

Roll no _____

PRE-BOARD EXAMINATION (2023-24)

CLASS-X

SUBJECT: SCIENCE (086)

SET 2

Max.Marks:80

Time allowed: 3 hours

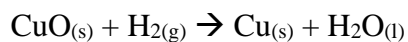
General Instructions:

- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short Answer questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

Multiple Choice Questions

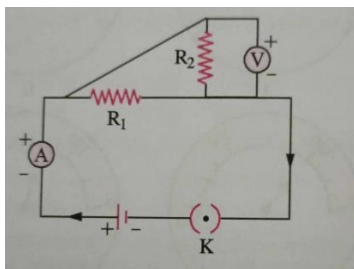
1. Which is the oxidising agent in the following reaction:



- a) $\text{CuO}_{(s)}$
 - b) $\text{H}_{2(g)}$
 - c) $\text{Cu}_{(s)}$
 - d) $\text{H}_2\text{O}_{(l)}$
2. The reaction in which two compounds exchange their ions to form two new compounds is:
- a) A displacement reaction
 - b) A decomposition reaction
 - c) An oxidation reaction

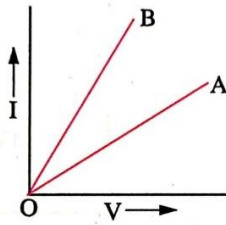
- d) A double displacement reaction
3. Plaster of Paris is made from :
- a) Limestone
 - b) Slaked lime
 - c) Quick lime
 - d) Gypsum
4. With the increase in the concentration of hydrogen ions, the pH value will
- a) Increase
 - b) Decrease
 - c) Remain constant
 - d) Remain fluctuating
5. Metals which are mixed with iron to make stainless steel are:
- a) Copper and nickel
 - b) Copper and chromium
 - c) Nickel and chromium
 - d) Copper and silver
6. Which one of the following properties is not generally exhibited by ionic compounds?
- a) Solubility in water
 - b) Electrical conductivity in solid state
 - c) High melting and boiling point
 - d) Electrical conductivity in molten state
7. During electrolytic refining of zinc, it gets:
- a) Deposited on cathode
 - b) Deposited on anode
 - c) Deposited on cathode as well as anode
 - d) Remains in the solution
8. Carbohydrates in plants are stored in the form of
- a) Glycogen
 - b) Starch
 - c) Lactic acid

- d) None of the above
9. In the experiment chlorophyll is essential for photo synthesis, why is the leaf dipped in alcohol not heated directly?
- a) Alcohol is inflammable
 - b) For better heating
 - c) Alcohol is acidic in nature
 - d) Alcohol is basic in nature
10. The number of pair(s) of autosomes in the zygote of humans is
- a) Twenty
 - b) Twenty-Two
 - c) Twenty-Three
 - d) Twenty-Four
11. Dwarfism results due to
- a) Excess secretion of thyroxine
 - b) Less secretion of adrenaline
 - c) Excess secretion of growth hormone
 - d) Less secretion of growth hormone
12. The anther contains
- a) Sepals
 - b) Ovules
 - c) Carpel
 - d) Pollen grains
13. Which of the circuit components in the following circuit diagram are connected in parallel?



- a) R_1 and R_2 only
- b) R_1 , R_2 and V
- c) R_2 and V only

d) R_1 and V only



14. Graphs between electric current (I) and potential difference (V) across two conductors A and B made of same material and plotted as shown in figure. In this case,

- a) Resistivity of conductor A is greater than the resistivity of conductor B.
- b) Resistivity of conductor A is less than the resistivity of conductor B.
- c) Resistivity of conductor A is equal to the resistivity of conductor B.
- d) Resistivity of conductor B is equal to or greater than the resistivity of conductor A.

15. The opening and closing of stomatal pore depends upon

- a) Oxygen
 - b) Temperature
 - c) Water and guard cells
 - d) Concentration of CO_2 in stomata
16. If a pea plant having pink flowers is crossed with a pea plant having white flowers, what percentage of pink and white flowering plants respectively will be obtained in F_2 generation:
- a) 75%, 25%.
 - b) 50%, 50%.
 - c) 25%, 75%.
 - d) 25%, 25%.

