

CBSE
Class X Science

Time: 3 hrs

Total Marks: 80

General Instructions:

1. The question paper comprises of two **Sections, A and B**. You are to attempt both the sections.
 2. All questions are compulsory.
 3. All questions of **Section A** and **Section B** are to be attempted separately.
 4. There is an internal choice in **three** questions of **three** marks each, **two** questions of **five** marks each in Section A and in **one** question of **two** marks in Section B.
 5. Question numbers **1** and **2** in **Section A** are **one mark** questions. These are to be answered in one word or in **one** sentence.
 6. Question numbers **3** to **5** in **Section A** are **two marks** questions. These are to be answered in about **30 words each**.
 7. Question numbers **6** to **15** in **Section A** are **three marks** questions. These are to be answered in about **50 words each**.
 8. Question numbers **16** to **21** in **Section A** are **five marks** questions. These are to be answered in about **70 words each**.
 9. Question numbers **22** to **27** in **Section B** are based on practical skills. Each question is a **two** marks question. These are to be answered in brief.
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Section A

1. Why are organisms formed by asexual reproduction considered clones? (1)
2. Which of the following belong to the first trophic level? (1)
Grasshopper, rose plant, neem plant, cockroach, vulture
3. Why do ventricles have thicker walls than auricles? (2)
4. An electric bulb is connected to a 220 V generator. The current flowing is 2 A. Find the power of the bulb and resistance of its filament. (2)
5. How can the valency of an element be determined if its electronic configuration is known? What will be the valency of an element of atomic number 9? (2)

6. A water-insoluble calcium compound A on reacting with dil. H_2SO_4 released a colourless and odourless gas B with brisk effervescence. When gas B was passed through lime water, the lime water turned milky and again formed compound A. Identify A and B, and write the chemical equations for the reactions involved.
7. Give reasons for the following: (3)
- Diffusion is insufficient to meet the oxygen requirements of multicellular organisms.
 - People living in the mountains have more red corpuscles in their blood than people living in the plains.
 - Energy requirement is less for amphibians than for birds.
8. Complete the following equations:
- $\text{CH}_4 + \text{O}_2 \rightarrow$
 - $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Hot conc. H}_2\text{SO}_4}$
 - $\text{CH}_3\text{COOH} + \text{NaOH} \rightarrow$ (3)

9. Why does a current-carrying solenoid, when suspended freely, rest along a particular direction? Explain. (3)

OR

Is it possible that a magnetic field be produced without using a magnet? Show that a magnetic field exerts a force on a current-carrying conductor with a suitable experiment.

10. Name and define the phenomenon due to which we observe a rainbow. Explain with a diagram and name the colour of light which bends (i) the most and (ii) the least while passing through a glass prism. (3)
11. An object is placed between infinity and the pole of a convex mirror. Draw a ray diagram and also state the position, the relative size and the nature of the image formed. (3)
12. Explain why: (3)
- Digestion of food is a decomposition reaction.
 - All decomposition reactions are endothermic reactions.
 - A pop sound is produced when a burning candle is brought near the mouth of a test tube used in the electrolysis of water.

OR

- Soaps are not effective for washing woolen garments. Why?
- Detergents are called 'soapless soaps'. Why?
- Why is common salt added in the soap-making process?

13. Rahul complained of acidity on reaching home after a marriage. Explain the reason for acidity. (3)

OR

Most of the CO₂ produced in a tissue enters the red blood cells by diffusion. What happens to this CO₂?

14. If we cross a pure-bred tall (dominant) pea plant with a pure-bred dwarf (recessive) pea plant, we will obtain pea plants of the F₁ generation. If we now self-cross the pea plants of the F₁ generation, then we obtain pea plants of the F₂ generation. (3)

(a) What would the plants of the F₁ generation look like?

(b) State the ratio of tall plants to dwarf plants in the F₂ generation.

(c) State the type of plants not found in the F₁ generation but which appeared in the F₂ generation, mentioning the reason for the same.

15. Sanjeev, a marketing manager in an MNC, was not keeping well for a long time. He underwent a complete medical check-up and was diagnosed as HIV+. He was terminated on account of his condition. (3)

(a) To which category of diseases does AIDS belong? Give its causative organism.

(b) Do you think it was a right decision by the company to terminate Sanjeev?

(c) What concern should society show towards HIV+ individuals?

