BOARD ACTIVITY SHEET: March 2025

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. Scientifically correct, labelled diagrams should be drawn wherever necessary.

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

i. Alkaline earth metals have valency 2. This means that their position in the modern periodic table is in _____.
(A) Group 2 (B) Group 16
(C) Period 2 (D) d-block

ii. The reaction in which ions in the reactants are exchanged to form a precipitate is called as _____ reaction.
(A) Combination (B) Decomposition
(C) Displacement (D) Double Displacement

iii. _____ is used to make a solenoid type coil in an electric bulb.
(A) Nichrome (B) Copper
(C) Tungsten (D) Aluminium

iv. Light changes its direction when going from one transparent medium to another transparent medium. This process is called _____.
(A) Reflection (B) Dispersion
(C) Scattering (D) Refraction

v. $CaO + H_2O \longrightarrow Ca(OH)_2$ + Heat is an example of _____ reaction.
(A) Exothermic (B) Electrolysis
(C) Decomposition (D) Endothermic

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

i. State whether true or false:
A redox reaction takes place during cellular respiration.

ii. Find the odd one out:
Loudspeaker, microphone, electric motor, magnet.

iii. What is the reason for twinkling of stars?

iv. Match the columns:

Column 'A'		Column 'B'
Simple microscope	a.	used to observe minute objects
	b.	used to see distant objects
	c.	used for watch repair

v. Name the behaviour of water between its temperature from 0°C to 4°C.

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

i. While going from left to right within a period, the size of atom decreases.

ii. For electric power transmission, copper or aluminium wire is used.

iii. In some countries, ethanol is used as an additive to increase the efficiency of petrol.

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

i. Name and state the principle used to measure the specific heat capacity of a substance.

ii. What is done to prevent rusting of iron door of your house?

iii. Distinguish between mass and weight.

iv. The 'rocket' is a type of fire cracker used in Diwali.
(a) Name the launcher.
(b) Name the law on which its working is based.

v. What is meant by decomposition reaction? Write the chemical reaction of decomposition of sugar on heating.

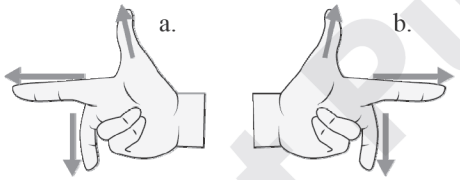
Q.3. Answer the following questions (any *five*): **[15]**

i. An iron ball of mass 3 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:
(a) Time taken by the ball to reach the ground.
(b) Velocity of the ball on reaching the ground.

ii. Write the name and symbol of the element from the description:
(a) The most electronegative atom.
(b) The atom having smallest atomic mass.
(c) The noble gas with the smallest atomic radius.

iii. (a) What happens when copper reacts with concentrated nitric acid? What is the colour of the gas released during the reaction?
(b) Write its balanced chemical equation.
(c) Write the names of reactants and products.

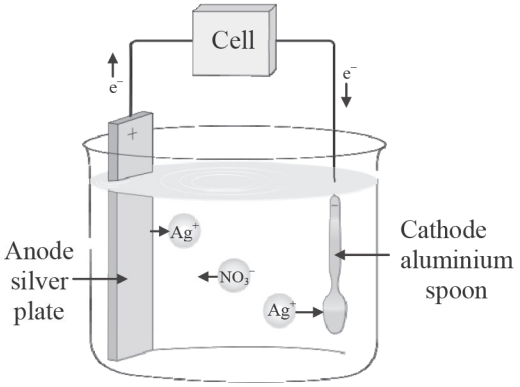
iv. Name the following diagrams and explain the concept behind them:



v. Answer the following with respect to the 'Formation of Rainbow':
(a) Draw a neat diagram to show the formation of rainbow.
(b) Name any *two* natural processes involved in formation of rainbow.
(c) What does a small droplet of water act as?

vi. Name the following:
(a) The *two* metals which can be cut with knife.
(b) A sound is produced when certain metals are struck. Name this property of metals.
(c) The non-metallic substance which is a good conductor of electricity.

vii. Answer the following questions with the help of the given diagram:



(a) Name the process shown in the diagram.
(b) How does this process take place?
(c) Give *two* examples in which this process is used.

viii. Complete the following table:

	Type of the satellite	Function of the satellite	The names of the Indian satellite series and their launch vehicles
(a)	_____	Fix the location of any place on the earth's surface	_____
(b)	Weather satellite	_____	_____
(c)	_____	_____	IRS Launcher: PSLV

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

i. (a) Draw a neat labelled diagram of human eye.
(b) What is the minimum distance of distinct vision for a normal human eye?
(c) Name the capacity of the eye lens to change its focal length as per need.
(d) Name the defect of eye vision in which the focussing power of eye lens decreases with age.

ii. Atomic number of chlorine is 17.
(a) Write the electronic configuration of chlorine.
(b) What is the number of electrons in the valence shell of chlorine?
(c) Write the molecular formula of chlorine.
(d) Name the type of bond in the formation of chlorine molecule.
(e) Draw the electron dot structure of a chlorine molecule.

BOARD ACTIVITY SHEET: MARCH 2024

Science and Technology Part - 1

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v. Scientifically correct, labelled diagrams should be drawn wherever necessary.

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

i. The SI unit of heat is _____.
(A) calorie (B) joule
(C) kcal/kg °C (D) cal/g °C

ii. We can see the sun even when it is little below the horizon because of _____.
(A) Reflection of light (B) Refraction of light
(C) Dispersion of light (D) Absorption of light

iii. _____ is the functional group of carboxylic acid.
(A) —COOH— (B) —CO—
(C) —CHO— (D) —OH—

iv. In simple microscope _____ lens is used.
(A) Concave (B) Plano concave
(C) Plano convex (D) Convex

v. In _____ process a layer of molten tin is deposited on metals.
(A) Anodization (B) Tinning
(C) Galvanizing (D) Alloying

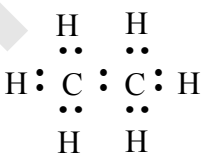
(B) Answer the following: **[5]**

i. Write the name of the atom having the smallest size.

ii. Write the molecular formula of calcium carbonate.

iii. Write the use of 'Calorimeter'.

iv. Identify the hydrocarbon from the given electron–dot structure :



v. Match the columns:

Column 'A'		Column 'B'
Refractive index of water	(a)	1.31
	(b)	1.36
	(c)	1.33

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

i. When the gas formed on heating limestone, is passed through freshly prepared lime water, the line water turns milky.

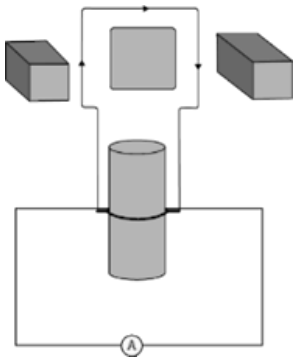
ii. Tungsten metal is used to make a solenoid type coil in an electric bulb.

iii. On exposure to air, silver articles turn blackish after some time.

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

i. State Dobereiner's law of triad. Give *one* example of it.

ii. Identify the figure and explain its use:



iii. What is meant by satellite launch vehicle? Name any one Indian satellite launch vehicle.

iv. What is free fall? When is it possible?

v. The focal length of a convex lens is 20 cm. What is its power?

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

i. Select the appropriate option and complete the following paragraph :

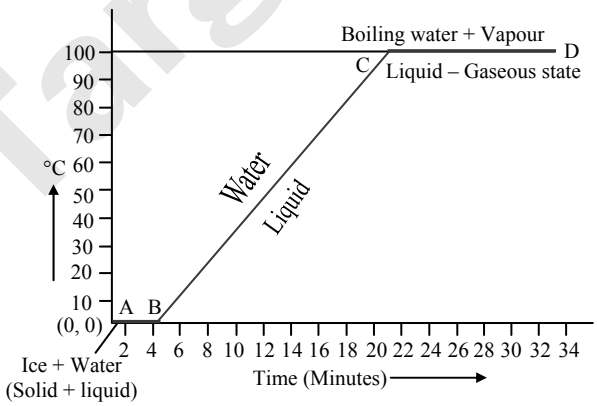
(Metals, non-metals, metalloids, four, seven, s-block, p-block, d-block, f-block.)

On the basis of electronic configuration, elements in the modern periodic table are classified into _____ blocks. Group 1 and 2 elements are included in _____ and all these elements are metals. (except hydrogen). Group 13 to 18 elements are included in _____. This block contains metals, non-metals and metalloids. Group 3 to 12 elements are included in _____ and all the elements are _____ elements shown at the bottoms of the periodic table i.e., lanthanides and actinides constitute _____ and all these elements are metals.

ii. (a) What are the factors affecting the rate of chemical reaction?

