hellooo

hello

Class 10 - Science

Date: 02-10-2025

Section A - Multiple Choice Questions

Q1. Which substance is added to the soil to neutralize its excessive acidic nature? (1 marks)

a. Common Salt (NaCl)
b. Slaked Lime [$Ca(OH)_2$]
c. Sulphuric Acid (H_2SO_4)
d. Baking Soda ($NaHCO_3$)

Q2. If three resistors R_1, R_2, and R_3 are connected in parallel, the reciprocal of the equivalent resistance (R_p) is given by: (1 marks)

a. $R_p = R_1 + R_2 + R_3$
b. $1/R_p = 1/R_1 + 1/R_2 + 1/R_3$
c. $R_p = (R_1 R_2 R_3) / (R_1 + R_2 + R_3)$
d. $1/R_p = R_1 + R_2 + R_3$

Q3. The primary function of Villi in the small intestine is to: (1 marks)

a. Secrete digestive enzymes
b. Increase the surface area for absorption of digested food
c. Filter out waste products
d. Help in the initial breakdown of proteins

Q4. Compounds belonging to the same homologous series show a difference in molecular formula by: (1 marks)

a. $-CH_3$ group
b. $-CH_2$ group
c. $-C_2H$ group
d. -OH group

Q5. A student places an object 15 cm from a convex lens of focal length 10 cm. The magnification produced by the lens is: (1 marks)

a. -2

b. +2
c. -0.5
d. +0.5

Q6. Which of the following methods of asexual reproduction results in the formation of a chain of cells or buds? (1 marks)

a. Fission
b. Fragmentation
c. Spore formation
d. Budding

Section B - Fill in the Blanks

Q7. A reaction in which one reactant is oxidized while the other is reduced is known as a/an _____ reaction. (1 marks)

Q8. The gap between two adjacent neurons where information is transmitted in the form of chemical signals is called a _____. (1 marks)

Q9. The rule used to determine the direction of the force experienced by a current-carrying conductor placed in a magnetic field is _____. (1 marks)

Q10. Organs that have a common fundamental structure but perform different functions are called _____ organs. (1 marks)

Q11. The process of heating carbonate ore strongly in the absence of air to convert it into metal oxide is called _____. (1 marks)

Section C - Short Answer Questions

Q12. State Joule's Law of Heating. If a current of 4 A flows through a resistor of 10 Ω for 5 minutes, calculate the heat generated. (3 marks)

Q13. Differentiate between the response mechanism of nervous control and hormonal control in animals based on speed and duration. (2 marks)

Q14. Draw the electron dot structure for Methane (CH_4). Why is carbon unable to form C^{4+} or C^{4-} ions? (3 marks)

Q15. Explain the phenomenon of 'Dispersion of White Light' when passed through a prism. Why does dispersion occur? (4 marks)

Section D - Long Answer Questions

Q16. Describe the mechanism of gaseous exchange in human beings. Draw a neat, labeled diagram of the human respiratory system including the path of air. (5 marks)

Q17. Define Ionic Compounds. Using electron dot structures, show the formation of Magnesium Chloride ($MgCl_2$). List three characteristic properties of ionic compounds. (5 marks)

Q18. State the principle of an Electric Motor. Draw a neat, labeled diagram of a simple electric motor and explain its working. What is the role of the Split Ring/Commutator? (5 marks)

Q19. Explain Mendel's Dihybrid cross experiment using pea plants. State the Law derived from this experiment and mention the resultant phenotypic ratio. (5 marks)

Q20. An object is placed between the pole (P) and the principal focus (F) of a concave mirror. 1. Draw a neat ray diagram showing the image formation. 2. State the properties of the image formed. 3. Briefly explain the sign conventions used for this scenario. (5 marks)

Section E - Matching Questions

Q21. Match the items in Column I with the correct description or function in Column II. (5 marks)

Section F - Case Study

Q22. A chemist performs an experiment involving three solutions: P, Q, and R. P is a strong acid, Q is a strong base, and R is a salt solution derived from a weak acid and a strong base. The pH of the solutions are measured. 1. If solution P has a pH of 2, calculate the hydrogen ion concentration $[H^+]$. 2. When equal volumes of P and Q are mixed, what is the expected pH of the resulting mixture? Why? 3. Predict whether solution R will be acidic, basic, or neutral, and give a reason. (4 marks)

Q23. Variation is crucial for the survival of a species. Consider two modes of reproduction: (A) Asexual Reproduction (e.g., fragmentation in Spirogyra) and (B) Sexual Reproduction. 1. Why does asexual reproduction, like fragmentation, produce very little variation compared to sexual reproduction? 2. State one specific disadvantage that lack of variation (high similarity) poses to a population of organisms in a changing environment. 3. How is the process of generating variation different in human males and females during gamete formation? (4 marks)