SCIENCE SAMPLE PAPER # 2

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) Receptors are usually located in sense organs. Gustatory receptors are present in
(1) tongue (2) nose (3) eye (4) ear

(ii) Which of the following is a plant hormone?
(1) Insulin (2) Thyroxin (3) Estrogen (4) Cytokine

(iii) A farmer wants to grow banana plants genetically similar enough to the plant already available in his field. Which one of the following methods would you suggest for this purpose?
(1) Regeneration (2) Budding
(3) Vegetative propagation (4) Sexual reproduction

(iv) Asexual reproduction takes place through budding in,
(1) Amoeba. (2) Yeast. (3) Plasmodium. (4) Leishmanial

(v) Which of the following group does not contain only biodegradable items?
(1) Grass, flowers and leather. (2) Grass, wood and plastic.
(3) Fruit-peels, cake and lime-juice. (4) Cake, wood and grass.

(vi) Which of the following features relates to biodegradable substances?
(1) Broken down by biological processes (2) Remain inert
(3) Persist in environment for long time (4) May harm the ecosystem

(vii) In the reaction $3MnO_2 + 4Al \rightarrow 3Mn + 2Al_2O_3$ the oxidizing agent is.
(1) MnO_2 (2) Al (3) Al_2O_3 (4) Mn

(viii) In the reaction, $2H_2S + SO_2 \rightarrow 3S + 2H_2O$
(1) H_2S has been oxidized
(2) SO_2 is the oxidizing agent
(3) H_2S is the reducing agent
(4) SO_2 is the reducing agent

(ix) Which is not the property of a metal?
(1) malleability (2) ductility
(3) Form acidic oxides (4) conductivity

(x) The electrostatic force of attraction between oppositely charged ions is known as.
(1) Covalent Bond (2) Ionic Bond (3) Coordinate Bond (4) Polar Bond

(xi) Identify the formula of benzene.
(1) C_6H_6 (2) C_5H_{10} (3) C_6H_{12} (4) C_6H_{14}

(xii) Identify the molecular formulae of the acid and the alcohol from which an ester can be prepared.
(1) $CH_3COOH + C_2H_5OH$ (2) $CH_3CHO + C_2H_5OH$
(3) $HCHO + CH_3OH$ (4) $CH_3CH_2CHO + CH_3OH$

(xiii) Myopia can be corrected by using:
(1) Convex lens (2) Concave lens
(3) Cylindrical lens (4) Bifocal lens

(ivx) The band of seven colors obtained after dispersion of white light is called.
(1) Spectrum (2) Image (3) Reflection (4) Scattering

(xv) An electric bulb draws a current of 0.5 A when connected to a 220 v supply. The power of the bulb is:
(1) 55 W (2) 100W (3) 110W (4) 220W

(xvi) A heater of resistance 50Ω operates at 220 V. How much current will it draw?
(1) 2.2 A (2) 4.4 A (3) 0.22A (4) 0.44A

(xvii) A current-carrying solenoid behaves like a:
(1) Bar magnet (2) Straight conductor (3) Soft iron core (4) Galvanometer

(xviii) Which of the following increases the strength of an electromagnet?
(1) Decreasing current (2) Increasing number of turns
(3) Removing iron core (4) Increasing radius of coil

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

(i) Bile juice is secreted by _____.

(ii) Iodine turns blue-black on reacting with _____.

(iii) If a sperm carrying X-chromosome fertilizes the egg, the child born will be a _____ .

(iv) In monohybrid cross experiment, Mendel obtained genotype ratio as _____ .

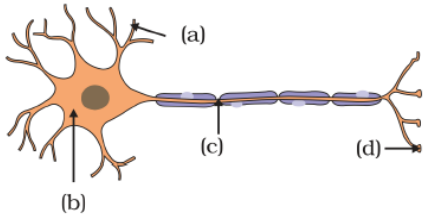
(v) Acids turn blue litmus paper red, while bases turn red litmus paper____.

(vi) When an acid reacts with a base, they form _____and water.

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

(i) Name the smallest structural unit of the human nervous system.

(ii) Label the parts of a neuron in given figure.



(iii) What is meant by 'environment'?

(iv) What type of plants were used by Mendel for conducting his experiments on inheritance?

(v) In a human, how many chromosomes are present in a brain cell?

(vi) Why is sodium hydrogen carbonate an essential ingredient if antacids?