(b) Explain any *one* factor.

iii. Observe the following graph answer the following questions.



(a) What does the graph represent?

(b) What does the line AB represent?

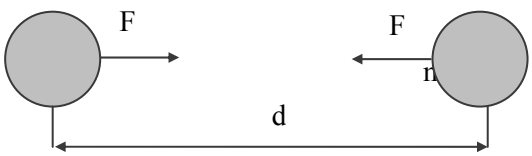
(c) What does the line BC represent?

iv. Complete the following table by observing the given figures:

Points ↓ \ Figure →		
(a) Name of the defect	_____	_____
(b) Position of the image	_____	_____
(c) Lens used to correct the defect.	_____	_____

v. Write any *three* general properties of ionic compounds.

vi. Observe the figure and answer the questions:



(a) State Newton's universal law of gravitation.

(b) If the distance between the two bodies is tripled, how will the gravitational force between them change?

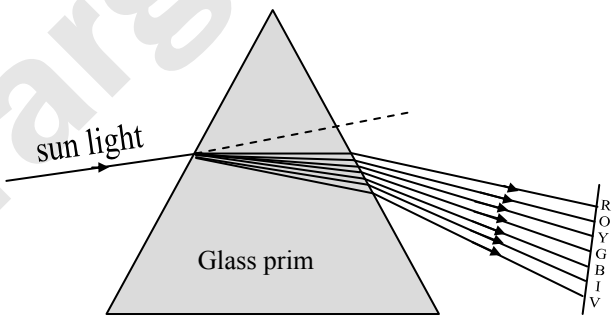
(c) What will happen to gravitational force, if mass of one of the objects is doubled?

vii. The orbit of a satellite is exactly 35780 km above the Earth's surface and its tangential velocity is 3.08 km/s.
How much time the satellite will take to complete one revolution around the earth?
(Radius of the Earth = 6400 km.)

viii. What is a solenoid? Draw a neat diagram and name its various components.

Q.4. Answer the following questions (any *one*): **[5]**

i. Observe the given diagram and answer the questions :



(a) Name the process shown in the figure.

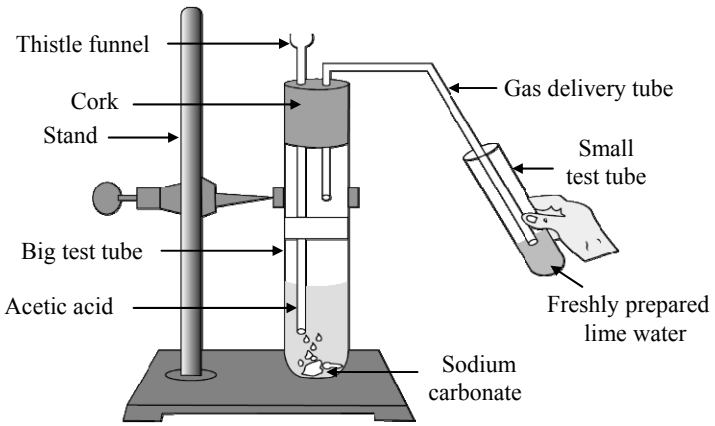
(b) Name the colour that deviates the most.

(c) Name the colour that deviates the least.

(d) Name any *one* phenomenon in the nature which is based on the above process.

(e) Define 'spectrum'.

ii. Observe the diagram given below and answer the questions :



(a) Name the reactants in this reaction.
(b) Which gas comes out as effervescence in the bigger test tube?
(c) What is the colour change in the lime water?
(d) In the above experiment instead of sodium carbonate which chemical can be used to get same product?
(e) Write the use of acetic acid.

BOARD ACTIVITY SHEET: July 2024

Science and Technology Part - 1

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

Note: i. *All* questions are compulsory.
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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 and technically correct labelled diagrams should be drawn wherever necessary.

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

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

ii. $CuSO_{4(aq)} + Zn_{(s)} \longrightarrow ZnSO_{4(aq)} + Cu_{(s)}$.
This is _____ type of chemical reaction.
(A) displacement (B) double displacement
(C) combination (D) decomposition

iii. The unit of electric power is _____.
(A) Joule (B) Volt (C) Watt (D) Coulomb

iv. We can see the sun even when it is little below the horizon because of_____:
(A) reflection of light (B) refraction of light
(C) dispersion of light (D) absorption of light

v. _____ is one of the combustible component of L.P.G.
(A) Ethane (B) Propane (C) Methane (D) Ethene

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

i. Write the correlation.
Brass: Copper and Zinc: : Bronze : _____

ii. Write True or False:
Benzene is an aromatic compound.

iii. Find the odd one out.
Myopia, Presbyopia, Hypermetropia, Retina

iv. What is angle of refraction when angle of incidence is 0°?

v. Name two appliances which work on the principle of magnetic effect of electric current.

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

i. Sodium is always kept in kerosene.

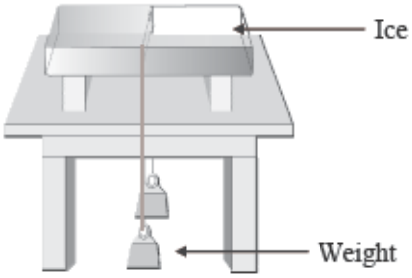
ii. A simple microscope is used for watch repairs.

iii. It is necessary to manage the space debris.

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

i. The absolute refractive index of water is 1.33. What is the velocity of light in water? (Velocity of light in vacuum = 3×10^8 m/s.)

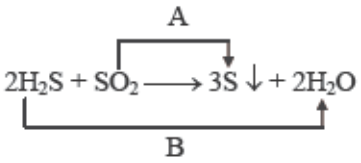
ii. Observe the figure and answer the questions given below:



(a) Name the phenomenon shown in the figure.

(b) Define the above phenomenon.

iii.



(a) Identify the above chemical reaction.

(b) Name the type of reaction in A and B.

iv. Rearrange the column 2 and 3 so as to match with the column 1.

Column 1	Column 2	Column 3
a. Triad	Concentrated mass and +ve charge	Thomson
b. Octave	Average of the atomic masses of first and third element	Newlands
	Properties of the eighth element are similar to first	Dobereiner

v. Define the following terms:

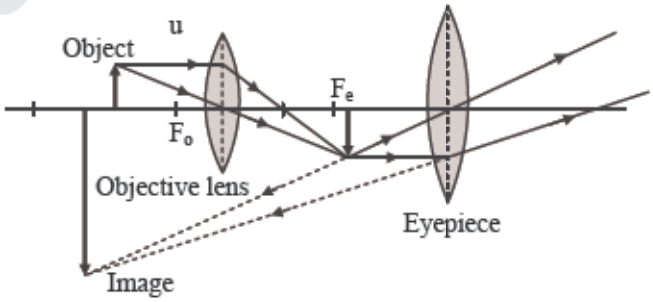
(a) Escape velocity (b) Free fall.

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

i. What information will you get from the given reaction?

$CaCO_{3(s)} \xrightarrow{\Delta} CaO_{(s)} + CO_2 \uparrow$

ii. Observe the following ray diagram and answer the questions given below:



(a) Identify the instrument shown in the diagram.

(b) What is the combined effect of two lenses?

(c) Write the use of the above instrument.

iii. Read the following paragraph and answer the questions given below:

Rainbow is a beautiful natural phenomenon. It is the combined effect of dispersion, refraction and total internal reflection of light. It can be seen mainly after rainfall. Small droplets of water act as small prisms. When light rays from the sun enter these droplets it gets refracted and dispersed. Then there is internal reflection and after that once again the light gets refracted while coming out of the droplet. All these three processes together produce the rainbow.

(a) Which three major phenomena are responsible for rainbow formation?
(b) How does refraction take place?
(c) Draw a diagrammatic representation of rainbow production.

iv. From the elements of second period of the modern periodic table given below, answer the following questions:

3	4	5	6	7	8	9	10
Li	Be	B	C	N	O	F	Ne
Lithium	Beryllium	Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon
6.941	9.012	10.811	12.011	14.007	15.999	18.998	20.180

(a) Name the elements in which both the shells are completely filled with electrons.
(b) Name the element which has same number of electrons in both the shells.
(c) Which is the most electropositive element in this period?

v. Explain on which factor the value of acceleration due to gravity 'g' depends.

