SCIENCE SAMPLE PAPER # 3

Time Allowed : 3 hour and 15 minutes **Maximum Marks : 80**

GENERAL INSTRUCTIONS :

1. All questions are compulsory.
2. This question paper comprises of subject : Science
3. The Question paper contains Four Sections A, B, C and D.
4. Distribution of marks are mentioned along with the questions.
5. In this paper a total of 51 questions are given.

SECTION – A

1. Write the answer of the following questions (i-xviii). Each question carries 1 marks.

(i) Chemical Coordination is observed –
(1) In plants (2) In animals (3) In plants and animals (4) None of these

(ii) The brain is responsible for –
(1) To think (2) For heart beat (3) To balance the body (4) All of the above

(iii) A student has to focus his compound microscope to observe a prepared slide showing different stages of binary fission in Amoeba. The steps he is likely to follow are listed below in a haphazard manner:
I. Adjust the diaphragm and the mirror of the microscope so that sufficient light may enter to illuminate the slide.
II. Fix the slide on the stage carefully.
III. Adjust the microscope to high power and focus.
IV. Adjust the microscope to low power and focus.
The correct sequence of the above steps to observe the slide under the microscope is:
(1) I, II, IV, III (2) II, I, IV, III (3) II, IV, I, III (4) I, IV, II, III

(iv) A student was asked to observe and identify the various parts of an embryo of a red kidney bean seed. He identified the parts and listed them as under:
I. Tegument. II. Teste. III. Cotyledon.
IV. Radicle. V. Plumage.
The correctly identified parts among these are:
(1) I, II and III. (2) II, III and IV. (3) III, IV and V. (4) I, III, IV and V.

(v) In 1987, an agreement was formulated by the United Nations Environment Programmed (UNEP) to freeze the production of "X" to prevent depletion of "Y "."X" and "Y" respectively referred here are:
(1) Ozone; CFCs (2) CFCs; rays UV
(3) CFCs; Ozone (4) UV rays; Diatomic oxygen

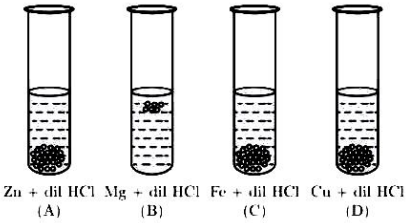
(vi) Which of the following constitute the food chain?
(1) Grass wheat and mango (2) Grass, goat and human
(3) Goat, cow and elephant (4) Grass, fish and goat

(vii) The chemical reaction between copper and oxygen can be categorized as:
(1) Displacement reaction (2) Decomposition reaction
(3) Combination reaction (4) Double displacement reaction

(viii) Which of the following gases can be used for storage of fresh sample of oil for a long time?
(1) Carbon dioxide or oxygen (2) Nitrogen or oxygen
(3) Carbon dioxide or Helium (4) Helium or Nitrogen

(ix) Which of the following metals do not react with oxygen even at high temperatures?
(i) Ag (ii) Al (iii) Au (iv) Fe
(1) (I) and (iv) (2) (iii) and (iv) (3) (i) and (iii) (4) (i) and (ii)

(x) The diagram shows the reaction between metal and dil. acid.



What is the reason for different behavior of Mg in test tube B?
(1) Mg is lighter element than dil HCl
(2) Mg reacts with dil HCl to produce H_2 gas which helps in floating
(3) Mg reacts with dil HCl to produce N_2 gas which helps in floating.
(4) Mg reacts with dil HCl to produce CO_2 gas which helps in floating.

(xi) Identify the types of chemical reaction occurring during the combustion of fuel:
(1) Oxidation and endothermic reaction (2) Decomposition and exothermic reaction
(3) Oxidation and exothermic reaction (4) Combination and endothermic reaction.

(xii) Hard water does not easily produce lather with soap because it contains:
(1) Only Mg^{2+} ions (2) Only Ca^{2+} ions
(3) Both Mg^{2+} and Ca^{2+} ions (4) Both Na^{+} and K^{+} ions

(xiii) A person is wearing a lens of power –2D- which of the following is correct about him.
(1) He is suffering from myopia
(2) He is suffering from Hypormetropia
(3) He is wearing concave lens
(4) Both (1) and (3)

(ivx) To focus the image of a nearby object on the retina of an eye :
(1) The distance between eye - lens and retina in increased
(2) The distance between eye - lens and retina is decreased
(3) The thickness of eye - lens is decreased
(4) The thickness of eye - lens is increased

(xv) Which of the following characteristic is not suitable for a fuse wire ?
(1) Thin and short
(2) Thick and short
(3) Low melting point
(4) Higher resistance than resistance of wiring

(xvi) One watt hour is equal to how many joules :
(1) 3.6×10^6 (2) 3600 (3) 3.6×10^5 (4) 36000

(xvii) A magnetic field exerts no force on :
(1) an electric charge moving perpendicular to its direction
(2) an unmagnetised iron bar
(3) a stationary electric charge
(4) a magnet

(xviii) A proton experience maximum force in a magnetic field when
(1) It is moving parallel to magnetic field
(2) It is moving perpendicular to magnetic field.
(3) It is placed at rest in magnetic field.
(4) It is moving antiparallel to magnetic field

2. Fill in the blanks (i – vi). Each questions carries 1 Mark.

(i) The largest gland of the body is _____.
(ii) Green plants use _____ and _____ to make food.
(iii) The basic unit of heredity is known as _____.
(iv) Genes are located on thread like structures called_____.
(v) Organic acids are generally _____ acids.
(vi) Tartaric acid is used in the manufacture of _____ powder.

