

ICSE Board
Class VI Physics
Sample Paper – 5

Time: 2 hrs

Total Marks: 75

General Instructions:

1. *All questions are compulsory.*
 2. *Questions 1 to 15 carry one mark each.*
 3. *Questions in 2 A and B carry one mark each.*
 4. *Questions in 3 A carry one mark each and 3 B carries 5 marks.*
 5. *Question 4 carries 5 marks each.*
 6. *Questions in 5 A and B carry one mark each.*
 7. *Questions in 6 A and B carry five mark each.*
 8. *Question 7 A and 7 B carry five marks.*
-

Question 1

Choose the correct answer out of the four available choices given under each question. [15]

1. What is the work done in lifting a 5 kg body through a height of 10 m? ($g = 10 \text{ m/s}^2$)
 - (a) 5 J
 - (b) 15 J
 - (c) 50 J
 - (d) 500 J

2. If the velocity of a moving car is reduced to half its original velocity, its kinetic energy would
 - (a) Become four times
 - (b) Become two times
 - (c) Become one fourth
 - (d) Become half

3. The S.I. unit of length is
 - (a) Metre
 - (b) Yard
 - (c) Cubit
 - (d) Foot

4. When a bar magnet is suspended freely, it comes to rest in the
- (a) East-West direction
 - (b) North-East direction
 - (c) North-South direction
 - (d) South-West direction
5. Which type/types of levers always have mechanical advantage greater than 1?
- (a) Class I
 - (b) Class II
 - (c) Class III
 - (d) All of the above
6. The unit of 1 atm is taken as the unit of
- (a) Force
 - (b) Area
 - (c) Work
 - (d) Pressure
7. Which of the following is force at a distance?
- (a) Muscular force
 - (b) Magnetic force
 - (c) Friction force
 - (d) Normal reaction force
8. Tyres are provided with deep grooves on their surface to
- (a) Increase the friction
 - (b) Reduce the cost of material used
 - (c) Decrease the friction
 - (d) Make them look attractive
9. For a wheelbarrow _____ is at the centre.
- (a) Fulcrum
 - (b) Effort
 - (c) Load
 - (d) None of the above
10. A cubit is length equal to
- (a) The distance between nose and toe
 - (b) The distance between finger-tips and elbow
 - (c) 3 metres
 - (d) The distance between outstretched arm and chin.

- 11.** Potential energy of a person is minimum when
- (a) A person is standing
 - (b) A person is sitting on a chair
 - (c) A person is sitting on the ground
 - (d) A person is lying on the ground
- 12.** Tools meant for cutting and piercing always have
- (a) Sharp edges
 - (b) Smooth edges
 - (c) Long handle
 - (d) All of the above
- 13.** A force which can change the motion of an object without actually touching it is
- (a) Contact force
 - (b) Non contact force
 - (c) Distant force
 - (d) None of the above
- 14.** Permanent magnets are made up of
- (a) Copper
 - (b) Soft iron
 - (c) Steel
 - (d) Aluminium
- 15.** A force can do which of the following?
- (a) It can alter the speed of the moving object
 - (b) It can change the direction of the motion of the body
 - (c) It can change the shape of an object
 - (d) All of the above

Question 2

(A) Name the following. [5]

1. A quantity which does not depend on other quantities.
2. Force exerted by a charged body.
3. Unit of pressure.
4. Energy produced by vibrating objects.
5. Space occupied by an object.

(B) Fill in the blanks. [5]

1. _____ is the degree of hotness or coldness of a body.
2. _____ is the ultimate source of energy.
3. Unlike poles of two magnets _____ each other.
4. Nuclear energy is released in the form of _____ energy when an atom disintegrates.
5. _____ is applied to moving parts of a machine to reduce friction.

