CBSE
Class X Science
Sample Paper – 5

Time allowed: 3 hrs. **Maximum 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. How is the brain protected from shocks and injuries? [1]

2. A muscle is called the pacemaker of the heart. Name it. Why do we call it so? [1]

Section B

3. The wattage of a bulb is 24 W when it is connected to a 12 V battery. Calculate its effective wattage if it operates on a 6 V battery (Neglect the change in resistance due to unequal heating of the filament in the two cases). [2]

OR

A bulb of 50 W runs for 30 minutes. Calculate the energy transfer that has occurred during this time.

4. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
Identify the oxidising and reducing agents. Give reason. [2]

5. Differentiate between biodegradable and non-biodegradable waste materials. [2]

Section C

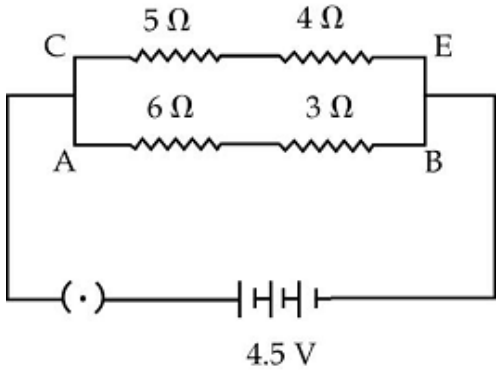
6. How are the alveoli designed to maximise the exchange of gases? [3]

7. Describe the concept of trophic levels. [3]

OR

Which part of the brain controls involuntary actions? Write the function of any of its two regions.

8. Study the circuit and find the [3]



(a) Total resistance in arm CE
(b) Current in arm AB
(c) Potential difference across the 4 ohm resistor

9. [3]

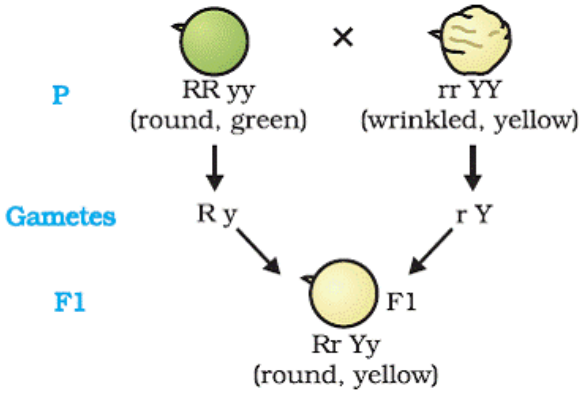
(a) Name two constituents of baking powder.
(b) How does baking powder differ from baking soda?
(c) Explain the action of baking powder in the making of cake (or bread). Write the equation of the reaction involved.

10. [3]

(a) How did the 'Chipko Andolan' ultimately benefit the local population?
(b) Why should we conserve wildlife?
(c) Expand the term IUCN.

11.

(a) How many characters are transmitted in the following cross? Name them. [3]
(b) Define dominant trait and recessive trait.



12. A substance 'X' is used in the kitchen for making tasty crispy pakoras and is also an ingredient of antacid. Name substance 'X'. [3]

(a) How does 'X' help to make cakes and bread soft and spongy.

(b) Is the pH value of a solution of 'X' lesser than or greater than 7.0?

OR

Acetic acid is a typical acid. Write the equation in each case for its reaction with a

(a) Metal

(b) Base/alkali

(c) Carbonate

13. How does the strength of the magnetic field at the centre of a circular coil of a wire depend on [3]

(a) Radius of the coil

(b) Number of turns of wire in the coil

(c) Draw the magnetic lines of force in case of a circular coil of a wire

OR

Mention the factors on which the direction of force experienced by a current-carrying conductor placed in a magnetic field depend.

(a) Under what condition is the force experienced by a current-carrying conductor placed in a magnetic field maximum?

(b) A proton beam is moving along the direction of a magnetic field. What force is acting on the proton beam?

14. Explain giving one example for each of the following chemical reactions:

(a) Double decomposition reaction

(b) Thermal decomposition reaction

(c) Displacement reaction [3]

15. [3]

(a) For what position of the object does a convex lens form an erect and virtual image?
(b) What is regular reflection of light?
(c) What type of mirror is used as a shaving mirror? Support your answer with a reason.

Section D

16. [5]

(a) Name a metal which is placed low in the activity series and exists as a liquid at room temperature.
(b) Write the name and formula of its ore.
(c) How is the metal extracted from this ore?
(d) Write the chemical equation for the reaction involved.

OR

Hydrogen gas is evolved by reacting a piece of magnesium ribbon with water:

(a) Describe how you could show that the gas collected is hydrogen.
(b) Write a symbol equation for the reaction taking place between magnesium and water.
(c) Suggest how the appearance of magnesium would change after a week.
(d) A few drops of universal indicator solution were added to water in a beaker. What colour would you expect to see and what pH would this colour indicate?

