

**ICSE Board**  
**Class VI Physics**  
**Sample Paper – 1 Solution**

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**Question 1**

1. (d) 500 J.

Given:  $m = 5 \text{ kg}$

$s = 10 \text{ m}$ ;  $g = 10 \text{ m/s}^2$

We know that

$W = Fs$  and  $F = mg$

$\therefore W = mgs = 5 \times 10 \times 10 = 500 \text{ J}$

2. (c) Become one fourth. Kinetic energy is directly proportional to velocity squared (K.E. =  $\frac{1}{2}mv^2$ ). So, if velocity is halved, then kinetic energy becomes one fourth.
3. (a) Metre. The S.I. unit of length is metre.
4. (c) North-South direction. A freely suspended bar magnet always comes to rest in the North-South direction.
5. (b) Class II. The mechanical advantage of Class II levers is always greater than 1. This is because the effort arm is always longer than the load arm of these levers.
6. (d) Pressure. 1 atm is the unit of pressure.
7. (b) Magnetic force. Magnetic force acts at a distance. All the others are contact forces.
8. (a) Increase the friction. Tyres are provided with deep grooves on their surface to increase the friction and the vehicle can move easily without skidding.
9. (c) Load. A wheelbarrow is a Class II type lever, so load is at its centre.
- 10.(b) The distance between finger-tips and elbow. A cubit is length equal to the distance between finger-tips and elbow.
- 11.(d) A person is lying on the ground. Potential energy of a person is the least when he is lying on the ground as its height is minimum wrt to the ground.
- 12.(a) Sharp edges. Tools meant for cutting and piercing always have sharp edges so that they may produce large pressure to cut things easily.

13.(b) Non contact force. A force that can change the motion of an object without actually touching it is called a non contact force.

14.(c) Steel. Permanent magnets are made of steel.

15. (d) All of the above.

A force can:

1. Alter the speed of the moving object.
2. Change the direction of the motion of the body.
3. Change the shape of an object.

### Question 2

(A)

1. Fundamental quantity
2. Electrostatic force
3. pascal
4. Sound energy
5. Volume

(B)

1. Temperature
2. Sun
3. Attract
4. Heat
5. Lubricant

### Question 3

(A)

Column A	Column B
1. Length	a. Metre
2. Oar	b. Class II lever
3. Electromagnet	c. Electric to magnetic
4. Temperature	d. Kelvin
5. Forceps	e. Class III lever

(B)

1. Friction resists motion because surfaces are in contact with each other.
2. A class III lever has effort in the middle.
3. The S.I. unit of area is metre squared.
4. Mercury is used in a thermometer because it does not wet the glass.
5. The strength of an electromagnet can be increased by increasing the number of turns or increasing the current flowing through the coil.

#### Question 4

(A) Friction is a necessary evil which acts both as a friend and a foe.

Examples of friction as a **friend**:

1. We are able to walk because of frictional forces between the ground and our feet.
2. We are able to write because of friction between a pen's nib and the paper surface.
3. Nails and screws embed to wall surfaces because of friction.
4. Lighting a match stick is due to friction between a match stick and the side surface of a match box.

Examples of friction as a **foe**:

1. Wear and tear of soles of our shoes is due to friction.
2. When a tyre deflates, it is difficult to move the vehicle because of increased friction between the tyre and the road surface.
3. Machines get heated up and produce noise because of friction.
4. Due to friction, machines and vehicles consume more fuel and increase maintenance cost.

(B) Uses of magnets:

1. They are used in magnetic compasses.
2. They are used in pencil boxes, soap stands, refrigerators, etc.
3. Ceramic magnets are used in large computers.
4. They are used in bicycle dynamos.
5. They are also used in toys to give a magical effect.

#### Question 5

(A)

1. Work done by a force depends on:
  - a. Magnitude of the force applied.
  - b. The distance through which the body moves in the direction of force.
2. Friction is the resistance to motion experienced when two surfaces in contact move with respect to each other.
3. The base of taller buildings is made broader because it reduces the pressure exerted on the ground so that they do not sink in due to the extremely high pressure of the building.
4. The two factors by which a machine's ability to do work is measured are its efficiency and mechanical advantage.
5. The substances which are magnetised when found in nature are natural magnets. Magnets which are made by man are artificial magnets.