Question 3

(A) Match the following. [5]

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

(B) Correct the following sentences. [5]

1. Friction resists motion because surfaces are attracted to each other.
2. A class III lever has fulcrum in the middle.
3. The SI unit of area is metre cubed.
4. Mercury is used in a thermometer because it wets the glass.
5. The strength of an electromagnet can be increased by increasing the number of turns or decreasing the current flowing through the coil.

Question 4

(A) Give examples to show that friction is both a friend and a foe. [5]

(B) What are the five important uses of a magnet? [5]

Question 5

(A) Answer in one sentence: [5]

1. State the factors on which work done depends.
2. What is friction?
3. The base of taller buildings is made broader. Why?
4. Name the two factors by which a machine's ability to do work is measured.
5. What are natural and artificial magnets?

(B) Find the odd one out. [5]

1. Plastic, brass, iron, copper
2. Sharp knife, pointed heel, wide tyres, pointed nail
3. Sound energy, chemical energy, heat energy, light energy
4. Wood, sun, water, wind
5. Nut cracker, sugar tongs, wheel barrow, bottle opener

Question 6

(A) Show with the help of diagrams, the differences between I, II and III classes of levers. [5]

(B) Define the following. [5]

1. One metre
2. Lower fixed point of thermometer
3. Contact force
4. Potential energy
5. Magnetic axis

Question 7

(A) Answer the following.

1. What is an inclined plane? Give four examples of inclined planes commonly used in daily life? [2]
2. How is hydroelectricity produced? [3]

(B) Answer the following.

1. What is the use of [2]
 - i. Clinical thermometer
 - ii. Laboratory thermometer
2. State the important properties of a magnet. [3]

Solution

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.

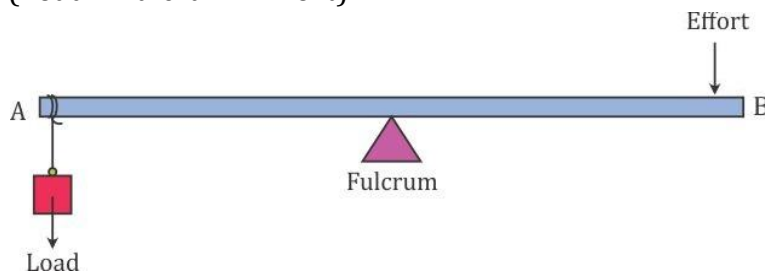
(B)

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

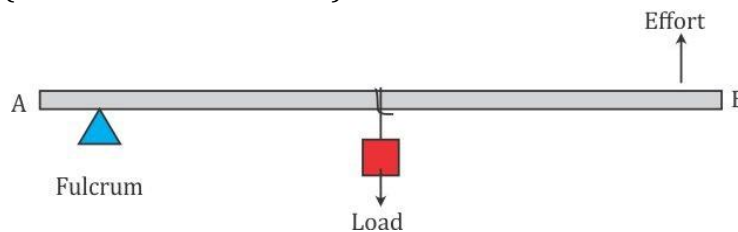
(A) Levers are of three kinds: Class I, Class II and Class III levers.

Class I lever: (Load – Fulcrum - Effort)



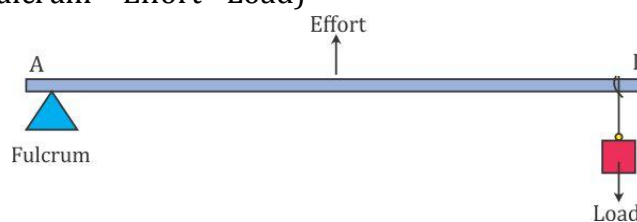
- (a) In this type of levers, the fulcrum is in between the load and the effort.
- (b) It is also called lever of the first order.
- (c) Examples: A beam balance, a pair of scissors, etc.

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°C.
2. Lower fixed point of a thermometer is the temperature of melting of pure ice, i.e. 0°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°C to 42°C.
 - ii. Laboratory thermometer: It is used in laboratories for measuring temperature and the temperature range marked is from -10°C to 110°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.