17. [5]

(a) Draw a neat diagram of the respiratory system and label the following parts:
(i) Lungs, (ii) Trachea, (iii) Bronchus, (iv) Diaphragm
(b) Name the respiratory pigment in human beings and discuss its role.
(c) Why is the rate of breathing in aquatic organisms faster than that in terrestrial organisms?

OR

(a) What is regeneration of an organism? With a neat diagram, describe regeneration in Planaria.
(b) How does the embryo get nourishment inside the mother's body?
(c) List the changes seen in the ovule and ovary after fertilisation.

18. [5]

(a) How has the method of artificial selection by humans helped in the evolution of different vegetables? Explain in brief with the help of an example.
(b) Mention some of the tools for tracing evolutionary relationships among species.

19. [5]

(a) State the rule to determine the direction of a

(i) Magnetic field produced around a straight conductor carrying current

(ii) Force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it

(iii) Current induced in a coil due to its rotation in a magnetic field

(b) Differentiate between AC and DC. Write one advantage of AC over DC.

20. Which element has [5]

(a) Two shells, both of which are completely filled with electrons

(b) The electronic configuration 2, 8, 2

(c) A total of three shells with four electrons in the valence shell

(d) A total of two shells with three electrons in the valence shell

(e) Twice as many electrons in the second shell as in the first shell

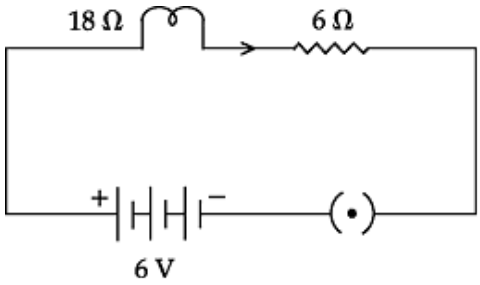
21. [5]

(a) What is electromagnetic induction?

(b) Describe the various methods of producing induced current.

(c) A coil of insulated copper wire is connected to a galvanometer. What will happen if a bar magnet is held stationary inside the coil?

OR



In the given circuit, calculate

(a) Total resistance of the circuit

(b) Current flowing through the circuit

(c) Potential difference across the lamp and the resistor

Section E

22. The following pairs of substances are available in the laboratory: [2]

(a) Zinc and dil. hydrochloric acid

(b) Sodium hydrogen carbonate solution and dilute hydrochloric acid

Which of these can be used to evolve a colourless and odourless gas that produces a pop sound on burning?

OR

How does the pH vary with hydrogen ion concentration? A fruit juice has pH between 3.4 and 2.6. Is the fruit juice acidic or basic in nature?

23. Sita heated 2 g of a white-coloured compound. After sometime she found that the colour of the compound changes to yellow with the evolution of reddish brown gas. What is this chemical compound and give the reaction involved? [2]

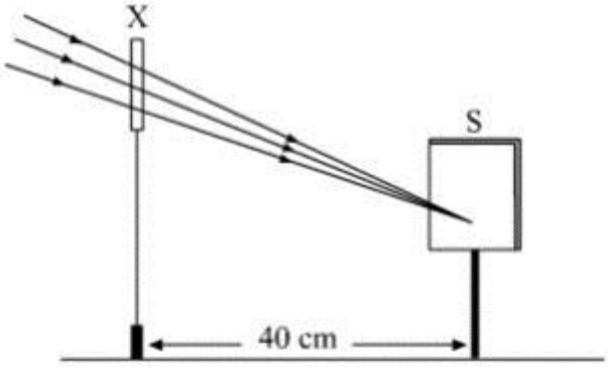
24. A student observed a permanent slide showing asexual reproduction in yeast. Draw diagrams of the observation he must have made from the slide. Also name the process. [2]

25. Name the type of asexual reproduction in which two individuals is formed from a single parent and the parental identity is lost. Draw the initial and final stages of this type of reproduction. State the event with which this reproduction starts. [2]

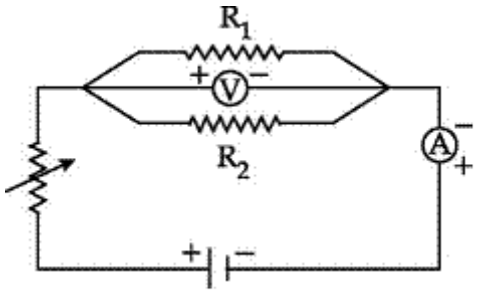
OR

Mention the four events which occur during the binary fission in *Amoeba*.

26. A student focused the image of a distant object using Device **X** on a white screen **S** as shown in the figure. If the distance of the screen from the device is 40 cm, find the focal length of Device **X** and state whether it is a concave mirror/lens or convex mirror/lens.[2]



27. A circuit to determine the equivalent resistance of two resistors in a parallel combination is shown below. The terminals of which component are connected incorrectly? How can this be corrected? [2]



OR

In circuit A, three bulbs are connected in series. In circuit B, three bulbs are connected in parallel. In circuit C, only one bulb is connected. Consider the potential difference in all circuits is the same.

(a) In which circuit do the bulbs glow dimmest?
(b) Which circuit emits light with maximum intensity?
(c) In which circuit does the bulb glow with equal brightness as that of the bulb connected in circuit C?