

SAMPLE PAPER – 4 CBSE BOARD CLASS - X SCIENCE

Time : 3 Hours

Max. Marks : 80

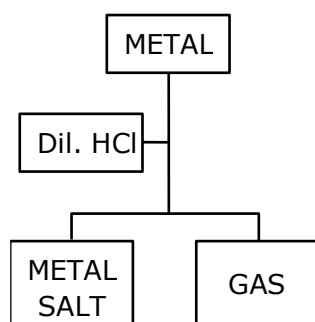
General Instructions:

- (i) This question paper consists of 39 questions in 5 sections.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) **Section A** consists of 20 objective type questions carrying 1 mark each.
- (iv) **Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (v) **Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (vi) **Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- (vii) **Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION – A

1. Which of the following oxide(s) is/are soluble in water to form alkalies?
(i) Na_2O (ii) SO_2 (iii) K_2O (iv) NO_2
(A) (i) and (iii) (B) (i) only (C) (ii) and (iv) (D) (iii) only
2. Vinay observed that the stain of curry on a white shirt becomes reddish-brown when soap is scrubbed on it, but it turns yellow again when the shirt is washed with plenty of water. What might be the reason for his observation?
(i) Soap is acidic in nature.
(ii) Soap is basic in nature.
(iii) Turmeric is natural indicator which gives reddish tinge in bases.
(iv) Turmeric is a natural indicator which gives reddish tinge in acids.
(A) (i) and (ii) (B) (ii) and (iii) (C) (i) and (iv) (D) (ii) and (iv)

3.



Which of the following two combination are correct?

	Metal	Gas evolved
(i)	Copper	Yes
(ii)	Iron	Yes
(iii)	Magnesium	No
(iv)	Zinc	Yes

- (A) (i) and (iii) (B) (i) and (iv) (C) (ii) and (iii) (D) (ii) and (iv)

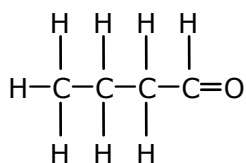
4. When sodium hydrogen carbonate is added to ethanoic acid, a gas is evolved. Consider the following statements about the gas evolved.

- (a) It turns lime water milky.
 (b) It is evolved with a brisk effervescence.
 (c) It has a smell of burning Sulphur.
 (d) It is also a by-product of respiration.

The correct statements are:

- (A) (a) and (b) only (B) (a) and (d) only (C) (a), (c) and (d) (D) (a), (b) and (d)

5. Identify the name of the given compound.

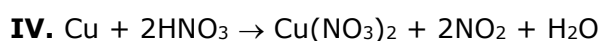
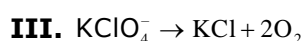
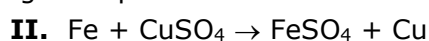
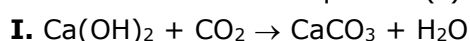


- (A) Butanal (B) Butanone (C) Propanol (D) Propanal

6. Choose the incorrect match.

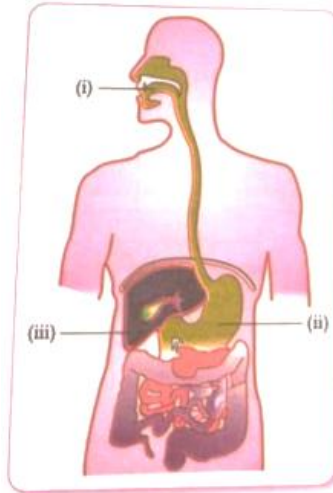
(A)	A metal used in joining electric wires	Magnesium
(B)	A metal whose oxide is soluble in both acids and bases	Zinc
(C)	A metal unreactive towards oxygen and dilute acids	Gold
(D)	A metal extracted by using electrolytic reduction	Aluminium

