

Sample Question Paper

Class X

Subject: Science

Max. Marks: 80

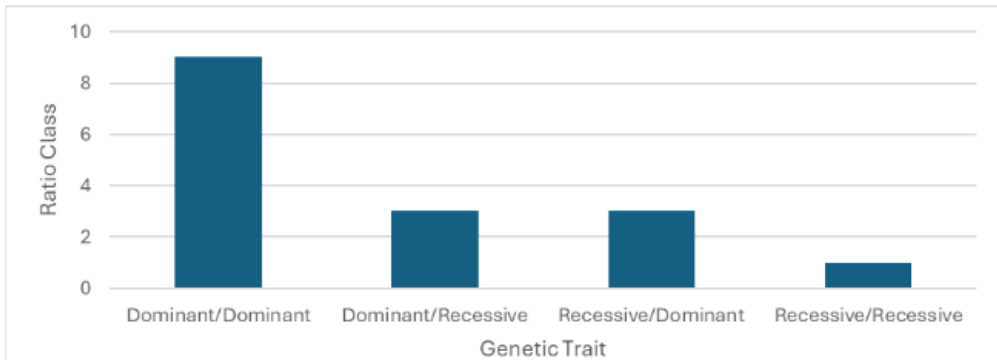
Max. Time: 3 Hours

General Instructions:

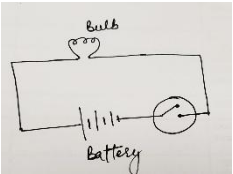
- I. This question paper consists of 37 questions in 3 sections. Section A is Chemistry; section B is Biology and section C is Physics.
- II. All questions are compulsory.
- III. Section A has 13 questions; Section B has 13 questions and Section C has 11 questions.

S.no	Question	Marks
Section A: Chemistry		
1	The reaction $CaO + H_2O \rightarrow Ca(OH)_2$ is an example of a: A. Decomposition reaction B. Displacement reaction C. Combination reaction D. Double displacement reaction	1
2	A student writes the equations below for the formation of water: Step I: $H_2 + O_2 \rightarrow 2H_2O$ Step II: $2H_2 + O_2 \rightarrow 2H_2O$ What is the significance of writing step II? A. It shows that more hydrogen makes the reaction faster than oxygen. B. It equalizes the number of atoms of each element on both sides. C. It indicates that two molecules of water are always produced. D. It confirms that the reaction occurs only in the presence of oxygen.	1
3	Which substance is prepared from common salt as a raw material? A. Calcium carbonate B. Copper sulphate C. Sodium hydroxide D. Magnesium oxide	1
4	Which gas is produced when a metal reacts with diluted acid? A. Oxygen gas B. Hydrogen gas C. Nitrogen gas D. Carbon dioxide	1
5	Carbon mainly forms covalent bonds with other carbon atoms and other elements, because it: A. gains four electrons to complete its octet. B. shares electrons to complete its octet. C. loses four electrons to complete its octet. D. shares two electrons and loses other two electrons to become stable.	1

