मंगलाबाई भागवत फाऊंडेशन

Time :2 hours **Xth- Science and Technology-Part I** **Marks:40**

Note :

1) All questions must be attempted.
2) Wherever necessary scientifically correct diagrams and correct labelling should be drawn.
3) Start every main question on a new page.
4) Numbers to the right indicate marks.
5) For Q.No.1(A) MCQ marks will be given only for the first attempt.
6) The answer to every MCQ should be written as shown - Example - i-a
7) There is no need to write the entire sentence or the words from the option chosen.

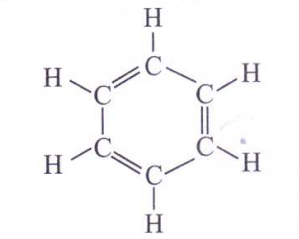
Q.1. (A) Choose the correct alternative. **(5)**

i. Electromagnetic induction means _____
   a. charging of an electric conductor
   b. production of magnetic field due to a current flowing through a coil
   c. generation of a current due to relative motion between the coil and the magnet
   d. motion of the coil around the axle in an electric motor

ii. A student obtained a clear image of window grills on the screen. But the teacher told him to get the image of a tree far away, instead of the window. To get a clear image, the lens must be _____
   a. moved towards the screen
   b. moved away from the screen
   c. moved behind the screen
   d. moved far away from the screen

iii. A pencil partially dipped in water appears to be broken due to_____
   a. dispersion of light
   b. absorption of light
   c. reflection of light
   d. refraction of light

iv. The following structural formula belongs to which carbon compound?



   a. Camphor
   b. Benzene
   c. Starch
   d. Glucose

v. Which of the following metal does not react with water?
   a. Potassium b. Calcium c. Iron d. Sodium

(B) Answer the following questions. **(5)**

i. Write the molecular formula of - Potassium chromate

ii. Make pairs.

A		B	
a.	C_2H_6	1.	Unsaturated hydrocarbon
		2.	Molecular formula of an alcohol
b.	C_2H_2	3.	Saturated hydrocarbon
		4.	Triple Bond

iii. State whether the following statement is true or false and state why it is so.
When a light ray passes from a rarer medium to a denser medium, it bends towards the normal.

iv. Find the odd one out.
Cl, O, Br, I

v. Name the following.
Any one device which provides the potential difference across a conductor

Q.2. (A) Give scientific reasons. (Any two) **(4)**

i. The lustre of the surface of aluminium utensils in the house is lost after a few days.

ii. Stars appear to be twinkling.

iii. Space expeditions are important for the development of a nation.

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

i. State Faraday's law of electromagnetic induction and give examples.

ii. If mass of a planet is 8 times that of Earth and its radius is twice the radius of Earth, what will be the escape velocity of that planet?
(Escape velocity for Earth is 11.2 km/s)

iii. Write short note on-Relative humidity.

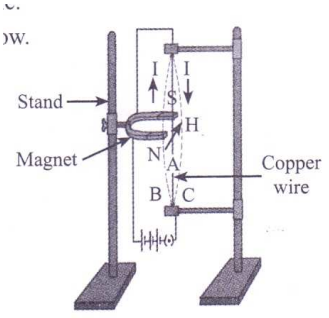
iv. Write the difference.
Physical properties of metals and non-metals

v. Give examples.
Write the names of two functional groups containing three different heteroatoms. the name and structured formula of one example each.

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

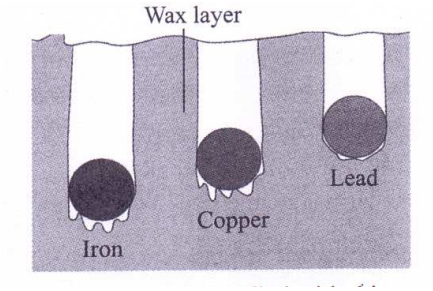
i. A ball falls off a table and reaches the ground in Is. Assuming g-10 m/s, calculate its speed on reaching the ground and the height of the table.

ii. Observe the figure and answer the questions given below.
   a. Which principle is explained in this figure?
   b. Which rule is used to find out the direction of force in this principle?
   c. In which machine is this principle used? Draw a diagram showing the working of that machine.



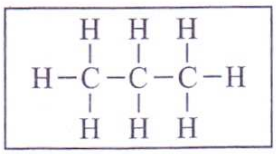
iii. Explain the following statement.
A ray of light emerging from a glass slab is slightly displaced to the left.

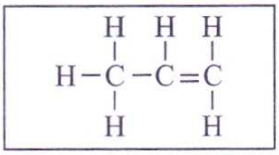
iv. Answer the questions based on the figure.
Solid spheres of iron, copper and lead having equal mass and heated to 100 °C are put on a slab of wax. Now, answer the following questions.



a. Which property of substance can be studied with this procedure?
b. Describe that property in minimum words.
c. Explain the rule of heat exchange with this property

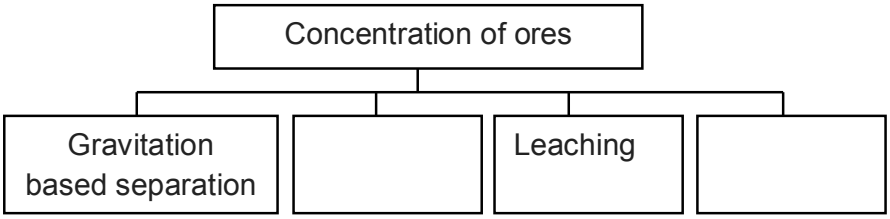
v. Observe the straight chain hydrocarbons given below and answer the following questions.


(A)


(B)

a. Which of the straight chain compounds from A and B has saturated and unsaturated straight chains?
b. Name these straight chains
c. Write their chemical formulae and number of -CH,-units.

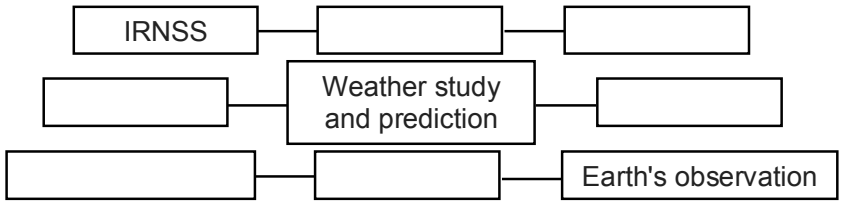
vi. Complete the following flowchart and answer the questions below.



a. In which method of concentration of ores is pine oil used?
b. Explain that method of concentration in brief.

vii. Explain the terms "reactant" and "product", giving examples.

Vii. Complete the table.



Q.4. Answer the following questions. (Any one) **(5)**

i. Write down the electronic configuration of the following elements from the given atomic numbers and answer the questions.

a. $_{4}Be$, $_{6}C$, $_{8}O$, $_{5}B$, $_{13}Al$

Which is the most electropositive element among these? Why? Draw the electronic configuration of that element.

b. $_{11}Na$, $_{15}P$, $_{17}Cl$, $_{14}Si$, $_{12}Mg$

Which of these has the largest atomic size? Why? Draw the electronic configuration of that element.

ii. Explain the working of an astronomical telescope using refraction of light with the help of a neat labelled diagram.