SCIENCE

A Highly Simulated Practice Questions Paper for
CBSE Class X Examination

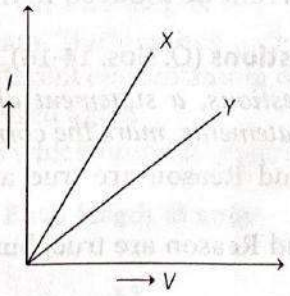
Time : **3 hrs** Max. Marks : **80**

Instructions

(i) The question paper comprises four **Sections** A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
(ii) **Section A** Qns. 1 to 20 all questions and parts there of are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion-reason type questions. Answers to these should be given in one word or one sentence.
(iii) **Section B** Qns. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
(iv) **Section C** Qns. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
(v) **Section D** Qns. 34 to 36 are long answer type question carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
(vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions
(vii) Wherever necessary, neat and properly labelled diagrams should be drawn.

Section A

1. *I-V* graph for the metallic wires X and Y at constant temperature are as shown in figure. Assuming that the two wires have same length and same diameter, then which of the two wires has higher resistance?



* You are advised to attempt this sample paper without referring the answers given here. However, cross check your answers with the answers given at the end of paper after you complete the paper.

2. If two elements X and Y are present on the left and right side of the same group in the periodic table, then the atomic size of X would be more than that of Y. Examine the given statement and justify your answer.

Or

What were the criteria used by Mendeleev in creating his periodic table?

3. The focal length of a convex mirror is 20 cm. Find the value of radius of curvature of the convex mirror.

4. Balance the following chemical equation.

$$NH_3 + H_2SO_4 \longrightarrow (NH_4)_2SO_4$$

5. What is the role of villi present in the internal wall of intestine?

6. What type of oxide would Eka-aluminium form?

7. When magnetic field lines are drawn around a current carrying circular loop, it has been observed that they are close to its axis. But these lines keeps on diverging as we move away from the centre. Explain this observation.

8. Which part of alimentary canal receives bile from the liver?

Or

In which part of the alimentary canal digestion gets completed?

9. Which one is not a base, HNO_3 or NH_4OH?

Or

The solution with the lowest concentration of H^+ ions is pH = 7 or pH = 8.6

10. Draw a schematic diagram of an electric circuit consisting of a battery of two cells each of 1.5 V, 5Ω, 10Ω and 15Ω resistors and a plug key, all connected in series .

11. Which one is most electronegative element among C, F, O and N?

12. Why SA node is known as the pacemaker of heart?

Or

Briefly explain the term gene and allele.

13. How is the strength of the magnetic field around a wire related to the strength of the electric current flowing in the wire?

Or

Two circular coils A and B are placed close to each other. If the current in the coil A is changed, will some current be induced in the coil B? Give reason.

Assertion-Reason Type Questions (Q. Nos. 14-16)

In each of the following questions, a statement of Assertion is given by the corresponding statement of Reason. Of the statements, mark the correct answer as

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c) If Assertion is true, but Reason is false.

(d) If Assertion is false, but Reason is true.

14. **Assertion** While passing through a prism, the violet light deviates the most and the red light deviates the least.

Reason Red light has the maximum wavelength and violet light has the minimum wavelength.

15. **Assertion** Molecular movement are needed for life.

Reason Body structure made up of these melecule need continuous repair and maintenance.

16. **Assertion** HCl produces hydronium ions (H_3O^+) and chloride ions (Cl^-) in aqueous solution.

Reason In presence of water, bases give H^+ ions.

Or

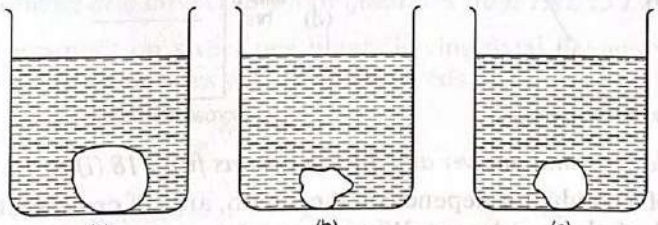
Assertion C_4H_{10} and C_6H_{12} are the successive members of homologous series of methane.

Reason Any two successive members in a homologous series differ in their molecular formula by $—CH_3$ unit.

Answer Q. Nos. 17-20 Contain five sub-parts each. You are expected to answer any four sub parts in these questions.

