

Class X 2022-23

Science (086)

Time: 3 Hours

Max. Marks: 80

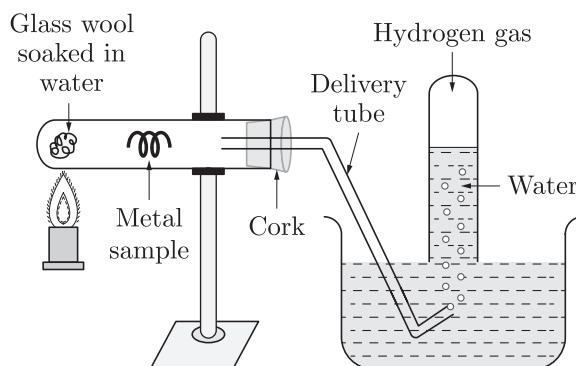
General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 Objective Type questions carrying 1 mark each.
4. 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.
5. 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.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 20.

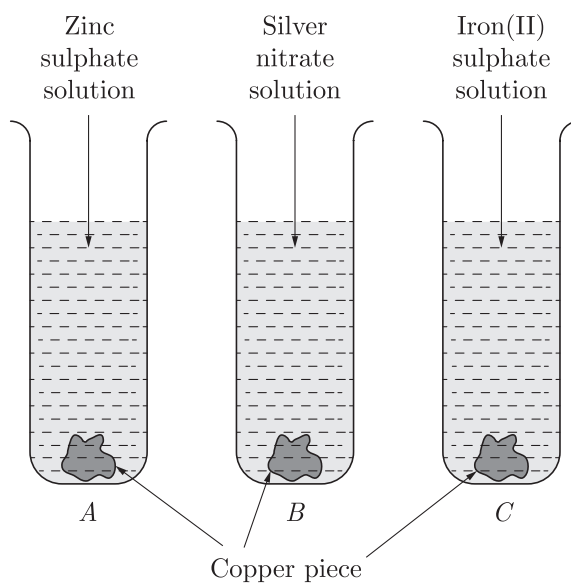
1. Action of steam on a metal is shown in the figure.



The metal sample in the above experiment is-

- (a) Zinc
 - (b) Copper
 - (c) Aluminium
 - (d) Platinum
2. Translate the following statement into the chemical equation and choose the correct option "Hydrogen gas combines with nitrogen to form ammonia."
- (a) $3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$
 - (b) $\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \longrightarrow \text{NH}_2(\text{g})$
 - (c) $2\text{H}(\text{g}) + \text{N}_2(\text{g}) \longrightarrow 2\text{NH}_3$
 - (d) None of these

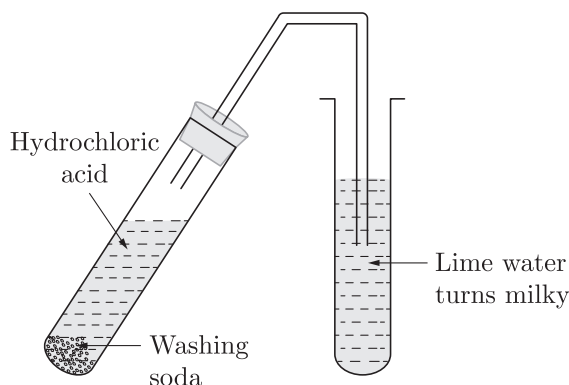
3. The physical change is:
- (a) melting of butter
 - (b) burning of paper
 - (c) digestion of food
 - (d) bursting of crackers
4. What happens when dilute hydrochloric acid is added to iron filings? Tick the correct answer :
- (a) Hydrogen gas and iron chloride are produced.
 - (b) Chlorine gas and iron hydroxide are produced.
 - (c) No reaction takes place.
 - (d) Iron salt and water are produced.
5. Test tubes *A*, *B* and *C* contain zinc sulphate, silver nitrate and iron (II) sulphate solutions respectively as shown in the figure. Copper pieces are added to each test tubes. Blue colour will appear in case of



- (a) Test tube *A*
- (b) Test tube *B*
- (c) Test tube *C*
- (d) All the test tube

Continue on next page.....

6.



This figure illustrates the reaction of hydrochloric acid with washing soda. Which of the following gas is evolved in this experiment?