7. Choose the balanced equation (s) from the given options.



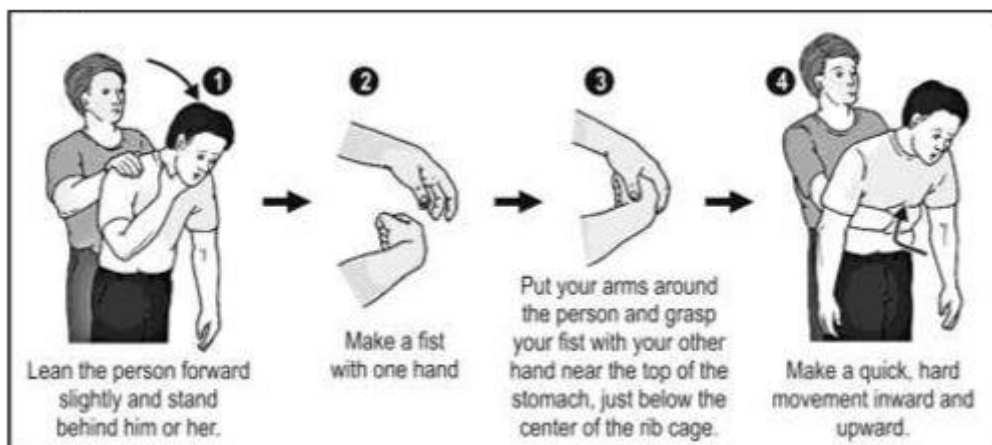
- (A) I and II only (B) I, II and III only
 (C) I, III and IV only (D) All of these

8. Identify the option that indicates the correct enzyme that is secreted in location (i), (ii) and (iii).



- (A) (i)-lipase, (ii)- trypsin, (iii)-pepsin
 (B) (i)-amylase, (ii)-pepsin, (iii)-trypsin
 (C) (i)-trypsin, (ii)-amylase, (iii)-carboxylase
 (D) (i)-permease, (ii)-carboxylase, (iii)-oxidase
9. Which of the following chemical reactions is incorrect?
- (A) Pyruvate $\xrightarrow[\text{in mitochondria}]{\text{Oxygen (Kreb's cycle)}}$ $6\text{CO}_2 + 6\text{H}_2\text{O} + 38 \text{ATP}$
 (B) Pyruvate $\xrightarrow[\text{in yeast}]{\text{in absence of Oxygen}}$ $2 \text{Lactic acid} + 2 \text{ATP}$
 (C) Pyruvate $\xrightarrow[\text{in yeast}]{\text{in absence of Oxygen}}$ $2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + 2 \text{ATP}$
 (D) Pyruvate $\xrightarrow[\text{muscle tissue in animals}]{\text{in absence of Oxygen}}$ $2 \text{Lactic acid} + 2 \text{ATP}$

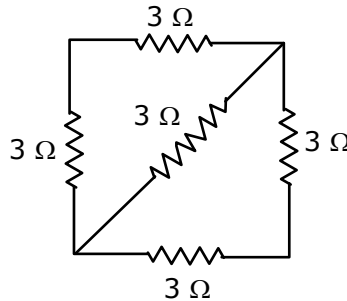
10. A person can choke when a piece of food becomes lodged in the windpipe, blocking the flow of air. A first aid procedure to remove the blockage is the Heimlich manoeuvre described below:



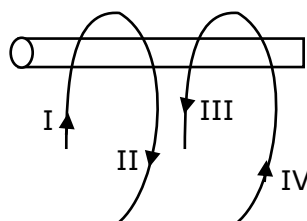
By performing this procedure, the piece of food is pushed out of the windpipe. Which of the following causes this to happen?

- (A) The expansion of the chest.
 (B) The air pressed out of the chest.
 (C) The food pressed out of the stomach.
 (D) The upward movement of the wall of the food pipe.

- 11.** In humans, the life processes are controlled and regulated by:
 (A) reproductive and endocrine system (B) respiratory and nervous system
 (C) endocrine and digestive system (D) nervous and endocrine system
- 12.** Which of the following is a recessive trait in garden pea?
I. Green seed colour **II.** Terminal flower position
III. Violet flower **IV.** Rounds seeds
 (A) I and II only (B) II and III only (C) I, II and III only (D) I, III and IV only
- 13.** What is the effective resistance between points P and Q in the circuit shown below?