Assertion-Reason Type

In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

17. Assertion: All decomposition reactions are generally endothermic reactions.

Reason: All decomposition reactions generally occur with the absorption of heat or light energy.

18. Assertion: Traits like height or eye colour are inherited traits.

Reason: Inherited traits are not transferred from parents to offsprings progeny.

19. Assertion: Iron filings sprinkled around a current carrying conductor arrange themselves in a regular pattern.

Reason: A current carrying conductor exerts magnetic force in the space surrounding it.

20. Assertion: The normal systolic pressure in human beings is 120 mm of Hg.

Reason: It is measured by sphygmomanometer.

Section B

21. a) Why is combustion reaction an oxidation reaction?

b) How will you test whether the gas evolved in a reaction is hydrogen?

22. What is the advantage of separate channels in mammals and birds for oxygenated and deoxygenated blood?

23. What is meant by double circulation in human beings? Why is it necessary?

OR

Though liver does not secrete any digestive enzymes, even then it is an essential organ of digestive system. Explain.

24. Name the phenomena responsible for

a) Tyndall effect in colloidal solutions.

b) Twinkling of stars.

c) White colour of clouds.

d) Spectrum of colours in a rainbow.

25. Name the three phenomena of light in the formation of rainbow in the sky. Arrange these phenomena in proper sequence.

OR

Name the phenomenon responsible for (i) Advanced sunrise and delayed sunset (ii) Colour of water in deep sea (iii) Twinkling of stars (iv) White colour of clouds.

26. How much energy will be available to hawks in the food chain comprising hawk, snake, paddy and mice, if 100000 J of energy is radiated to paddy from the sun?

Section C

27. i) Define the term 'anode mud'. Name the electrode made of pure metal.

ii) Give the reactions taking place at anode and at cathode.

28. A metal X acquires a green colour coating on its surface on exposure to air.

- a) Identify the metal X and name the process responsible for this change.
- b) Name and write chemical formula of the green coating formed on the metal.
- c) List two important methods to prevent the process.

OR

- a) Show the formation of MgO by the transfer of electrons.
 - b) Name the cation and anion.
29. Write three events of photosynthesis.
30. Which of the following materials are non-biodegradable – aluminium wire, tea leaves, synthetic fibres, wool. Define the term non-biodegradable materials.
31. Identify the nature of the mirror and mention two characteristics of the image formed when magnification ($m = +6$). Draw a ray diagram to show the image formation in this case.
32. a) A convex lens of power 4D is combined with a thin concave lens of power 2D. What is the power and nature of the combination of lenses?
b) If the refractive index of glass for light entering from air to glass is $\frac{3}{2}$, find the refractive index of light going from glass to air.
c) Define the term principal axis of a spherical mirror.
33. a) A compass needle is placed near a current carrying wire. State your observations for the following cases and give reasons for the same in each case:
i) Magnitude of electric current in wire is increased.
ii) The compass needle is displaced away from the wire.
b) Name the rule to find the direction of magnetic field around a straight wire carrying current.

Section D

34. Srishti heated ethanol with a compound A in the presence of a few drops of concentrated sulphuric acid and observed a sweet-smelling compound B is formed. When B is treated with sodium hydroxide it gives back ethanol and a compound C.
- a) Identify A and C.
 - b) Give one use each of compounds A and B.
 - c) Write the chemical reactions involved and name the reactions.

OR

- a) What are unsaturated hydrocarbons? How are they distinguished from saturated hydrocarbons?
- b) Seema by mistake forgot to label the two test tubes containing ethanol and ethanoic acid.

Suggest an experiment to identify the substances correctly. Illustrate the reactions with the help of chemical equation.

35. What is budding? Explain reproduction in hydra by budding with diagrams.

OR

What is pollination? State the difference between self and cross pollination. Write two functions of ovaries in human beings.

36. a) What is a solenoid?

b) What is the pattern of magnetic field lines inside a solenoid? What do they indicate?

c) State the two ways by which the strength of an electromagnet can be increased.

