BOARD ACTIVITY SHEET: July 2023

Science and Technology Part - 1

Time: 2 Hours **Max. Marks: 40**

Note: i. *All* questions are compulsory.
ii. Use of a calculator is not allowed.
iii. The numbers to the right of the questions indicate full marks.
iv. In case of MCQs (Q. No. 1(A)) only the first attempt will be evaluated and will be given credit.
v. For each MCQ, the correct alternative (A), (B), (C) or (D) with subquestion number is to be written as an answer.
For Eg.: (i) (A), (ii) (B), (iii) (C)
vi. Scientifically correct, labelled diagrams should be drawn wherever necessary.

Q.1. (A) Choose the correct alternative and write the correct option: **[5]**

i. _____ has the highest refractive index.
(A) Air (B) Water
(C) Glass (D) Diamond

ii. The left hand side of a chemical reaction represents _____.
(A) Product (B) Reactants
(C) Catalyst (D) Indicator

iii. In _____ block of the modern periodic table non-metals are found.
(A) s-block (B) d-block
(C) p-block (D) f-block

iv. The chemical reaction in which two or more products are formed from a single reactant is called _____ reaction.
(A) Decomposition (B) Combination
(C) Displacement (D) Double displacement

v. If the refractive index of glass with respect to air is $\frac{3}{2}$, the refractive index of air with respect to glass is _____.
(A) $\frac{1}{2}$ (B) 3
(C) $\frac{1}{3}$ (D) $\frac{2}{3}$

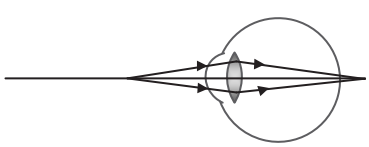
(B) Attempt the following questions: **[5]**

i. State whether the given statement is true or false:
Rancidity is oxidation process.

ii. Find the odd man out:
Camera, Telescope, Peephole in door, Microscope

iii. Find the co-relation:
Resistance : Ohm :: Potential difference : _____

iv. Write the defect of eye from the given figure:



v. Give the unit of intensity of magnetic field.

Q.2. (A) Give scientific reasons (any *two*): **[4]**

i. Tungsten metal is used to make solenoid type coil in an electric bulb.

ii. Simple microscope is used for watch repairs.

iii. Metallic character goes on decreasing while going from left to right in a period.

(B) Answer any *three* of the following questions: **[6]**

i. Write the IUPAC names of the following structural formulae:

(a) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

(b) $CH_3 - CH_2 - CH_2 - \underset{\underset{Cl}{|}}{CH} - CH_3$

ii. An iron ball of mass 5 kg is released from a height of 125 m and falls freely to the ground. Assuming that the value of g is 10 m/s^2, calculate time taken by the ball to reach the ground.

iii. What is meant by artificial satellite? Name the first satellite launched by Russia.

iv. Draw the image formed by convex lens, if object is placed at $2F_1$.

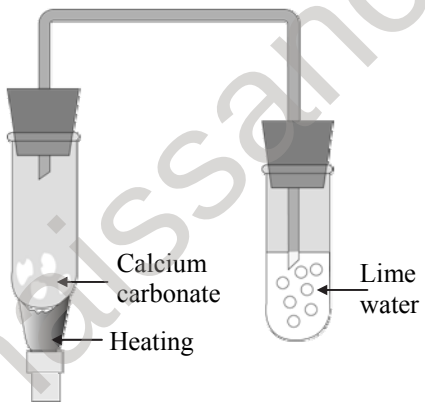
v. Why does the apparent position of stars keep changing a bit?

Q.3. Answer any *five* of the following questions: **[15]**

i. Identify the process given below and accordingly draw neat labelled diagram:

A molten mixture of alumina (melting point > 2000°C) is done in a steel tank. The tank has a graphite lining on the inner side. The lining does the work of cathode. A set of graphite rods dipped in the molten electrolyte works as anode. Cryolite (Na_3AlF_6) and fluorspar (CaF_2) are added in the mixture to lower its melting point upto 1000°C.

ii. With reference to the given diagram answer the following questions:



(a) Give type of chemical reaction.

(b) Give the names of reactants and products.

(c) Write down the balanced chemical equation.

iii. What is Electrical Power? Derive the unit of electric power from the given equations:

$P = V \times \square$

$P = \square \times$ ampere

$= 1 \text{ volt} \times 1 \square = \frac{1J}{1C} \times \frac{1C}{1S}$

$\therefore \quad P = \frac{1J}{\square} = W$ (Watt).

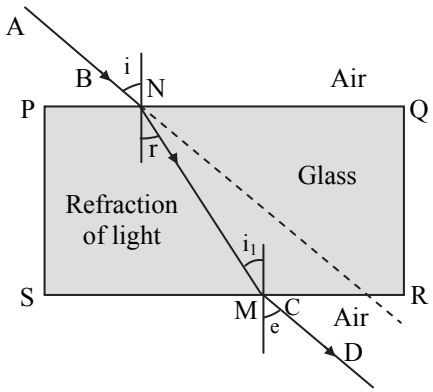
iv. Explain the term anodization with example. Give *one* use of it.

v. State Kepler's *three* laws of motion.

vi. The electronic configuration of an element X is 2, 8, 8, 2.
(a) What is the atomic number of the element X?
(b) To which group does this element belong?
(c) In which period does this element lie?

vii. What is the contribution of India in space technology?

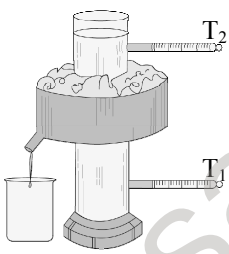
viii. Observe the given diagram and answer the following questions:



(a) What is refraction of light?
(b) Name the emergent ray.
(c) Which two angles are equal?

Q.4. Attempt any *one* of the following questions: **[5]**

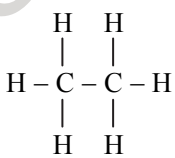
i. Observe the given diagram and answer the following questions:



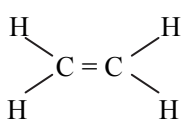
(a) What is the name of the given apparatus?
(b) Which phenomenon is studied with the help of this apparatus?
(c) What are the final temperatures in thermometers T_1 and T_2?
(d) At what temperature the density of water is maximum?
(e) Give *one* example of the above phenomenon in nature.

ii. Observe and write the answers to the questions given below:

(I)



(II)



(a) Write the names of compound I and II.
(b) Draw electron-dot structure for I and II.
(c) Which one of the above structures is saturated compound and unsaturated compound?