- (A) 0.15Ω (B) 0.66Ω (C) 1.5Ω (D) 1.75Ω
- 14.** You are given four bulbs of 25 W, 40 W, 50 W and 60 W. Which bulb has the lowest resistance?
 (A) 25 W (B) 50 W (C) 60 W (D) 40 W
- 15.** How the strength of an electromagnet can be increased?
 (A) By increasing the number of turns of solenoid.
 (B) By increasing the magnitude of current.
 (C) By using non-magnetic substance as core.
 (D) Both (A) and (B)
- 16.** Two current-conducting wires are hung on a plastic rod. A large current is passed through the two wires in the direction shown. Which of the following options is correct regarding this?



- (i) I and III parts of wire repel each other.
 (ii) II and IV parts of wire repel each other.
 (iii) I and IV parts of wire repel each other.
 (iv) II and III parts of wire repel each other.
 (A) Only (i) and (ii) (B) Only (i) and (iii)
 (C) Only (iii) and (iv) (D) Only (i) and (iv)

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):** The chemical name of bleaching powder is calcium oxychloride.
Reason (R): Bleaching powder is used as an oxidizing agent in chemical industries.
- 18. Assertion (A):** Photosynthesis is an anabolic process.
Reason (R): The process of photosynthesis occurs in chlorophyll.
- 19. Assertion (A):** Males have more stature than females during puberty.
Reason (R): This is because of presence of thyroxin in the blood of females.
- 20. Assertion (A):** Strength of an electromagnet can be increased by increasing the number of turns per unit length in solenoid coil.
Reason (R): Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.

SECTION – B**(Q. no. 21 to 26 are very short answer questions.)**

- 21.** 3 mL of ethanol is taken in a test tube and warmed gently in a water bath. A 5% solution of alkaline potassium permanganate is added first drop by drop to this solution, then in excess.
- (A) How is 5% solution of KMnO_4 prepared?
 - (B) State the role of alkaline potassium permanganate in this reaction. What happens on adding it in excess?

OR

In the electrolysis of water:

- (a) Name the gas collected at the cathode and anode respectively.
 - (b) Why the volume of one gas, collected at one electrode is double than that of the other electrode? Name this gas.
- 22.** Two green plants are kept separately in oxygen free containers, one in the dark and the other in continuous light. Which one will live longer? Give reasons.
- 23.** Why does absorption of digested food occur mainly in the small intestine?
- 24.** In a cross between plants with purple flowers and white flowers, the F_1 had all white flowers. When F_1 generation was self breed, the F_2 generation gave rise to 100 individuals, 75 of which had purple flowers. Make a cross and answer:
- (a) What are the genotypes of F_2 individual?
 - (b) what is the ration of purple to white flowered plants in F_2 generation?

25. A student needs spectacles of power -0.5 D for the correction of his vision.
(A) Name the defect in vision the student is suffering from.
(B) Find the nature and focal length of the corrective lens.

OR

What happens to beam of white light when it gets refracted through a glass 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.

26. You have been selected to talk on "Ozone layer and its protection" in the school assembly on 'Environment Day'.
(a) Why should ozone layer be protected to save the environment?
(b) List any two ways that you would stress in your talk to bring in awareness amongst your fellow friends that would also help in protection of ozone layer as well as the environment.

OR

Define an ecosystem. Draw a block diagram to show the flow of energy in an ecosystem.

SECTION – C

(Q. No. 27 to 33 are short answer questions)

27. Which compounds are called (a) alkanes, (b) alkenes and (c) alkynes? C_4H_{10} belongs to which of these? Draw two structural isomers of this compound.
28. How is copper extracted from its sulphide ore? Explain the various steps supported by chemical equations. Draw labelled diagram for the electrolytic refining of copper.
29. A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. State the immediate changes that take place in its body so that the squirrel is able to either fight or run?

OR

- (a) What is endocrine gland?
(b) Name any two endocrine glands present in a human body and write hormones secreted by them.

30. A student holding a mirror in his hand, directed the reflecting surface of the mirror towards the Sun. He then directed the reflected light on to a sheet of paper held close to the mirror.
(A) What should he do to burn the paper?
(B) Which type of mirror does he have?
(C) Will he be able determine the approximate value of focal length of this mirror from this activity? Give reason and draw ray diagram to justify your answer in this case.
31. A 10 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 12 cm. The distance of the object from the lens is 18 cm. Find the nature, position and size of the image formed.
32. (A) Nichrome wire of length 'L' and radius 'R' has resistance of $10\ \Omega$. How would the resistance of the wire change when:
(i) Only length of the wire is doubled?
(ii) Only diameter of the wire is doubled? Justify your answer.
(B) Why element of electrical heating devices are made up of alloys?
33. Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment.

