

Maharashtra State Board
Class X Science and Technology Part-I
Question Paper Set-1

Time : 2 Hours

Instructions :

Marks : 40

1. It is necessary to solve all the questions.
2. Draw neat and labelled diagrams wherever necessary.
3. Start every new main question on separate page.
4. Figures on the right indicate marks.
5. For each Multiple Choice Question (1.B), ONLY first answer will be considered.
6. Write answer of each MCQ with option number.

Eg. i) a..... ii) c.....

Q. 1 A) Solve the following questions.

5

i) When a liquid is getting converted into solid, the latent heat is

.....

ii) Identify the type of following reaction :

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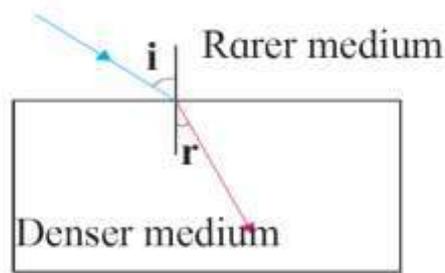
iii) In Dobereiner's triad containing Li, Na, K, if atomic masses of Lithium & Potassium are 6.9 and 39.1, then what will be the atomic mass of Sodium?

iv) Considering first correlation, complete the second.

Hubble telescope : At 569 km above the earth's surface

Orbit of Hubble telescope :

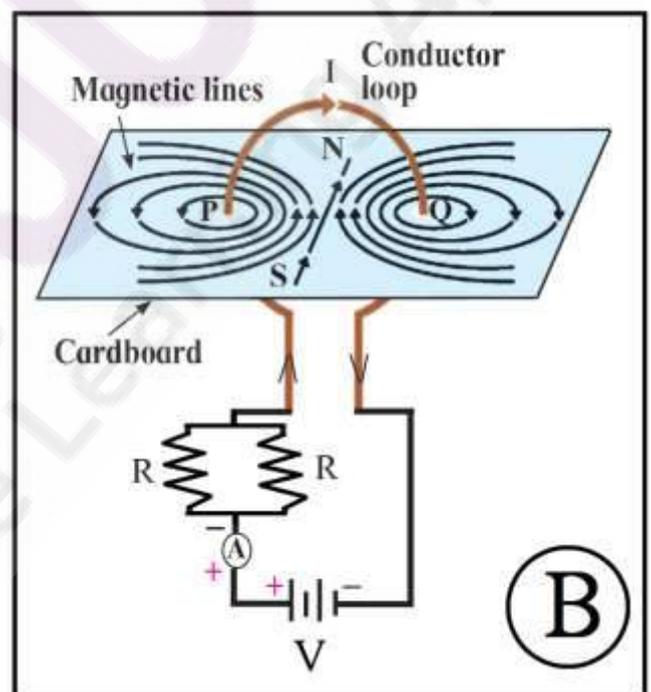
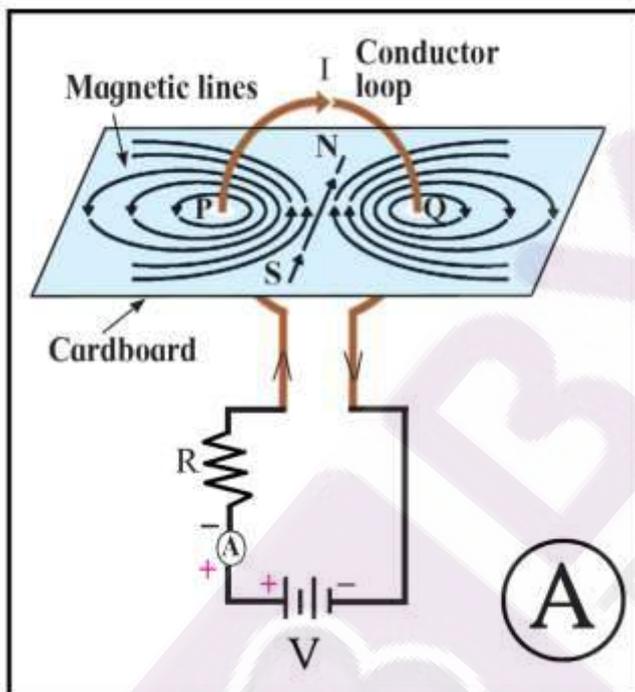
v) Observe the figure and write accurate conclusion regarding refraction of light.



Q 1 B) Choose and write the correct option.

5

i) Write the correct option by observing the figures.



- a) Magnetic field in A is stronger.
- b) Magnetic field in B is stronger.
- c) Magnetic fields in A and B are same.
- d) Magnetic fields in A and B are weaker.

ii) A student obtained clear image of window grills on the screen. But the teacher told him to get the image of a tree far away, instead of window. To get a clear image, the lens must be

- a) moved towards the screen.
- b) moved away from the screen.

