# MODEL QUESTION

**Time: 3 hours** **Maximum Marks: 80**

## SECTION–A

1. What is the effect of increase in temperature on the solid state of matter?
2. Define Green Revolution.
3. Write two drawbacks of Rutherford's model of an atom.
4. Relative density of mercury is 13.6. The density of water is $10^3$ kg/m$^3$. What is the density of mercury in SI unit?
5. An object of mass 5 kg is dropped from a height of 10 m. Find its kinetic energy, when it is half way down.
6. Give reason :
   (*a*) Gases exert pressure on the walls of the container.
   (*b*) Gases undergo diffusion very fast.
7. Name the only liquid metal and the only liquid non-metal. Mention two gaseous non-metals.

   **OR**

   Mention three points to justify that air is a mixture and not a compound.
8. Describe the structural features of cell membrane and cell wall.
9. 'Making antiviral medicines is harder than making antibacterial medicines'. Explain this statement.
10. Draw a diagram showing a stone describing a circular path with a velocity of constant magnitude. Also show the direction of the force acting on the stone. Also mark the direction of the velocity at any instant of time.
11. The weight of a body on the surface of the earth is 392 N. What will be the weight of this body on a planet whose mass is double that of the earth and radius is four times that of the earth?
12. In a hot summer afternoon a fruit vendor was selling fruits very loudly. As Amreen was preparing for her exams, she got disturbed. She inquired from her father about the instrument being used by the fruit vendor. Father told her that it was a megaphone also known as "loud speaker". He explained to the fruit vender not to use megaphone near home.
    (*a*) State the principle on which the megaphone works.
    (*b*) Explain its working.
    (*c*) Why megaphones should not be used in residential areas? Mention the value shown by her father.

**13.** What is soil pollution? What factors are responsible for it? Suggest two methods of preventing or reducing soil pollution.

**14.** Describe the structure of a simple glass house mentioning the climatic conditions in which they are used. Name any two greenhouse gases.

**15.** Mention three desirable agronomic characters for crop improvement.

OR

Differentiate between capture fishery and culture fishery.

**16.** (*a*) What are polyatomic ions? Give one example each of polyatomic cation and anion.

(*b*) Find the mass of the following:

(*i*) 0.5 mole of oxygen gas (*ii*) $3.011 \times 10^{23}$ atoms of oxygen

(*iii*) $6.022 \times 10^{24}$ molecules of oxygen

(Given atomic mass of O = 16u; $N_0 = 6.022 \times 10^{23}$ per mole)

**17.** (*a*) (*i*) Explain Bohr and Bury rules for distribution of electrons into different shells.

(*ii*) Draw the electronic structure of element X with atomic number 17 and element Y with atomic number 16.

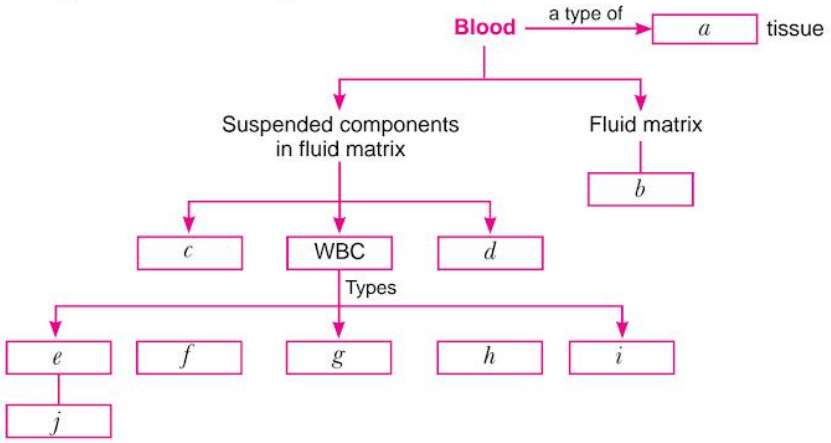
(*b*) Elements A, B, C, D and E have atomic numbers 4, 9, 13, 17 and 20 respectively.

(*i*) Write their electronic distribution.

(*ii*) Determine their valency.

(*iii*) Classify them as metals and non-metals.

**18.** Complete the following flow chart:




Name one more type of connective tissue.

**19.** Give the outline of the classification of plants on the basis of various features.

**20.** Consider the dot diagram for the motion of an object along a horizontal surface. The motion is divided into several time intervals and each labelled with a letter.

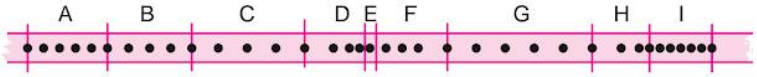
(*a*) During which time interval(s), if any, are there no forces acting upon the objects?

(*b*) During which time interval(s), if any, are the forces acting upon the objects balanced?

(*c*) During which time interval(s), if any, is the net force acting upon the objects?

(*d*) During which time interval(s), if any, is the net force acting upon the objects directed toward the right?

(*e*) During which time interval(s), if any, is the net force acting upon the objects directed toward the left?



OR

(*a*) Newton's first law of motion is also called law of inertia. Justify this statement.

(*b*) A plastic ball and a cricket ball are rolled on the floor with same velocity. Which one will cover larger distance before stopping? Give reason.

(*c*) A truck is moving with a velocity of 72 km/h and it takes 3 s to stop after the brakes are applied. Calculate the force exerted by brakes. Mass of truck is 1200 kg.

**21.** (*a*) Define power. Give its unit.

(*b*) A moving body of mass 20 kg has 40 J of kinetic energy. Calculate its speed.

(*c*) A person carrying a load of 20 kg climbs 4 m in 10 seconds. Calculate the work done and his power. ($g = 10\ m/s^2$)

## SECTION–B

**22.** A student prepared three solutions—a solution of alum, soil and milk in water. Can you distinguish between the three on the basis of transparency and stability ? Explain.

**23.** To verify the law of conservation of mass in a chemical reaction a student takes a known amount of solution of $BaCl_2$ in a small test tube which is hanged in a sealed conical flask, containing $Na_2SO_4$ solution. The flask is slightly tilted so that the two solutions get mixed with each other and a chemical reaction occurs. What is the relation between the masses of the chemicals involved?

**24.** Why is nucleus in eukaryotic cells centrally positioned?

**25.** Four students observed the given specimen carefully and recorded its one adaptive feature and phylum as given below. What is the correct identification of the adaptive feature and phylum of the given animal?

**26.** Two slinky A and B of the same length are made up of two different materials. The time taken by 20 pulses to travel in both of them are 70 s and 90 s respectively. In which slinky, the pulse travels faster and why?

**27.** While determining the density of a metal block using a spring balance and a measuring cylinder, write the correct sequence of steps to be followed in the experiment.