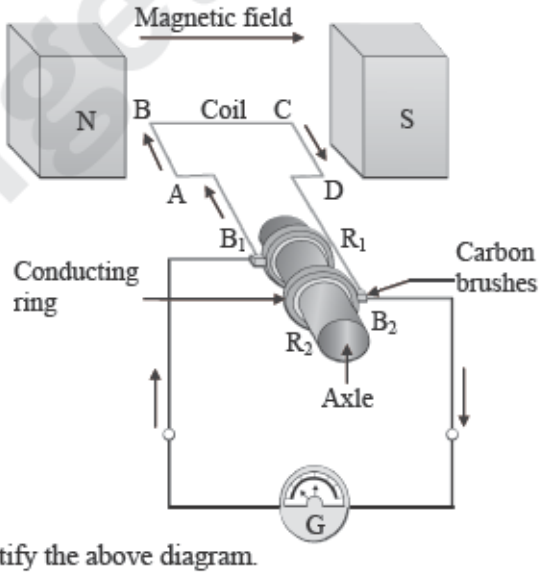
vi. Explain the following terms:
(a) Metallurgy (b) Ores (c) Gangue.

vii. Give the names of the following satellite series developed by India:
(a) Satellite series actively working in the field of telecommunication, television and meteorological services.
(b) Satellite series specially working in the field of education.
(c) Satellite series to exactly locate position of any place on earth's surface.

viii. (a) What is meant by anomalous behaviour of water ?
(b) Explain the role of anomalous behaviour of water in preserving aquatic life in cold climate.

Q.4. Answer the following question (any *one*): **[5]**

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



(a) Identify the above diagram.
(b) Write the principle on which the above appliance works?
(c) Write the working of the above appliance.
(d) Write the use of the above appliance.

ii. Read the following paragraph and answer the questions given below:

Carbon compounds contain many elements. The element hydrogen is present to a smaller or larger extent in majority of carbon compounds. The compounds which contain carbon and hydrogen as the only two elements are called hydrocarbons. Hydrocarbons are the simplest and the fundamental organic compounds. The smallest hydrocarbon is methane (CH_4), formed by combination of one carbon atom and four hydrogen atoms. We have already seen the structure of methane. Ethane is one more hydrocarbon. Its molecular formula is C_2H_6.

The carbon compounds having a double bond or triple bond between two carbon atoms are called unsaturated compounds. Ethene and ethyne are unsaturated hydrocarbons. The unsaturated hydrocarbons containing a carbon-carbon double bond are called 'Alkenes'. The unsaturated hydrocarbons whose structures contain a carbon-carbon triple bond are called 'Alkynes'. Generally the unsaturated compounds are more reactive than the saturated compounds.

(a) What is meant by hydrocarbon?
(b) Name the smallest hydrocarbon.
(c) Define unsaturated compound.
(d) Differentiate between Alkene and Alkyne.

BOARD ACTIVITY SHEET: MARCH 2023

Science and Technology Part - 1

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v. For every 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: **[5]**

i. The device used for producing current is called _____.
(A) A voltmeter (B) An ammeter
(C) A galvanometer (D) A generator

ii. If a ray of light passes from a denser medium to a rarer medium in a straight line, the angle of incidence must be _____.
(A) 0° (B) 30° (C) 60° (D) 90°

iii. The power of convex lens of focal length 20 cm is _____
(A) +5.0 D (B) 0.20 D (C) –5.0 D (D) 0.5 D

iv. Good conductor of electricity is _____.
(A) Bromine (B) Iodine (C) Graphite (D) Sulphur

v. The height of medium earth orbit above the surface of the earth is:
(A) 1,500 km (B) 250 km (C) 45,000 km (D) 25,000 km

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

i. Find the odd man out:
Loudspeaker, Microphone, Electric motor, Magnet.

ii. Complete the co-relation:
CuI_2 : Brown : : AgCl : _____

iii. Match the pair:

Group 'A' Substance	Group 'B' Refractive index
Air	(a) 1.33
	(b) 1.46
	(c) 1.0003

iv. State True *or* False:
"Wavelength of red light is close to 700 nm."

v. Write the name of small satellite made by a group of students from COEP (College of Engineering, Pune) sent to the space through ISRO in 2016.

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

i. For electric power transmission, copper or aluminium wire is used.
ii. Lemon or tamarind is used for cleaning copper vessels turned greenish.
iii. Elements belonging to the same group have the same valency.

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

i. How do we feel about air in each of the following conditions?

(a) Relative humidity is more than 60%.

(b) Relative humidity is less than 60%.

ii. Complete the following reaction:

$C_{12}H_{22}O_{11} \xrightarrow{\text{heat}}$ _____ + _____

iii. Distinguish between Mass and Weight.

iv. Complete the following table:

	Type of Satellite	The names of Indian Satellite and launcher
1.	Navigational Satellite	Satellite : _____ Launcher : _____
2.	Earth observation Satellite	Satellite : _____ Launcher : _____

v. Define periods and groups of modern periodic table.

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

i. Calculate the escape velocity on the surface of the moon given the mass and radius of the moon to be 7.34×10^{22} kg and 1.74×10^{6} m respectively. (Given: $G = 6.67 \times 10^{-11}$ Nm^2/kg^2).

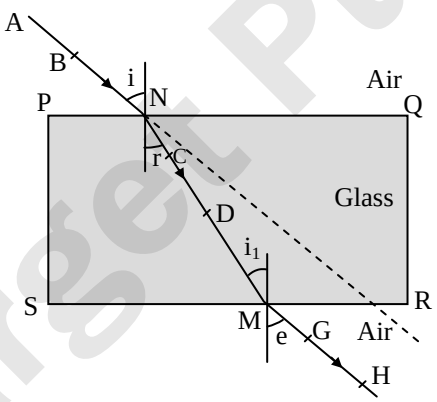
ii. An element has its electron configuration as 2, 8, 1. Now answer the following questions:

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

(b) What is the group of this element?

(c) To which period does the element belong?

iii. Observe the figure and name the ray AB, ray CD, ray GH:



iv. Read the following sentence and answer the questions:

"NaCl is an ionic compound."

(a) Why is NaCl an ionic compound?

(b) State any *two* properties of ionic compounds.

v. Identify the physical and chemical changes from the following phenomena:

(a) Transformation of ice into water.

(b) Ripening of fruit.

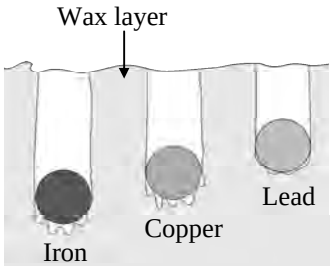
(c) Milk turned into curd.

(d) Evaporation of water.

(e) Digestion of food in the stomach.

(f) Iron fillings get attracted towards the magnet.

vi. Observe the following figure and answer the questions:



Specific heat capacity of metals

(a) Which element has maximum specific heat capacity? Justify.
(b) Which element has minimum specific heat capacity? Justify.
(c) Define specific heat of object.

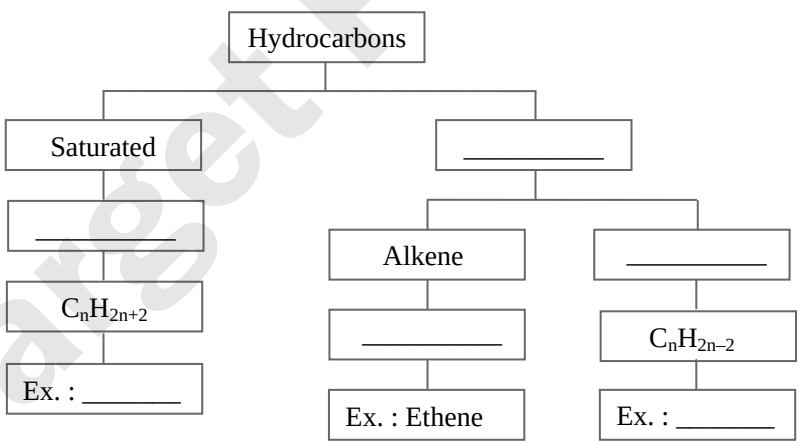
vii. Identify figures A, B, C and given their uses:

(A)

(B)

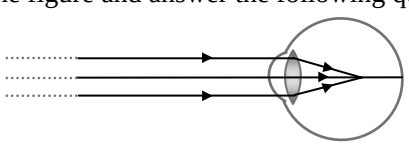
(C)

viii. Complete the following flow chart:



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

i. Observe the figure and answer the following questions:



(a) Name the defect of vision represented in above figure.
(b) State the reasons for this defect.
(c) How is it corrected?
(d) Draw the diagram to show the correction of this defect.

ii. Complete the following table:

S.N.	Common Name	Structural Formula	IUPAC Name
1.	Ethylene	$CH_2 = CH_2$	_____
2.	Acetylene	_____	Ethyne
3.	Acetic acid	$CH_3 – COOH$	_____
4.	Methyl alcohol	_____	Methanol
5.	_____	$CH_3 – CO – CH_3$	Propane-2-one

BOARD ACTIVITY SHEET: July 2023

Science and Technology Part - 1

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

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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) $\frac{2}{3}$

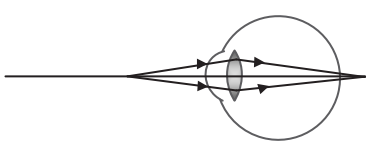
(B) Attempt the following questions: **[5]**

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 $2F_1$.