OR

a) Draw the magnetic field lines through and around a single loop of wire carrying electric current.

b) How will the magnetic field produced in a current carrying circular coil change if we -

i) increase the value of current?

ii) increase the distance from the coil?

iii) increase the number of turns in the coil?

Section E

Read the following passage and answer the questions

37. All metals do not react with oxygen with the same speed. Different metals show different reactivity towards oxygen. For eg. Potassium and Sodium react so vigorously that they catch fire even if kept in open air. They are therefore kept under kerosene or paraffin oil. Metal oxides are solids. They are basic in nature. They turn red litmus blue. Some metal oxides such as aluminium oxide, zinc oxide etc. show both acidic as well as basic behaviour.

a) Arrange the following metals in the decreasing order of reactivity – Fe, Al, Zn, Mg.

b) Name the element which reacts with oxygen to give a compound with a high melting point.

OR

b) Why are sodium and potassium stored in kerosene?

c) An element X forms an oxide X_2O_3 which is basic in nature. Is the element metal or non-metal?

d) Name an element which reacts violently with water.

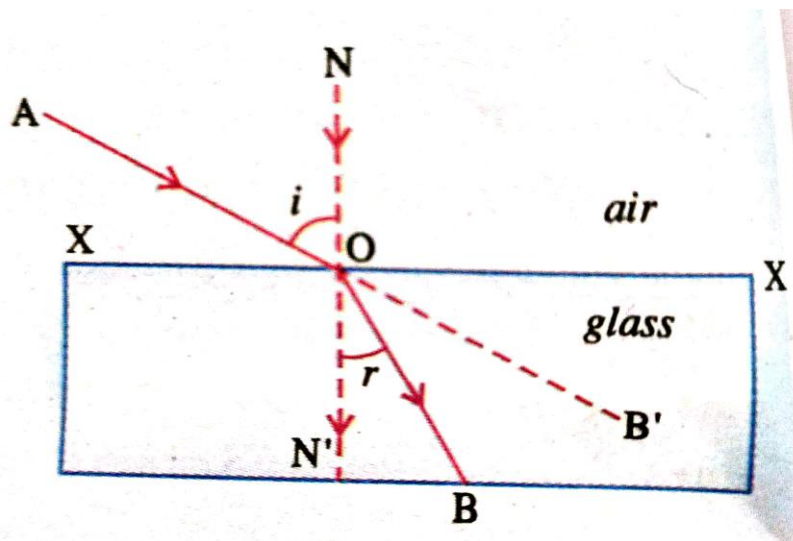
38. Mendel used a number of contrasting visible characteristics of garden peas – round / wrinkled

seeds, tall / short plant, white / violet flowers and so on. He took pea plants with different characteristics – a tall plant and a short plant, produced progeny from them and calculated the percentages of tall or short progeny. “In this first generation, or F1 progeny – no medium height plants.” All plants were tall. Mendelian experiments test this by getting both the parental plants and these F1 tall plants to reproduce by self-pollination.

- Give genotype of the parents of F1 progeny.
- Give genotype and phenotype of F1 generation.
- Make a cross between pure tall and pure dwarf pea plant

OR

- In a cross between pure tall and pure dwarf pea plant, which character is dominant and recessive? What do you understand by dominant character?



39.

In the above figure, when ray AO enters the glass, it prefers to travel in glass in the least possible time. Decidedly it will take less time if it follows path OB instead of OB' because glass is optically denser than air and speed of light decreases in glass. It is clear that it happens when the ray strikes the interface obliquely. Thus, if a ray of light strikes the interface at 90 degrees i.e., along the normal, then it has no option but to follow the same straight-line path along the normal.

- What is the cause of refraction of light?
- What happens when a ray of light strikes the surface of separation between the two media at right angle.
- Redraw the given diagram to show the path of emergent ray. Also mark the angle of emergence and the lateral shift suffered by the ray of light while passing through the glass slab.

OR

- c) i) What is the relationship between the angle of incidence and the angle of emergence when a ray of light undergoes refraction through a parallel sided glass slab?
- ii) List any two factors on which lateral shift suffered by a ray of light while passing through a glass slab depends.