

IX**First Semester Exam.**

Time : 2 Hrs.

Class : 9th

Total Marks : 40

S.No. **Subject : Science and Technology**

Medium : English

Paper - 1**Note : i) All questions are compulsory.****ii) Draw proper diagrams for answer wherever necessary.****iii) Figures to the right of questions indicate full marks.****Q. 1. A) Select the correct option and write the completed statements. (05)**

1) Law of conservation of momentum is a corollary to Newton's
of motion.

A) first Law B) third law C) fourth law D) fifth law

2) The total energy of an object falling freely towards the ground

A) decreases B) remains unchanged
C) increases D) increases in the beginning and then decreases

3) The effective resistance of a parallel connection of resistors is

A) smaller than the smallest resistance

B) greater than the greatest resistance

C) an average of all resistances

D) summation of all resistances

4) The electronic configuration of sodium (Na) is

A) 2, 8, 1 B) 2, 8, 2 C) 2, 8, 3 D) 2, 8, 4

5) Identify an acid from among the following.

A) NaOH B) CaO C) H₂CO₃ D) KOH

B) Answer the following questions.**(05)**

1) Choose the correct alternative : Which of the following is a simple radical ?

A) Bromate ion

B) Bromide ion

C) Ammonium ion

D) Bisulphate ion

- 2) Identify the odd one out : Chloride, nitrate, hydride, ammonium
 3) Write the name : An instrument used to measure electric current.
 4) State whether the following statements are true or false. If a statement is false, correct it and rewrite it.

The CGS unit of energy is the dyne.

- 5) Answer the following question in one sentence.

When is a body said to be in motion ?

Q. 2. A) Give scientific reasons. (Any two) (04)

- 1) It is easier to stop a tennis ball as compared to a cricket ball, when both are travelling with the same velocity.
 2) It is easy to swim in a swimming pool than in a river.
 3) Butter milk spoils if kept in a copper or brass container.

B) Answer the following questions. (Any three) (06)

- 1) State the law of conservation of momentum.
 2) Differentiate between kinetic energy and potential energy.
 (give two two points)

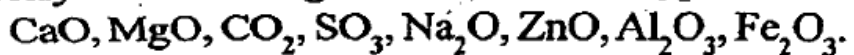
3) Match the columns.

I	II	III
1) Resistances in parallel	Gives the relation between V and I	$P = \frac{RA}{L}$
2) Resistivity	Depends on the material of the conductor	$V = IR$
3) Ohm's law	Is used to reduce the effective-resistance in a circuit	$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$

4) Write define. (Any one)

- i) Symbol of an element ii) Molecular mass

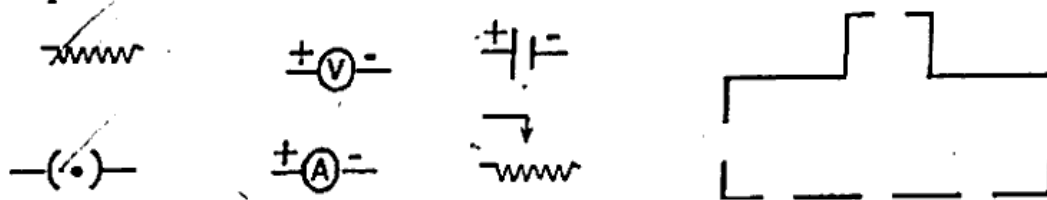
5) Classify the following oxides into three types and name the types.