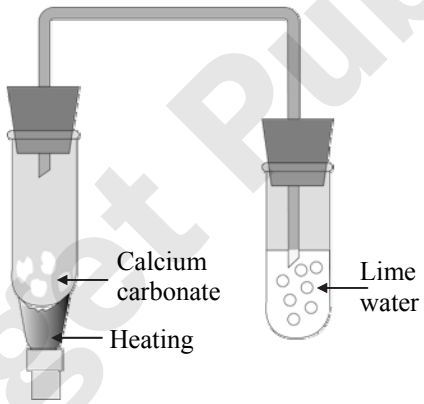
v. Why does the apparent position of stars keep changing a bit?

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).

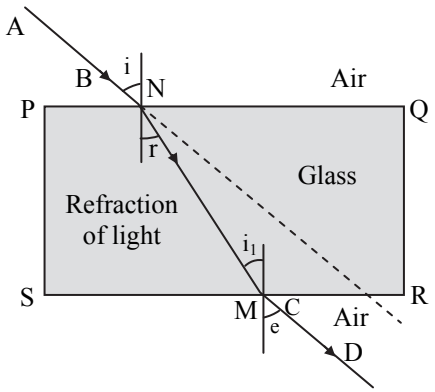
iv. Explain the term anodization with example. Give *one* use of it.

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?

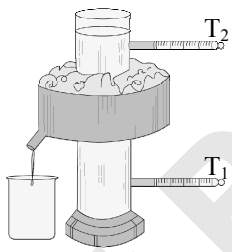
viii. Observe the given diagram and answer the following questions:



(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]**

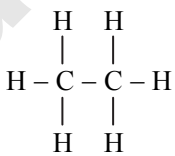
i. Observe the given diagram and answer the following questions:



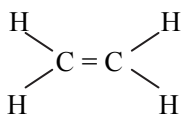
(a) What is the name of the given apparatus?
(b) Which phenomenon is studied with the help of this apparatus?
(c) What are the final temperatures in thermometers T_1 and T_2?
(d) At what temperature the density of water is maximum?
(e) Give *one* example of the above phenomenon in nature.

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?

BOARD QUESTION PAPER: MARCH 2022

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: **[5]**

i. Gold plated ornaments is the example of _____.
(A) Electroplating (B) Alloying
(C) Anodizing (D) Galvanizing

ii. The functioning of the satellite launch vehicle is based on _____.
(A) Newton's first law of motion (B) Newton's second law of motion
(C) Newton's third law of motion (D) Newton's universal law of gravitation

iii. _____ is one of the combustible components of L.P.G.
(A) Ethane (B) Propane
(C) Methane (D) Ethene

iv. The power of a convex lens of focal length 25 cm is _____.
(A) 4.0 D (B) 0.25 D (C) –4.0 D (D) –0.4 D

v. _____ colour is deviated the least, in the spectrum of white light obtained with a glass prism.
(A) Red (B) Yellow (C) Violet (D) Blue

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

i. Find the odd one out:
INSAT, GSAT, IRS, PSLV

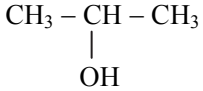
ii. Complete the correlation:
Group 1 : Alkali metals : : _____ : Halogens.

iii. Match the correct pair:

Column 'A'	Column 'B'
Refractive index of water	(a) 1.31
	(b) 1.36
	(c) 1.33

iv. State True or False:
An electric motor converts mechanical energy into electrical energy.

v. Write the IUPAC name for the following structural formula:



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

i. Atomic radius goes an increasing down a group.

ii. Simple microscope is used for watch repairs.

iii. It is recommended to use airtight container for storing oil for long time.

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

i. An object takes 5 s to reach the ground from a height of 5 m on a planet. What is the value of 'g' on the planet?

ii. Draw a neat labelled diagram of Hope's Apparatus.

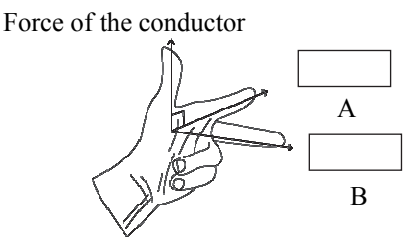
iii. State the Laws of Refraction.

iv. Answer the following:

(a) Name the main ore of aluminium.

(b) What impurities are present in aluminium ore?

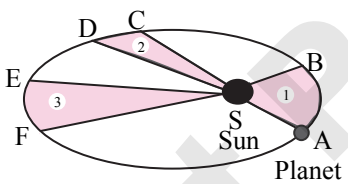
v. Observe the given figure of Fleming's Left Hand Rule and write the labels of 'A' and 'B':



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

i. Write the demerits of Mendeleev's periodic table.

ii. State the laws related to the given diagram:



iii. Identify the type of chemical reaction given below:

(a) $CuSO_4 + Fe \longrightarrow FeSO_4 + Cu$

(b) $2Mg + O_2 \longrightarrow 2MgO$

(c) $2KClO_3 \longrightarrow 2KCl + 3O_2 \uparrow$

iv. If the speed of light in a medium is 1.5×10^8 m/s, what is the absolute refractive index of the medium? (Speed of light in vacuum = 3×10^8 m/s).

v. Read the following paragraph and answer the questions based on it:

If heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy.

The change in temperature continues till the temperatures of both the objects attain the same value. In this process, the cold object gains heat energy and the hot object loses heat energy. If the system of both the objects is isolated from the environment by keeping it inside a heat resistant box, then no energy can flow from inside the box or come into the box.

(a) Heat is transferred from where to where?

(b) Which principle do we learn about from this process?

(c) How will you state the principle briefly?

vi. Complete the following table for convex lens:

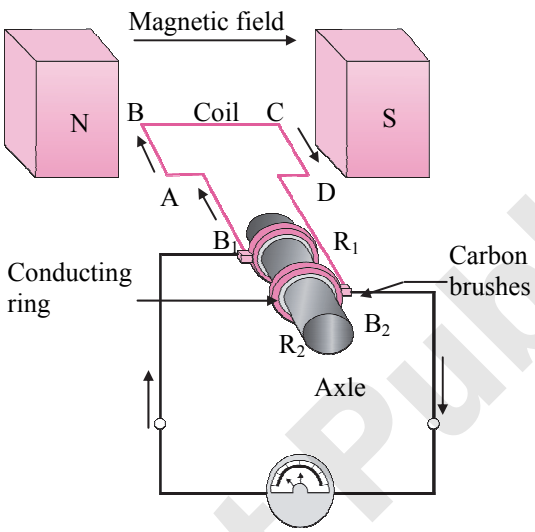
Sr. No.	Position of the object	Position of the image	Nature of the image
1.	Beyond $2F_1$	_____	_____
2.	_____	At infinity	
3.	_____	_____	Real, inverted and enlarged

vii. Explain the following terms:
(a) Metallurgy
(b) Ores
(c) Gangue.

viii. State the importance of Space Mission.