- (a) Carbon dioxide
- (b) Hydrogen
- (c) Nitrogen
- (d) Helium

7. The correct electron dot structure of a water molecule is

- (a) $\text{H} \cdot \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{O}}} \cdot \text{H}$
- (b) $\text{H} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{O}}} \cdot \text{H}$
- (c) $\text{H} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{O}}} : \text{H}$
- (d) $\text{H} : \text{O} : \text{H}$

8. Which of the following statements are true about respiration?

- A. Haemoglobin has greater affinity for CO_2 than O_2 .
- B. The gaseous exchange takes place in the alveoli.
- C. During inhalation ribs move inward and diaphragm is raised.
- D. Haemoglobin has greater affinity for O_2 than CO_2 .

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

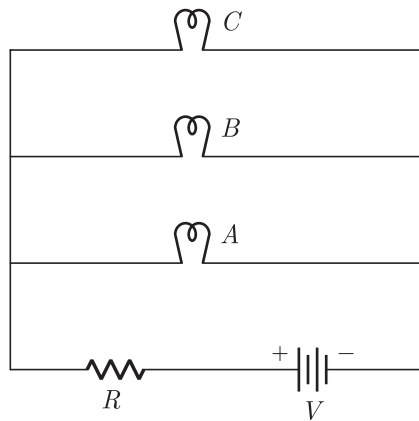
9. Atmospheric nitrogen is converted into organic matter by with plant with the help of

- (a) Bacteria
- (b) Organic compounds
- (c) Air born viruses
- (d) Fertilizers

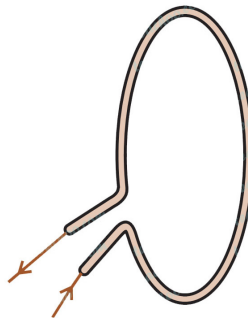
10. A cross between a tall plant (TT) and short pea plant (tt) resulted in progeny that were all tall plants because

- (a) tallness is the dominant trait
- (b) shortness is the dominant trait
- (c) tallness is the recessive trait
- (d) height of pea plant is not governed by gene 'T' or 't'

11. Which of the following statements are true ?
- (i) Sudden action in response to something in the environment is called reflex action.
 - (ii) Sensory neurons carry signals from spinal cord to muscles.
 - (iii) Motor neurons carry signals from receptors to spinal cord.
 - (iv) The path through which signals are transmitted from a receptor to a muscle or a gland is called reflex arc.
- (a) (i) and (ii) (b) (i) and (iii)
 (c) (i) and (iv) (d) (i), (ii) and (iii)
12. Characters that are transmitted from parents to offspring during reproduction show
- (a) only similarities with parents
 - (b) only variations with parents
 - (c) both similarities and variations with parents
 - (d) neither similarities nor variations
13. In an electrical circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness ?



- (a) Brightness of all the bulbs will be the same
 - (b) Brightness of bulb A will be the maximum
 - (c) Brightness of bulb B will be more than that of A
 - (d) Brightness of bulb C will be less than that of B
14. The nature of magnetic field line passing through the centre of current carrying circular loop is

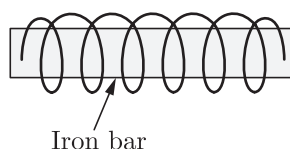


- (a) circular
- (b) ellipse
- (c) parabolic
- (d) straight line

15. If the current I through a resistor is increased by 100% (assume that temperature remains unchanged), the increase in power dissipated will be

- (a) 100%
- (b) 200%
- (c) 300%
- (d) 400%

16. A soft iron bar is introduced inside the current carrying solenoid as shown in the figure. The magnetic field inside the solenoid



- (a) will decrease
- (b) will remains same
- (c) will increase
- (d) will become zero

Question no. 17 to 20 are Assertion - Reasoning based questions.

17. **Assertion :** Precipitation reactions produce insoluble salts.

Reason : Precipitation reaction is a double decomposition reaction.

- (a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
- (b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
- (c) Assertion is True but the Reason is False.
- (d) Both Assertion and Reason are False.

18. **Assertion :** Learning a skill such as dance and music is an acquired trait.

Reason : Acquired traits develops in the life time of an individual and do not pass to the progeny.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

19. **Assertion :** Dark phase reactions take place at night.

Reason : Dark phase is independent of light, hence, called light independent phase.

