CBSE
Class IX Science
Sample Paper - 15

Time: 3 hrs   **Total Marks: 80**

General Instructions:
- The question paper comprises five sections – A, B, C, D and E. You are to attempt all the sections.
- All questions are compulsory.
- Internal choice is given in sections B, C, D and E.
- Question numbers 1 and 2 in Section A are one mark questions. They are to be answered in one word or in one sentence.
- Question numbers 3 to 5 in Section B are two marks questions. These are to be answered in about 30 words each.
- Question numbers 6 to 15 in Section C are three marks questions. These are to be answered in about 50 words each.
- Question numbers 16 to 21 in Section D are five marks questions. These are to be answered in about 70 words each.
- Question numbers 22 to 27 in Section E are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section A

1. Define eutrophication. (1)

2. What are the components of cattle feed? (1)

Section B

3. Explain the law of constant proportion by taking ammonia as an example.

OR

Give an example each of a monatomic, diatomic and polyatomic element.

4. The distance of the gunman from a cliff is 560 metres. How much time will he take to hear an echo of the gunshot fired by him? (Speed of sound = 340 m/s) (2)

5. Why do animals in colder regions have a thicker layer of subcutaneous fat on their body?
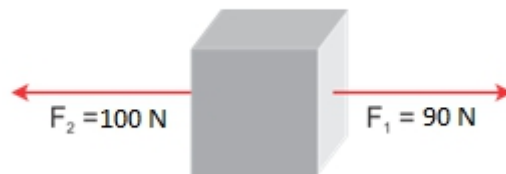
Section C

6. Name the following: (3)
   (a) Suicidal bag of the cell
   (b) Transporting channel of the cell
   (c) Brain of the cell

7. Identify the phyla based on the characteristics stated below. (3)
   (a) Jointed appendages
   (b) Locomotion by setae
   (c) Body perforated with numerous pores

   OR

   How are bony fish different from cartilaginous fish? List any three points of differences.

8. Two forces F_1 and F_2 are acting on an object as shown. (3)

   (i) What must be the force added to F_2 or F_1 so as to make the net force the balanced force?
   (ii) How much force is required to be exceeded on F_1 so that the net force will act along the direction of F_1?
   (iii) After exceeding the force F_1 as per the condition mentioned in question (ii) and if the mass of the object is 10 kg, what will be the acceleration produced in it?

9. State the law of reflection of sound. (3)

   OR

   What are reverberations? Which type of material should be used to avoid reverberations? Give two examples of these materials.

10. What is the need of crop improvement? What are the desirable agronomic characteristics for crop improvement? (3)

11. Give reasons for the following: (3)
    (a) Echidna and Platypus lay eggs but are considered mammals.
    (b) Crocodile has a four-chambered heart but is still a reptile.
    (c) Birds have pneumatic bones.

12. Calculate the number of molecules of sulphur (S_8) present in 16 g of solid sulphur. (3) (Atomic weight of sulphur = 32 g)

OR

State the number of atoms present in each of the following chemical species:

(a) CO_3^{2-}

(b) PO_4^{3-}

(c) P_2O_5

(d) CO

13. When do we use the process of centrifugation? State the principle involved in this process. List any two of its applications in daily life.

14. Harsh and Jay were performing an activity in the chemistry lab of their school. They add a solution of barium chloride to the sulphuric acid taken in the test tube. Harsh suggested that as they already knew the amount of both compounds taken by them, they need not measure the amount of the final solution. On the contrary, Jay insisted on measuring the amount of the final solution, which had barium sulphate and hydrochloric acid.
Atomic mass of ions:
Ba^{2+} = 137 units, Cl^- = 35.5 units, H^+ = 1 unit, S^{2-} = 32 units, O^{2-} = 16 units
Determine the molecular mass of
a) Barium chloride
b) Barium sulphate
c) Hydrochloric acid
d) Sulphuric acid
Comment on Jay's insistence to complete the activity.

15. When thrown vertically downwards, a box covers a distance of 30 m. Find the initial velocity of the box, time taken by it to reach the ground and its final velocity. (g = 10 m/s^2) (3)

Section D

16. An atom contains 20 protons, 20 electrons and 20 neutrons. Mention the following details of that atom: (5)
(a) Atomic number
(b) Mass number
(c) Electronic configuration
(d) Valency

OR

Compare the characteristics of an electron, proton and neutron. (5)

17. (5)

    (a) What is the role of photosynthesis in plants to maintain the biogeochemical cycle?

