N 383

Seat No. [ ][ ][ ][ ][ ][ ]

2020 III 16 1100 – N 383 – SCIENCE AND TECHNOLOGY (72) – PART I (E)

| Time : 2 Hours | (Pages 11) | 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), (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.

1. (A) Write the *correct* alternative :   5

(i) According to Mendeleev's periodic law, properties of elements are periodic function of their ....

    (A) Atomic numbers

    (B) Atomic masses

    (C) Densities

    (D) Boiling points

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(ii) The vapour content in the air is measured using a physical

quantity called ....

(A) Absolute humidity

(B) Relative humidity

(C) Dew point

(D) Humidity

(iii) For the normal human eye, the near point is at

.... cm.

(A) 10

(B) 20

(C) 25

(D) 30

(iv) The astronomical object closest to us is ....

in our galaxy.

(A) Mars

(B) Venus

(C) Jupiter

(D) Moon

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(v) In the Wilfley table method, the particles of gangue are separated by .... separation method.

    (A) Magnetic

    (B) Froth floatation

    (C) Hydraulic

    (D) Gravitational

(B) **Answer the following :**   5

(i) Find the odd one out :

Voltmeter, Ammeter, Thermometer, Galvanometer.

(ii) Complete the correlation :

Alkene : C = C :: Alkyne : ....

(iii) State true or false :

The frequency of AC is 50 Hz.

(iv) Match the Columns :

Column 'A'		Column 'B'
The wavelength of red light	(a)	600 nm
	(b)	700 nm
	(c)	500 nm

(v) Name the first artificial satellite sent by Russia in space.

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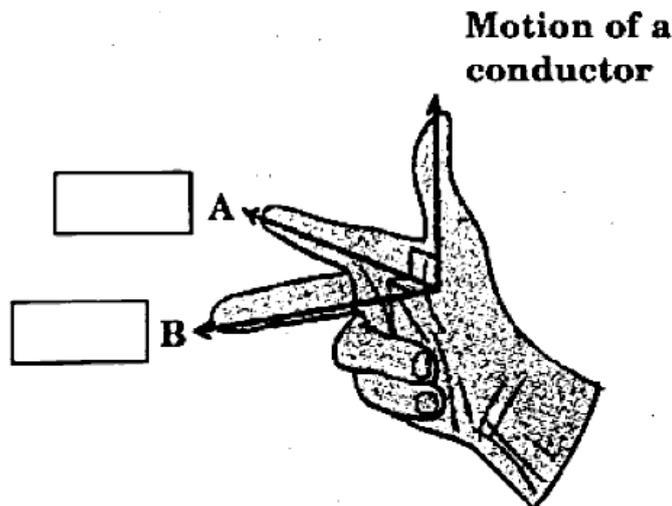2. (A) **Give scientific reasons (any *two*) :** 4

   (*i*) The weight of an object changes from place to place though its mass is constant.

   (*ii*) Stars twinkle but we do not see the twinkling of planets.

   (*iii*) Elements belonging to the same group have the same valency.

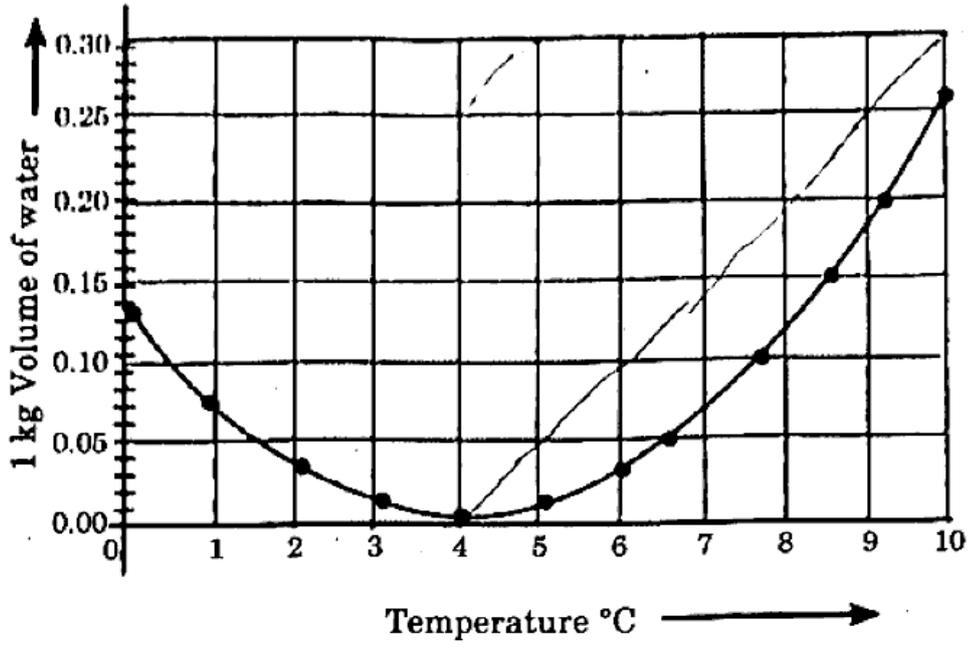   (B) **Answer the following (any *three*) :** 6