17. *Read the following and answer any four questions from 17 (i) to 17 (v).*

A candidate in order to study the process of osmosis has taken 3 potato cubes and put them in 3 different beakers containing 3 different solutions. After 24 hours, in the first beaker the potato cube increased in size, in the second beaker the potato cube decreased in size and in the third beaker there was no change in the size of the potato cube. The following diagram shows the result of the same experiment.



17. (i) The technical term used for beaker a is

(a) Hypotonic-hypotonic (b) Hypertonic-plasmolyses

(c) Isotomic (d) Plasmolysis

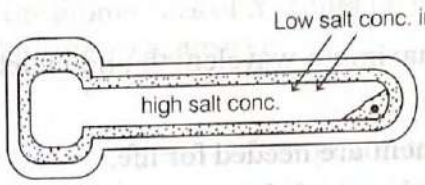
17. (ii) Four steps all cut from a fresh potato. The length of each step is measured. One strips is placed in water, the other in different concentration of sugar solution.

After an hour, the strips are measured again.

The results are shown in the table which liquid is water?

	Original length of strip	Final length of strip
(a)	75	75
(b)	78	85
(c)	82	80
(d)	86	87

17. (iii) The arrow show the movement of salt into a cell



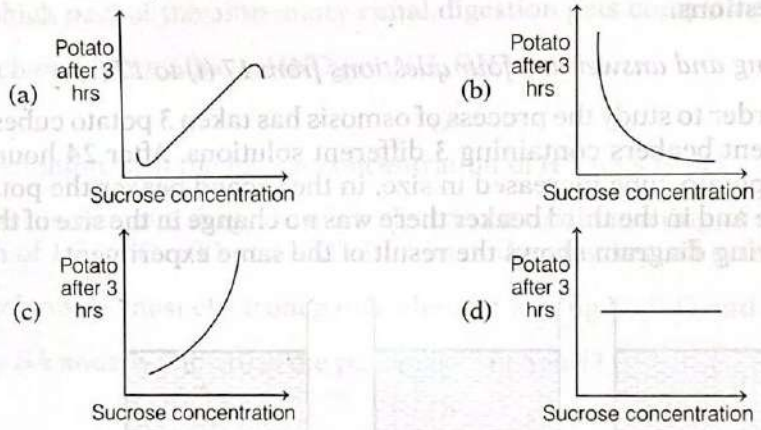
Which describe the movement of the cells?

(a) Active transport against concentration gradient
(b) Active transport down concentration gradient
(c) Diffusion against the concentration gradient
(d) Diffusion down the concentration gradient

17. (iv) Which is an example of active transport?

(a) Movement of glucose into the cells of the villi
(b) Movement of glucose molecules down a concentration gradient
(c) Movement of ions in blood plasma
(d) Movement of water in the transpiration stream

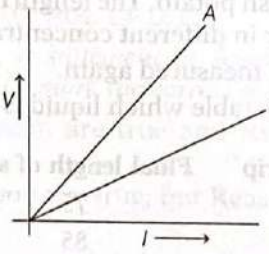
17. (v) Pieces of potato are placed in sucrose solution of different concentration. After three hours, the mass of each potato piece is measured. Which graph shows the result of their experiment?



18. *Read the following and answer any four questions from 18 (i) to 18 (v).*

Resistance of a conductor depends on the length, area of cross-section and nature of the material of the conductor. When a conductor is stretched (increased in its length), then its area of cross-section decreases accordingly but the volume (i.e., area × length) of the conductor remains same.

18. (i) *V-I* graphs for two wires *A* and *B* are shown in the figure. If both wires are of same length and same thickness, then



(a) the resistivity of wire *A* is greater than that of wire *B*
(b) the resistivity of wire *B* is greater than that of wire *A*

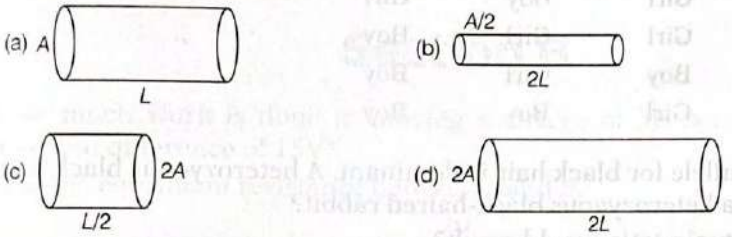
(c) the resistivity of both the wires are equal
(d) this graph does not depict any information regarding the resistivities of two wires