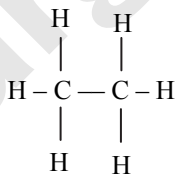
Q.4. Answer any *one* of the following questions: **[5]**

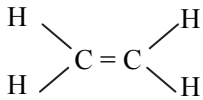
i. Observe the following diagram and answer the questions given below:



a. Identify the above diagram. **1**
b. Write the principle on which the above appliance works. **1**
c. Write the working of the above appliance. **2**
d. Write the use of the above appliance. **1**

ii. a. Identify saturated and unsaturated hydrocarbon from the given structural formula: **2**

(1) 

(2) 

b. Draw electron dot structure for (1) and (2). **2**
c. Define Homologous series. **1**

BOARD ACTIVITY SHEET: July 2022

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. The formula for escape velocity is _____

(A) $\sqrt{\frac{2M}{R}}$ (B) $\sqrt{\frac{2GM}{R}}$

(C) $\sqrt{\frac{GM}{R^2}}$ (D) $\sqrt{\frac{Gm}{R^2}}$

ii. To prevent rusting, a layer of _____ metal is applied on iron sheets.
(A) potassium (B) sodium
(C) magnesium (D) zinc

iii. Carbonate ores are strongly heated in a limited supply of air to transform them into oxides, this process is called _____.
(A) leaching (B) calcination
(C) roasting (D) tinning

iv. For a particular value of 'i', the value of 'r' becomes equal to 90°. This value of 'i' is called the _____.
(A) critical angle (B) angle of deviation
(C) angle of refraction (D) angle of emergence

v. The _____ controls the amount of light entering the eye.
(A) iris (B) pupil
(C) cornea (D) retina

(B) Answer the following **[5]**

i. Match the correct pair:

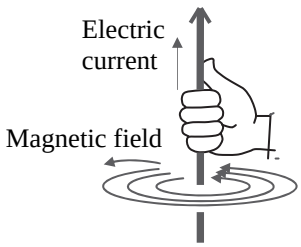
Column 'A'		Column 'B'
Electric	a.	The ohm
	b.	The ampere
	c.	The volt

ii. What is the height of the low earth orbit satellite above the earth's surface?

iii. State true or false :
When the incident ray is parallel to the principal axis, the refracted ray does not pass through the principal focus.

iv. Find the odd man out :
Methane, Ethene, Propane, Butane:

v. Identify the law from the given figure :



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

i. Generally, most of the carbon compounds are bad conductors of electricity.

ii. A magnetic needle shows decreasing deviation of its angle as distance from a current conductor is increased.

iii. We see the sun even before it emerges above the horizon.

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

i. How much heat energy is necessary to raise the temperature of 10 kg of water from 30°C to 100°C?
(Specific heat capacity of water (c) = 1 kcal/kg •°C)

ii. Will the value of g be the same everywhere on the surface of the earth? Justify your answer.

iii. Identify the exothermic and endothermic reactions :

a. $HCl \rightarrow NaOH \longrightarrow NaCl + H_2O + heat$

b. $2KClO_{3(s)} \xrightarrow{\Delta} 2KCl_{(s)}\ 3O_2\uparrow$

c. $CaO + H_2O \longrightarrow Ca(OH)_2 + heat$

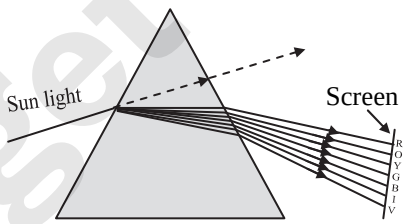
d. $CaCO_{3(s)} \xrightarrow{\Delta} CaO_{(s)} + CO_2\uparrow$

iv. Give one function of each of the following satellites:
a. Communication satellite b. Earth observation satellite

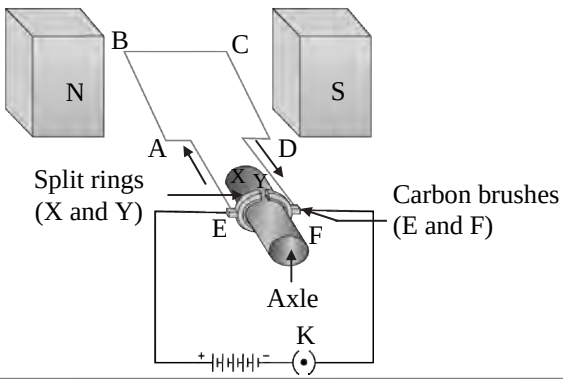
v. State any two uses of ethanol.

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

i. Identify the phenomenon shown in the figure below. State and explain it :



ii. Observe the following diagram and answer the questions given below :
a. Identify the device shown in the figure.
b. On which rule is the working of the above device based?
c. Give any two uses of this device.



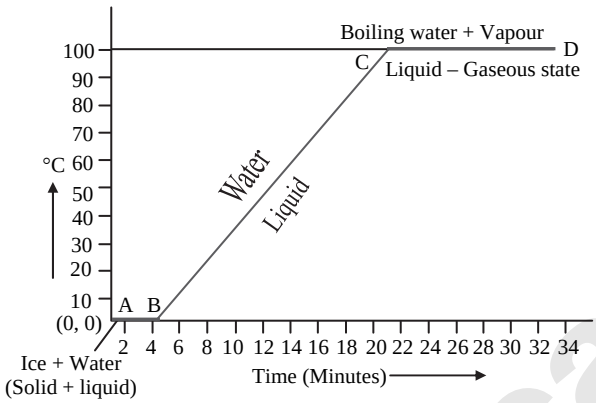
iii. a. The atomic number of nitrogen is 7. How many electrons are present in the valence shell of nitrogen?
b. Molecular formula of nitrogen is N_2. Draw the electron-dot structure and line structure of a nitrogen molecule.

iv. The mass and weight of an object on the earth are 5 kg and 49 N respectively. What will be their values on the moon? Assume that the acceleration due to gravity on the mode is 1/6th of that of the earth.

v. To which group does the halogen family belong? Write any four halogens.

vi. What is redox reaction? Explain with the help of a balanced chemical equation.

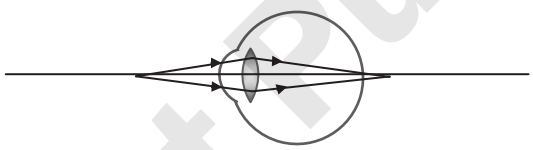
vii. Explain the following temperature vs. time graph :



viii. An element has its electronic configuration as 2, 8, 2. 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?

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

i. a. What is the minimum distance of distinct vision for normal human eye?
b. Identify the defect of vision shown in the figure :



c. Focal length of a convex lens is 25 cm. What is its power?
d. Define power of a lens.

ii. State the general properties of ionic compounds.

BOARD QUESTION PAPER: MARCH 2020

Science and Technology Part - 1

Time: 2 Hours **Total 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 sub-question 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) 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

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 _____ is our galaxy.
(A) Mars (B) Venus (C) Jupiter (D) Moon

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

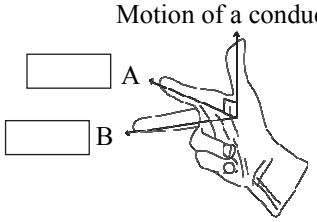
v. Name the first artificial satellite sent by Russia in space.

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

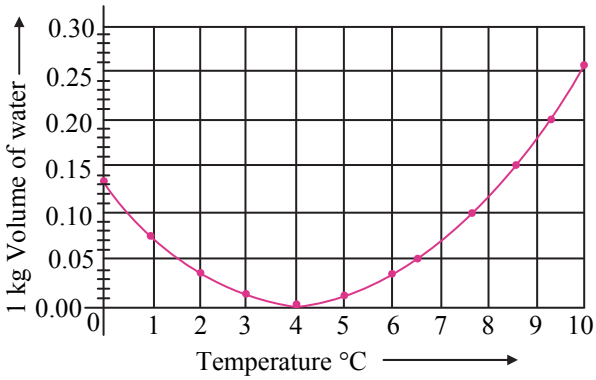
i. The weight of an object changes from place to place though its mass is constant.
ii. Stars twinkle but we do not see the twinkling of planets.
iii. Elements belonging to the same group have the same valency.

(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.



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:

$CuSO_4$ (aq) + Fe (s) → _____ + _____.

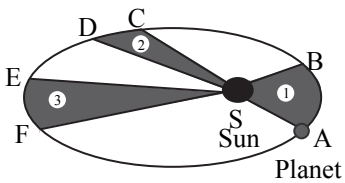
Name the type of the reaction.

v. Write a short note on Alloying.

Q.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?

