SAMPLE PAPER - 2

TIME : 3 HRS. **MAX. MARKS : 80**

GENERAL INSTRUCTIONS :

1. **The question paper comprises three sections – A, B and C. Attempt all the sections.**
2. **All questions are compulsory.**
3. **Internal choice is given in each section.**
4. **All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.**
5. **All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.**
6. **All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.**
7. **This question paper consists of a total of 30 questions.**

SECTION-A

1. (a) State the Modern periodic law.

(b) What is the total number of periods and groups in Modern Periodic Table.

2. Write name of next two members of the given homologous series - C_2H_6,C_3H_8

3. **Answer question numbers 3(a) - 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

Consider a ray of light AB passing from air (medium a) through a parallel sided glass slab (medium b) into air (medium a). The ray of light will clearly suffer two refractions. Since the medium on both sides of glass is the same therefore the ray of light will get laterally shifted without any deviation. This is proved below.

When ray of light is refracted from air to glass, then the refractive index of glass (medium b) w.r.t. air (medium a) is given by

$$n_{ba} = \frac{\sin i_1}{\sin r_1} \qquad \text{.....(1)}$$

When ray of light is refracted from glass to air, then the refractive index of air w.r.t. glass is given by

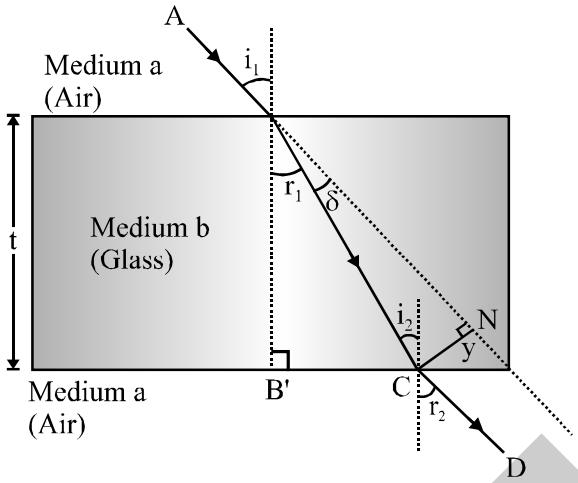
$$n_{ab} = \frac{\sin i_2}{\sin r_2} \qquad \text{.....(2)}$$

Multiplying (1) and (2), we get

$$n_{ba} \times n_{ab} = \frac{\sin i_1}{\sin r_1} \times \frac{\sin i_2}{\sin r_2}$$

But we know that $n_{ba} = \frac{1}{n_{ab}}$

$$\therefore \quad \frac{1}{n_{ab}} \times n_{ab} = \frac{\sin i_1}{\sin r_1} \times \frac{\sin i_2}{\sin r_2}$$



Since the slab is parallel sided,

$$\therefore \quad i_2 = r_1 \quad \therefore \quad \frac{\sin i_1}{\sin r_2} = 1 \quad \text{or} \quad \boxed{i_1 = r_2}$$

(a) What can you conclude regarding incident and emergent ray from the phenomenon discussed above?

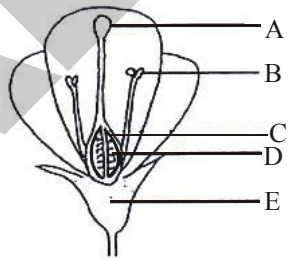
(b) If the absolute refractive index of glass is 1.5, then find the speed of light through it.

(c) If the emergent ray in the phenomenon incidents normally on a plane mirror, what will happen to it?

(d) Write the another name for the 'law of refraction' expressed by equation (1) in paragraph.

4. Question numbers 4(a) - 4(d) are based on sexual reproduction in plants.

(a) Which is the male part of the flower?



(1) A (2) B (3) C (4) E

(b) Which part of the flower develop into fruit and seed?

(c) The correct sequence of reproductive stages seen in flowering plants is

(1) gametes, zygote, embryo, seedling (2) zygote, gametes, embryo, seedling

(3) seedling, embryo, zygote, gametes (4) gametes, embryo, zygote, seedling

(d) Define Pollination.

