

**ICSE Board  
Physics  
Sample Paper – 3**

**Time: 2 hrs**

**Total Marks: 75**

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**General Instructions:**

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

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

1. Electric charges can flow through
  - (a) Both conductors and insulators
  - (b) Insulators
  - (c) Conductors
  - (d) Neither conductors nor insulators
  
2. A freely suspended magnet would come to rest in the
  - (a) East west direction
  - (b) North south direction
  - (c) South east direction
  - (d) North west direction
  
3. The change of state from vapour to liquid at a constant temperature is called
  - (a) Fusion
  - (b) Vapourisation
  - (c) Freezing
  - (d) Condensation
  
4. The type of lens used as a magnifying glass
  - (a) Concave lens
  - (b) Convex lens
  - (c) Concavo-convex lens
  - (d) Convexo-concave lens

5. Our solar system belongs to the
- (a) Seyfert galaxy
  - (b) Milky way galaxy
  - (c) Whirl pool galaxy
  - (d) Andromeda galaxy
6. If the weight of a body is more than the weight of fluid displaced by it, then the body
- (a) Sinks
  - (b) Floats
  - (c) First floats and then sinks
  - (d) None of these
7. Air in motion possesses
- (a) Potential energy
  - (b) Kinetic energy
  - (c) Electrical energy
  - (d) Geothermal energy
8. When a positively charged body is brought close to another positively charged body, it will show
- (a) Attraction
  - (b) Repulsion
  - (c) No effect
  - (d) None of these
9. The Earth's magnetic field is maximum
- (a) At the poles of the Earth
  - (b) At the centre of Earth
  - (c) At the outer surface of the Earth
  - (d) None of these
10. Speed of light is maximum in
- (a) Air
  - (b) Water
  - (c) Glass
  - (d) Vacuum
11. Land breeze blows
- (a) During the day
  - (b) During the night
  - (c) Both during day and night
  - (d) None of the above

12. An image which can be captured on a screen is called

- (a) Erect
- (b) Inverted
- (c) Virtual
- (d) Real

13. Liquid pressure is measured by

- (a) Anemometer
- (b) Odometer
- (c) Manometer
- (d) Barometer

14. The direction of buoyant force is always

- (a) Vertically downward
- (b) Vertically upward
- (c) Along the surface
- (d) At any angle with the surface of liquid

15. Small insects like water striders can walk on water due to

- (a) Surface tension
- (b) Strong feet
- (c) Elastic tension
- (d) Attraction between feet and water

### Question 2

(A) Match the columns and rewrite them correctly.

[5]

	Column A		Column B
1	1 Calorie	1	Myopia
2	Concave lens	2	No unit
3	Silver	3	Hydroelectric energy
4	Water in a dam	4	Insulator
5	Relative density	5	Wind energy
		6	Conductor
		7	4.2 Joules

**(B)** Fill up the blanks and rewrite the sentences: [5]

1. The space around a magnet where its influence can be felt is called \_\_\_\_\_.
2. \_\_\_\_\_ protects buildings from the damage caused by lightning.
3. Water is used as a \_\_\_\_\_ in thermal power stations.
4. A ray of light passing through \_\_\_\_\_ of a lens passes undeviated.
5. The force of attraction between molecules of the same substance is called \_\_\_\_\_.

### Question 3

**(A)** State whether the following statements are true or false. Correct the false statement and rewrite it. [5]

1. Earth is the largest planet of the solar system.
2. In an electric motor, mechanical energy is converted into electrical energy.
3. Good conductors have excess of free electrons.
4. Convex lenses are always tapering in the middle and thicker at their edges.
5. During vapourisation, temperature of a liquid remains constant.

**(B)** Give reasons for the following: [5]

1. A gas can be easily compressed.
2. Dispersion of light occurs when it passes through a prism.
3. Kilometre is not a convenient unit to measure distances in the universe.
4. A piece of tile or stone feels colder than a piece of wood, even though both are at the same temperature.
5. A normal atom is electrically neutral though it contains charged particles like electrons and protons.

### Question 4

**(A)**

1. Define: [2]
  - (a) Refraction of light
  - (b) Angle of refraction
  - (c) Angle of incidence
2. Define surface tension. Give two examples where surface tension is seen. [3]

**(B)**

1. What is an electroscope? Name two kinds of electroscopes. [2]
2. Draw field lines when two bar magnets are placed with their opposite poles facing each other. List any two properties of magnetic field lines. [3]

### Question 5

(A)

1. Differentiate between renewable and non-renewable sources of energy with one example for each. [2]
2. What is heat? State three factors on which the amount of heat gained or lost by a body depends. [3]

(B)

1. Write any six characteristics of matter and its constituent particles. [3]
2. State the uses of a convex lens. [2]

### Question 6

(A)

1. Differentiate between : [3]
  - (a) Planets and satellites
  - (b) Stars and planets
2. Give two consequences of high latent heat of steam. [2]

(B)

1. Name the two factors on which buoyant force depends. State the relationship between the buoyant force on an object and the weight of a liquid displaced by it? [2]
2. Define the following: [3]
  - (a) Conduction
  - (b) Principal axis
  - (c) Valence electrons.