   (*i*) How much heat energy is necessary to raise the temperature of 5 kg of water from 20°C to 100°C ?

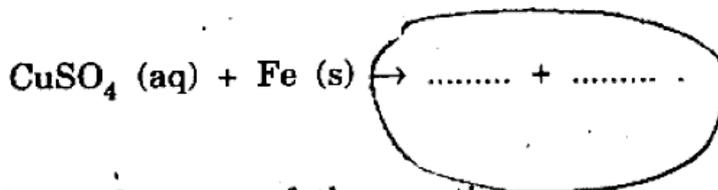   (*ii*) Observe the given figure of Fleming's Right Hand Rule and write the labels of A and B correctly.

Motion of a conductor

A ◄

B ◄

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(iii) Observe the given graph and answer the following questions :

(a) Name the process represented in the figure.

(b) At what temperature does this process take place ?

(iv) Complete the given chemical reaction :

$$CuSO_4 \text{ (aq)} + Fe \text{ (s)} \rightarrow \text{.........} + \text{.........} .$$

Name the type of the reaction.

(v) Write a short note on Alloying.

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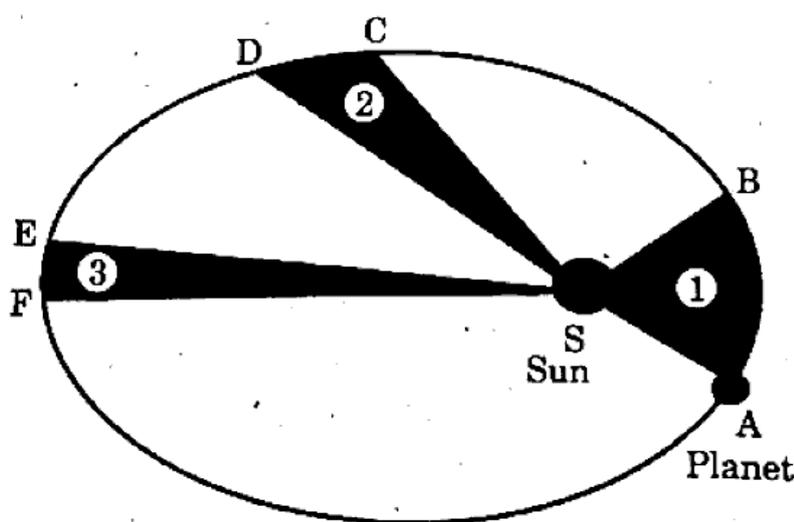3. **Answer the following (any *five*) :** 15

(i) An element has its electronic configuration as 2, 8, 2. Now answer the following questions :

    (a) What is the atomic number of this element ?

    (b) What is the group of this element ?

    (c) To which period does this element belong ?

(ii) Observe the given figure showing the orbit of a planet moving around the Sun and write the *three* laws related to it :

The orbit of a planet moving around the Sun.

