

Newton's Academy

Science 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.

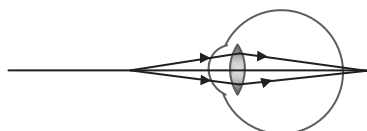
(A) Decomposition	(B) Combination
(C) Displacement	(D) Double displacement
- v. If the refractive index of glass with respect to air is $\frac{3}{2}$, the refractive index of air with respect to glass is _____.

(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:

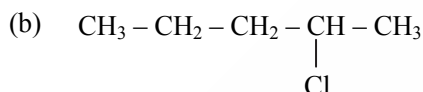
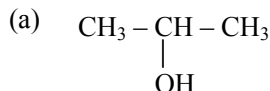


- v. Give the unit of intensity of magnetic field.

- Q.2. (A) Give scientific reasons (any two):** [4]
- Tungsten metal is used to make solenoid type coil in an electric bulb.
 - Simple microscope is used for watch repairs.
 - 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:



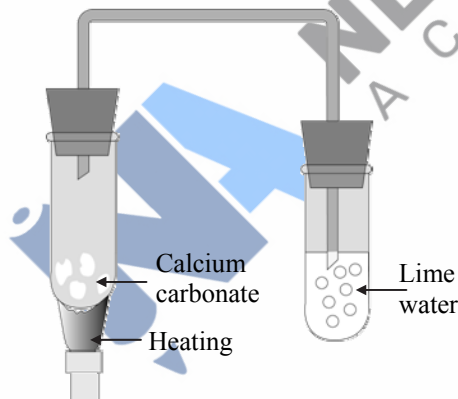
- An iron ball of mass 5 kg is released from a height of 125 m and falls freely to the ground. Assuming that the value of g is 10 m/s^2 , calculate time taken by the ball to reach the ground.
- What is meant by artificial satellite? Name the first satellite launched by Russia.
- Draw the image formed by convex lens, if object is placed at $2F_1$.
- 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 $> 2000^\circ\text{C}$) 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:



- Give type of chemical reaction.
 - Give the names of reactants and products.
 - Write down the balanced chemical equation.
- What is Electrical Power? Derive the unit of electric power from the given equations:

$$P = V \times \square$$

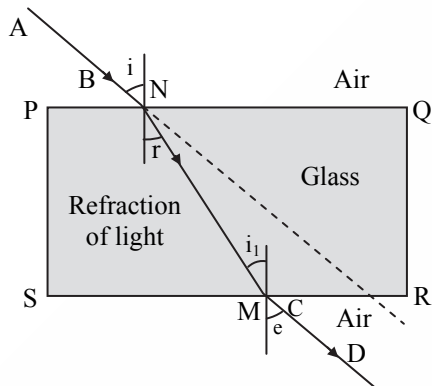
$$P = \square \times \text{ampere}$$

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

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

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

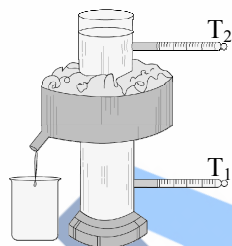


- (a) What is refraction of light?
- (b) Name the emergent ray.
- (c) Which two angles are equal?

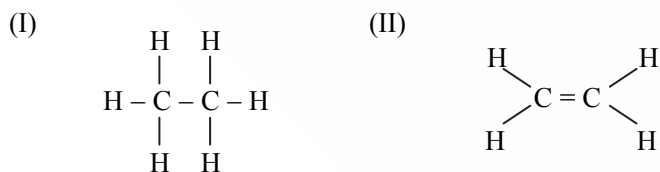
Q.4. Attempt any one of the following questions:

[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 T₁ and T₂?
 - (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:



- (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?