General Instructions :
i)   This question paper comprises of two sections A and B. You are to attempt both the sections.
ii)   All questions are compulsory.
iii)   There is no overall choice.
iv)   **In Section A**
         -       Question nos. 1 and 2 carry one mark each.
         -       Question nos. 3 to 5 carry two marks each.
         -       Question nos. 6 to 15 are three marks questions.
         -       Question nos. 16 to 21 are five marks questions.
v)   **In Section B**
         -       Question nos. 22 - 27 are based on practical skills and carry 2 marks each.

SECTION - A

1.   Define: a)   Humidity   b)   Latent heat of fusion   (1)

2.   Name any two factors for which crop variety improvement is done   (1)

3.   Calculate the work done
         a)   by the force of gravity on a satellite moving round the earth.
         b)   by a person who holds a bundle of hay over his head for 30 minutes and
                  gets tired. Justify your answer in each case.   (2)

4.   Define power. A man of mass 72kg climbs up a stair case of 25 steps in 12 seconds.
         If height of each step is 20cm. Calculate his power.   (2)

5.   The alpha particle scattering experiment gave totally unexpected results. What
         observations were made by Rutherford? Draw a diagram to explain the observations.   (2)

6.   a)   Calculate the density of silver in SI units if the relative density of silver is 10.8.
         b)   What happens to the force between two objects if
                  (i)   the mass of one object is doubled?
                  (ii)   the distance between the objects is doubled?
                                              (OR)
         a)   If the relative density of a body is 2. Will it float in water or sink?
                  Justify your answer.
         b)   If a small stone and a big stone are dropped from the roof of a house
                  simultaneously. Will they reach at same time? Explain.   (3)

7.   The following table gives the data about motion of a car:

Time (h)	11.00	11.30	12.00	12.30	1.00
Distance (km)	0	30	30	65	100

         a)   Plot the graph
         b)   Find the speed of the car between 12.00 and 12.30 h.
         c)   What is the average speed of the car?   (3)

8.   Give reasons for the following: (3)
         a)   While putting clothes for drying up we spread them out.
         b)   Gas exerts pressure on the walls of the container.
         c)   Rubber band is a solid even though it can be stretched.

9.   a)   Give the principle used in centrifugation as a method of separation.
         b)   Draw a labelled diagram to show how you will separate the mixture containing
                  oil and water.
         c)   Define solubility. How does it vary with temperature?
                                              (OR)

    a)   Which method will you use to separate the following mixtures:
          i)   Miscible liquids with more than 25°C difference in their boiling point.
          ii)   Dye from ink.
    b)   Draw a labelled diagram to show how you will separate the mixture containing ammonium chloride and common salt.
    c)   To make a saturated solution, 36g of sodium chloride is dissolved in 100g of water at 293K. Find its concentration at this temperature.   (3)

10.   a)   What is an antibiotic?
     b)   Why are antibiotics not effective for viral disease?   (3)

11.   a)   If there is no atmosphere around the earth, what will happen to its temperature?
     b)   Why does life not exists on venus and mars while it exists on earth?   (3)

12.   a)   Differentiate between ultrasound and infrasound.
     b)   A ship sends out ultrasound that returns from the seabed and is detected after 3.42s. If the speed of ultrasound through sea water is 1500 m/s then what is the distance of seabed from the ship?   (3)

13.   a)   What was green revolution meant for?
     b)   Write any two advantages of composite fish culture.   (3)

14.   a)   How is CO_2 fixed in the atmosphere?
     b)   Complete the following cycle.   (3)
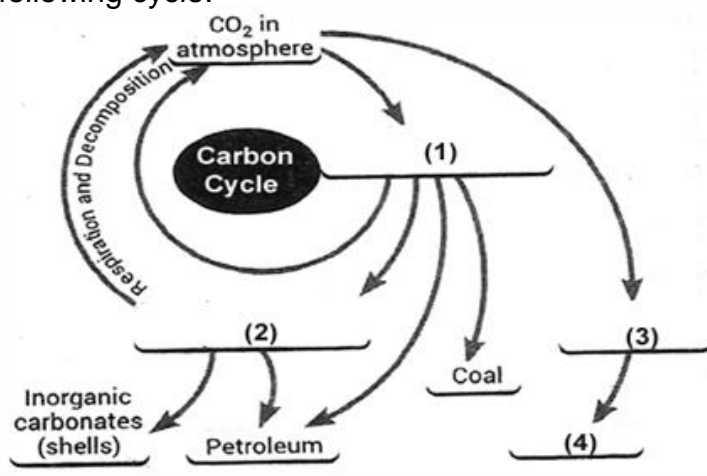
15.   In brief state what happens when:
    a)   Rheo leaves are boiled in water first and then a drop of sugar syrup is put on it?
    b)   Golgi apparatus is removed from the cell.
    c)   Dry apricots are left for sometime in pure water and later transferred to sugar solution.

