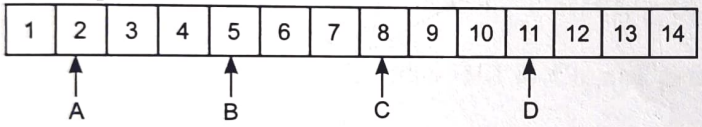
[Time Allowed: 3 Hours] [Maximum Marks: 80]

***General Instructions:*** Same as Practice Paper 1.

## SECTION–A

**Select and write one most appropriate option out of the four options given for each of the questions 1–20. There is no negative mark for incorrect response.**

**1.** The image shows the pH values of the solution on a pH scale




Which solution/s are acidic in nature?

(*a*) B and C (*b*) A and B
(*c*) C and D (*d*) A and D

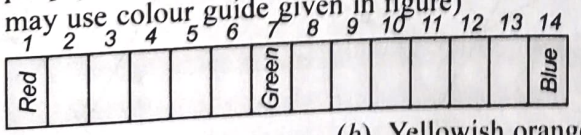
**2.** In which of the following chemical equations, the abbreviation represent the correct states of the reactants and products involved at reaction temperature?

(*a*) $2H_2(l) + O_2(l) \longrightarrow 2H_2O(g)$
(*b*) $2H_2(g) + O_2(l) \longrightarrow 2H_2O(l)$
(*c*) $2H_2(g) + O_2(g) \longrightarrow 2H_2O(l)$
(*d*) $2H_2(g) + O_2(g) \longrightarrow 2H_2O(g)$

**3.** What is observed when a solution of potassium iodide is added to silver nitrate solution?

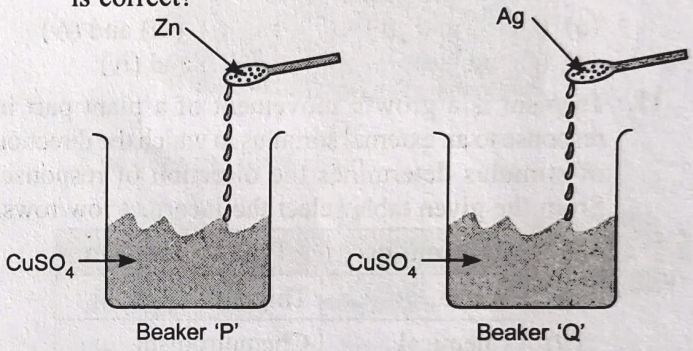
(*a*) No reaction takes place
(*b*) White precipitate of silver iodide is formed
(*c*) Yellow precipitate of AgI is formed
(*d*) AgI is soluble in water.

**4.** Equal volumes of hydrochloric acid and ammonium hydroxide solutions of same concentration are mixed and the pH of the resulting solution is checked with a pH paper. What would be the colour obtained? (You may use colour guide given in figure)




(*a*) Red (*b*) Yellowish orange
(*c*) Yellowish green (*d*) Blue

**5.** Given figure shows, a student adds an equal amount of $CuSO_4(aq)$ in two beakers. He added zinc in beaker 'P' and Ag in beaker 'Q'. The student observes that the colour of solution in beaker 'P' changes while no change is observed in beaker 'Q'. Which option is correct?



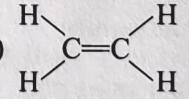
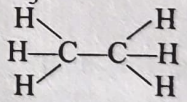

(*a*) Ag < Zn < Cu (*b*) Zn < Cu < Ag
(*c*) Ag < Cu < Zn (*d*) Cu < Ag < Zn

**6.** The salt formed when conc. $H_2SO_4$ reacts with $KNO_3$ above 200°C:

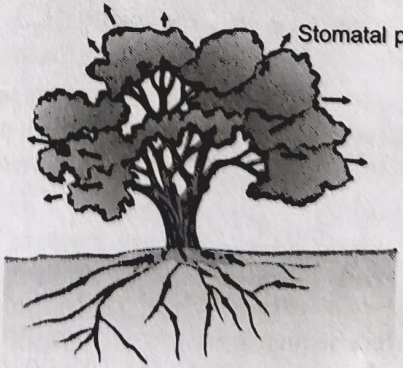
(*a*) $K_2SO_4$ (*b*) $K_2SO_3$
(*c*) $KHSO_4$ (*d*) $KHSO_3$

**7.** Structural formula of ethyne is

(*a*) H—C≡C—H (*b*) $H_3C$—C≡C—H

(*c*)  (*d*) 

**8.** Identify the process shown in given diagram




(*a*) Movement of water during transpiration in a tree.
(*b*) Movement of minerals during transpiration in a tree.

(*c*) Movement of carbon dioxide during transpiration in a tree.
(*d*) None of the above.