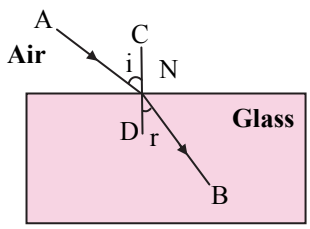
ii. Observe the given figure showing the orbit of a planet moving around the Sun and write the *three* laws related to it:



The orbit of a planet moving around the Sun

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.

iv. Observe the given figure and answer the following questions:

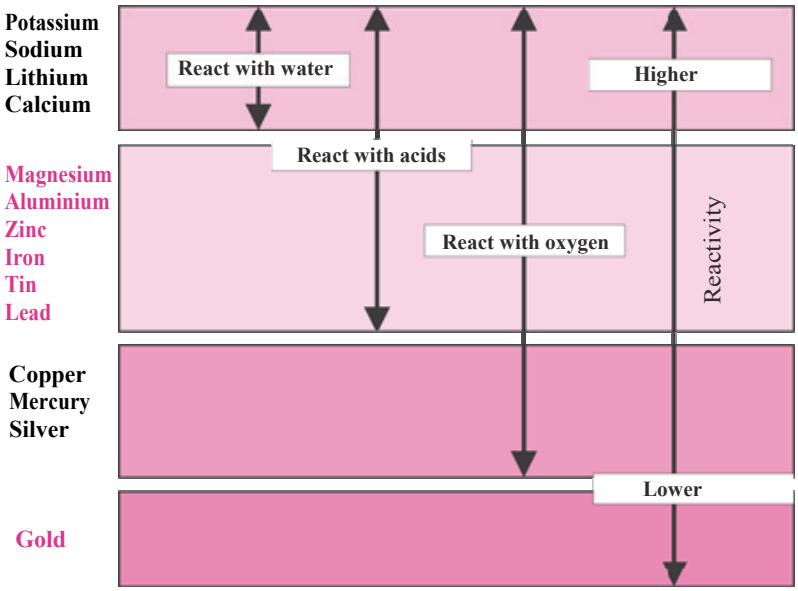


a. Name the process represented by the figure.
b. State the two laws related to the process.

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.

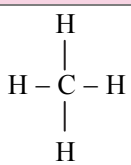
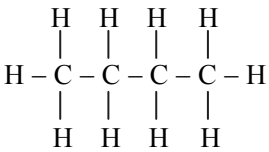
vii. Observe the given figure of reactivity series of metals and answer the following questions:



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.

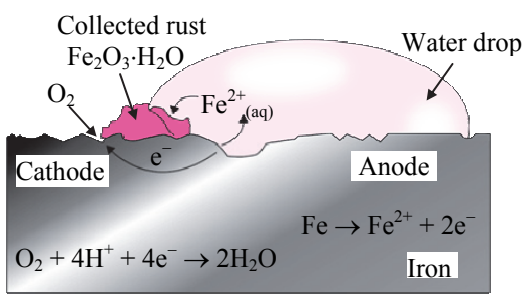
viii. Complete the following table:

Straight chain of Carbon compounds	Structural formula	Molecular formula	Name
C		CH_4	Methane
C–C	_____	_____	Ethane
C–C–C	_____	C_3H_8	_____
C–C–C– C		_____	_____

Q.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.

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?



BOARD QUESTION PAPER: JULY 2020

Science and Technology Part - 1

Time: 2 Hours **Total 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 sub-question 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* option: **[5]**

i. The minimum velocity of the spacecraft to escape from earth's gravitational force must be _____.
(A) 112 km/s (B) 11.2 km/s (C) 1.12 km/s (D) 0.112 km/s

ii. The melting point of pure ethanoic acid is _____.
(A) 17°C (B) 19°C (C) 15°C (D) 27°C

iii. The process of separation of light into its component colour while it is passing through a medium is called _____.
(A) Reflection (B) Refraction
(C) Dispersion (D) Internal reflection

iv. The conversion of ferrous sulphate into ferric sulphate is _____ reaction.
(A) Oxidation (B) Displacement
(C) Electrolysis (D) Reduction

v. Lithium (Li), _____ and Potassium (K) is Dobereiner's triad.
(A) Magnesium (Mg) (B) Aluminium (Al)
(C) Sodium (Na) (D) Calcium (Ca)

(B) Solve the following sub-questions: **[5]**

i. State true *or* false:
The refractive index depends upon the velocity of light in medium.

ii. Write the correlated answer:
Torch : Concave lens :: Camera : _____.

iii. Find odd man out:
Zinc, Iron, Phosphorus, Sodium.

iv. Draw the structural formula of C_3H_8.

v. Which satellite is used in educational field among INSAT and GSAT series?

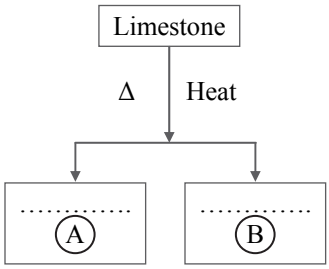
Q.2. (A) Give scientific reasons (any *two*): **[4]**

i. Star appears to be twinkling at night.
ii. Simple microscope is used for watch repairs.
iii. The copper vessels turn greenish and silver articles turn blackish when kept open in air for long time.

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

i. An object takes 5 seconds to reach the ground from a height of 5 m on a planet. What is the value of '*g*' on that planet?

ii. Identify 'A' and 'B' from the following table and complete the table. Write the chemical equation:



iii. Write the modern periodic law and also give the names of 'blocks' in modern periodic table.

iv. Distinguish between 'alternating current' and 'direct current'.

v. Define specific heat capacity. Write its S.I. unit.

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

i. An iron ball of mass 3 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:
   a. Time taken by the ball to reach the ground.
   b. Velocity of the ball on reaching the ground.

ii. An element has its electron configuration as (2, 8, 2). Answer the following:
   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?

iii. a. Write the 'endothermic' or 'exothermic' nature of the reaction:

$$2KClO_{3(s)} \xrightarrow{\Delta} 2KCl_{(s)} + 3O_2 \uparrow$$

   b. Balance the given chemical equation:

$$NaOH_{(aq)} + H_2SO_{4(aq)} \rightarrow Na_2SO_{4(aq)} + H_2O_{(l)}$$

   c. From given reaction, identify 'oxidant' and 'reductant':

$$CuO + H_2 \rightarrow Cu + H_2O$$

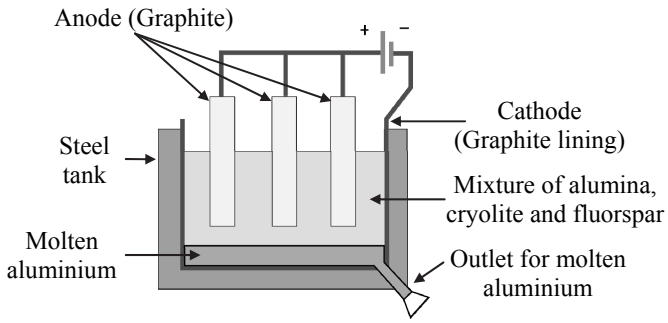
iv. A copper sphere of 100 g mass is heated to raise its temperature to 100°C and is released in water of mass 195 g and temperature 20°C in a copper calorimeter. If the mass of the calorimeter is 50 g, what will be the maximum temperature of water?
(Specific heat of copper = 0.1 cal/g°C)

v. a. Draw a neat labelled diagram of 'dispersion of white light through glass prism'.
   b. Which coloured ray is the least deviated?
   c. Which coloured ray is the most deviated?

vi. Complete the following table for convex lens:

	Position of object	Position of image	Size of image	Nature of image
(a)	_____	At focus F_2	Point image	Real and inverted
(b)	At $2F_1$	At $2F_2$	_____	Real and inverted
(c)	Between F_1 and O (within focal length)	On the same side (object side)	Very large	_____

vii. Observe the following diagram and answer the questions:

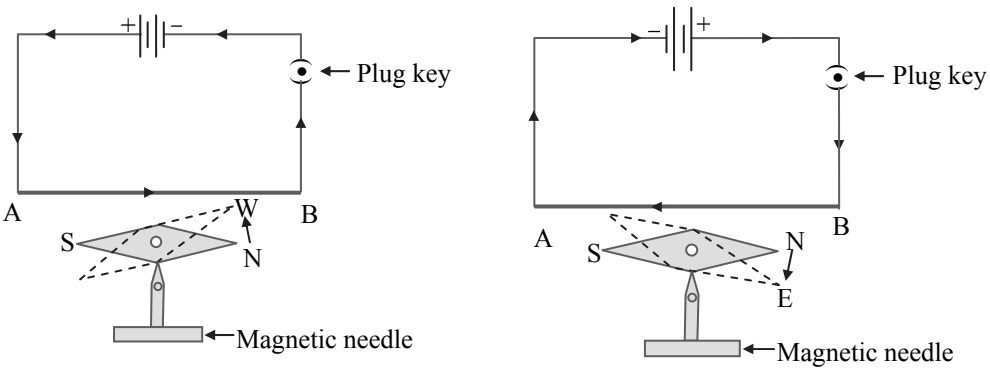


a. Write the 'anode reaction'.
b. Write the 'cathode reaction'.
c. What is the purpose of mixing 'cryolite' and 'fluorspar' with 'alumina' in the electrolytic reduction of alumina?

viii. a. What is the principle behind the working of satellite launch vehicle?
b. Write the formula for the escape velocity.
c. Write the long form of 'ISRO'.