18. (ii) The length (l) of a wire of resistance (R) is halved and area of cross-section (A) is doubled, its new resistance (R') will be

(a) R (b) $\frac{R}{2}$

(c) $\frac{R}{4}$ (d) $\frac{R}{8}$

18. (iii) The figures below show four cylindrical copper conductors along with their face areas and lengths. The geometrical shape in which the resistance will be highest is



18. (iv) If the radius of the conductor is doubled, the ratio of its new resistivity to the old one is

(a) 1 : 2 (b) 2 : 1

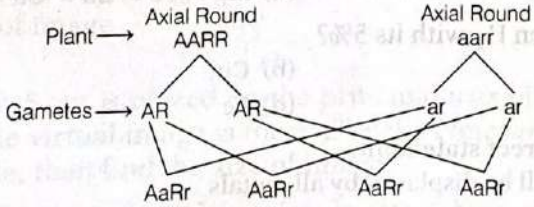
(c) 1 : 4 (d) 1 : 1

18. (v) In practical applications, resistors are used to

(a) increase or decrease the current
(b) increase the current
(c) decrease the current
(d) None of the above

19. *Read the following and answer any four questions from 19(i) to 19(v).*

Mendel's experiment on sweet pea plants having axial flowers with round seeds (AARR) and terminal flowers with wrinkled seeds (aarr).



19. (i) Phenotype of F_1 progeny

(a) axial round seeds (b) axial wrinkled seeds

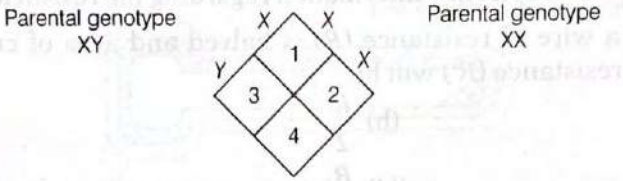
(c) terminal wrinked (d) terminal round

19. (ii) Phenotype of F_2 progeny produced upon by the self-pollination of F_1 progery

(a) axial round and wrinkled (b) terminal round

(c) terminal wrinkled (d) All of these

19. (iii) The diagram show the inheritence of sex in humans



Which sex are of the offspring in boxes 1, 2, 3 and 4?

	1	2	3	4
(a)	Boy	Girl	Boy	Girl
(b)	Boy	Girl	Girl	Boy
(c)	Girl	Boy	Girl	Boy
(d)	Girl	Girl	Boy	Boy

19. (iv) In rabbit the allele for black hair is dominant. A heterozygous black-haired rabbit is crossed with a heterozygous black-haired rabbit?
Which phenotypic ratio would result?
(a) 1 : 1 (b) 1 : 2 : 2
(c) 3 : 1 (d) All similar

19. (v) Which statement is true of a dominant allele?
(a) It cannot undergo mutation
(b) It give greater chance of survival than recessive allele
(c) It give the same phenotype in heterozygote and homozygote
(d) It is only responsible for male characters

20. *Read the following and answer any four questions from 20 (i) to 20 (v).*

A student was given Mg, Zn, Fe and Cu metals. He puts each of them in dil. HCl contained in different test tubes.

20. (i) Which is the correct order of reactivity?
(a) Mg < Zn < Fe < Cu (b) Mg < Fe < Zn < Cu
(c) Mg > Zn > Fe > Cu (d) Mg > Fe > Zn > Cu

20. (ii) Which will given H_2 with its 5%?
(a) Mg (b) Cu
(c) Zn (d) Fe

20. (iii) Choose the correct statement.
(a) Cu metal will be displaced by all metals
(b) Cu metal will displace the all other metals
(c) Mg metal will be displaced by all other metals
(d) None of these correct

20. (iv) Which of these reaction(s) is/are correct?
(a) $Cu + H_2SO_4 \longrightarrow CuSO_4 + H_2\uparrow$
(b) $Fe + H_2SO_4 \longrightarrow FeSO_4 + H_2\uparrow$
(c) $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2\uparrow$
(d) All of the above

20. (v) Choose the correct match.

