1. Why is it difficult to hold a school bag having a strap made of a thin and strong string?

2. What is Archimedes’ principle. What do you mean by buoyancy?

3. Why does an object float or sink when placed on the surface of water?

4. What is known as up thrust or buoyant force? At what factors it depends on.

5. What do you mean by Relative density of silver is 10.8. The density of water is 103 kg m$^3$. What is the density of silver in SI unit?

6. Define term work and energy?

7. Write an expression for the work done when a force is acting on an object in the direction of its displacement. Define 1 J of work.

8. What is the work to be done to increase the velocity of a car from 30 km/h to 60 km/h if the mass of the car is 1500 kg?

9. Define and find expression for kinetic and potential energy.

10. Energy can only be converted from one form to another; it can neither be created or destroyed. Prove it.

11. Define power. A boy of mass 50 kg runs up a staircase of 45 steps in 9 s. If the height of each step is 15 m, find his power. Take $g = 10$ m s$^2$.

12. An electric bulb of 60 W is used for 6 h per day. Calculate the ‘units’ of energy consumed in one day by the bulb.

13. What are the various energy transformations that occur when you are riding a bicycle?

14. An object of mass 15 kg is moving with a uniform velocity of 4 m s$^{-1}$. What is the kinetic energy possessed by the object?

15. What will be the change in kinetic energy of a body when its speed is halved?
16. An electric motor of power 100 W is used to drive the stirrer in a water bath. If 50% of the energy supplied to the motor is spent in stirring the water, calculate the work done on the water in one minute.

17. A mass of 4 kg is dropped from a tower of height 45 m. Calculate
   (i) the potential energy possessed by the body when it is at the top of the tower
   (ii) the kinetic energy possessed by the body when it is at a height of 35 m
   (iii) the kinetic energy just before hitting the ground
   (iv) the velocity of the body just before hitting the ground.

Sol. (i) 1764 J.  (ii) \( v^2 = 192 \text{ m/s}^2 \) : KE = 192 Joule  (iii) \( v = \sqrt{882} = 29.69 \text{ m/s} \)