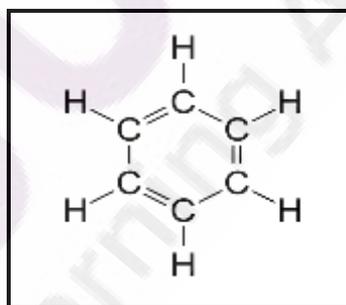
c) moved behind the screen. d) moved far away from the screen.

iii) What would be the correct order if Zn, Fe, Al and Cu are arranged in increasing order of reactivity?

- a) Cu, Fe, Zn, Al b) Al, Cu, Fe, Zn
c) Zn, Al, Cu, Fe d) Fe, Zn, Al, Cu.

iv) The following structural formula belongs to which carbon compound?

- a) Camphor b) Benzene
c) Starch d) Glucose.



v) What will be the weight of a person on earth, who weighs 9N on the moon?
a) 3 N b) 15 N c) 45 N d) 54 N

Q 2. Solve ANY 5 from the following questions.

10

1. Statement 1 : Electric current (flow of electrons) creates heat in the resistor.

Statement 2 : Heat in the resistor is created according to the rule of energy conservation.

Explain Statement 1 with the help of Statement 2.

2. Swarali has got the following observations while doing an experiment. Answer her questions with the help of observations.

Swarali observed that the light bent away from the normal, while travelling from dense medium to rarer medium. When Swarali increased the values of angle of incidence (i), the values of angle of refraction (r) went on increasing. But at a certain angle of incidence, the light rays returned into the dense medium.

So, Swarali has some questions. Answer them –

- a) Name this certain value of ' i '. What is the value of ' r ' at that time ?
 - b) Name this process of returning of light in dense medium. Explain the process.
3. What is the correct reason for blinking / flickering of stars? Explain it.
- a) The blasts in the stars.
 - b) Absorption of star light by the atmosphere.
 - c) Motion of the stars.
 - d) Changing refractive index of gases in the atmosphere.
4. Atomic number of metal "A" is 11, while atomic number of metal "B" is 20.
- Which of them will be more reactive? Write the chemical reaction of dilute HCl with metal "A".
5. Draw electron – dot structure and structural formula of methane.
6. If mass of a planet is 8 times that of the earth and its radius is twice the radius of the earth, what will be the escape velocity of that planet? (Escape velocity for the earth – 11.2 km/s)

7. What are space expeditions? Explain their need and importance in your words.

Q.3 Solve ANY 5 from the following questions.

15

1. A ball falls off a table and reaches the ground in 1 s. Assuming $g=10 \text{ m/s}^2$, calculate its speed on reaching the ground and the height of the table.

2. Write down what you understood from the following chemical reaction.

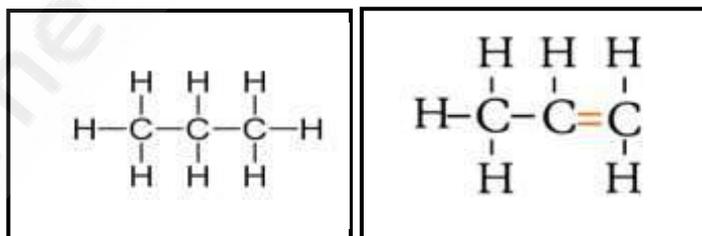


3. Observe the straight chain hydrocarbons given below and answer the following questions :

i) Which of the straight chain compounds from A and B is saturated and unsaturated straight chains?

ii) Name these straight chains.

iii) Write their chemical formulae and number of $-\text{CH}_2-$ units.



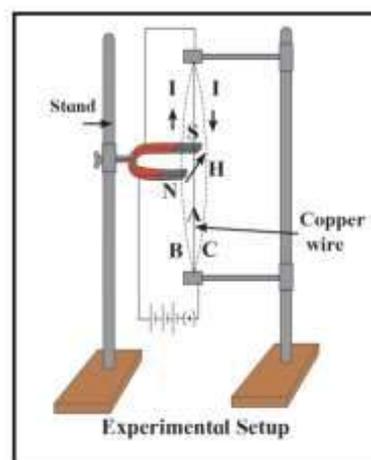
(A)

(B)

4. i) Which principle is explained in this figure ?

ii) Which rule is used to find out the direction of force in this principle?

iii) In which machine this principle is used? Draw a diagram showing working of that machine.