9. Reflex arc is formed by
(*a*) muscle → brain → receptor
(*b*) muscle → spinal cord → receptor
(*c*) receptor → brain → muscles
(*d*) receptor → spinal cord → muscle

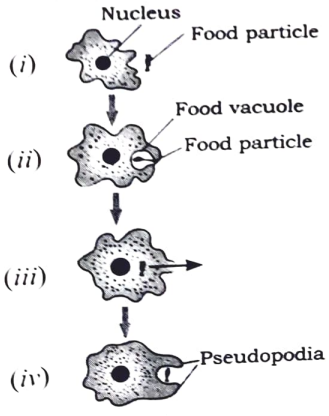
10. Mendel selected garden pea plant for hybridisation experiments for which of the following reasons?
(*i*) Pea plants have short life cycle and are easy to maintain.
(*ii*) Pea plants are cross pollinating plants.
(*iii*) The flowers of pea plants are unisexual.
(*iv*) Pea plants have distinct, easily observable contrasting traits.
(*a*) (*i*), (*ii*) and (*iv*) (*b*) (*i*), (*iii*) and (*iv*)
(*c*) (*i*) and (*iii*) (*d*) (*i*) and (*iv*)

11. Tropism is a growth movement of a plant part in response to an external stimulus in which the direction of stimulus determines the direction of response. From the given table select the incorrect row/rows.

| | Stimulus | Type of Tropism |
|---|---|---|
| (*i*) | Water | Thigmotropism |
| (*ii*) | Chemical | Chemotropism |
| (*iii*) | Light | Hydrotropism |
| (*iv*) | Gravity | Geotropism |

(*a*) (*i*) and (*ii*) (*b*) (*i*) and (*iii*)
(*c*) (*ii*) and (*iii*) (*d*) (*iii*) and (*iv*)

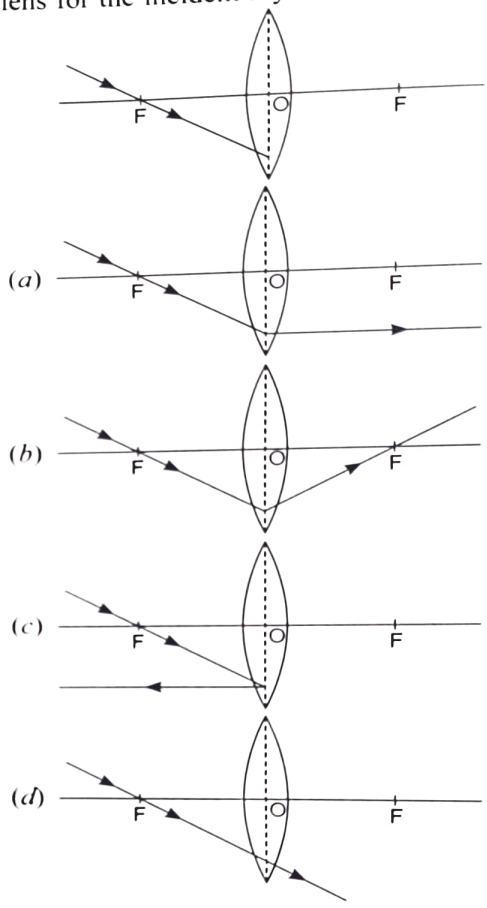
12. In the following figure, different stages in nutrition of *Amoeba* are depicted which are not in the proper sequence.



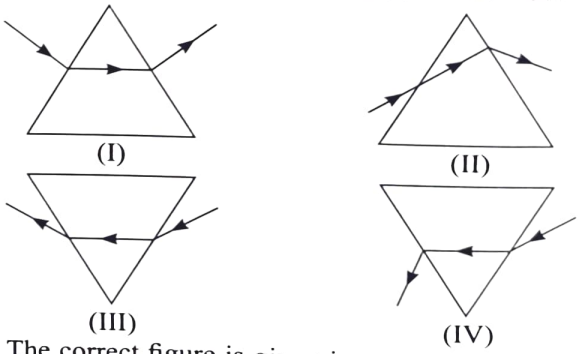

The correct sequence is:
(*a*) (*i*), (*ii*), (*iv*) and (*iii*) (*b*) (*i*), (*iii*), (*ii*) and (*iv*)
(*c*) (*iv*), (*i*), (*ii*) and (*iii*) (*d*) (*i*), (*iv*), (*ii*) and (*iii*)

13. An object is placed 25 cm from a convex lens whose focal length is 10 cm. The image distance is _____ cm.
(*a*) 50 cm (*b*) 16.66 cm
(*c*) 6.66 cm (*d*) 10 cm

14. Which of the following ray diagrams is showing the correct path of the ray after refraction for the convex lens for the incident ray as shown below?