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(iii)   Read the given passage and answer the following questions :
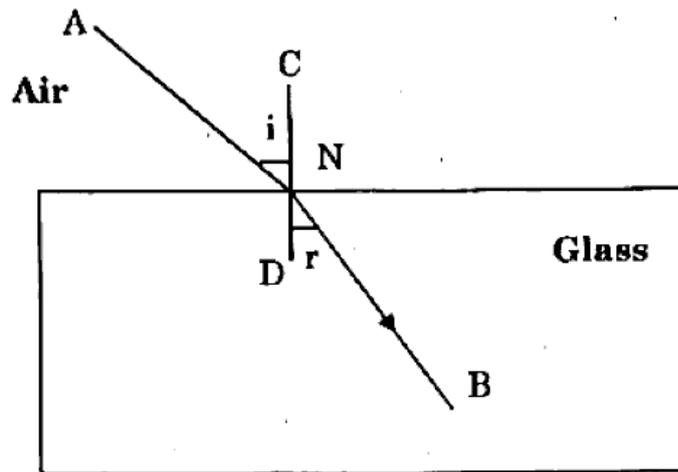
The home electrical connection consists of 'live', 'neutral' and 'earth' wires. The 'live' and the 'neutral' wires have potential difference of 220 V. The 'earth' is connected to ground. Due to a fault in the equipment or if the plastic coating on the 'live' and the 'neutral' wires gives a way the two wires come in contact with each other and a large current flows through it producing heat. If any inflammable material (such as wood, cloth, plastic etc.) exists around that place it can catch fire. Therefore a fuse wire is used as a precautionary measure.

(a)   Name the *two* wires having potential difference of 220 V.

(b)   What is short circuit ?

(c)   Write the function of a fuse.

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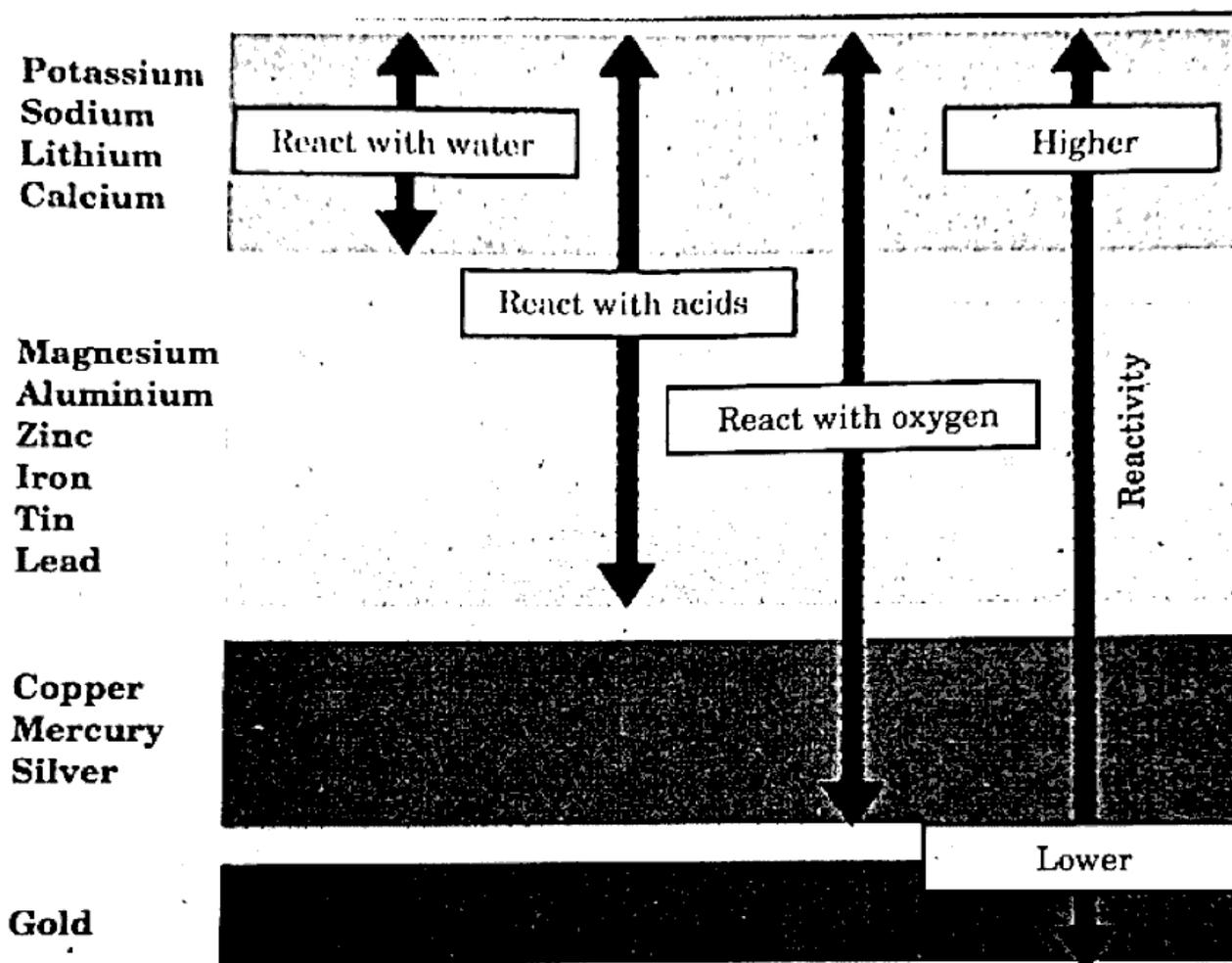(iv) Observe the given figure and answer the following questions :