3. Very short answer type of question[(i)-(xii)]. Each questions carries 1 mark.

(i) Give three examples of reflex actions.
(ii) Name the plant part:
a. bends in the direction of gravity but away from light.
b. bends towards light but away from the force of gravity.
(iii) Why is excessive use of CFCs a cause of concern?
(iv) Which of the two, sperm or ovum, decides the sex of the child?
(v) What is genetics?
(vi) Give the chemical name of the reactants as well as the products of the following chemical equation:
$2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$
(vii) Read the following statements.
(P) Stainless steel does not rust.
(Q) Iron, nickel and chromium form an alloy.
Does statement (Q) present a valid explanation for statement (P)? Justify your answer.
(viii) Which type of hydrocarbons burn with yellow smoky flame? Why?
(ix) Write difference between reflection and refraction.
(x) What is Refractive index ?
(xi) Why does a compass needle get deflected when brought near a bar magnet?
(xii) Explain Fleming's Left hand Rule.

SECTION – B

Short Answer Type Questions (Q.4 to Q.13): Each question carries only 2 marks

4. Why do arteries have thick and elastic walls whereas veins have valves?

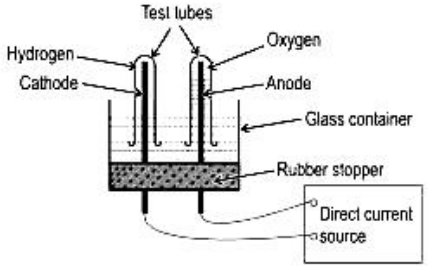
5. How are involuntary actions and reflex actions different from each other?

6. State the post-fertilization changes that lead to fruit formation in plants.

7. Will the impact of removing all the organisms in a trophic level be different for different trophic levels? Can the organisms of any trophic level be removed without causing any damage to the ecosystem?

Chemistry

8. The diagram below shows the set-up in which electrolysis of water takes place.



(a) What type of reaction takes place?
(b) Explain why this is an example of an endothermic reaction?
(c) The test tube containing hydrogen is removed carefully from the apparatus. A lit match stick is brought near the mouth of this test tube. The gas burns with an explosive ‘ POP” sound.

Write a balanced chemical equation for this reaction and indicate whether energy is absorbed or released.

9. Write the chemical equation of the reaction in which the following changes have taken place with an example of each:
(a) Change in color:
(b) Change in temperature.
(c) Formation of precipitate.

10. What type of image is formed:
(i) by a plane mirror
(ii) on a cinema screen ?

11. What is Power of Accommodation.

12. Define Quantization of Charge.

13. Explain why, two magnetic field lines do not intersect each other.

SECTION – C

Long Answer Type Questions (Q.14 to Q.17) internal choice has been provided in each questions. Each question carries only 3 marks.

14. Explain the term "Regeneration" as used in relation to reproduction of organisms. Describe briefly how regeneration is carried out in multicellular organisms like *Planaria.*

OR

List four categories of contraceptive methods. State in brief two advantages of adopting such preventive methods.

15. What is water of crystallization? Name and give formula two salts which contain water of crystallization.

OR

White chemical compound becomes hard on mixing proper quantity of water. It is also used to maintain broken founts in fixed position. Name the chemical compound and write its chemical formula. Write the chemical equation to show what happens when water is added to this compound in proper quantity?

16. 2.2 mL of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and the test to detect the gas. Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid.

OR

To prepare a salad dressing, Parag adds a solution of sodium chloride in distilled water to vinegar. State what change will occur in the following:
(a) The pH of the vinegar
(b) The acidity of the vinegar

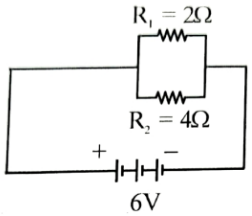
17. (i) 100 joules of heat is produced per second in a 4 ohm resistor. What is the potential difference across the resistor ?

(ii) Insulation cover of which color is

(ii) conventionally used for earth wire ? Why is an earth wire connected to metallic parts of appliances? Insulation of green color is conventionally used for earth wars. Earth wire is connected to metallic parts of appliances so that it carry any leak current from appliances to ground and protect use from shock.

OR

In an electrical circuit two resistors of 2 Ω and 4Ω respectively are connected in parallel to a 6 V battery. The heat dissipated by the 4 Ω resistor in 5 s will be



SECTION – D

Essay Answer Type Questions (Q.18 to Q.20) internal choice has been provided in each questions. Each question carries only 4 marks.

18. a. List the three events that occur during the process of photosynthesis. Explain the role of stomata in this process.

b. Describe an experiment to show that "sunlight is essential for photosynthesis."

OR

Explain the process of digestion of food in mouth, stomach and small intestine in human body.

19. An aldehyde as well as ketone can be represented by the same molecular formula, say C_3H_6O. Write their structures and name them. State the relation between these compounds.

OR

C_3H_6, C_4H_8 and C_5H_{10} belong to the same homologous series.

(a) Define homologous series.

(b) Why the melting and boiling points of C_5H_{10} is higher than C_4H_8?

(c) Arrange these hydrocarbons in order of increasing boiling points.

20. (A) A convex mirror produces an image three times smaller than the object when the object is placed at 24 cm from the mirror.

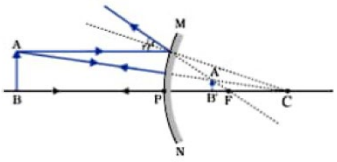
Calculate:

(i) Magnification

(ii) Image distance

(iii) Focal length of the mirror

(B) Draw a ray diagram showing why a concave mirror can be used as a shaving mirror.



OR

(A) A concave lens has a focal length of 18 cm. An object is placed at 27 cm from the lens.

Determine:

(i) Position of the image

(ii) Magnification

(iii) Nature of the image

(B) Draw a ray diagram for convex lens when the object is placed between optical center and focus.