 2λ
33. Two waves of equal frequency travelling in same direction give rise to phenomena, called
    a. interference   b. beats   c. compression waves   d. stationary waves
34. The wavelength of the fundamental mode of stationary waves produced in an organ pipe closed at one end is
    a. $\ell / 2$ b. ℓ c. 2ℓ d. 4ℓ
35. Newton calculated speed of sound in air at STP equal to
    a. 250 m/s   b. 280 m/s   c. 300 m/s   d. 333 m/s
36. Increase in velocity of sound in air for every 1 ^{0}C rise in temperature is
    a. 1.61 m/s   b. 0.61 m/s   c. 16.1 m/s   d. 2.0 m/s
37. Silence zone takes place due to
    a. constructive interference   b. destructive interference   c. stationary waves   d. beats
38. Radar is a practical application of
    a. stationary waves   b. beats   c. Doppler effect   d. none of these
39. Wavelength of x-rays is of the order of
    a. 10^{-10} m   b. 10^{-8} m   c. 10^{-6} m   d. 10^{-4} m 40.
41. The speed of sound in air is at 0°C is 330 m/s. Its speed at 2°C is
    a. 333.2 m/s   b. 335 m/s   c. 330 m/s   d. none of these
42. The beats are formed when two notes of frequencies f_1 and f_2 $(f_1 > f_2)$ are sounded together, then beat f will be
    a. $f_1 + f_2$ b. $f_1 - f_2$ c. $(f_1 + f_2)/2$ d. $(f_1 - f_2)/2$
43. The waves which do not require any medium for their propagation are called
    a. mechanical waves   b. electromagnetic waves   c. matter waves   d. stationary waves
44. Propagation of sound waves through air is
    a. isothermal process   b. adiabatic process   c. isochoric process   d. none of these
46. The density of oxygen is 16 times greater than hydrogen. The speed of sound in hydrogen --- greater than oxygen
    a. 2 times   b. 3 times   c. 4 times   d. 16 times
47. Fundamental frequency of stationary waves produced in stretch string is 30 Hz. Frequency of fourth harmonics is
    a. 30 Hz   b. 60 Hz   c. 90 Hz   d. 120 Hz
48. When source and observer are moving in same direction with same frequency, the apparent frequency will
    a. increase   b. decrease   c. remain same   d. becomes zero
49. When observer moves away from a stationary source with a speed equal speed of sound, apparent frequency will
    a. decrease   b. increase   c. remain same   d. become zero
50. When source moves towards a stationary observer with a speed equal speed of sound, apparent frequency become
    a. double   b. four time   c. half   d. one by four
51. The ultrasonic have the frequencies
    a. in audible range   b. below 20 Hz   c. above 20,000 Hz   d. none of these
52. The ratio of speed of sound in hydrogen to the speed of sound in oxygen is
    a. 4:1   b. 1:4   c. 8:1   d. 1:8
53. Sound waves are
    a. longitudinal waves   b. transverse waves   c. stationary waves   d. standing waves
54. Two tuning forks produce two beats in the time interval of 0.4 s, so beat frequency is
    a. 8 Hz   b. 5 Hz   c. 2 Hz   d. 6 Hz
55. Which of the following media can transfer both longitudinal and transverse waves?
    a. solid   b. liquid   c. plasma   d. gas
56. If pressure is doubled the speed of sound is
    a. also doubled   b. become four time   c. become half   d. not effected
57. The speed of sound is has maximum value in
    a. oxygen   b. air   c. hydrogen   d. helium
58. A set of frequencies, which is the multiple of fundamental frequency is called
    a. beat frequency   b. harmonics   c. Doppler effect   d. nodal wave front
59. The wavelength of microwaves is
    a. 10 cm   b. 12 cm   c. 14 cm   d. 15 cm
60. Wave can transmit from one place to another
    a. wavelength   b. amplitude   c. matter   d. energy

Assignment 2   Chapter 8   Subject: Physics   Class: First year   Total Marks: 8

Note: Write short answers
Q.1   Define waves and progressive waves.
Q.2   Write characteristics of stationary waves.
Q.3   State the superposition principle.
Q.4   Write any two applications of Doppler's effect.