16. (5)

(a) Draw a diagram of the excretory unit of the human kidneys and label the following parts:

Bowman's capsule, glomerulus, collecting duct, renal artery

(b) Write the important function of the structural and functional unit of the kidneys.

(c) Write any one function of an artificial kidney.

17. Which physical quantity indicates the degree of convergence or divergence of light rays passing through a lens?

One student uses a lens of focal length +75 cm and another of -75 cm. Find the nature of each lens and find their powers. State which of the two lenses will always give a virtual, erect and diminished image irrespective of the position of the object. (5)

18. (a) What are amphoteric oxides? Give two examples. (5)

(b) Metals such as sodium and potassium are kept immersed in kerosene. Why?

(c) Give the balanced chemical equation for the reaction between aluminium and steam.

(d) Name a non-metal which is

(i) Liquid at room temperature

(ii) Lustrous

OR

(a) Name one metal each which is extracted by:

- (i) reduction with carbon
- (ii) electrolytic reduction
- (iii) reduction with aluminium
- (iv) reduction with heat alone

(b) Give reason for the following :

Carbonate and sulphide ores are usually converted into oxides during the process of extraction of metals.

19.

[5]

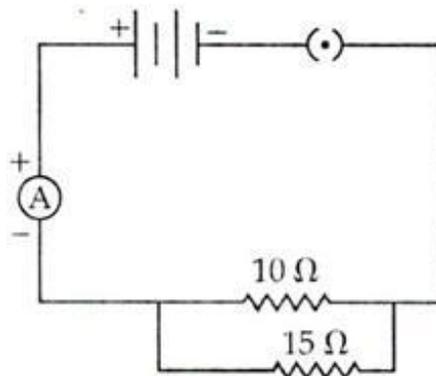
(a) What is an electric circuit?

(b) Calculate the number of electrons that flow per second to constitute a current of one ampere. Charge on an electron is $1.6 \times 10^{-19}\text{C}$.

(c) Draw an electric circuit for studying Ohm's law. Label the circuit component used to measure electric current and potential difference.

OR

Study the following circuit and answer the questions that follow.



(a) State the type of combination of the two resistors in the circuit.

(b) How much current is flowing through the

- i. 10 ohm resistor
- ii. 15 ohm resistor

(c) What is the ammeter reading?

(d) Define the S.I. unit of current.

20.

[5]

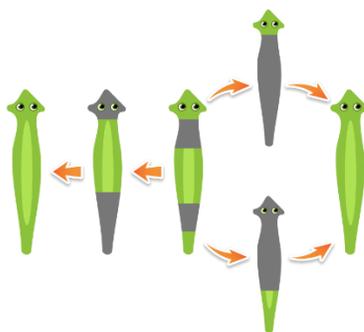
(a) Why should we conserve our forests? List any two causes of deforestation.

(b) Prejudice against the traditional use of forest areas has no basis. Comment.

21. An organic compound 'C' molecular formula ($C_3H_6O_2$) reacts with sodium metal to form a compound 'R' and evolves a gas which burns with a pop sound. Compound 'C' on treatment with an alcohol 'A' in presence of an acid forms a sweet smelling compound 'S' (molecular formula $[C_4H_8O_2]$). On addition of NaOH to 'C', it also gives 'R' and water. 'S' on treatment with NaOH solution gives back 'R' and 'A'. Identify 'C', 'R', 'A', 'S' and write reactions involved. (5)

Section B

22. Observe the figure carefully. (2)



- (a) Name the method of reproduction. What happens in this method?
(b) Give two examples of organisms which reproduce by this method.
23. How can potato plants be propagated faster—by sexual reproduction or by vegetative propagation? (2)
24. Write the balanced chemical equation for the chemical reaction between manganese dioxide and aluminium powder. What happens if manganese powder is heated with aluminium oxide? (2)
25. Complete the following reactions: (2)
a) $Mg + HCl \rightarrow$
b) $CaCO_3 + H_2SO_4 \rightarrow$
26. A simple circuit has its resistors connected in series. What will be the change in voltage and amount of current flowing through that circuit if a student rearranges and connects the resistors of that circuit in parallel? (2)
- OR**
- In a voltmeter there are 20 divisions between the 0 mark and 0.5 V mark. What is the least count of the voltmeter?
27. Given that the refractive index of a glass slab is 1.5, four observations were made by tracing the path of a ray of light passing through it for an angle of incidence 40° . The observed measures of the angle of refraction were 18° , 22° , 25° and 30° , respectively. Which of these observations are correct? (2)