DPP – 1 SOUND

1. Define echo. Mention twe practical use of echoes.
2. State three conditions for the formation of echo.
3. What do you understand by the term reverberations? Give an example.
4. How do sound travels in air?
5. Write the frequency range of infrasonic, audible and ultrasonic waves.
6. Define the terms wavelength, amplitude and frequency.
7. What is SONAR? State the principle on which it is based on.
8. Differentiate between sound wave and light wave?
9. Write the necessary condition for hearing an echo.
10. What should be the minimum distance between a source of sound and the reflector to hear the echo distinctly?
11. What is the order of wavelength of visible light and audible sound?
12. How is the sound wave produced in strings fixed at both ends?
13. How does a stretched string on being set into vibration, produce the audible sound?
14. Will the sound be audible if the string is set into vibration on the surface of the moon? Give reason to your answer.
15. During lightening, first we observe light and then hear sound. Why?
16. Why echo is not heard when distance between source of sound and reflecting body is 10 m?
17. What are mechanical waves? Name one property of waves that do not change when the waves passes from one medium to another.
18. Name the type of waves used for sound ranging. Are they audible to us? Give reason to use these waves only.
19. Name the type of waves used for RADAR. Give uses of RADAR.
20. Two astronauts on the surface of the moon cannot talk each other. Why? What type of hearing aids are required by them?
21. Bats can ascertain distances, direction, nature and size of the obstacle without eyes. Explain how.
22. How do trawler-men locate shoals of fish in high sea?

DPP – 2 SOUND

1. What do you understand by the following terms:
(a) Free vibrations, (b) Natural frequency, (c) Natural time period?

2. Distinguish between free vibrations and forced vibrations.

3. When does resonance occur? Give one example based on the phenomenon of resonance.

4. The stem of a vibrating tuning fork is pressed against the table top. Answer the following questions:

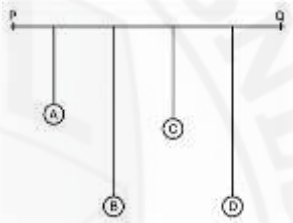
(i) Will the above action produce any audible sound?

(ii) Does the above action cause the table to set into vibration?

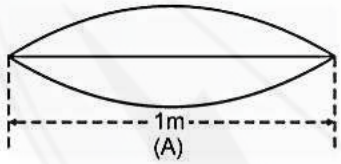
(iii) If the answer in (ii) is yes, what kind of vibrations are they?

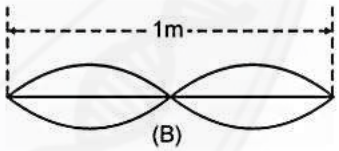
(iv) Under what conditions, the above action leads to resonance?

5. In the given diagram, A, B, C and D are four pendulums suspended from same elastic wire PQ, such that lengths of pendulums B and D are same. The pendulum D is set to motion. What is your observation? State reason for your observation.



6. A stretched wire 10 m long is made to vibrate in two different modes as shown in diagrams (A) and (B) given below.





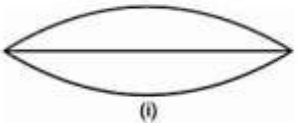
a) If the wavelength of wave produced in (A) is 2 m, what is the wavelength of wave produced in mode (B) in the diagram?

b) In which case is the note produced louder? Give reason for your answer.

c) In which case is the pitch of the note produced higher? Give reason for your answer.

7. Write down the factors on which frequency of a vibrating string depends. What adjustments will you make for tuning stringed instruments, such as violin, for it to emit a desired pitch?

8. A 0.6 m long stretched wire is made to vibrate in two different modes as shown in the figures below. Copy and mark the points with N for the points of least displacement. If the frequency of the note produced in diagram (ii) is n, what is the frequency in case of (i)? By stating a reason, explain which of two notes (i) or (ii) is louder?



9. Why are soldiers asked to walk out of step while crossing bridges?

10. Why does a wine glass start rattling, when a note of some particular frequency is struck by a piano?

11. Why does rear-view mirror of a motor bike start vibrating violently, at some particular speed of motor bike?

12. A tuning fork (vibrating) is held close to the ear. One hears a faint hum. The same (vibrating) tuning fork is placed on table, such that its handle is in contact with table, one hears a loud sound. Explain?

13. Why are stringed musical instruments provided with large sound boxes?

14. A person walking past a railway line, at the middle of night hears a ringing sound along with the sound of his footsteps. Why?

