ICSE Board
Class VIII Physics
Sample Paper – 1 Solution

Question 1

1. **(c)** increase
   If the number of turns in a solenoid is increased, the strength of the magnetic field produced will increases.

2. **(c)** Apparent loss of weight of the body
   Buoyant force exerted by a fluid on a body is equal to the apparent loss of weight of the body.

3. **(a)** Two oppositively charged clouds
   Lightning is caused in the sky due to two oppositely charged clouds.

4. **(b)** 4200 $Jkg^{-1}C^{-1}$
   The specific heat of water is 4200 $Jkg^{-1}C^{-1}$.

5. **(b)** Bends towards the normal
   A ray of light travelling from an optically rarer medium to an optically denser medium bends towards the normal.

6. **(b)** 8 minutes and 10 seconds
   Time taken by light to reach the Earth from the Sun is 8 minutes and 10 seconds.

7. **(c)** Solar energy
   Solar energy is a renewable source of energy.

8. **(b)** Anticlockwise
   The direction of magnetic lines of force due to a current carrying straight conductor when the electric current flows upwards is anticlockwise.

9. **(a)** Behind
   For a person suffering from hypermetropia, the image of a nearby object is focused behind the retina.

10. **(c)** Land
    A sea breeze occurs when there is a fall in pressure over the surface of land.

11. (a) 76 cm of mercury column
The atmospheric pressure at sea level is 76 cm of mercury column.

12. (d) Red
When light is dispersed by a prism, the colour which is dispersed the least is red.

13. (b) Lower potential to higher potential
The direction of conventional current is from low to high potential.

14. (a) Geographical South Pole
Earth behaves like a huge bar magnet with its Magnetic North Pole situated near the geographical South Pole.

15. (c) Biogas
Biogas is not obtained from petroleum. All others are obtained from petroleum.

Question 2

(A)

	Column A		**Column B**
1	Latent heat of fusion of ice	1	336000 J/gm
2	Like charges	2	Repulsion
3	Velocity of light	3	3×10^8 m/s
4	Artificial satellite	4	Aryabhatta
5	Rainbow	5	Dispersion

(B)

1. Steam from within the Earth can be used to generate electricity. This is called geothermal energy.
2. In a step up transformer, the primary coil is thicker; less heavily insulated and has less number of turns.
3. The pressure exerted by a solid is directly proportional to its weight and inversely proportional to its surface area.
4. When an ebonite rod is rubbed with fur, the charge acquired by the ebonite rod is negative.
5. Between air and water, water is the denser medium.

Question 3

(A)

1. True.
2. False. An electromagnet is a temporary magnet.
3. True.
4. True.
5. False. Evaporation does not need an external source of heat.

(B)

1. A concave lens is used in spectacles for the correction of myopia because it enables the formation of image of a far-off object at the retina.
2. The Earth rotates from west to east and hence the Sun appears to move from east to west.
3. When a comb is rubbed on dry hair, it attracts small bits of paper because the charge acquired on the comb is opposite to that of the charge on the bits of paper.
4. Due to surface tension, molecules of water tend to acquire the smallest possible area which is a sphere.
5. 1 g of ice takes away 336 J of heat from the drink and melts into water at 0°C. Hence the drink looses heat and cools down.

Question 4

(A)

1. When a piece of metal like soft iron is placed inside a solenoid and current is passed through it, it gets magnetised. The magnet so formed is called an electromagnet. An electromagnet is a temporary magnet. Its polarity can be reversed by reversing the direction of current, whereas the polarity of a permanent magnets is fixed. Uses:-
   i. They are used in the separation of magnetic substances from non magnetic impurities.
   ii. They are used in electrical appliances such as electric bell, electric motor, electric fan etc.

2. The laws of refraction of light are:
   i. The incident ray, the refracted ray and the normal lie on the same plane.
   ii. For a given pair of media, the ratio of the sine of angle of incidence to the sine of angle of refraction is a constant. i.e.

   $$\frac{\sin i}{\sin r} = \text{constant } \mu$$

   This is also known as Snell's law.

(B)

1. Astronauts go beyond the limit of atmosphere where the pressure is so low that the pressure on their bodies would be negligible. So astronauts are made to wear special suits to protect themselves from the adverse effects of low pressure at higher altitudes. These suits maintain a pressure equal to the atmospheric pressure.

2. Following are some daily life observations where the principle of evaporation produces cooling:
   i. During summer, we use earthen pots to get cool water.
   ii. A desert cooler blows cold air.
   iii. On a hot day, we feel relieved under a fan after perspiring.

Question 5

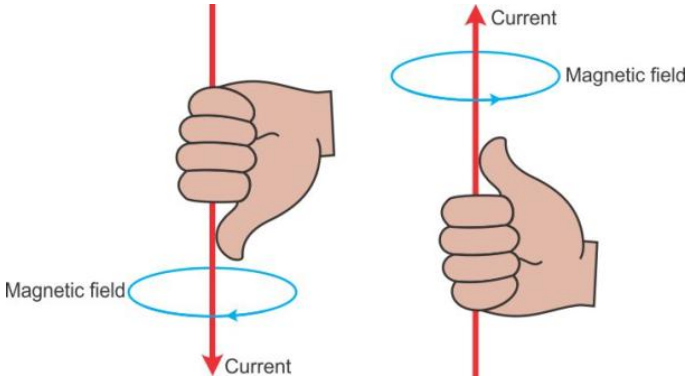
(A)

1. The energy stored in the nucleus of some heavy elements like uranium and plutonium, is called nuclear energy. Nuclear energy is released during nuclear reactions like nuclear fission and nuclear fusion.
   Two precautions to be taken in nuclear power plants are:
   i. There should be proper arrangements for the disposal of waste products from nuclear power plants.
   ii. The radioactive elements used in nuclear reactors should be kept in thick lead walled containers.