Q.4. Solve the following questions (any *one*): **[5]**

i. Observe the diagrams and answer the questions:



a. Which effect of electric current is shown in the above figure?
b. What will happen if the number of electric cells is increased on the magnetic needle?
c. If the distance between the conductor and magnetic needle is increased, what will be the effect on intensity of magnetic field?
d. If the ends of electric cell are interchanged, what will be the effect of the magnetic needle?
e. Write the names of any *two* instruments which work on magnetic effect of electric current.

ii. Answer the following:
a. Draw the electron-dot structure of Methane.
b. Define Homologous series.
c. Write the IUPAC names of the following:
(i) $CH_3 - CH_2 - COOH$
(ii) $CH_3 - CHOH - CH_3$
(iii) $CH_3 - CO - CH_2 - CH_3$

BOARD QUESTION PAPER: MARCH 2019
SCIENCE AND TECHNOLOGY PART – 1

Time: 2 Hours **Total Marks: 40**

Note:
i. *All* questions are compulsory.
ii. Draw scientifically, technically correct labelled diagrams wherever necessary.
iii. Start writing each main question on new page.
iv. Figures to the right indicate full marks.
v. For each MCQ (i.e. Q. No. 1-B) evaluation would be done for first attempt only.
vi. For each MCQ correct answer must be written along with its alphabet.
Eg.: (i) (a)……..., (ii) (b) ……..., (iii) (c) ……...

1. (A) Answer the following questions: **[5]**

1. Write proper answer in the box:

If $F = \frac{Gm_1m_2}{d^2}$, then F = ☐

2. In Dobereiner's triads Li, Na, K, the atomic masses of Lithium and Potassium are 6.9 and 39.1 respectively, then what will be the atomic mass of sodium.

3. State whether the given statement is true or false:
A concave lens is a converging lens.

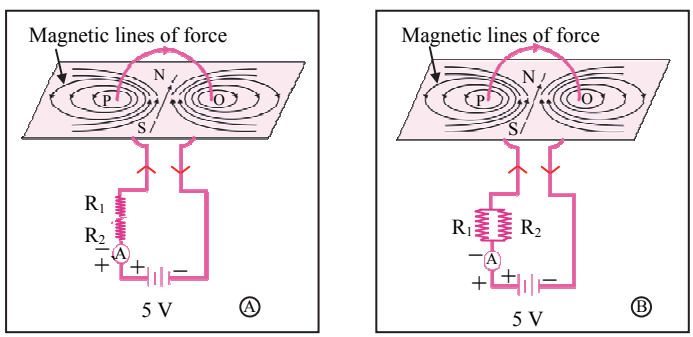
4. By considering first correlation complete the second correlation:
Hubble telescope: 569 km high from earth surface
Revolving orbit of Hubble telescope: ☐

5. Find the odd man out:
Tinning, Anodization, Alloying, Froth floatation.

(B) Choose the *correct* alternative: **[5]**

1. The reaction of iron nail with copper sulphate solution is _____ reaction.
(A) Combination
(B) Decomposition
(C) Displacement
(D) Double displacement

2. Observe the following diagram and choose the correct alternative:



(A) The intensity of magnetic field in A is larger than in B.
(B) The intensity of magnetic field in B is less than in A.
(C) The intensity of magnetic field in A and B is same.
(D) The intensity of magnetic field in A is less than in B.

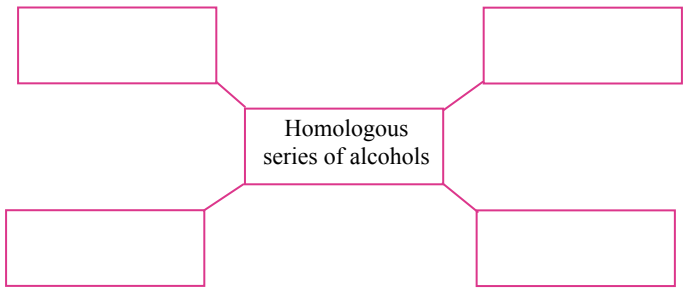
3. A ray of light makes an angle of 50° with the surface S_1 of the glass slab. Its angle of incidence will be _____.
   (A) 50° (B) 40°
   (C) 140° (D) 0°

4. Water expands on reducing its temperature below _____°C.
   (A) 0 (B) 4
   (C) 8 (D) 12

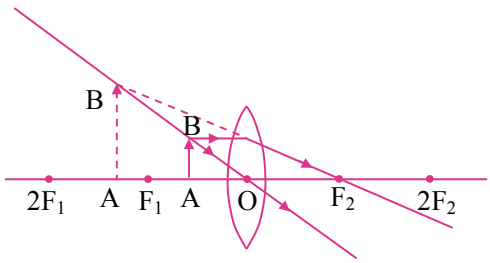
5. The carbon compound is used in daily life is _____.
   (A) Edible oil (B) Salt
   (C) Carbon dioxide (D) Baking soda

2. Attempt any *five* of the following questions: **[10]**

1. Two tungsten bulbs of power 50 W and 60 W work on 220 V potential difference. If they are connected in parallel, how much current will flow in the main conductor?
2. Give scientific reason:
   In the electric equipment producing heat e.g. iron, electric heater, boiler, toaster etc., an alloy such as Nichrome is used, not pure metals.
3. A metal ball of mass 5 kg falls from a height of 490 m. How much time it will take to reach the ground? ($g = 9.8\ m/s^2$)
4. Write names of first four homologous series of alcohols:



5. Observe the following figure and complete the table:



	Points	Answers
i.	Position of the object	
ii.	Position of the image	
iii.	Size of the image	
iv.	Nature of the image	

6. Out of sodium and sulfur which is a metal? Explain its reaction with the oxygen.
7. A tapping vessel opens in a tank like container that is tapering on the lower side. The tank has an outlet for water on the upper side and a water inlet on the lower side. Finely ground ore is released in the tank. A forceful jet of water is introduced in the tank from lower side and gangue particles and pure ore are separated by this method.
   i. The above description is of which gravitation separation method?
   ii. Draw labelled diagram of this method.

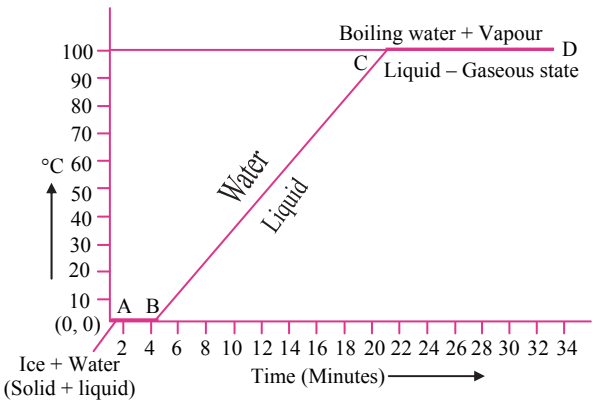
3. Attempt any *five* of the following questions: **[15]**

1. What would be the value of 'g' on the surface of the earth if its mass was twice and its radius half of what it is now?
2. Write merits of Mendeleev's periodic table.
3. Study the following chemical reaction and answer the questions given below:

$$AgNO_{3(aq)} + NaCl_{(aq)} \longrightarrow \underset{\text{(Precipitate)}}{AgCl_{(s)}\downarrow} + NaNO_{3(aq)}$$

   i. Identify and write the type of chemical reaction.
   ii. Write the definition of above type of chemical reaction.
   iii. Write the names of reactants and products of above reaction.

4. Explain the following temperature Vs time graph:



5. Surabhi from std. X uses spectacle. The power of the lenses in her spectacle is 0.5 D. Answer the following questions from the given information:
   i. Identify the type of lenses used in her spectacle.
   ii. Identify the defect of vision Surabhi is suffering from.
   iii. Find the focal length of the lenses used in her spectacle.

6. Complete the following table:

Sr. No.	Common Name	Structural Formula	IUPAC Name
1.	Ethylene	$CH_2 = CH_2$	…….
2.	…….	CH_3COOH	Ethanoic acid
3.	Methyl alcohol	…….	Methanol

7. What is meant by space debris? Why there is need to manage the debris?

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

1. Taking into consideration the period of the elements given below, answer the following questions:

Elements	Atomic Radius (pm)
O	66
B	88
C	77
N	74
Be	111
Li	152

   i. Arrange the above elements in a decreasing order of their atomic radii.
   ii. State the period to which the above elements belong.
   iii. Why this arrangement of elements is similar to the above period of modern periodic table?

iv. Which of the above elements have the biggest and the smallest atom?
v. What is the periodic trend observed in the variation of atomic radius while going from left to right within a period?