<center>(OR)</center>

  Write the name of different plant parts in which chromoplast, chloroplast and leucoplast are present and mention their functions also.   (3)

16.   a)   Derive the expression for kinetic energy.
     b)   Illustrate the law of conservation of energy by taking an example of a body of mass 20 kg falling from a height of 3 m
          i)   at highest point   ii)   at 2m
          iii)   just above the ground. Show all the necessary calculations.   (2+3)

17.   a)   The motion of a body of mass 5 kg is shown in the v-t graph. Find acceleration and the force acting on the body.
     b)   State and prove the law of conservation of momentum.
     c)   Why does a gun recoil after firing a bullet?   (2+2+1)
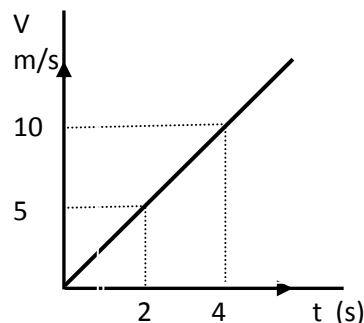
18.   a)   Define atomicity. Give an example of a tri-atomic molecule.

      b)   Give the chemical formula of:
           i)   Calcium chloride.   ii)   Aluminium phosphate

      c)   What is the name of the following compounds?
           i) $Mg(OH)_2$ ii) Na_2CO_3

      d)   How many atoms are present in 2 moles of calcium?   (Atomic mass: Ca=40)

      e)   Calculate the mass of 3.011×10^{26} particles of carbon dioxide.
           (Atomic mass: C=12, O=16)   (5)

19.   a)   Give an example of isobars.

      b)   If chlorine atom is available in the form of two isotopes Cl-35(75%) and
           Cl-37(25%), calculate the average atomic mass of the chorine atom.

      c)   Consider the following table:

Atom	Protons	Neutrons	Electrons
A	8	8	8
B	18	22	18
C	19	20	19
D	8	10	8

           Consider the table given above and answer the following questions:
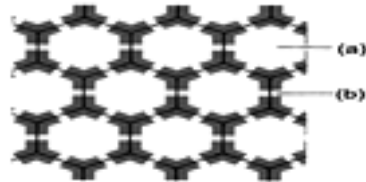   i)   Identify the pair of isotopes.
           ii)   Give the electronic configuration of element C.
           iii) What is the mass number of B?
           iv)   What type of ion will be formed by element A?
           v)   What is the valency of D?
           vi)   Which of these is an inert gas?   (5)

20.   a)   How are simple tissues different from complex tissues in plants.
      b)   Write the name of different types of complex tissues.
      c)   Differentiate between parenchyma and sclerenchyma on the basis
           of their cell wall.
      d)   Draw and identify different elements of phloem.   (5)

21.   a)   Which plants are perennial, evergreen and woody and bear naked seeds?
      b)   Name: i)   The largest phylum of invertebrate.
                      ii)   One mammal that lays eggs.
      c)   What are vertebrates? Write any four main features of vertebrates.
                                    (OR)
      You are given leech, Nereis, prawn and scorpion and all have segmented body
      organisation. Will you classify them in one group? If no, name the phylum to which
      they belong and give the important characters based on which you will separated
      these organisms into different groups.   (5)

SECTION - B

22. a) Define up thrust.
    b) Density of sealing wax is 1.8 g/cm^3. Express it in kg/m^3.   (1+1)

                                      (OR)

    State Archimedes's principle. If an object is immersed in tap water and sea water one by one. In which case loss in weight is more and why?

23. State two laws of reflection of sound. What will happen if we place a porous surface at the back of hollow tubes in the experimental set up of reflection of sound waves?   (2)

24. a) Write the order of steps to separate the components of a mixture containing common salt, sand and iron filings.
    b) A student prepared two solutions A and B. Solution A is soil in water and solution B is milk in water. Distinguish between the two solutions on the basis of stability.   (2)

25. Answer the following:
    a) What change is observed when magnesium ribbon is burnt in air?
    b) Write the formula of the white precipitate formed due to the reaction between barium chloride solution and sodium sulphate solution?
    c) What will happen when the mixture of iron and sulphur is treated with carbon disulphide?
    d) What will be the colour change when copper sulphate is heated?   (2)

26. Four students A, B, C and D observed the roots and leaves of a maize plant and reported their observation as :   (2)
    a) It has fibrous root and reticulate venation in leaves.
    b) It has fibrous root and parallel venation in leaves.
    c) It has tap roots and reticulate venation in leaves.
    d) It has tap roots and parallel venation in leaves.

27. Identify that tissue shown in figure and name A and B.   (2)

-x-x-x-x-x-x-x-x-