## BLUE PRINT : CLASS X

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Note: * - Internal Choice Questions of same chapter.
\textsuperscript{AR} – Assertion, Reason based question
SECTION – A

1. Which of the following are combination reactions?
   (i) $2\text{KClO}_3 \xrightarrow{\text{Heat}} \text{KCl} + 3\text{O}_2$
   (ii) $\text{MgO} + \text{H}_2\text{O} \rightarrow \text{Mg(OH)}_2$
   (iii) $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$
   (iv) $\text{Zn} + \text{FeSO}_4 \rightarrow \text{ZnSO}_4 + \text{Fe}$
   (a) (i) and (iii)  (b) (iii) and (iv)  (c) (ii) and (iv)  (d) (ii) and (iii)

2. In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus (see below Figure) was set up. Which among the following statement(s) is(are) correct?
   (i) Bulb will not glow because electrolyte is not acidic
   (ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction.
   (iii) Bulb will not glow because circuit is incomplete
   (iv) Bulb will not glow because it depends upon the type of electrolytic solution
   (a) (i) and (iii)  (b) (ii) and (iv)  (c) (ii) only  (d) (iv) only

3. What is the maximum resistance which can be made using five resistors each of $\frac{1}{5} \Omega$?
   (a) $\frac{1}{5} \Omega$  (b) $10 \Omega$  (c) $5 \Omega$  (d) $1 \Omega$
4. Identify the circuit (see below Figure) in which the electrical components have been properly connected.

(a) (i)  
(b) (ii) 
(c) (iii)  
(d) (iv)  

5. A person cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using a lens of power
(a) + 0.5 D  
(b) − 0.5 D  
(c) + 0.2 D  
(d) − 0.2 D  

OR
A student sitting on the last bench can read the letters written on the blackboard but is not able to read the letters written in his text book. Which of the following statements is correct?
(a) The near point of his eyes has receded away  
(b) The near point of his eyes has come closer to him  
(c) The far point of his eyes has come closer to him  
(d) The far point of his eyes has receded away

6. Which of the following are the characteristics of isotopes of an element?
(i) Isotopes of an element have same atomic masses  
(ii) Isotopes of an element have same atomic number   
(iii) Isotopes of an element show same physical properties  
(iv) Isotopes of an element show same chemical properties
(a) (i), (iii) and (iv)  
(b) (ii), (iii) and (iv)  
(c) (ii) and (iii)  
(d) (ii) and (iv)  

OR
Arrange the following elements in the order of their increasing nonmetallic character  
Li, O, C, Be, F  
(a) F < O < C < Be < Li  
(b) Li < Be < C < O < F  
(c) F < O < C < Be < Li  
(d) F < O < Be < C < Li
7. Which of the following statements about the construction of a dam are incorrect?
(a) It provides an eco-friendly environment
(b) It is used to generate electricity
(c) It displaces the largely poor tribals that do not get any benefit
(d) It prevents the occurrence of floods in the river

OR
Which of the following movements means ‘Hug the trees movement’?
(a) Narmada Bachao Andolan  
(b) Chipko Andolan  
(c) Tehri Andolan  
(d) Biodiversity movement

8. Which of the following is employed for harnessing the potential energy of surface water stored in a reservoir?
(a) Thermal power plant  
(b) Nuclear power plant  
(c) Tidal power plant  
(d) Hydroelectric power plant

9. Write the number of horizontal rows in the modern periodic table. What are these rows called?

10. Name the functional group present in each of the following organic compounds:
(i) C₂H₅Cl  
(ii) C₂H₅OH

11. Answer question number 11(i)-11(iv) on the basis of your understanding of the following paragraph and the related studies concepts.

(a) Electricity is generated at the power station. It is brought to our homes by two thick copper wires or aluminium wires fixed over tall electric poles (or by underground cables). From the electric pole situated in our street, two insulated wires L and N come to our house (see the below figure). One of these wires is called live wire and it is at a high potential of 220 volts whereas the other wire is called neutral wire and it is at the ground potential of zero volt. Thus, the potential difference between the live wire and the neutral wire in India is 220 – 0 = 220 volts. In the below figure, L is the live wire and N is the neutral wire. The live wire has red insulation covering whereas neutral wire has black insulation covering. There is no harm if we touch the neutral wire but we will get an electric shock if, by chance, we touch the live wire.

11(i) What name is given to the device which automatically cuts off the electricity supply during short-circuiting in household wiring?

11(ii) When does an electric short circuit occur?
(b) In the ocean, fossils are settled at the bottom in the soil/sand layer by layer. In the course of time, these layers changed into rocks due to the presence of the water above and also due to chemical reactions. The distribution of fossils indicates that early fossils present in the bottom layer are simple; however, the recent fossils found in the upper layers are more complex.

11(iii) Define the term fossil.

11(iv) State any one role of fossils in the study of organic evolution?

12. Study the given diagram of reflex arc and answer the question No. 12(i)-12(iv).

12(i) Give an example of reflex action.

12(ii) Name the parts labelled A and C.
(a) A = Sensory neuron, B = Spinal cord
(b) A = Spinal cord, B = Receptor
(c) A = Receptor, B = Relay neuron
(d) A = Motor neuron, B = Relay neuron

12(iii) Write the functions of B and E.

