

PVG's
Muktangan English School & Jr. College, Pune - 9
Preliminary Examination (2024-25)
STD X

Subject : Science and Technology (Part I)

Marks - 40

Date : 14.01.2025

Time : 8.15 am - 10.15 am

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 1A) only the first attempt will be evaluated and will be given credit.
- v) For every 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), ...
- vi) Scientifically correct labelled diagrams should be drawn wherever necessary.

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

- i) Water expands on reducing its temperature below _____ °C
 - A) -4
 - B) 1/4
 - C) 4
 - D) 0.4

- ii) The astronomical object closest to us is _____ in our galaxy.
 - A) Venus
 - B) Moon
 - C) Mars
 - D) Sun

- iii) When electric current is passed through the solenoid, it shows magnetic lines of force similar to a _____
 - A) Bar magnet
 - B) Disc magnet
 - C) Spherical magnet
 - D) Horseshoe magnet

- iv) A ray of light makes an angle of 50° with the surface of the glass slab, its angle of incidence is _____
 - A) 50°
 - B) 40°
 - C) 140°
 - D) 0°

v) The colour of precipitate obtained in a chemical reaction $\text{KCl} + \text{AgNO}_3 \rightarrow \text{KNO}_3 + \text{AgCl} \downarrow$ is _____.

- A) Light yellow B) White
C) Bright yellow D) Blue

B] Answer the following questions (5)

i) Name the reagent that dissolves noble metals.

ii) Complete the following analogy :

Alkene : C = C :: Alkynes :

iii) "The escape velocity is same for different planets"

State whether the given statement is true or false.

iv) Match the following

Group A	Group B
1) 1 joule	a) 4.18 calories
	b) 10^7 erg
	c) 4.18×10^{10} erg

v) Find the odd one out:

Melting of ice, corrosion of iron, photosynthesis in plants, conversion of milk to curds

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

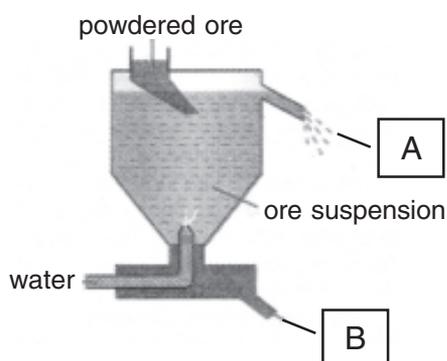
i) Carbon generally forms compounds by covalent bonds.

ii) Stars appear to be twinkling at night.

iii) Zero group elements are called noble gases.

B] Answer the following questions (Any three)**(6)**

- i) Observe the given figure and label the parts A and Part B and hence name the process shown in the figure.

A - B -

- ii) What is regelation? Explain
- iii) Calculate the amount of heat energy to be supplied to convert 2 kg of ice at 0°C completely in water at 0°C, if latent heat of fusion for ice is 80 cal/g.
- iv) Observe the given table answer the questions given below

Elements	K	Na	Rb	Cs	Li
Atomic Radius (Pm)	231	186	244	262	152

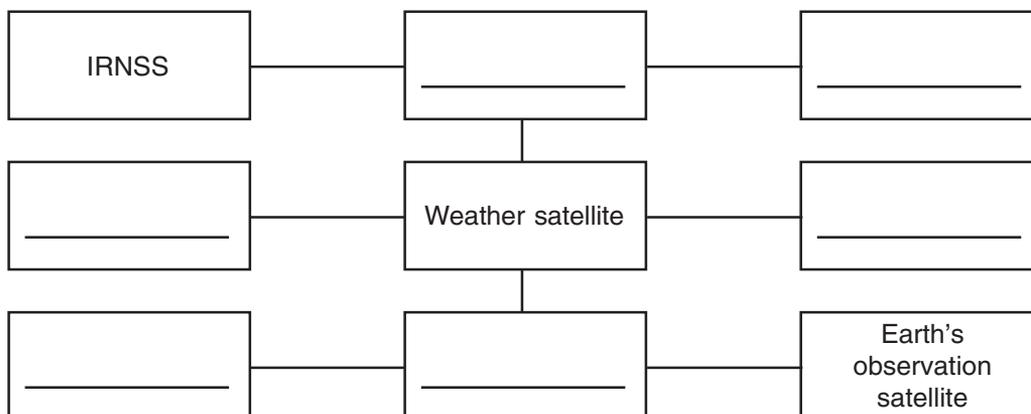
- 1] Which of the above element have the biggest and the smallest atomic radius?
- 2] State the group to which the above elements belong in the modern periodic table?
- v) Complete the following table