### Question 7

(A)

1. A coil of insulated wire is connected to a galvanometer. What would be seen if a bar magnet brought towards one face of the coil is: [3]
  - (a) Moved quickly towards it? What does the change indicate?
  - (b) Moved quickly away from it?
  - (c) Name the phenomena involved and explain it.
2. State the characteristics of liquid pressure. [2]

(B)

1. What are constellations? Name any three constellations. [2]
2. State the type of lens used to get a [3]
  - (a) Virtual and diminished image of an object
  - (b) Real and diminished image of an objectJustify your answers in the above two cases by drawing ray diagrams.

# Solution

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## Question 1

1. **(c)** Conductors

Electric charges can flow through conductors. Insulators do not allow charges to flow through them.

2. **(b)** North south direction

A freely suspended magnet would come to rest in the north south direction.

3. **(d)** Condensation

The change of state from vapour to liquid at a constant temperature is called condensation.

4. **(b)** Convex lens

Convex lens is used as a magnifying glass.

5. **(b)** Milky way galaxy

Our solar system belongs to the Milky way galaxy.

6. **(a)** Sinks

If the weight of a body is more than the weight of fluid displaced by it, then the body sinks.

7. **(b)** Kinetic energy

Air in motion possesses kinetic energy.

8. **(b)** Repulsion

When a positively charged body is brought near another positively charged body, it will show repulsion.

9. **(a)** At the poles of the Earth

The Earth's magnetic field is maximum at the poles of the Earth.

10. **(d)** Vacuum

Speed of light is maximum in vacuum.

11. **(b)** During the night

Land breeze blows during the night.

**12.(d)Real**

An image which can be taken on a screen is called real image.

**13.(c) Manometer**

Liquid pressure is measured by a manometer.

**14.(b) Vertically upward**

The direction of buoyant force is always vertically upwards.

**15.(a) Surface tension**

Small insects like water striders can walk on water due to surface tension.

**Question 2**

**(A)**

	<b>Column A</b>		<b>Column B</b>
1	1 Calorie	1	4.2 Joules
2	Concave lens	2	Myopia
3	Silver	3	Conductor
4	Water in a dam	4	Hydroelectric energy
5	Relative density	5	No unit

**(B)**

1. The space around a magnet where its influence can be felt is called magnetic field.
2. Lightning conductor protects buildings from the damage caused by lightning.
3. Water is used as a coolant in thermal power stations.
4. A ray of light passing through optical centre of a lens passes undeviated.
5. The force of attraction between molecules of the same substance is called cohesion.

### Question 3

(A)

1. False. Jupiter is the largest planet of the solar system
2. False. In an electric motor, electrical energy is converted into mechanical energy.
3. True.
4. False. Convex lenses are always tapering at the edges and thicker at their middle.
5. True.

(B)

1. Molecules of gases are very far apart and there is a lot of empty space between them. So a gas can be easily compressed.
2. Dispersion of light occurs when it passes through a prism because different colours are refracted through different angles.
3. Kilometre is not a convenient unit to measure distances in the universe because heavenly bodies are very far from each other.
4. A piece of tile or stone is a good emitter in comparison to wood.
5. Electrons are negatively charged and protons are positively charged. For an atom the number of electrons is equal to the number of protons and therefore it is neutral.

### Question 4

(A)

1.
  - (a) Refraction of light – When light travels from one transparent medium to another transparent medium, it bends from its original path. This phenomenon of bending of light is called refraction.
  - (b) Angle of refraction - The angle formed between the refracted ray and the normal is called the angle of refraction.
  - (c) Angle of incidence - The angle formed between the incident ray and the normal is called the angle of incidence.
2. Surface tension: It is the property of a liquid by virtue of which its free surface behaves like a stretched membrane with a tendency to contract and acquire minimum surface area.  
Examples:
  - i. Soaps and detergents help in cleaning clothes as they lower the surface tension of water. This water readily soaks in the pores of clothes and cleans them efficiently.
  - ii. Small insects like the water strider can walk on water as its weight is not enough to penetrate the surface tension of water.

(B)

1. An electroscope is a device with the help of which one can detect whether a body is charged or uncharged and identify the charge on it.

The two kinds of electroscopes are: 1) Pith ball electroscope, 2) Gold leaf electroscope.

2.



Unlike poles of two magnet facing each other

The properties of magnetic field lines are as follows.

- i. Magnetic field lines originate from the North Pole and terminate at the South Pole.
- ii. Magnetic field lines never intersect each other.

