Practice Questions
(Energy, Power, Sound)
Class-9
Session-2017-2018

Energy and Power

1. What is energy? Mention different forms of energy. What are the two types of mechanical energy? State and define them.
2. Derive the K.E. = 1/2 mv^2 ;m,v≡ usual notation.
3. Derive gravitational P.E. as 'mgh'.

4. Gravitational P.E. is relative in nature - Explain.

5. How much work should be done on a body of mass 100kg to increase its speed from 20$ms^{-1}$to 40ms^{-1}?
6. When a ball is thrown inside a moving bus, does the K.E depend on the speed of the bus? Explain.
7. State the law of conservation of energy. Mention its limitation if any.

8. Explain the law of conservation of mechanical energy in case of a falling body. What happens to the mechanical energy after it falls on the ground?
9. Explain the conservation of mechanical energy in case of an oscillating pendulum. What makes the pendulum ultimately stop? Is it a violation of the law?
10. Give example of conservation of energy in the following cases.

- Chemical to sound
- Light to electrical
- Chemical to electrical
- Mechanical to electrical

11. What is the difference between gravitational potential energy and elastic potential energy? Give an example of a body having gravitational potential energy and another having elastic potential energy.

12. If 1084J of work is done in lifting a 24 kg mass, calculate the height through which it was lifted.

13. A man A goes to the top of a building by a vertical spiral staircase. Another man B of the same mass goes to the top of the same building by a slanting ladder. Which of the two does more work against gravity and why?

14. What do you understand by the mechanical energy of an object?

15. What type of quantity is power? Is it a scalar or vector? Define it. Define S.I. unit of power.

16. What is the commercial unit of energy? Derive the relation between commercial unit and S.I. unit of energy.
17. Ramesh uses

- A refrigerator of 2HP for 14 hours .
- 4 fans of 100W each for 18 hours.
- 10 lights of 40W each for 16 hours per day. Find the electricity bill for the month of April 2015. (Given 1HP = 750 W and cost of electricity as Rs.5 per unit.)

18. When a ball is thrown inside a moving bus , does the kinetic energy depend on the speed of the bus? Explain.

19. A boy weighing 45kg makes a high jump of 1.6m.

i) What is his kinetic energy at the highest point?

ii) What is his potential energy at the highest point?

iii) Calculate the total mechanical energy of the boy at the highest point.

20. Give an example of a body possessing both potential and kinetic energy.

Sound

1. What is a wave? Give an example.
2. Give reasons:
   i) Sound waves are called mechanical waves.
   ii) Sound waves in air are longitudinal waves
3. Describe an activity with diagram that sound is produced by vibrating tuning forks.
4. How is sound transmitted through air? Explain with the help of a diagram.
5. Explain compression and rarefaction.
6. What is sound? How is it produced?
7. Define the following terms: wave velocity, time period, frequency, amplitude of wave, wavelength.
8. How does the velocity of sound depend on temperature, density and humidity of air?
9. State the laws of reflection of sound.
10. Mention the differences between reflection of sound and light.
11. Write two uses of reflection of sound.
12. What is reverberation? How can it be reduced?
13. What is persistence if hearing?
14. What is echo? Write two applications of echo.
15. In which medium the speed of sound is greatest and why?
16. Draw and label the structure of a human ear. Mention the functions of each part.