6	Propanol and butanol show almost similar chemical reactions but have varying boiling points. What does this pattern suggest? A. Both share a functional group but differ in chain length. B. Both have the same molecular mass but different formulas. C. Both contain the same number of hydrogen atoms. D. Both belong to different functional groups.	1
7	A student wants to name the compound $\text{CH}_3\text{--CH}_2\text{--OH}$. Which of the following sequences should the student follow to name it correctly? A. Identify functional group → count carbons → assign '-ane' suffix B. Count hydrogen atoms → locate double bond → use alcohol suffix C. Count carbon atoms → identify functional group → use alcohol suffix D. Calculate molecular mass → identify valency → choose '-OH' suffix	1
8	Two classmates argue about rusting. One says it is just a physical change, the other says it is due to a chemical reaction. What is a constructive way to settle this difference during discussion?	2
9	A student claims that if a metal produces bubbles with acid, it must be highly reactive. Provide your thoughts on this claim. Support your idea using a reaction equation.	2
10	When magnesium burns in oxygen, magnesium oxide is formed. i. Write the balanced chemical equation for this reaction. ii. What is the type of this reaction? Explain. iii. What does happen to the elements during the reaction?	3
11	You are given four metals: zinc, copper, iron, and magnesium. Write any three possible displacement reactions of a combination of these metals where a more reactive metal displaces a less reactive one from its salt solution. Write balanced equations and identify which metal is displaced in each case.	3
12	Two students are planning an experiment with bromine water. One insists that both ethane and ethene will decolorize bromine water, while the other disagrees. Their argument is delaying the experiment. How would you help them resolve the conflict using your understanding of bonding in carbon compounds? Explain the reasoning you would present to help them agree.	3
13	A marble statue in a city park is gradually losing its shine and fine surface details. The city is known to experience acid rain. Explain the chemical process responsible for this damage using the appropriate chemical equations. How could a conservation team confirm whether the acid rain is causing corrosion? Suggest some steps that could be taken to reduce or slow down the damage.	5
Section B: Biology		
14	During a classroom discussion, it is stated that oxygen is required to release energy from food in cells. Which cell organelle is directly involved in the process? A. Mitochondria carrying enzymes B. Nucleus containing chromosomes C. Vacuole storing cell sap D. Endoplasmic Reticulum Forming Membranes	1
15	When a tendril of a climbing plant coils around a support, the response is identified as coordination in plants because it involves: A. nerve impulses causing muscle action. B. rapid movement using stored energy. C. directional growth due to stimulus. D. immediate change in leaf position.	1

16	In a group task, a student says excretion happens only through the kidneys. While other student says lungs and skin also remove wastes. Both are confident about their views, and the group is unsure. What would be the most appropriate action? A. Ask both to elaborate and check from the class notes on excretion. B. Keep both views in their final notes on their own and let the teacher choose the correct one later. C. Vote within the group to finalize the opinion chosen by the majority. D. Wait for the teacher to decide who is correct.	2										
17	During a group task, students need to classify actions as reflex or voluntary. Student A says pulling a hand from a hot object is voluntary. While another student B, says it is a reflex controlled by the spinal cord. The group must submit only one response together. What would be the most appropriate response? A. Suggest that both explain their reasoning and check it with the textbook before deciding together. B. Accept student B's answer because it sounds more scientific and completes the task quickly. C. Write student B's answer but tell student A that they can check it to timely completion of task. D. Move ahead with other parts of the work and leave this part undecided.	2										
18	During a project on a pond ecosystem, your group creates a food web. One member says removing small fish from the food web will not affect birds because birds can eat insects. Another member shows data from a similar pond where bird numbers declined after small fish disappeared. What is the most appropriate response? A. Suggest examining the data carefully and revising the food web if evidence shows fish affect bird populations. B. Keep the original food web since birds eating insects already explains their survival. C. Accept both ideas as equal and submit the project without changing the diagram. D. Ignore the outside data because it comes from a different pond ecosystem.	2										
19	Name the cell organelle that stores water, food, and wastes in plant cells. Mention any one way this storage function supports a life process in plants.	2										
20	How does the semi-permeable nature of the cell membrane help a cell during nutrition and excretion?	2										
21	Hormones act much slower than nerve impulses in the body. Then, why are hormonal responses considered necessary for coordination in the body?	2										
22	The bar graph given below represents the Mendelian F₂ dihybrid ratio for seed shape (Round/R vs wrinkled/r) and seed colour (Yellow/Y vs green/y) in pea plants.  <table><caption>Mendelian F₂ Dihybrid Ratio Data</caption><thead><tr><th>Genetic Trait</th><th>Ratio Class</th></tr></thead><tbody><tr><td>Dominant/Dominant</td><td>9</td></tr><tr><td>Dominant/Recessive</td><td>3</td></tr><tr><td>Recessive/Dominant</td><td>3</td></tr><tr><td>Recessive/Recessive</td><td>1</td></tr></tbody></table>	Genetic Trait	Ratio Class	Dominant/Dominant	9	Dominant/Recessive	3	Recessive/Dominant	3	Recessive/Recessive	1	2
Genetic Trait	Ratio Class											
Dominant/Dominant	9											
Dominant/Recessive	3											
Recessive/Dominant	3											
Recessive/Recessive	1											