### Question 5

(A)

1. Energy sources which can be regenerated or those which provide energy continuously without getting exhausted are called renewable sources of energy. Example: Solar energy.  
Energy sources which will get depleted someday are called non-renewable sources of energy. Example: Fossil fuels
2. Heat is a form of energy which brings the sensation of hotness or coldness of a body in us. The amount of heat gained or lost by a body depends on:
  - Mass of the substance
  - Rise or fall in temperature of the substance
  - Nature of the substance

(B)

1. Matter and its constituent particles have the following characteristics:
  - Matter is made up of tiny particles known as **atoms** which consist of three particles called **protons, electrons** and **neutrons**.
  - Protons carry a positive charge (+), electrons carry a negative charge (-) and neutrons carry no charge, i.e. it is electrically neutral. The charges on protons and electrons are equal and opposite.
  - The central part of the atom which consists of protons and neutrons is called **nucleus**. Electrons revolve around the nucleus in circular paths called **orbits** or **shells**.

- Electrons present in the outermost orbit are called **valence electrons** which can be easily removed or transferred from an atom. Hence, they are also called free electrons.
  - Bodies are charged due to the transfer of electrons.
  - The number of protons in an atom is equal to the number of electrons and the total positive charge in it is equal to the total negative charge which shows that an atom is electrically neutral.
2. The uses of a convex lens are:
- It is used in optical instruments like camera, projector, telescope, microscope, etc.
  - It is used as a reading lens and as a magnifying glass.
  - It is used in spectacles for correction of long sightedness of eyes.

### Question 6

(A)

1.

(a)

<b>Planets</b>	<b>Satellites</b>
Planets revolve around the Sun	Satellites revolve around the planets
It has a bigger size	It has a smaller size
There are 9 known planets in our solar system out of which 8 are classical planets and Pluto is a dwarf planet.	There are 91 natural satellites known so far in solar system.

(b)

<b>Stars</b>	<b>Planets</b>
Stars have their own light	Planets do not have their own light
They twinkle	They do not twinkle
They are huge in size	They are very small in size
Example: Sun	Example: Earth, Jupiter

2. Two consequences of high latent heat of steam are:
- Steam is used for running trains or machines because the high amount of heat contained in it can be efficiently turned into mechanical energy.
  - Water from the soil does not evaporate quickly by the heat of the Sun as it has high specific latent heat of vaporisation. Thus, the plants are protected from wilting (becoming loose and flaccid).

**(B)**

1. The factors on which buoyant force depends are:
  - i. Volume of the object immersed.
  - ii. Density of the fluidBuoyant force on an object = weight of the liquid displaced by the object
  
2.
  - (a) Conduction is the process of heat transmission in which heat energy is transferred from one atom to another, in the direction of lower temperature, without actual movement of atoms from their mean positions.
  - (b) Principle axis is a line passing through the optical centre of the lens and perpendicular to both the faces of the lens.
  - (c) Valence electrons: The electrons present in the outermost orbit of an atom are known as valence electrons.

**Question 7**

**(A)**

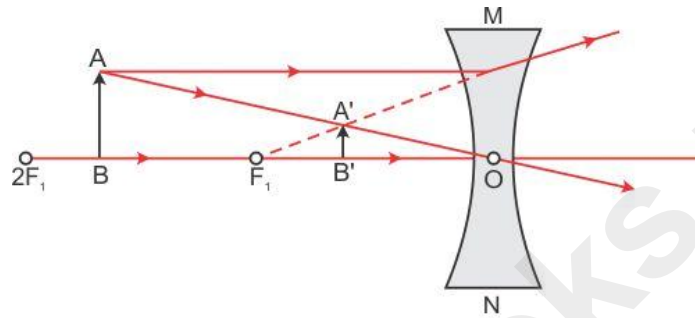
1.
  - (a) A momentary deflection in the galvanometer to one side is seen. This indicates the presence of electric current.
  - (b) Momentary deflection in the galvanometer to the opposite direction showing the presence of current in the reverse direction.
  - (c) Phenomenon involved is electromagnetic induction. It is the property by which a changing magnetic field within a closed conducting coil induces electric current in the coil.
  
2. The characteristics of liquid pressure are:
  - i. Liquid pressure increases with depth.
  - ii. Liquid pressure remains the same in all directions at a given depth.
  - iii. Liquid pressure depends upon the density of the liquid.
  - iv. Liquids exert pressure on the sides of the container they are stored in.
  - v. A liquid seeks its own level.

(B)

1. A group of stars forming a particular pattern in the sky is called constellation. Orion, Ursa Major and Scorpio are examples of three constellations.

2.

(a) Concave lens is used to get a virtual and diminished image of an object.



(b) Convex lens is used to get a real and diminished image of an object.