15. While performing the experiment to trace the path of a ray of light passing through a glass prism, four students marked the incident ray and the emergent ray in their diagrams in the manner shown below:




The correct figure is given in
(*a*) I (*b*) II
(*c*) III (*d*) IV

16. If the current varies periodically from zero to a maximum value, back to zero and then reverses its direction, the current is
(*a*) direct (*b*) alternating
(*c*) pulsating (*d*) none of the above

**Q. no 17 to 20 are Assertion – Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:**

(*a*) Both A and R are true and R is the correct explanation of A.
(*b*) Both A and R are true and R is not the correct explanation of A.
(*c*) A is true but R is false.
(*d*) A is False but R is true.

17. **Assertion (A):** Brain is a delicate organ which is protected from injury
**Reason (R):** Only the bony box protects the brain from any shock.

18. **Assertion (A):** $MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl_2 + 2H_2O$ is a redox reaction.
**Reason (R):** $MnO_2$ oxides HCl to $Cl_2$ and gets reduced to $MnCl_2$.

19. **Assertion (A):** All proteins in our food are digested in small intestine only.
**Reason (R):** The protein digesting enzymes are released into small intestine and stomach.

20. **Assertion (A):** When a pencil is partly immersed in water and held obliquely to the surface, the pencil appears to bend at the water surface.
**Reason (R):** The apparent bending of the pencil is due to the refraction of light when it passes from water to air.

## SECTION–B

**Q. no. 21 to 26 are Very Short answer questions.**

21. "We need to balance a skeletal chemical equation." Give reason to justify the statement.

*Or*

Consider the following chemical reaction

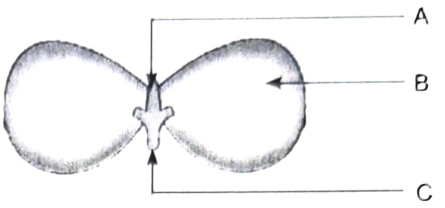
$X$ + Barium chloride $\longrightarrow$ Y + Sodium chloride
(White ppt)

(*a*) Identify 'X' and 'Y'
(*b*) The type of reaction

22. Name the part of neuron:
(*a*) where information is acquired
(*b*) through which information travels as an electrical impulse.

23. What are blood capillaries? How are these structurally different from arteries?

4. Identify the parts shown in the diagram and write the function of part 'B'.

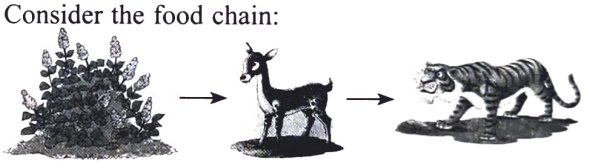



25. A concave mirror produces three times magnified real image of an object placed at 10 cm in front of it. Where is the image located?

26. Observe the given image and write any two ways in which non-biodegradable substances would affect the environment.

*Or*

Consider the food chain:



What will happen if lion is removed from the above food chain?

## SECTION–C

**Q.no. 27 to 33 are Short answer questions.**

27. (*a*) Why does carbon show catenation to maximum extent? List two reasons.
(*b*) Draw electron dot structures of (*i*) ethane, and (*ii*) ethene.

*Or*

(*a*) In an organic compound, which part largely determine the chemical properties ?
(*b*) The molecular formula of two hydrocarbons is $C_5H_{10}$ and $C_5H_{12}$. Which one of them is more reactive and why?

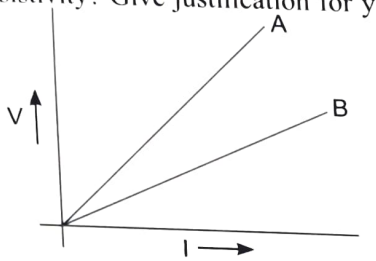
28. What are covalent compounds? Why are they different from ionic compounds? List their three characteristic properties.

29. (*a*) In a germ cell, there is a haploid number of chromosomes. How is this chromosome number restored in the zygote?
(*b*) Inherited traits are capable of directing evolution. Explain.

30. (*a*) Find the absolute refractive index of a medium in which light travels with a speed of $1.4 \times 10^8$ m/s.
(*b*) How do we distinguish a medium to be rarer or denser? Give two reasons.

31. How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.

32. V-I graph for two wires A and B is shown in the figure. If both wires are of same length and same thickness, which of the two is made of a material of high resistivity? Give justification for your answer.




33. (*a*) Food web increases the stability of an ecosystem. Explain.
(*b*) Forests are known as natural ecosystems. Comment.