    (b) The nitrogen cycle is called a perfect cycle in nature. Explain.

18. (5)

    (i) A girl weighing 300 N climbs a vertical ladder. Calculate the work done by her after climbing 3 m.(g = 10 m/s^2)

    (ii) Name the effect of force which occurs when

        a) A moving ball is hit by a bat

        b) A dough ball is pressed by a rolling pin (*belan)*

        c) Breaks are suddenly applied to a moving car

19. (5)

    (i)   What is retardation also called? Why is it called so? State whether it is a scalar or vector quantity.

    (ii)   The speed of a bike decreases from 40 m/s to 30 m/s in 5 seconds. Calculate the acceleration of the bike.

    (iii)   What is the distance travelled during this time by the bike?

OR

A car travels the first 40 km at a speed of 30 km/h, the next 60 km at 36 km/h and the final 80 km at 40 km/h. What is the average speed attained by the car over the entire journey?

20. List three characteristics of particles of matter. Describe one example for each characteristic to illustrate it.

Name the characteristics which are responsible for

(a) spreading of smell of scent in a room

(b) water taking the shape of the vessel in which it is poured (5)

21. Give reasons: (5)

    (a) Majority of children in many parts of India are already immune to Hepatitis A.

    (b) Chronic diseases cause more harm to the body than acute diseases.

    (c) A balanced diet is necessary for maintaining a healthy body.

    (d) Social harmony and good economic conditions are necessary for good health.

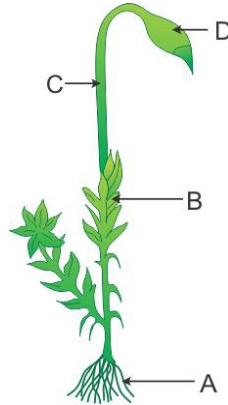   (e) Infectious diseases are called communicable diseases.

OR

(a) List any six characteristics of parenchyma tissue.

(b) Compare the three types of epithelial tissues. (any two parameters)

Section E
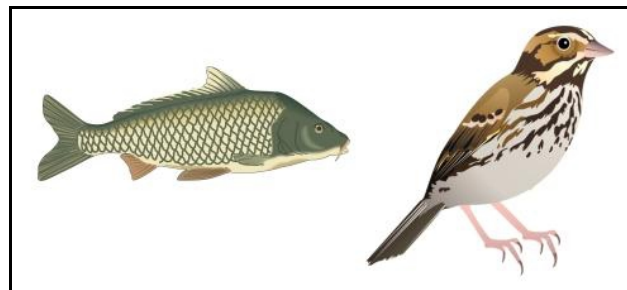
22. Observe the figure carefully. (2)

(a) Which plant is shown in the figure? Write its classification.
(b) Identify the parts A, B, C and D.

23. Observe this picture of a fish and a bird. (2)

(a) Which striking feature enables both of them to be placed in the same phylum?
(b) List any one important adaptation in case of birds and fish.

OR

Give any two features to categorise a plant into monocot or dicot.

24. A mixture consists of an insoluble substance P and a soluble substance Q. The mixture is dissolved in water and filtered. What does the collected filtrate contain? (2)
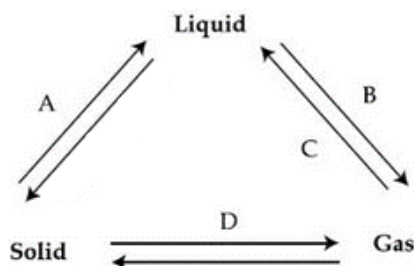
25. Explain what is observed when a strong beam of light is focused on a colloidal solution of starch in water. State your observation on light. (2)

OR

Can the two components of a mixture that are soluble in water be separated by any technique? Justify.

26. Time taken by ultrasonic sound to reach the seabed and return to a SONAR receiver is 3 seconds. At some point the engineer notes that the time of ultrasound reaching the receiver is 2 seconds. What does this situation mean? Calculate the depth from which the obstacle reaches the receiver at 2 s. (Speed of sound in water = 1500 m/s)

(2)

OR

Which of the following instruments produces sound due to vibrating membranes?
i) Sitar
ii) Drum
iii) Flute
iv) *Tabla*
v) Guitar

27. Three pinholes A, B and C are made in a plastic bottle. At which of the three holes is the pressure of the liquid the lowest? Give reason for the same.