SECTION – D**(Q. No. 34 to 36 are long answer questions.)**

- 34.** (A) Write chemical equations for the following reactions:
(i) Calcium metal reacts with water.
(ii) Cinnabar is heated in the presence of air.
(iii) Manganese dioxide is heated with aluminium powder.
(B) What are alloys? List two properties of alloys.

OR

Define a chemical reaction. State four observations which help us to determine that a chemical reaction has taken place. Write one example of each observation with a balanced chemical equation.

- 35.** Define pollination. Explain the different types of pollination. List two agents of pollination. How does suitable pollination lead to fertilization?

OR

(a) Draw a diagram of human excretory system and label the following parts on it:

- (i) Right renal artery
(ii) Vena cava.
(iii) Urinary bladder
(iv) Left Kidney

(b) List two vital functions of Kidney.

- 36.** A piece of wire having resistance 'R' is cut into four equal parts.
(A) How does the resistance of each part compare with the original resistance?
(B) If the four parts are placed in parallel, how will be the resistance of the combination compare with the resistance of the original wire?

OR

(A) Explain with the help of the pattern of magnetic field lines the distribution of magnetic field due to a current carrying a circular loop.

(B) Why is it that the magnetic field of a current carrying coil having n turns, is ' n ' times as large as produced by a single turn (loop)?

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.** Answer the following questions on the basis of your understanding of the following paragraph and the related studied concepts.

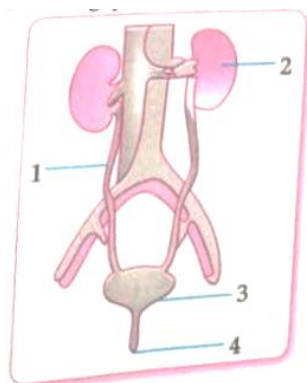
Sohan went door to door posing as a goldsmith. He promised to bring back the glitter of old and dull gold ornaments. An unsuspecting lady gave a set of gold bangles to him, which he dipped in a particular solution. The bangles sparkled like new but their weight was reduced drastically. The lady was sad but after a futile argument, the man beat a hasty retreat.

- (A) What is used for dissociation of gold? **1**
(B) Why the weight of the bangle was reduced drastically? **1**
(C) Aqua-regia is a strong oxidising agent. (True or False). **2**

OR

What is the other name of the solution (in Latin) used by that man posing as the goldsmith? **2**
Why is it so called?

- 38.** The excretory system is responsible for the elimination of wastes produced by homeostasis. There are several parts of the body that are involved in this process, such as sweat glands, the liver, the lungs and the kidney system. Every human has two kidneys. The given diagram represents the structure of human excretory system. Study the diagram and answer the following questions.

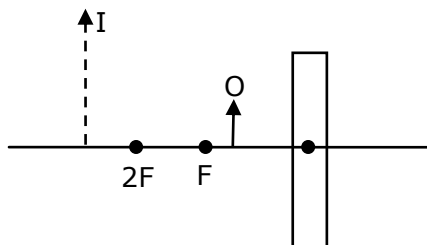


- (a) What is the role of part 1 in excretion? **1**
 (b) Name the structural and functional part of 2? **1**
 (c) What will happen, if one kidney of a person is removed? **2**

OR

The urge to urinate can be controlled. Give reason. **2**

- 39.** The diagram given below shows an object O and its image I. Without actually drawing the ray diagram state the following:



- (a) Type of lens (converging/Diverging). **1**
 (b) Name two optical instruments where such an image is obtained. **1**
 (c) List three characteristics of the image formed if this lens is replaced by a concave mirror of focal f and an object is placed at a distance $f/2$ in front of the mirror. **2**

OR

List four precautions which a student should observe while determining the focal length of a given convex lens by obtaining image of a distant object on a screen. **2**