5. Which of the following can make a parallel beam of light when light from a point source is incident on it?

(1) Concave mirror as well as convex lens.

(2) Convex mirror as well as concave lens.

(3) Two plane mirrors placed at 90° to each other.

(4) Concave mirror as well as concave lens.

OR

Electrical resistivity of a given metallic wire depends upon :

(1) its length (2) its thickness

(3) its shape (4) nature of the material

6. A rectangular coil of copper wire is rotated in a magnetic field. The direction of the induced current changes once in each :

(1) two revolutions (2) one revolution

(3) half revolution (4) one-fourth revolution

7. An optical device has been given to a student and he determines its focal length by focusing the image of the sun on a screen placed 24 cm from the device on the same side as the sun. Select the correct statement about the device.

(1) Convex mirror of focal length 12 cm (2) Convex lens of focal length 24 cm

(3) Concave mirror of focal length 24 cm (4) Convex lens of focal length 12 cm

8. Chipko Andolan is concerned with

(1) Conservation of fossil fuel (2) Development of new breeds

(3) Forest conservation (4) Zoological survey of India

OR

The three R's to save the environment are

(1) Reserve, reduce, recycle (2) Reuse, reserve, reduce

(3) Reserve, reduce, reuse (4) Recycle, reduce, reuse

9. If the fossil of an organism is found in the deeper layers of earth, then we can predict that

(1) The extinction of organism has occurred recently

(2) the extinction of organism has occurred thousands of years ago

(3) the fossil position in the layers of earth is not related to its time of extinction

(4) time of extinction cannot be determined

10. The following reaction is an example of a

$4H_3N(g) + 5O_2(g) \longrightarrow 4NO(g) + 6H_2O(g)$

(i) Displacement reaction

(ii) Combination reaction

(iii) Redox reaction

(iv) Neutralisation reaction

(1) (i) and (iv) (2) (ii) and (iii) (3) only (iii) (4) (iii) and (iv)

11. Which of the following gives the correct increasing order of acidic strength ?

(1) Water < Acetic acid < Hydrochloric acid

(2) Water < Hydrochloric acid < Acetic acid

(3) Acetic acid < Water < Hydrochloric acid

(4) Hydrochloric acid < Water < Acetic acid

12. According to Mendeleev's Periodic Law, the elements were arranged in the periodic table in the order of :

(1) increasing atomic number (2) decreasing atomic number

(3) increasing atomic masses (4) decreasing atomic masses

13. Assertion (A) : To dilute sulphuric acid, acid is added to water and not water to acid.

Reason (R) : Specific heat of water is quite large.

(1) If, Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(2) If, Both assertion (A) and reason (R) are true but reason (R) is NOT the correct explanation of assertion (A).

(3) If, Assertion (A) is true but reason (R) is false.

(4) If, Assertion (A) is false but reason (R) is true.

14. **Assertion (A) :** Refractive index of glass with respect to air is different for red light and violet light.

Reason (R) : Refractive index of a pair of media depends on the wavelength of light used.

(1) If, Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(2) If, Both assertion (A) and reason (R) are true but reason (R) is NOT the correct explanation of assertion (A).

(3) If, Assertion (A) is true but reason (R) is false.

(4) If, Assertion (A) is false but reason (R) is true.

SECTION-B

15. (a) A white powder is an active ingredient of antacids and is used in preparation of cakes. Name the compound and state how it is manufactured? Give chemical equation.

(b) Write an equation to show the effect of heat on this compound.

16. (a) Name any two amphoteric oxides.

(b) What is thermite reaction? Mention its application.

OR

When a metal X is treated with cold water, it gives a basic compound Y with molecular formula XOH (Molecular mass = 40) and liberates a gas Z which easily catches fire. Identify X, Y and Z and also write the reaction involved.