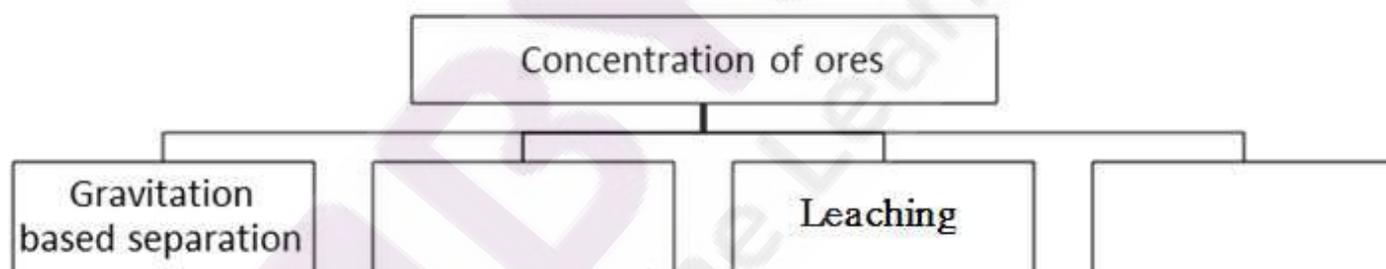


5. Study the following procedure and answer the questions below :

1. Take 3 spheres of iron, copper and lead of equal mass.
2. Put all the 3 spheres in boiling water in a beaker for some time.
3. Take 3 spheres out of the water. Put them immediately on a thick slab of wax.
4. Note, the depth that each sphere goes into the wax.

- i) Which property of substance can be studied with this procedure?
- ii) Describe that property in minimum words.
- iii) Explain the rule of heat exchange with this property.

6. Complete the following flow chart and answer the questions below:



- i) In which method pine oil is used?
- ii) Explain that method of concentration in brief.

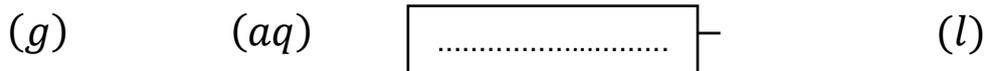
7. Complete the process of iron rusting by filling the blanks. Suggest a way to prohibit the process.

The iron rust is formed due to reaction. Different regions on iron surface become anode and cathode.

❖ Reaction on anode region :



❖ Reaction on anode region :



When Fe^{2+} ions migrate from anode region they react with $\boxed{\dots\dots\dots}$ to form Fe^{3+} ions.

A reddish coloured hydrated oxide is formed from $\boxed{\dots\dots\dots}$ ions. It is called rust.



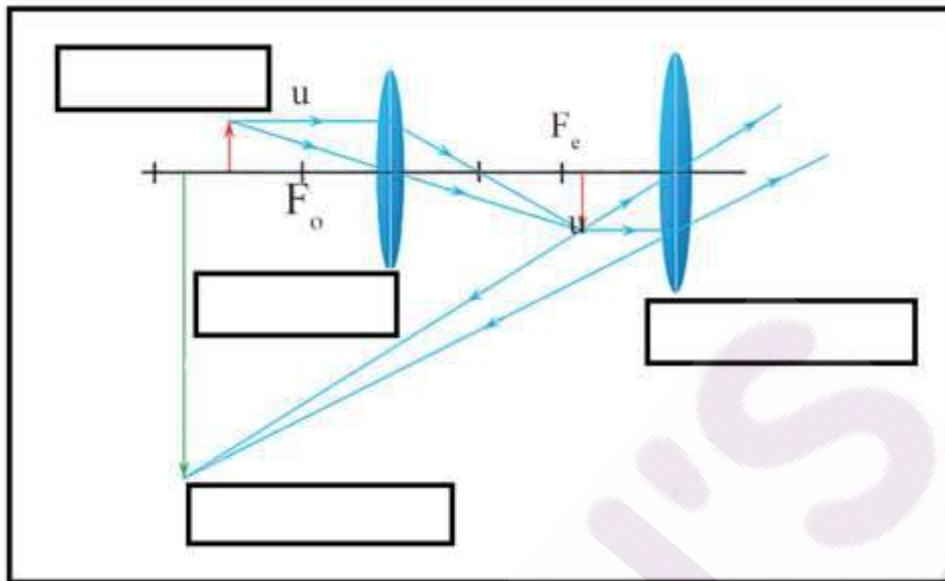
A way to prevent rusting

Q.4. Solve ANY ONE from the following questions. 5

1. An element has its electron configuration as 2,8,2. Now answer the following questions.

- i. What is the atomic number of this element?
- ii. What is the valency of this element?
- iii. What is the group of this element?
- iv. To which period does this element belong?
- v. With which of the following elements would this element resemble?

2.



- i. Which type of microscope has the arrangement of lenses shown in the adjoining figure?
- ii. Label the figure correctly.
- iii. Write the working of this microscope.
- iv. Where does this microscope used?
- v. Suggest a way to increase the efficiency of this microscope.