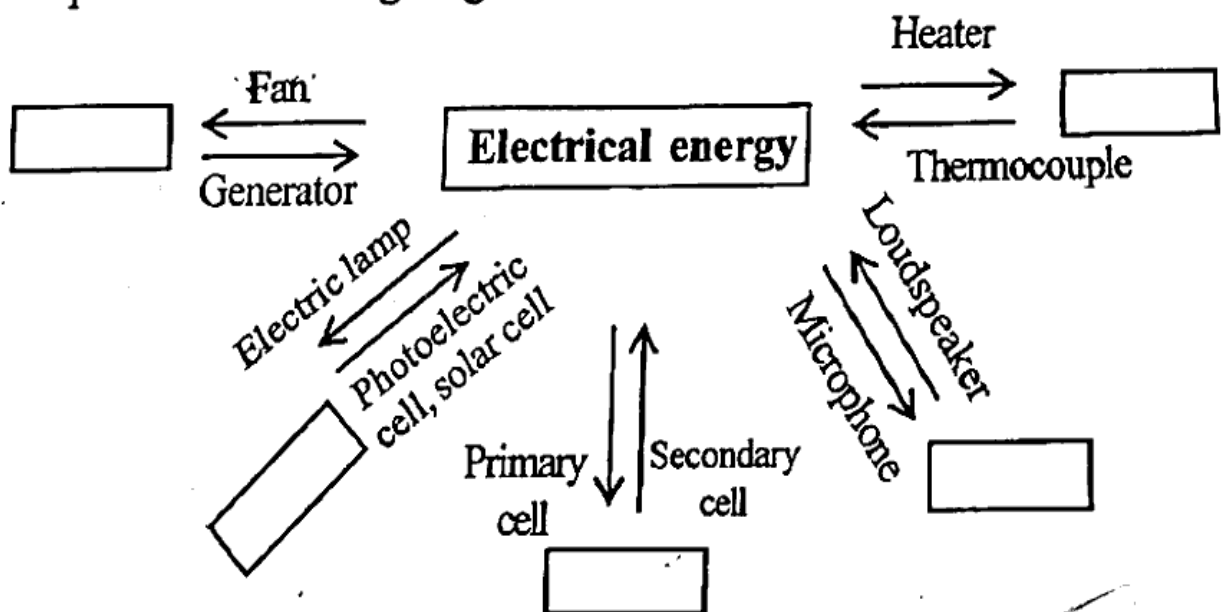
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Q. 3. Answer the following sub-questions. (Any five) (15)

- 1) Solve : An object moves 18 m in the first 3 seconds, 22 m in the next 3 seconds and 14 m in the last 3 seconds. What is its average speed ?
- 2) What is meant by neutralization ? Give two examples from everyday life of neutralization reaction ?
- 3) State the effects of a force acting on a body. Give one example in each case.
- 4) Explain the following reactions giving their balanced chemical equations.
 - a) NaOH solution was added to HCl solution.
 - b) Dilute HCl was poured on baking soda.
 - c) Carbon dioxide gas was passed through KOH solution.
- 5) Explain with examples what is meant by a mole of a substance.
- 6) The following figure shows the symbols for components used in the accompanying electrical circuit. Place them at proper places and complete the circuit. <https://www.maharashtrastudy.com>



7) Complete the following diagram.



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8) Two samples 'm' and 'n' of slaked lime were obtained from two different reactions. The details about their composition are as follows.

'sample m' mass : 7 g	'sample n' mass : 1.4 g
Mass of constituent oxygen : 2 g	Mass of constituent oxygen : 0.4 g
Mass of constituent calcium : 5 g	Mass of constituent calcium : 1.0 g

Which law of chemical combination does this prove? Explain.

Q. 4. Answer the following questions. (Any one)

(05)

- 1) Write down the changes that will be seen in each instance and explain the reason behind it
 - a) 50 ml water is added to 50 ml solution of copper sulphate.
 - b) Two drops of the indicator phenolphthalein were added to 10 ml solution of sodium hydroxide.
 - c) Two or three filings of copper were added to 10 ml dilute nitric acid and stirred.
 - d) Dilute HCl was added to lime stone.
 - e) Dilute H_2SO_4 was taken in an electrolytic cell and electric current was passed through it.
- 2) Read the following paragraph and answer the questions based on it.

The resistance of a metal falls when cooled below room temperature. Many scientists believed that the value of the resistance would become constant at some very low temperature, allowing the current to flow with little or no resistance. H. K. Onnes successfully liquefied helium in 1908 by cooling it to about 4 K. In 1911, while investigating the electrical property of very pure mercury, Onnes discovered that at a temperature of 4.2 kelvin, its resistance practically vanished. This new state, on account of its extraordinary property, is now called the superconducting state and the phenomenon is called superconductivity. A superconductor, below a certain critical temperature, offers almost zero resistance to a flow of current through it. Onnes also discovered that a superconductor exhibits persistent current : once set up, the current continues to flow for a very long time without an electric potential difference driving it and without significant loss. Superconductivity is used in many diverse areas, such as magnetically levitated trains, transmission of electricity, increasing speed of computers, in MRI (magnetic resonance imaging).

- i) Name the scientist who discovered superconductivity.
- ii) At what temperature does the resistance of very pure mercury become almost zero?
- iii) What is a superconductor?
- iv) What is special about a superconductor?
- v) Name any two applications of superconductivity.

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