17. 1g of solid sodium chloride is taken in a clean and dry test tube and 2mL of conc. sulphuric acid is added to it. If the gas evolved is tested first with dry and then with wet blue litmus paper, in which case will the litmus paper change colour? Give reason for your answer. What inference can be drawn about the nature of the evolved gas? Support your answer with chemical equation for the reaction.

18. (a) What is meant by double circulation?

(b) Mention two differences between arteries and veins.

19. How does feedback mechanism regulate the hormone secretion?

20. (a) Choose one consumer each that belongs to the second and third trophic levels from the organisms given below.

Eagle, frog, deer, rabbit, fox

(b) Pesticides added to a field is seen in increased amounts in the crop and in the birds that feed on them. What is this phenomenon called? Define it.

OR

What is an ecosystem? List its two main components. We do not clean natural ponds or lakes but an aquarium needs to be cleaned regularly. Why is it so? Explain.

21. (a) Draw a reflex arc.

(b) Name the part of a neuron -

(i) where the information is acquired.

(ii) through which information travels as an electric impulse.

22. What happens to a beam of white light when it gets refracted through a glass prism? Which colour deviates the most and the least after refraction through a prism? What is likely to happen if a second identical prism is placed in an inverted position with respect to the first prism? Justify your answer.

OR

A student needs spectacles of power –0.5 D for the correction of his vision.

(i) Name the defect in vision the student is suffering from.

(ii) Find the nature and focal length of the corrective lens.

(iii) List two causes of this defect.

23. (a) Nichrome wire of length 'L' and radius 'R' has resistance of 10 Ω. How would the resistance of the wire change when :

(i) Only length of the wire is doubled with keeping its other dimensions constant?

(ii) Only diameter of the wire is doubled with keeping its other dimensions constant? Justify your answer.

(b) Why element of electrical heating devices are made up of alloys?

24. If the image formed by a lens for all positions of an object placed in front it is always erect and diminished, what is the nature of this lens? Draw ray diagram to justify your answer. If the numerical value of the power of this lens of 10 D, what is its focal length in the Cartesian system?

SECTION-C

25. (a) Name the main ore of mercury. How is mercury obtained from its ore? Give balanced chemical equations.

(b) With the help of a labelled diagram, explain the process of electrolytic refining of the metal.

(c) Name the method used to extract metals of low reactivity.

OR

(a) State the physical nature of metals. (Any two)

(b) List any two examples of metals found in combined state.

(c) Metals moderate in the reactivity series can be obtained from their compounds by heating with carbon. Why?

(d) Name an alloy of aluminium which is used for making air crafts and state its constituents elements.

(e) What happens when dilute hydrochloric acid is added to zinc granules?

26. A metal carbonate X on heating with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry Y, it gives a compound Z, used for disinfecting drinking water. Identify X, Y, G and Z. (Write equations)

27. (a) Draw a labelled diagram of human - male reproductive system.

(b) Name the part that produces sperms. What is the structure of sperm?

28. (a) Draw human excretory system and label the following parts: -

(i) Left kidney (ii) Urethra (iii) Urinary Bladder (iv) Vena cava

(b) State the purpose of making urine.

(c) Name any two substances which are selectively reabsorbed from the tubules of a nephron.

OR

Describe various steps of holozoic nutrition in reference to human beings.

29. Establish a relationship to determine the equivalent resistance R of a combination of three resistors having resistance R_1, R_2 and R_3 connected in series. Calculate the equivalent resistance of the combination of three resistors of 2Ω, 3Ω and 6Ω joined in parallel.

30. (i) State Fleming's left hand rule.

(ii) Write the principle of working of an electric motor.

(iii) Explain the function of the following parts of an electric motor.

(a) Armature (b) Brushes (c) Split ring

OR

(i) Explain why two magnetic lines do not intersect each other.

(ii) State the rule for determining the direction of the magnetic field produced around a current carrying conductor. Draw a sketch of the pattern of field lines due to a current flowing through a straight conductor.

(iii) Explain on what factors does the magnetic field produced by a straight current carrying carying conductor depends?

ALLEN