Sr No.	Reactions	Products	Type of Chemical Reaction
1.	$\text{NH}_{3(g)} + \text{HCl} \rightarrow$	<input type="text"/>	<input type="text"/>
2.	$\text{Zn}_{(s)} + \text{CuSO}_{4(ag)} \rightarrow$	<input type="text"/> + $\text{Cu}_{(s)}$	<input type="text"/>

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

- i) At which position will you keep an object in the front of a convex lens so as to get a real image of the same size as the object? Draw the ray diagram for the same.
- ii) Distinguish between electric motor and electric generator stating three points of distinction.

iii) Complete the table given below



iv) State and explain the factors which affect the value of acceleration due to gravity.

v) A concave lens has focal length 15 cm. At what distance should be the object placed from the lens so that the image is formed at 10 cm from the lens. Also find the magnification.

vi) Complete the process of rusting of iron by filling the blanks and also suggest a way to prevent this process.

“The iron rust is formed due to _____ reaction. Different regions on iron surfaces become anode and cathode.

Reaction on anode region:



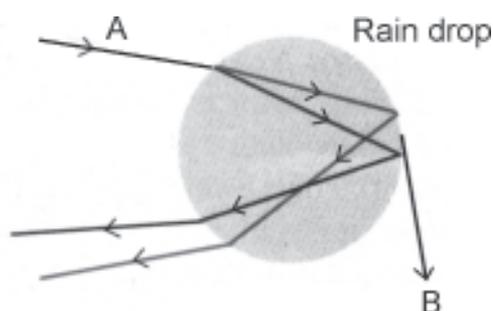
Reaction of Cathode region :



When Fe^{2+} ions migrate from anode region they react with _____ and further get oxidised to form _____ ions. A reddish coloured hydrated oxide is formed from _____ ions called rust.

A way to prevent rusting is _____ .

vii)



a) Observe the given figure and label the parts A and B.

b) Name and explain the natural phenomenon which is observed in the figure given above.

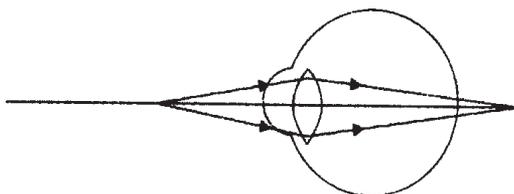
viii) Complete the following table

Structural Formulae	IUPAC Name	Common Name
1) <input type="text"/>	n- propane	<input type="text"/>
2) $\text{CH}_3\text{-CHO}$	<input type="text"/>	<input type="text"/>
3) <input type="text"/>	<input type="text"/>	Methanol

Q.4 Answer the following questions (Any one)

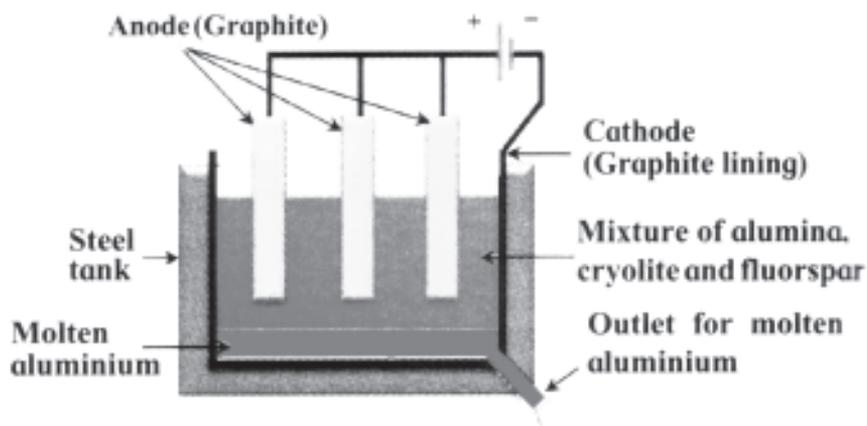
(5)

i) Observe the figure and answer the questions given below :



- Name the defect of vision represented in the above figure.
- State the reasons for this defect (any 2).
- How is it corrected ?
- Draw diagram to show the correction of this defect.

ii) Observe the following diagram and answer the questions given below:



- Write the anode reaction.
- Write the cathode reaction.
- Name the two substances that are added during the process to lower the temperature of the molten aluminium.
- Why is the molten aluminium collected at the bottom of the tank?
- Anode rods are changed from time to time during the extraction of aluminium, Why?