2. The differences between the two methods of charging a body are as follows:
   i. Charging a body by conduction is done by touching a charged body, whereas no touching is needed to charge a body by induction.
   ii. While charging by conduction, charge moves from a charged body to an uncharged body, whereas while charging by induction no charge flows from the charged body to the uncharged body.
   iii. Some charge is lost while charging by conduction, whereas there is no loss in any charge while charging by induction.

(B)

1. According to right hand thumb rule, hold the current carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then, the fingers of the right hand wrap around the conductor in the direction of the field lines of the magnetic field.

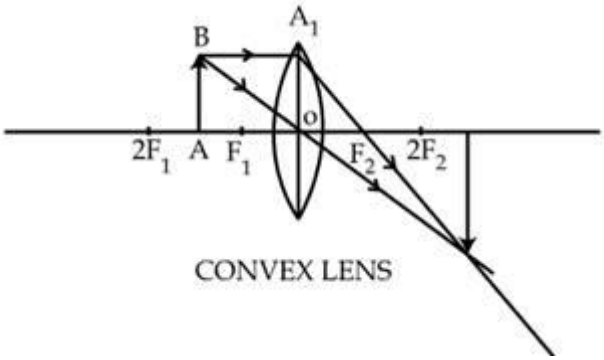


2. The law of floatation states that when the weight of a body is equal to the weight of the liquid displaced by it then the body floats in the liquid.
   The density of ice is less than the density of water, so it experiences an upthrust greater than its own weight. Hence ice floats on the surface of water.

Question 6

(A)

1.



The nature of the image formed - Real, inverted and enlarged.

2. Archimedes' principle states that when an object is immersed wholly or partially in a fluid, it experiences an upward force which is equal to the weight of the fluid displaced by it.
   Liquid C has the highest density. Because upthrust $\propto$ density of liquid, if the density of liquid is more, upthrust is greater and the object immersed in it will sink less.

(B)

1. The specific latent heat of fusion is the quantity of heat required to convert unit mass of a substance from solid to liquid at its melting point without any change in its temperature and it is denoted by L_f.

   $Q = mL$

   Thus, $L = Q/m$

   $L = 67200/200 = 336$ J/g

2.

(a)

Convex Lens	Concave Lens
It is thicker at the centre and thin at the edges.	It is thinner at the centre and thicker at the edges.
It converges rays of light falling on it.	It diverges rays of light falling on it.
Image formed may be real or virtual.	Image formed is always virtual and erect.

(b)

Solids	Liquids
The molecules are very tightly packed.	The molecules are less tightly packed than solids.
They have a definite shape and volume due to the fixed position of molecules.	They have a definite volume at a particular temperature but not a definite shape.
The intermolecular forces are strong.	The intermolecular forces are not so strong.

Question 7

(A)

1.

Galaxy	Constellation
It is a collection of stars, dust and gas	It is a group of stars.
It does not form any particular pattern. Galaxies can be elliptical, spiral and irregular.	It forms the shape of an animal or any other recognizable object.
There are around 10^{11} galaxies in the universe.	There are only 88 constellations known so far.
Example: Milky Way	Example: Orion

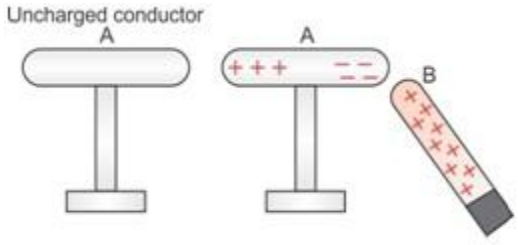
A lunar eclipse always occurs on a full moon day when the Sun, the Earth and the moon lie in the same line.

2. The assumptions of kinetic theory are as follows:
   i. Molecules are in a state of continuous motion and hence they possess kinetic energy.
   ii. The kinetic energy of molecules increases with increase in temperature and decreases with decrease in temperature.
   iii. Molecules of matter always attract each other and this force is known as intermolecular force of attraction.
   iv. The force between molecules of similar kind is called force of cohesion and that between dissimilar molecules is called force of adhesion

(B)

1.
   i. Use of fossil fuels like coal, petroleum and natural gas must be done only when there is no alternative energy.
   ii. Renewable sources of energy like solar energy, wind energy, hydro-electric energy, etc. must be used more than the non-renewable sources.
   iii. Use of public transport or sharing vehicles (car pooling) must be done to save fuel.
   iv. More trees must be planted instead of cutting them down.

2. When an uncharged body is placed near a charged body without touching it, the nearer end of the uncharged body acquires a charge of opposite nature as compared to the charge on a charged conductor. This process is known as charging by induction.



Example:
An uncharged conductor 'A' is mounted on an insulating stand and a charged conductor 'B' is brought near it, because of which an opposite charge develops on the near end of the conductor 'A'.
At the same time, the same kind of charge as of 'B' is developed on the farther end of 'A'.
Thus, if charge on the conductor 'B' is positive then the charge developed on the nearer end of 'A' is negative and the charge developed on the farther end of 'A' is positive.