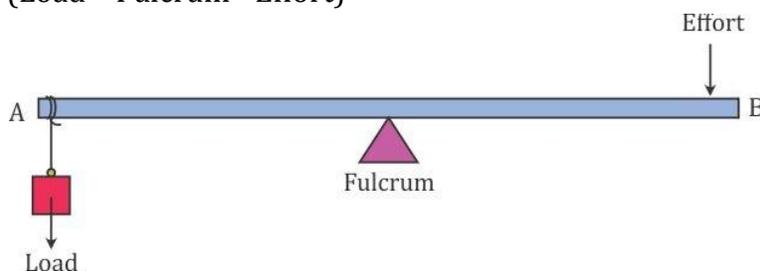
(B)

1. Iron. Only iron is a magnetic substance. Others are non-magnetic substances.
2. Wide tyres. Wide tyres have large area of contact. Others have very small area of contact.
3. Chemical energy. Chemical energy is a stored energy. Others are forms of energy in action.
4. Wood. Wood is a conventional source of energy. Others are non-conventional sources.
5. Sugar tongs. Sugar tongs is a class III lever. Others are class II levers.

### Question 6

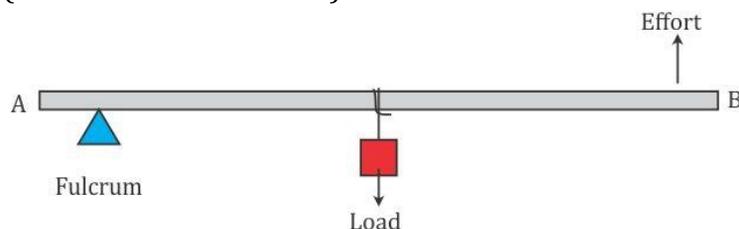
(A) Levers are of three kinds: Class I, Class II and Class III levers.

**Class I lever:** (Load – Fulcrum - Effort)



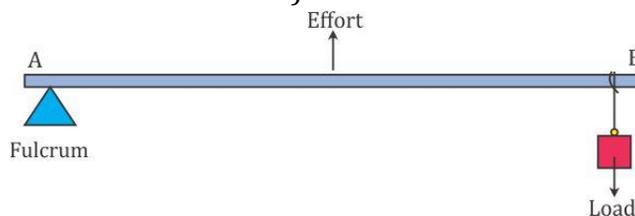
- (a) In this type of levers, the fulcrum is in between the load and the effort.
- (b) It is also called lever of the first order.
- (c) Examples: A beam balance, a pair of scissors, etc.

**Class II lever:** (Fulcrum – Load - Effort)



- (a) In this type of levers, the load is in between the fulcrum and the effort.
- (b) It is also called lever of the second order.
- (c) This type of lever is used when less effort is to be used to do more work. Hence, effort arm is always longer than load arm.
- (d) Examples: A nut cracker, a bottle opener, etc.

**Class III lever:** (Fulcrum – Effort - Load)



- (a) In this type of levers, the effort is in between the fulcrum and the load.

- (b) It is also called lever of the third order.
- (c) In this type of lever effort arm is always smaller than the load arm.
- (d) Examples: Forceps, sugar tongs, etc.

**(B)**

1. It is defined as the distance between two fine lines engraved on a platinum-iridium bar kept at International Bureau of Weights and Measures in Paris maintained at  $0^{\circ}\text{C}$ .
2. Lower fixed point of a thermometer is the temperature of melting of pure ice, i.e.  $0^{\circ}\text{C}$ .
3. Contact forces are those forces which act only when objects are in physical contact with each other.
4. Potential energy is the energy possessed by the body by virtue of its position with reference of the earth.
5. The imaginary line joining the poles of a magnet is called the magnetic axis of a magnet.

**Question 7****(A)**

1. An inclined plane is any sloping flat surface along which a load can be easily pushed or pulled. Four examples of inclined planes are ramp, a gang plank, winding staircase and hill road.
2. River water is stored in reservoirs in the dam. When the stored water is made to flow through special channels, the potential energy of water changes into kinetic energy. The kinetic energy of flowing water is utilised in rotating the blades of the turbine. The K.E. of the rotating turbine is converted into electrical energy by a generator. This is how hydroelectricity is produced.

**(B)**

1.
  - i. Clinical thermometer: It is used for measuring temperature of a human body and the temperature range marked on the clinical thermometer is about  $35^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ .
  - ii. Laboratory thermometer: It is used in laboratories for measuring temperature and the temperature range marked is from  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ .
2. The following are the important properties of a magnet:
  1. A magnet attracts objects made of iron and steel.
  2. When a magnet is suspended freely using a thread, it always comes to rest pointing in the North-South direction.
  3. The strength of a magnet is concentrated at the poles of a magnet. These are poles are termed as the North Pole and South Pole.
  4. The poles of a magnet always exist in pair and thus, there cannot be a single pole.
  5. Like poles repel each other and unlike poles attract each other.