12(iv) The correct path of reflex action is
(a) Receptors → Sensory neuron → Spinal cord → Motor neuron → Effector
(b) Receptors → Motor neuron → Spinal cord → Sensory neuron → Effector
(c) Effector → Sensory neuron → Brain → Motor neuron → Receptors
(d) Effector → Motor neuron → Brain → Sensory neuron → Receptors

For question numbers 13 and 14, two statements are given—one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below
i) Both A and R are true and R is correct explanation of the assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true.

   Reason (R): Some elements can have several different structural forms while in the same physical state. These forms are called allotropes.

14. Assertion (A): Two bar magnets attract when they are brought near to each other with the same pole.
   Reason (R): Unlike poles will attract each other.
SECTION – B

15. (a) Write two observations when lead nitrate is heated in a test tube.
   (b) Name the type of reaction.
   (c) Write a balanced chemical equation to represent the above reaction.

16. A compound ‘X’ of sodium is used as an antacid and it decomposes on strong heating.
   (a) Name the compound ‘X’ and give its chemical formula.
   (b) Write a balanced chemical equation to represent the decomposition of ‘X’.
   (c) Give one use of compound ‘X’ besides an antacid.

   OR

   You are provided with 90 mL of distilled water and 10 mL of concentrated sulphuric acid to prepare dilute sulphuric acid.
   (a) What is the correct way of preparing dilute sulphuric acid? Give reason.
   (b) How will the concentration of H_3O^+ ions change on dilution?

17. Two elements X and Y have atomic numbers 12 and 16 respectively. To which period of the modern periodic table do these two elements belong? What type of bond will be formed between them and why? Also give the chemical formula of the compound formed.

18. Why does a current carrying conductor experiences a force when it is placed in a magnetic field? State Fleming’s left hand rule.

19. Explain the processes of aerobic respiration in mitochondria of a cell and anaerobic respiration in yeast and muscle with the help of word equations.

20. In a pea plant, the trait of flowers bearing purple colour (PP) is dominant over white colour (pp). Explain the inheritance pattern of F_1 and F_2 generations with the help of a cross following the rules of inheritance of traits. State the visible characters of F_1 and F_2 progenies.

21. Define the term dispersion of white light. Name the colour of light which bends (i) the most, (ii) the least, while passing through a glass prism. Draw a ray diagram to justify your answer.

   OR

   A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram. A student makes the following statements about the spectrum observed on the screen.

   ![Diagram of dispersion of white light]

   (a) The colours at positions marked 3 and 5 are similar to the colour of the sky and the colour of gold metal respectively. Is the above statement made by the student correct or incorrect? Justify.
   (b) Which two positions correspond closely to the colour of
   (i) a brinjal (ii) ‘danger’ or stop signal lights?
22. Explain giving reasons the bending of the shoot tip of a plant towards light source coming from one side of the plant.

23. Write the aquatic organisms in order of who eats whom starting from producer and form a chain of at least three steps. What name is given to such a chain in an ecosystem and what name is given to each stage?

OR

What is ozone? How and where is it formed in the atmosphere? Explain how does it affect ecosystem.

24. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm.
   (a) What should be the range of the object distance in the above case?
   (b) Will the image be smaller or larger than the object? Draw a ray diagram to show the formation of image in this case.
   (c) Where will the image of this object be, if it is placed 24 cm in front of the mirror?

SECTION – C

25. (a) Identify any two parts from the below diagram which carry oxygenated and deoxygenated blood.

(b) Explain the process of double circulation with the help of a flow chart.

26. (a) An ore on treatment with dilute hydrochloric acid produces brisk effervescence. What step will be required to obtain metal from the enriched ore.
   (b) Copper coin is kept immersed in silver nitrate solution for some time. What change will take place in coin and colour of the solution? Write balanced chemical equation of the reaction involved.

OR

A metal (E) is stored under kerosene. When a small piece of it is left open in the air, it catches fire. When the product formed is dissolved in water, it turns red litmus to blue.
   (a) Name the metal (E).
   (b) Write the chemical equation for the reaction when it is exposed to air and when the product is dissolved in water.
   (c) Explain the process by which the metal is obtained from its molten chloride.
27. (a) Define the term ‘isomers’.
    (b) Draw two possible isomers of the compound with molecular formula C₃H₆O and write their names.
    (c) Give the electron dot structures of the above two compounds.

28. (a) One-half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30 cm from the lens? Draw a ray diagram to justify your answer.
    (b) A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image.

    OR

    (a) List the sign conventions that are followed in case of refraction of light through spherical lenses.
    (b) Draw a diagram and apply these conventions in determining the nature and focal length of a spherical lens which forms three times magnified real image of an object placed 16 cm from the lens.

29. (a) What is spore formation?
    (b) Draw a diagram showing spore formation in Rhizopus.
    (c) List two advantages for organisms to reproduce themselves through spores.

    OR

    Draw a diagram of a human female reproductive system and label the part
    (i) that produces egg (ii) where fusion of egg and sperm takes place (iii) where zygote is implanted
    What happens to human egg when it is not fertilised?

30. (a) A student has three voltmeters across three resistances R₁, R₂ and R₃ as shown in the circuit. Given that R₁ < R₂ < R₃ (i) Write V₁, V₂ and V₃ in decreasing order of the reading shown by each of them. (ii) What will you observe about the potential difference across the series the series combination?

    (b) Draw a schematic diagram of a circuit consisting of a cell of 1.5 V, 10 Ω and 15 Ω resistor and a plug key all connected in series.
    (c) Which one is same in series, current or voltage?