## SECTION–D

**Q.no. 34 to 36 are Long answer questions.**

34. (*a*) What is the difference between efflorescence and deliquescence?
(*b*) What is the pH scale? How can you know, if the given sample is acidic, basic or neutral from its pH value?
(*c*) Give chemical name, formula and one use of Plaster of Paris.

*Or*

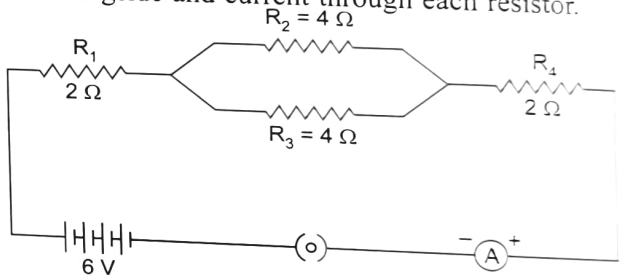
(*a*) Write the chemical equation for production of washing soda from soda ash.
(*b*) Explain chlor-alkali process with chemical equation. Name the products of cathode and anode.
(*c*) Explain any two uses of washing soda.

35. (*a*) Give three advantages and three disadvantages of vegetative propagation in plants.
(*b*) Write the steps involved in micropropagation in plants.
(*c*) Give two advantages of tissue culture in plants.

*Or*

(*a*) List three points of difference between nervous and hormonal mechanisms for control and coordination in animals.
(*b*) How are auxins related with the bending of plant shoot towards unidirectional light? Explain.

36. (*a*) Define current. What is its SI unit?
(*b*) Calculate the total resistance of the circuit given alongside and current through each resistor.




*Or*

How can three resistors of resistances 2 Ω, 3 Ω and 6 Ω be connected to give a total resistance of (*a*) 4 Ω (*b*) 1 Ω? Draw the well labelled circuit diagrams in each case. Also, give expressions for the total resistance in each case.

## SECTION–E

**Q.no. 37 to 39 are Case-based/Data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.**

37. The table given below, in which samples of four metals A, B, C and D were taken and added to the following solutions one by one. The results obtained have been tabulated as follows.

| Metal | Iron(II) sulphate | Copper(II) sulphate | Zinc sulphate | Silver nitrate |
|---|---|---|---|---|
| A | No reaction | Displacement reaction | | |
| B | Displacement reaction | | No reaction | |
| C | No reaction | No reaction | No reaction | Displacement reaction |
| D | No reaction | No reaction | No reaction | No reaction |

(*a*) Study the table carefully and select the most reactive metal. Give reason to justify your selection.
(*b*) What would you observe when B is added to a solution of copper (II) sulphate?
(*c*) Arrange the metals A,B,C and D in the order of decreasing reactivity. Give reason.

*Or*

(*c*) Name two metals which will displace hydrogen from dilute acids and two metals which will not.

38. Within minutes of a baby's birth, people start remarking about who this new baby resembles. 'Oh, he has his daddy's chin!' or 'She's got her mother's eyes!'. But from where exactly do these similarities arise? Every individual has 46 chromosomes, 23 chromosomes from each parent. The chromosomes are composed of deoxyribonucleic acid or DNA that is tightly bundled. Now, certain segments of the DNA which are responsible for different traits in an individual are termed genes. Each chromosome contains over 20,000 genes. There is a lot of copying that has to take place to pass all these genes on from parents to a child. Understandably sometimes mistakes are made in the copying process.

(*a*) Newly formed DNA copies may not be identical at times. Give reason.

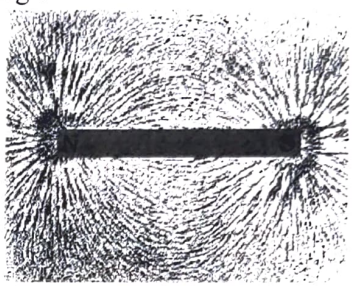
(*b*) Why no two individuals are absolutely similar in a population?

(*c*) What is the importance of variation?

***Or***

(*c*) What is the function of cellular DNA? Explain by taking an example.

39. Michael Faraday was an experimental physicist. He introduced the concept of the magnetic line of force to represent a magnetic field visually. According to his experiment, when a bar magnet is surrounded by little bits of iron filings, each of iron filings becomes a little magnet of its own. By tapping the surface, the iron filings arrange themselves in a particular pattern. They respond to an unseen presence— what Faraday called it "lines of force." The following sketch shows the lines of force due to a bar magnet on the accumulated action on little iron filings.



(*a*) What is magnet?

(*b*) What happens if a bar magnet is cut into two pieces along its length?

(*c*) Draw a diagram indicating uniform magnetic field.

***Or***

(*c*) Why don't two magnetic field lines intersect each other?