(a) Name the process represented by the figure.

(b) State the *two* laws related to the process.

(v) What is an artificial satellite ? Name any *two* types of artificial satellite and state their functions.

(vi) Answer the following questions :

(a) Define Hydrocarbons.

(b) Name the types of Hydrocarbons.

(c) Name *two* carbon compounds used in day-to-day life.

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(vii) Observe the given figure of reactivity series of metals and answer the following questions :

Potassium
Sodium
Lithium
Calcium

React with water

Higher

Magnesium
Aluminium
Zinc
Iron
Tin
Lead

React with acids

React with oxygen

Reactivity

Copper
Mercury
Silver

Lower

Gold

Reactivity series of metals.

(a) Name *two* metals which react with water.

(b) Name *two* moderately reactive metals.

(c) Name the most highly reactive metal and the most less reactive metal. http://www.maharashtrastudy.com

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(viii) Complete the following table :

Straight chain of Carbon compounds	Structural formula	Molecular formula	Name
C	H—C—H with H above and H below	CH_4	Methane
C—C	—	—	Ethane
C—C—C	—	C_3H_8	—
C—C—C—C	H—C—C—C—C—H with H above and below each C	—	—

4. Answer any *one* of the following : 5

(i) Draw a scientifically correct labelled diagram of a human eye and answer the questions based on it :
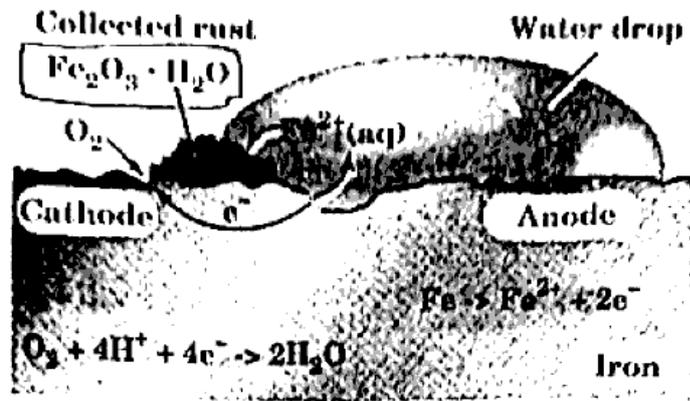
(a) Name the type of lens in the human eye.

(b) Name the screen at which the maximum amount of incident light is refracted ?

(c) State the nature of the image formed of the object on the screen inside the eye.

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(ii) Observe the following picture and answer the following questions :

(a) What is a rust ?

(b) Write the chemical formula of rust.

(c) Write the reaction of oxidation of iron at anode.

(d) Write the reaction of oxidation of iron at cathode.

(e) What is corrosion ?