15. Fill in the blanks.

(i) A wire is stretched between two fixed supports. It is plucked exactly in the middle and then released. The string executes..... .

(ii) When a body vibrates with its natural frequency the force acting on body is directly ..... to it's.....

16. Name one factor on which the frequency of sound emitted due to vibration in air column depends.

17. What adjustments would you make for tuning a stringed instrument for it to emit a note of desired frequency?

18. Explain, why are the strings of different thickness provided on a stringed instrument?

19. Draw a sketch showing displacement of a body executing damped vibrations against time.

20. How is it possible to detect the filling of bottle under tap by hearing sound at distance?

DPP – 3 SOUND

1. What do you understand by the terms: (i) Musical sound, (ii) Noise?
2. State three differences between musical sound and noise.
3. State three characteristics of musical sound and define each of them.
4. State three factors which determine the loudness of sound.
5. What determines pitch of sound? Why do the qualities of sound of same pitch differ when emitted by different musical instruments?
6. In what respect does frequency of noise pattern differ from musical sound? Show by drawing diagrams.
7. What do you understand by the term quality of musical note? Illustrate your answer with diagram.
8. How do you account for the fact that two strings can be used to give notes of same pitch and loudness, but of different quality?
9. State two differences between light wave and sound wave. Explain, why lightning flash is seen before the crack of thunder.
10. Two persons are playing on identical stringed instruments, whose strings are adjusted to give notes of same pitch. Will the quality of two notes be same? Give a reason for your answer.
11. Name the unit in which loudness of sound is measured. What does the unit named by you signify? What is the range of loudness of sound which is picked by the human ears? What is the normal range of loud sound for human ears?
12. What do you understand by the term noise pollution? Name two factors which contribute to noise pollution at a particular place.
13. Name four causes of noise each in: (a) homes, (b) surroundings.
14. State four harmful effects of noise pollution. State four ways of minimizing noise with tolerable limits.

DPP – 4 SOUND

1. An ultrasonic wave is sent from a ship towards the bottom of the sea. It is found that the time interval between the sending and the receiving of the wave is 1.5 second. Calculate the depth of the sea if the velocity of sound in sea water is 1400 m/s.
2. A radar sends a signal to an aeroplane at a distance 45 km away with speed of 3×10^8 m/s. After how long is the signal received back from the aeroplane?
3. A man standing in between two cliffs produces a sound and hears two successive echoes at intervals of 3 s and 4 s respectively. Calculate the distance between the two cliffs. The speed of sound in the air is 330 m/s.
4. A man standing 25 m away from wall produces a sound and receives the reflected sound. Calculate the time after which he receives the reflected sound if the speed of sound in air is 350 m/s.
5. Will the man be able to hear a distinct echo? Give reason for your answer.
6. A sound made on the surface of a lake takes 3 s to reach a boatman. How much time will it take to reach a diver inside the water at the same depth? v_{air} = 330 m/s, v_{water} = 1450 m/s
7. An observer stands at a certain distance away from cliff and produces a loud sound. He hears the echo of sound after 1.8 s. Calculate distance between cliff and observer. v_{air} = 340 m/s
8. A child hears an echo from a cliff 4 seconds after the sound from a powerful cracker is produced. How far away is the child from the cliff? v_{air} = 340 m/s
9. What type of waves are produced when a bell rings in air, longitudinal or transverse wave?
10. A string vibrates with frequency of 500 Hz. If distance between two consecutive troughs of transverse wave produced in the string is 20 cm, find velocity and time period of the wave.
11. An observer sitting in between two vertical walls claps 10 times per second. He adjusts his distance 17 m from one wall in such a way that the sound of his clapping coincides with the echo. Calculate the velocity of sound.

12. A man stand at a distance of 68 m from a cliff and fires a gun. After what time interval will he hear the echo, if the speed of sound in air is 340 m/s? If the man had been standing at a distance of 12 m from the cliff would he have heard a clear echo?

13. The wavelength of a sound wave is 66 m. Calculate the frequency of the wave, if the velocity of sound is 330 m/s. Would this sound be audible to human ear?

14. A person standing between two vertical cliffs and 480 m from the nearest cliff shouts. He hears the firs echo after 3 s and the second echo 2 s later. Calculate:

a) speed of sound,

b) the distance of other cliff from the person.