2. The observation made by Swarali while doing the experiment are given below. Based on these write answers to the questions:
Swarali found that the light ray travelling from the denser medium to rarer medium goes away from the normal. If the angle of incidence (i) is raised by Swarali, the angle of refraction (r) went on increasing. However after certain value of the angle of incidence the light ray is seen to return back into the denser medium.
Questions:
i. What is the specific value of Li called?
ii. What is the process of reflection of incident ray into denser medium called?
iii. Draw the diagrams of three observations made by Swarali.

BOARD QUESTION PAPER: July 2019

Science and Technology Part - 1

Time: 2 Hours **Total Marks: 40**

Note:
i. *All* questions are compulsory.
ii. Draw scientifically, technically correct labelled diagrams wherever necessary.
iii. Start writing each main question on new page.
iv. Figures to the right indicate full marks.
v. For each MCQ (i.e. Q. No. 1-B) evaluation would be done for first attempt only.
vi. For each MCQ correct answer must be written along with its alphabet.
Eg.: (i) (a)……..., (ii) (b) ……..., (iii) (c) ……...

Q.1. (A) Solve the following questions: **[5]**

i. Fill in the blank and rewrite the sentence: (1)
The initial velocity (during launching) of the Mangal-Yaan must be greater than _____ of the earth.

ii. Match the pairs: (2)

	Group 'A'		Group 'B'
i.	Ethanol	a.	Hydrogen peroxide
ii.	Methane	b.	Tincture iodine
		c.	Biogas
		d.	Non-stick cookware

iii. Write co-relation: (1)
Molecular formula of beryllium oxide: BeO :: Molecular formula of beryllium chloride : _____

iv. Write whether the following statement is true or false: (1)
Simple microscope is used for watch repairs.

(B) Choose the correct alternative and rewrite the statement: **[5]**

i. Combustion of coal in air is a _____ reaction.
(A) combination (B) displacement
(C) decomposition (D) double displacement

ii. When electric current is passed through the solenoid, it shows magnetic lines of force similar to a _____.
(A) bar magnet (B) horse shoe magnet
(C) disk magnet (D) spherical magnet

iii. The crystals of ferrous sulphate are_____.
(A) Blue in colour (B) Pink in colour
(C) Pale green in colour (D) Colourless

iv. A laser beam enters from air to soap solution in water then _____.
(A) it goes away from the normal (B) it bends towards the normal
(C) it travels straight without bending (D) it returns back into air

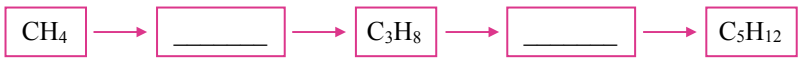
v. When temperature of water is reduced below _____ °C, it expands.
(A) 0 (B) 4 (C) 5 (D) 12

Q.2. Solve the following questions (any five): **[10]**

i. If mass of a planet is eight times the mass of the earth and its radius is twice the radius of the earth, what will be the ratio of escape velocity of earth to the escape velocity on the planet?

ii. Explain why value of g changes if we go inside the earth.

iii. Complete the following flowchart and write the general formula of alkane:



iv. What is a geostationary satellite? Why are geostationary satellites not useful for studies of polar region?

v. If the speed of light in a medium is 1.5×10^8 m/s, what is the absolute refractive index of the medium? (Velocity of light in vacuum 3×10^8 m/s)

vi. In two methods of control of corrosion of aluminium, either a layer of aluminium oxide is formed or a silver plating is done on the surface. State to which electrode the aluminium article is attached in these methods respectively.

vii. Write down any two rules used for drawing ray diagrams for the formation of image by convex lens.

Q.3. Solve the following questions (any five): **[15]**

i. An object thrown vertically upwards reaches a height of 500 m. What was its initial velocity? How long will the object take to come back to the earth? ($g = 10$ m/s^2)

ii. Explain the similarity and difference in two events namely adding NaOH to water and adding CaO to water.

iii. Observe the following reaction carefully and answer the sub-questions:

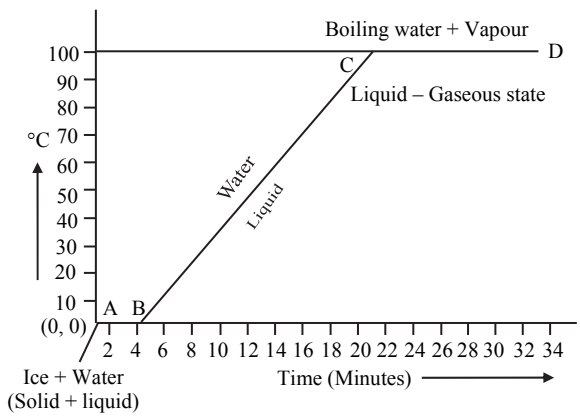
$NH_3 + HCl \longrightarrow NH_4Cl$

a. What are the salt and acid in the above reaction?

b. Which is the base in the above reaction? It is weak or strong?

c. Write a reaction showing dissociation of this base in water.

iv. Explain the following temperature Vs. time graph:



v. Doctor has prescribed a lens having power +1.5 D for correction of eye defect. What will be the focal length of the lens? What is the type of the lens and what must be the defect of vision?

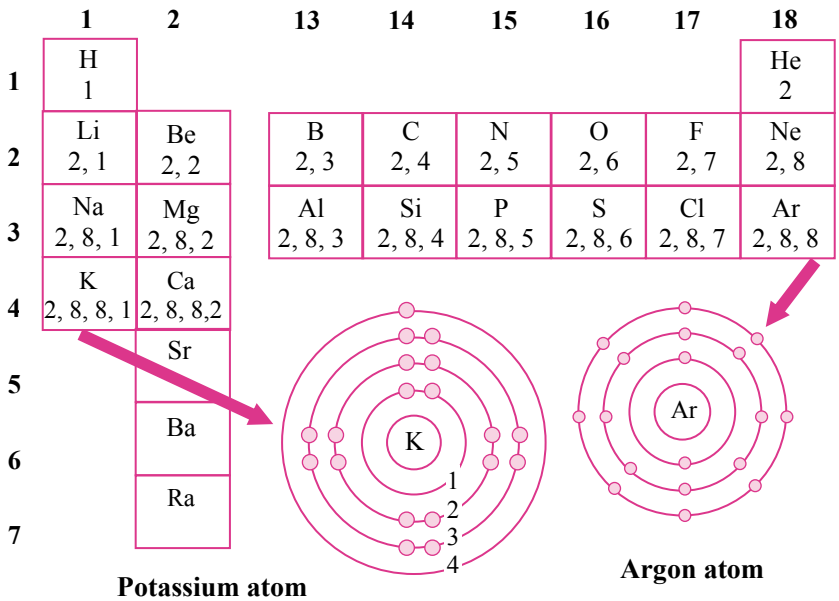
vi. Give scientific reason:

Anodes need to be replaced from time to time during the electrolysis of alumina.

vii. What is meant by Vinegar and Gashol? What are their uses?

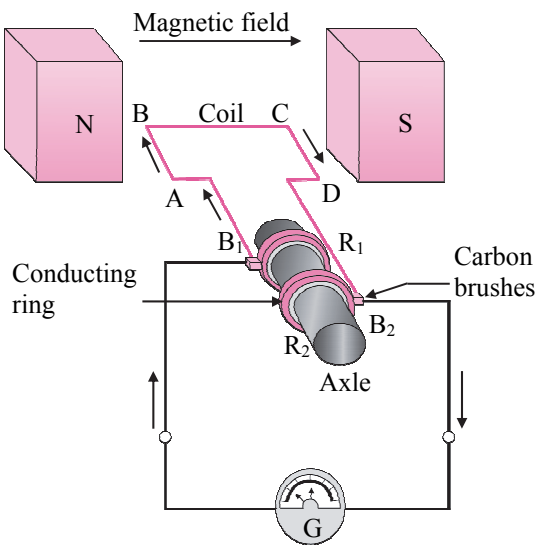
Q.4. Solve the following questions (any one): **[5]**

i. Observe the following diagram and write the answers of the following questions:



a. Write the atomic numbers of first two elements in the second group.
b. Write the number of valence electrons of the elements in the halogen group.
c. Draw the diagram of electronic configuration of magnesium atom.
d. After completion of a period, what change does take place in the electronic configuration of the next element?
e. Write the names of any two elements from the diagram which do not take part in chemical reaction.

ii. Observe the following diagram and write the answers of the given sub-questions:



a. Which instrument the above figure shows?
b. Which rule is used to determine the direction of the current produced?
c. State the rule.
d. In which direction (B_1 to B_2 or B_2 to B_1) will the current flow in the external circuit in that situation?
e. What change will have to be made in the coil for increasing the current several times without changing the magnet?