N 640

2024 III 18 1100 – N 640 – SCIENCE AND TECHNOLOGY (72) – PART I (E)

(REVISED COURSE)

Time : 2 Hours   (Pages 12)   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, labeled diagrams should be drawn wherever necessary.

P.T.O.

2/N 640

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

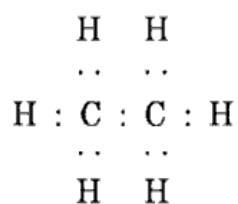(D) Alloying

(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 :

$$
\begin{array}{ccc}
& H & H \\
& \cdot\cdot & \cdot\cdot \\
H : & C : C & : H \\
& \cdot\cdot & \cdot\cdot \\
& H & H
\end{array}
$$

(*v*)   Match the Columns :

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

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

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

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

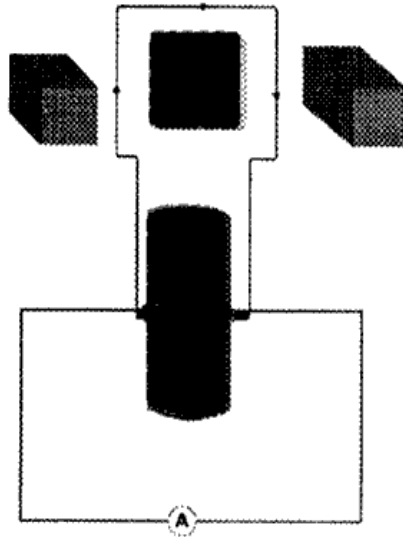(*iii*)   On exposure to air, silver articles turn blackish after some time.

P.T.O.

6/N 640

(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 ?

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

(*i*)   Select the appropriate options 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. Groups 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 bottom of the periodic table i.e. Lanthanides and Actinides constitute .... and all these elements are metals.
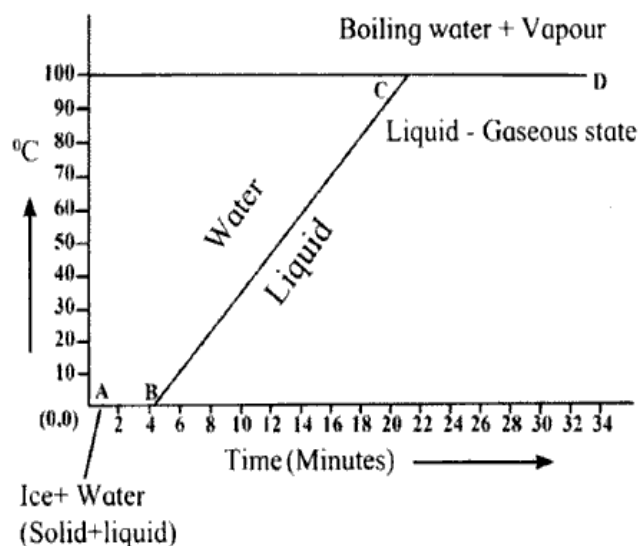
(*ii*)   (*a*)   What are the factors affecting the rate of chemical reaction ?

(*b*)   Explain any *one* factor.

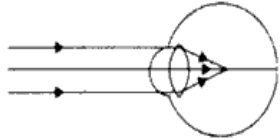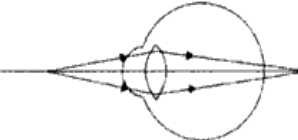(*iii*)   Observe the following graph and answer the following questions :

(*a*)   What does the graph represent ?

(*b*)   What does the line AB represent ?

(*c*)   What does the line BC represent ?

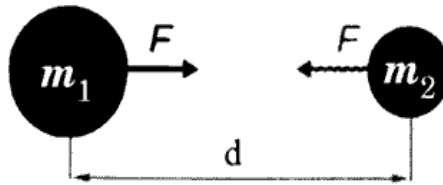(*iv*)   Complete the following table by observing the given figures :

Figure → Points ↓		
(*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 object 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 ? https://www.maharashtrastudy.com

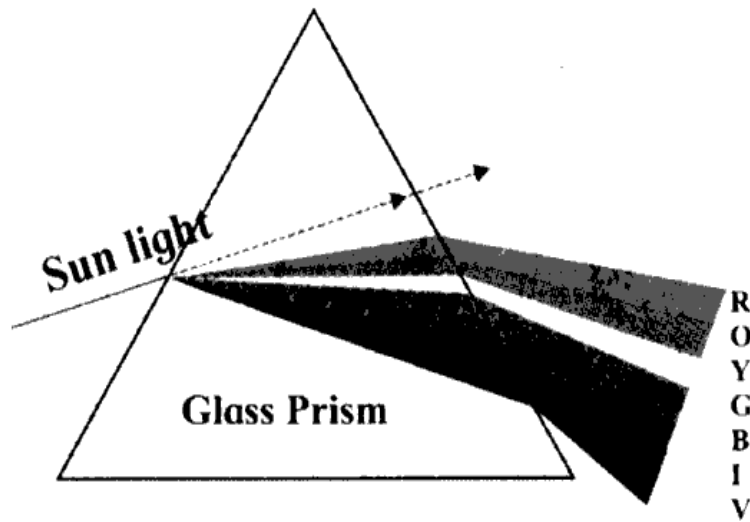(Radius of earth = 6400 km.)

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

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

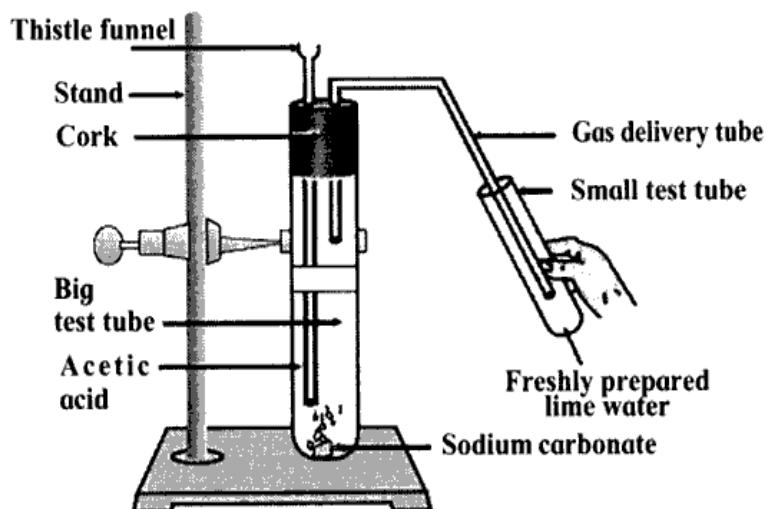   (*i*)   Observe the given diagram and answer the questions :

   (*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'.

<div align="right">P.T.O.</div>

(*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 products ?

(*e*)   Write the use of acetic acid.