SAMPLE PAPER – 4

Time: 3 *Hours* *Maximum Marks*: 80

General Instructions:

(i) *The question paper comprises of two Sections, A and B. You are to attempt both the sections.*

(ii) *All questions are* ***compulsory****. However, an internal choice will be provided in two questions of 3 marks each and one question of five marks.*

(iii) *All questions of Section A and all questions of Section B are to be attempted separately.*

(iv) *Question numbers* **1** *to* **2** *in Section A are one-mark questions. These are to be answered in one word or in one sentence.*

(v) *Question numbers* **3** *to* **5** *in Section A are two-marks questions. These are to be answered in about* **30** *words each.*

(vi) *Question numbers* **6** *to* **15** *in Section A are three-marks questions. These are to be answered in about* **50** *words each.*

(vii) *Question numbers* **16** *to* **21** *in Section A are five-marks questions. These are to be answered in about* **70** *words each.*

(viii) *Question numbers* **22** *to* **27** *in Section B are two-marks questions based on practical skills. These are to be answered in brief.*

SECTION–A

Q1. Balance the following chemical equation: 1

$$Fe(s) + H_2O(g) \longrightarrow Fe_3O_4(s) + H_2(g)$$

Q2. Out of 60 W and 40 W lamps, which one has a higher electrical resistance when in use? 1

Q3. Choose from the following:

$_6C$, $_8O$, $_{10}Ne$, $_{11}Na$, $_{14}Si$

(i) Elements that should be in the same period.

(ii) Elements that should be in the same group.

State reason for your selection in each case. 2

Q4. Fresh milk has a pH of 6. When it changes into curd (yogurt) will its pH value increase or decrease? Why? 2

Q5. Name an organism which reproduces by spore formation. List three conditions favourable for spores to germinate and grow. 2

Q6. What is the minimum number of rays required for locating the image formed by a concave mirror for an object. Draw a ray diagram to show the formation of virtual image by a concave mirror. 3

Q7. Give reasons for the following observations:

(a) The element carbon forms a very large number of compounds.

(b) Air holes of a gas burner have to be adjusted when the heated vessels get blackened by the flame.

(c) Use of synthetic detergents causes pollution of water. 3

Q8. List three problems which arise due to construction of big dams. Suggest a solution for these problems. 3

Q9. What is meant by homologous series of organic compounds? Write the chemical formulae of two members of a homologous series and state which part determines the (i) physical properties, (ii) chemical properties, of these compounds. 3

Q10. (a) What is fertilisation? Distinguish between external fertilisation and internal fertilisation.

(b) What is the site of fertilisation in human beings? 3

OR

List and explain in brief three methods of contraception. 3

Q11. Define the terms:

(i) Analogous organs (ii) Vestigial organs (iii) Sex chromosome 3

Q12. If we cross, pure-bred tall (dominant) pea plant with pure-bred dwarf (recessive) pea plant to obtain of F_1 generation, then we obtain pea plants of F_2 generation.

(a) What do the plants of F_1 generation look like?

(b) State the ratio of tall plants to dwarf plants in F_2 generation.

(c) State the type of plants not found in F_1 generation but appeared in F_2 generation, mentioning the reason for the same. 3

Q13. (a) What are amphoteric oxides? Choose the amphoteric oxides amongst the following oxides:

Na_2O, ZnO, Al_2O_3, CO_2, H_2O

(b) Why is it that non-metals do not displace hydrogen from dilute acids? 3

OR

Na, Mg and Al are the elements having one, two and three valence electrons respectively. Which of these elements (i) has the largest atomic radius, (ii) is least reactive? Justify your answer stating reason for each. 3

Q14. "Burning of fossil fuels results in global warming". Give reasons to justify this statement. 3

Q15. (a) What is the colour of ferrous sulphate crystals? How does this colour change after heating?

(b) Name the products formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change? 3

Q16. Two lamps, one rated 60 W at 220 V and the other 40 W at 220 V are connected in parallel to the electric supply at 220 V.

(a) Draw a circuit diagram to show the connections.

(b) Calculate the current drawn form the electric supply.

(c) Calculate the total energy consumed by the two lamps together when they operate for one hour. 5

Q17. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 24 cm. The distance of the object from the lens is 16 cm. Find the position, size and nature of the image formed, using the lens formula. 5

Q18. Draw a diagram of human female reproductive system and label the part:

(a) that produces eggs. (c) where fusion of egg and sperm takes place.

(b) where zygote is implanted.

What happens to human egg when it is not fertilised? 5

Q19. A blue coloured flower plant denoted by BB is crossbred with that of white coloured flower plant denoted by bb.

(a) State the colour of flower you would expect in their F_1 generation plants.

(b) What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?

(c) State the expected ratio of the genotypes BB and Bb in the F_2 progeny. 5

Q20. (a) Draw the structure of a neuron and label the following on it:

Nucleus, Dendrite, cell body and Axon

(b) Name the part of neuron

(i) where information is acquired.

(ii) through which information travels as an electrical impulse. 5

Q21. (a) What is a solenoid? Draw a sketch of the pattern of field lines of the magnetic field through and around a current carrying solenoid.

(b) Consider a circular loop of wire lying in the plane of the table. Let the current passes through the loop in clockwise manner . Apply the right hand rule to find out the direction of magnetic field inside and outside the loop. 5

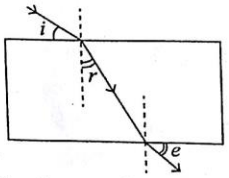
OR

What is an electromagnet? Draw a circuit diagram to show how a soft iron piece can be transformed into an electromagnet. 5

SECTION–B

Q22. A student takes Na_2CO_3 powder in a test tube and pour some drops of acetic acid over it. Write any two observations that he will see. 2

Q23. A student traces the path of a ray of white light through a rectangular glass slab and marks the angles of incidence ($\angle i$), refraction ($\angle r$) and emergence ($\angle e$) as shown in the figure. Which angle or angles has he not marked correctly? 2



Q24. A student is given a permanent slide showing binary fission in amoeba. The following are the steps in focusing the object under the microscope

I. Place the slide on the stage, look through the eye-piece and adjust the mirror and diaphragm to get even illumination.

II. Look through the eye-piece and raise the objective using coarse adjustment until, the object is focussed.

III. Make the focus sharp with the help of fine adjustment.

IV. Look through the eye-piece and move the slide, until the object is visible.

Arrange them in right sequence. 2

Q25. If you insert a thermometer in a sealed beaker containing germinating seeds, the temperature of thermometer increases. Why? 2

Q26. What does hydrophobic and hydrophilic parts of a soap mean to you? 2

Q27. Why is emergent ray parallel to the incident ray, after the refraction of incident ray through a glass slab? 2