	Metal		Used in
A.	Fluorine	(i)	Making utensils
B.	Copper	(ii)	Making ornaments
C.	Silver	(iii)	Tooth paste

Codes

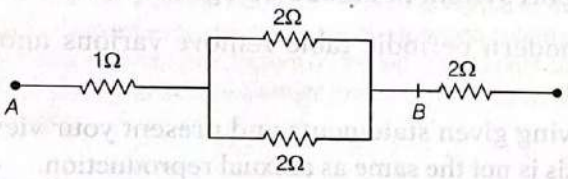
	A	B	C
(a)	(i)	(ii)	(iii)
(c)	(ii)	(i)	(iii)

	A	B	C
(b)	(iii)	(i)	(ii)
(d)	(ii)	(iii)	(i)

Section B

21. (i) How much work is done in moving a charge of 3C across two points having a potential difference of 15V?

(ii) Find the equivalent resistance between *A* and *B*.



22. State the differences between the sperm and ovum.

23. While diluting an acid, why is it advised that the acid should be added to water and not water to the acid?

Or

The gas *X* reacts with lime water to give a compound *Y*, which is used as a bleaching agent in chemical industry.
Identify *X* and *Y* by giving the chemical equation of the reaction involved.

24. An object of height 4 cm is placed perpendicular to the principal axis of a concave lens of focal length 10 cm. If object is kept at a distance 20 cm from optical centre, then find the size of image.

Or

An object of height 5 cm is placed on the principal axis of concave mirror of focal length 20 cm. If the virtual image is formed by the concave mirror at a distance of 10 cm from its pole, then find the size of image.

25. Give the electron dot structure of a molecule of sulphur, which is made up of eight atoms of sulphur.

26. Explain the process by which the autotrophic organisms fulfill their carbon and energy requirements?

Section C

27. A household uses the following electric appliances.

(i) Refrigerator of rating 400 W for 10 h each day.
(ii) Two electric fans of rating 80 W each for 6 h daily.
(iii) Six electric tubes of rating 18 W each for 6 h daily.

Calculate the electricity bill for the household for month of June, if cost of electrical energy is ₹ 3 per unit.

28. What is a homologous series of organic compounds? State any two characteristics of a homologous series.

29. State the role of the following in human respiratory system

(a) Diaphragm (b) Alveoli

(c) Nasal hairs

Or

(i) Why human females have X-chromosome in all of their gametes?

(ii) How the sex of the children will be determined ?

(iii) Name an organism in which the individuals can change sex. What does this tells us about the sex-determination in such organisms?

30. The absolute refractive indices of glass and water 1.5 and 1.33, respectively. In which medium does light travel faster ? Calculate the ratio of speeds of light in the two media.

31. Discuss the transport system in human beings in detail.

32. How could the modern periodic table remove various anomalies of Mendeleev's periodic table?

33. Analyse the following given statements and present your views on the same.

(i) Parthenogenesis is not the same as asexual reproduction.

(ii) The male reproductive system is also called the urinogenital system.

Section D

34. (i) Mention the functions of the following structures in the human excretory system.

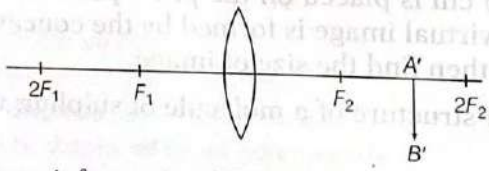
(a) Kidney (b) Ureter

(c) Urinary bladder (d) Urethra

(ii) (a) Define excretion. Write the important functions of the structural and functional unit of the kidney.

(b) Write any two functions of artificial kidney.

35. (i) Observe the following incomplete ray diagram of an object, where the image $A'B'$ is formed after refraction from a convex lens.



On the basis of above information fill in the blanks.

(a) The position of object AB would have been ..... .

(b) Size of the object would have been ..... than the size of image.

(ii) Refractive indices of water and glass are 4/3 and 3/2 respectively. A light ray travelling in water is incident on water glass interface at 45°. What is the angle of refraction? (Take, sin 38.9 = 0.6284)

Or

Explain the phenomenon of dispersion of white light through a glass prism using suitable ray diagram.

36. (a) On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas *X* is formed.

(i) Write a balanced chemical equation of the reaction.

(ii) Identify the brown gas *X* evolved.

(iii) Identify the type of reaction.

(iv) What could be the pH range of the aqueous solution of the gas *X*?

(b) The carbonate of metal *X* is a white solid. It decomposes when heated to form carbon dioxide and a yellow solid oxide. What is metal *X*?

Or

An iron salt *A* reacts with NaOH to form a green precipitate. Another iron salt *B* reacts with NaOH to form a brown precipitate. Identify the iron salts, *A* and *B* along with their colours and write the reactions involved.