	Draw the bar graph representing the Mendelian F ₂ dihybrid ratio for a cross between round-yellow (RRYy) and wrinkled-yellow (rrYy) pea plants.	
23	In a classroom debate, one student argues that plants take food directly from the soil through roots. Another student says plants prepare their own food, but for that absorb minerals from the soil. How would you evaluate both ideas of nutrition in plants? Describe how you would reach to a scientifically accurate explanation.	3
24	A group of students studied in a journal that a bird species' beak size changed over generations as food sources changed. Some students think this is a coincidence, while others link it to a survival advantage. How should you examine both viewpoints before concluding?	3
25	During a class garbage audit, different groups measure the amount of plastic waste produced in one day. • Group A reports 2 kg • Group B reports 5 kg • Group C reports 2.5 kg Though all groups collected waste from the same school on the same day, their values varied. Explain how the students should work together to find out why their results differ and how they can report a reliable final finding.	3
26	A farmer wants to increase both the number and quality of rose and grapevine plants on his farm. While exploring scientific methods of plant reproduction, he learns about the following practices: In grapevines, a low branch is bent to the ground and covered with soil. After some time, it develops roots and grows as a new plant. In roses, a stem from one plant is attached to the stem of another healthy plant so that they grow together and combine desirable features. Answer the following questions: I. Identify and explain the vegetative propagation techniques used in both cases. Describe the biological process involved in each. II. Explain how these methods help the farmer improve both the quantity and quality of plants. III. Give two scientific reasons why vegetative propagation is often preferred over seed propagation in such crops.	5
Section C: Physics		
27	A person who can see nearby objects clearly but cannot see distant objects distinctly is suffering from: A. Hypermetropia. B. Myopia. C. Presbyopia. D. Cataract.	1
28	When white light passes through a glass prism, it splits into different colors because: A. Light reflects inside the prism. B. Different speeds of light colors inside the prism. C. The prism absorbs some colors. D. After refraction, all colors reflect into the prism.	1
29	When three resistors are connected in parallel in a circuit, the equivalent resistance of the circuit is:	1

	A. Equal to the sum of all resistances B. Greater than the value of the largest resistance C. Less than the value of the smallest resistance D. Equal to the average value of all three resistances	
30	In a circuit, if the wire is replaced by another wire of the same material and length but thicker. The resistance of the circuit will: A. Increase B. Decrease C. Remain same D. Become zero	1
31	In the circuit, the symbol encircled represents: A. Closed key B. Resistor C. Fuse D. Open key 	1
32	What is meant by electric power? Write its SI unit.	2
33	If a pattern is observed on the screen after passing white light through a prism. If the position of the prism remains the same but white light is replaced with red light only, what change will you observe in the pattern on the screen? Why?	2
34	During a practical, a student places a candle very close to a concave mirror and is unable to get its image on a screen. The image appears bright in the mirror but not on the screen. Why are students not able to obtain images on the screen? Explain what the student should do to successfully obtain the image on the screen.	3
35	In a home, the fuse wire melts repeatedly when the washing machine and heater are used together. The family wants solutions but does not want to stop using appliances. Suggest three different ways to solve this issue.	3
36	A community center wants a low-cost vision aid using convex lenses of varying focal length that can help both: i. read small text nearby ii. see distant signboards clearly Propose a way to design such a device. Explain how lens choice and positioning would change for near and distant viewing using the ray diagrams. Suggest how users could adjust it for different needs.	5
37	A factory owner plans to replace all bulbs in their factory with energy-efficient LED bulbs. Each old bulb is 100 W and is used for 5 hours daily. The new LED bulb is 20 W and provides similar brightness. Answer the following: i. How much energy is saved per bulb after replacement? ii. Is the replacement of bulbs anyway beneficial for the environment? iii. Why are energy-efficient appliances scientifically and socially beneficial?	5