(vii) Why do ionic compounds have high melting points?

(viii) Define soaps?

(ix) State two differences between a concave mirror and a convex mirror.

(x) State Snell's laws of refraction.

(xi) What is magnetic field?

(xii) What is the direction of the magnetic field at the center of a circular current-carrying loop?

SECTION – B

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

4. What would be the consequences of a deficiency of hemoglobin in our bodies?

5. What is the function of receptors in our body? Think of situations where receptors do not work properly. What problems are likely to arise?

6. What could be the reasons for adopting contraceptive methods?

7. What are the problems caused by the non-biodegradable wastes that we generate?

8. Give one example each of :

(a) Thermal decomposition

(b) Electrolytic decomposition

(c) Photo decomposition

9. Transfer the following into chemical equation and balance them.

(i) Hydrogen gas combines with nitrogen to from ammonia.

(ii) Hydrogen supplied gas burns in air to give water and Sulphur dioxide.

(iii) Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.

10. State the laws of reflection of light:

11. Define myopia. State one cause of this defect.

12. What is resistance? State factor on which resistance of a conductor depends.

13. Explain the magnetic field pattern around a circular current-carrying loop.

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. What is the probability of a girl or a boy being born in a family? Justify your answer

OR

What is vegetative propagation? State two advantages and two disadvantages of vegetative propagation.

15. You have two solutions 'A' and 'B'. The pH of solution 'A' is 6 and pH of solution 'B' is 8. Which solution has more hydrogen ions concentration? Which is acidic and which one is basic?

OR

Under what soil condition do you think a farmer would treat the soil of his field with quicklime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate).

16. Explain why?
(a) Common salt becomes sticky during the rainy season.
(b) Blue vitriol change to white upon heating.

OR

Complete the following reaction:
(a) $CH_2 = CH_2 + H_2O \rightarrow$
(b) $CH_2 = CH_2 + Br_2 \rightarrow$

17. Ohm's Law & Resistance:
(a) State Ohm's Law and writes the necessary conditions for its validity.
(b) How is this law verified experimentally? Draw a circuit diagram for the same.
(c) A wire of resistance R' is cut into five equal pieces. These pieces are then connected in parallel. If the equivalent resistance of this combination is R, find the ratio R/R'.

OR

Heating Effect & Commercial Energy:
(a) State and derive Joule's Law of Heating.
(b) An electric iron consumes energy at a rate of 420W when heating is at maximum and 180W when at minimum. If the voltage is 220V calculate the current and resistance in each case.
(c) Define 1 kWh and convert it into Joules

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. **(i)** Draw a sectional view of the human heart and label on it: Aorta, Pulmonary arteries, Vena cava, Left ventricle.
(ii) Why is double circulation of blood necessary in human beings?

OR

(i) Draw the structure of a nephron and label the following on it: Glomerulus, Bowman's capsule, Renal arteriole, Collecting duct.
(ii) What happens to glucose that enters the nephron along with filtrate?

19. Write chemical equation of the reactions of ethanoic acid with
(a) Sodium
(b) Sodium carbonate
(c) Ethanol in the presence of conc. H_2SO_4

OR

Complete the reaction and names of the products formed.
(a) $CH_3COOH + NaOH \xrightarrow{Heat}$
(b) $C_2H_5OH + 2[O] \xrightarrow[KMnO_4]{Alkaline}$
(c) $CH_3COOH + C_2H_5O_4 \xrightarrow{conc.H_2SO_4}$

20. (A) A Concave mirror forms a real image of size 4cm when the object size is 1 cm. if the object is placed at 30 cm from the mirror, find the focal length of the mirror.(Use magnification formula and mirror formula.)
(B) Draw a ray diagram showing the formation of image by a convex mirror when the object is placed in front of it. Show all three rays used in the ray diagram and mark the position of the image.

OR

(A) State Snell's law of refraction. also define the refractive index.
(B) If the speed of light in glass is 2×10^8, m/s, calculate the refractive index of glass.
(Speed of light in air = 3×10^8, m/s)
(C) Draw a ray diagram to show the formation of image by convex lens when the object is placed between the focus and the lens. Indicate the nature of the image formed.
(D) Draw a diagram to show the refraction of light through a triangular prism. Mark the incident ray, refracted ray, emergent ray, and the angle of deviation.