15. A person standing between two vertical cliffs and 640 m from the nearest cliff shouts. He hears the firs echo after 4 s and the second echo 3 s later. Calculate:

a) velocity of sound in air,

b) the distance between the cliffs.

16. A pendulum has a frequency of 5 vibrations per second. An observer starts the pendulum and fires a gun simultaneously. He hears the echo from a cliff after 8 vibrations of the pendulum. If the velocity of sound in air is 340 m/s, what is distance between cliff and the observer?

17. A radar sends signal to an aircraft at a distance of 30 km away and receives it back after 2×10^{-4} second. What is the speed of the signal?

DPP – 5 SOUND

1. A man shouts and hears the echo of sound from a distant hill after 1.4 seconds. What is the distance of hill from man? Velocity of sound in air 340 m s^{-1}.
2. A man is standing between two vertical cliffs 685 m apart. He claps his hands and hears two distinct echoes after 0.9 second and 1.1 seconds respectively. What is the speed of sound in air?
3. A ship sends ultrasonic waves in all directions. A particular wave reflects from the rock inside sea in 4.6 seconds. What is the distance of the rock from ship? Velocity of sound in water = 1450 ms^{-1}
4. A stone is dropped into a 10-m-deep well. After how many seconds of dropping the stone the sound of splash would he heard? Given g 10 ms^{-2}: Velocity of sound in air 340 m s^{-1}.
5. A man claps his hands and hears the echo from a cliff 1.4 seconds later. What is the distance of the cliff from man? Velocity of sound in air = 340 m/s
6. A boy standing between two vertical cliffs claps his hands and hears two distinct echoes after 1.8 seconds and 2.2 seconds respectively. What is his distance from the nearest cliff and what is the distance between the two cliffs? Velocity of sound in air = 340 m/s
7. A submarine is inside water 3.77 km away from a ship. The ship sends ultrasonic waves that reflect from the submarine and is received back in 5.2 seconds. What is the speed of ultrasonic in water?
8. A person fires a gun in front of a building 167 m away. If the speed of sound is 334 ms^{-1}, calculate the time in which he hears an echo.
9. An echo is heard after 0.8 s, when a person fires a cracker, 132.8 m from a high building, calculate the speed of sound.
10. The speed of sound is 130 ms^{-1}, a person fires gun an echo is heard after 1.5 s, calculate the distance of the person from the cliff from which the echo is heard.
11. An echo is heard by a radar in 0.08 s, if velocity of radio waves is 3×10^8 ms^{-1}, how far is the enemy plane?

12. An enemy plane is at distance of 300 km from a radar, in how much time the radar will be able the detect the plane? Take velocity of radio waves as 3×10^8 ms^{-1}.

13. A man stands in between two high rise building and blows a whistle, he hears two successive echoes after 0.4 s and 1.6 s. Calculate distance between the buildings. [speed of sound = 332 ms^{-1}]

14. A man stands between two parallel cliffs and explodes a cracker. He hears the first echo after 0.6 and the second echo after 2.4 s. calculate the distance between the cliffs.[speed of sound is 336 ms^{-1}]

15. A man stands between two cliffs, such that he is at a distance of 133.6 m from the nearer cliffs. He fires a gun and hears the first echo after 0.8 s and the second echo after 1.8 s. calculate: (i) speed of sound (ii) distance between the two cliffs.

16. A man stands in between two parallel cliffs which are 99 m apart. He fires a gun and hears two successive echoes after 0.2 s and 0.4 calculate: (i) the distance of the person from the nearer cliff (ii) speed of sound.

17. A man stands in the front of a vertical cliffs and fires a gun. He hears an echo after 2.5 s. on moving 80 m closer to the cliff he again fires the gun and he hears an echo after 2 s. Calculate: (i) distance of the mam from the cliffs to his initial position (ii) speed of sound.

18. A boy stands in front of a cliff on the other side of a river, and fires a gun and hears an echo after 6 second. The boy then moves 170 m backwards and again fires the gun. He hears an echo after 7 second .calculate (i) width of the river (ii) speed of sound.

19. An elastic string fixed from the ends is vibrating in fundamental note of frequency 200 Hz. Now the string is plucked from 1/6 length from one end. What is the frequency of vibration of the string now? Show the two positions of the vibrating string with the help of neat diagram.

20. A string vibrates with frequency of 256 Hz when plucked from 1/4 length from one end. What is the fundamental frequency of its vibration?