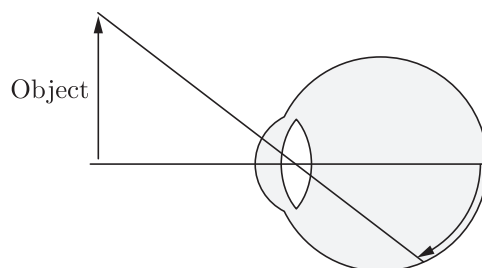
- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Both Assertion and Reason are false.

20. **Assertion :** A neutral body may experience a net non-zero magnetic force.
Reason : The net charge on a current carrying wire is zero, but it can experience a force in a magnetic field.
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - (c) Assertion (A) is true but reason (R) is false.
 - (d) Assertion (A) is false but reason (R) is true.

SECTION-B

Question no. 21 to 26 are very short answer questions.

21. What happens when a metal reacts with dilute acid?
or
How are the less reactive metals extracted ? Explain with the help of an example.
22. How are the lungs designated in human beings to maximise the area for exchange of gases ?
23. If both kidneys of a person stop functioning, which machine can be used ? What is this procedure known as ?
24. How do autotrophs obtain food ? Explain the process with the help of a balanced chemical equation.
25. What is meant by near point of a human eye ?



or

Write the role of the following parts of an eye :

- (a) Pupil,
 - (b) Retina,
 - (c) Optic nerve.
26. Government of India is imposing ban on the use of polythene bags for stopping. List for advantages of using cloth or jute bags over polythene bags.

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SECTION-C

Question no. 27 to 33 are short answer questions.

27. In the electrolysis of water :
- Name the gases liberated at anode and cathode.
 - Why is it that the volume of gas collected on one electrode is two times that on the other electrode?
 - What would happen if dil. H_2SO_4 is not added to water ?
28. (a) What is meant by reactivity series of metals ?
(b) Why metals are not equally reactive? Arrange the following metals in decreasing order of their reactivity: Fe, Ag, Na, Cu, Al.

29. What are the aspects included in reproductive health?

or

Write the two causes of human population explosion. Explain with the help of suitable examples how this explosion can be checked.

30. Rohit is uses a concave mirror which produces three times enlarged real image of an object placed at 12 cm in front of it. Calculate the radius of curvature of the mirror.
31. (a) Define 1 dioptre of power. Find the focal length of a lens of power -2.0 D .
(b) Why does a lemon kept in water in a glass tumbler appear to be bigger than its actual size?
(c) Study the table given below and state the medium in which light ray will travel fastest. Why ?

Medium	A	B	C
Refractive index	1.33	1.5	2.4

32. Explain two ways to induce current in a coil. When is the induced current produced highest ? State the rule used to find direction of induced current.

or

Write some precautions in the use of electricity.

33. You have been selected to talk on “ozone layer and its protection in the school assembly” on “Environment Day”
- Why should ozone layer be protected to save the environment ?
 - 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.

SECTION-D

Question no. 34 to 36 are Long answer questions.

34. A compound X undergoes addition reaction with H_2 to form a compound Y having molecular mass 30 g mol^{-1} . X decolourize bromine water and burns with a smoky flame.
- Identify X and Y and write chemical equations of the reactions involved.
 - Write the structural formulae of (i) Butanone and (ii) Pentanoic acid.

(c) Would you be able to check if water is hard by using a detergent ? Give reason to justify your answer.

or

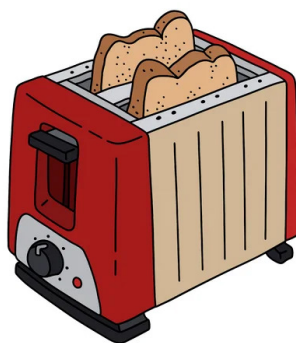
- (a) Write the names and structures of (i) an alcohol, and (ii) an aldehyde with four carbon atoms in their molecules.
- (b) List two differences between saturated and unsaturated hydrocarbons

35. Define the term pollination. Differentiate between self pollination and cross pollination. What is the significance of pollination?

or

- (a) Draw a longitudinal section of a flower and label the following parts :
- (i) Part that produces pollen grain.
 - (ii) Part that transfers male gametes to the female gametes.
 - (iii) Part that is sticky to trap the pollen grain.
 - (iv) Part that develops into a fruit.
- (b) Differentiate between pollination and fertilisation.

36. Although electric kettle and electric toaster were used simultaneously in the kitchen to prepare breakfast for the family, yet the two devices could work efficiently due to 'fuse' used in the electric circuit.



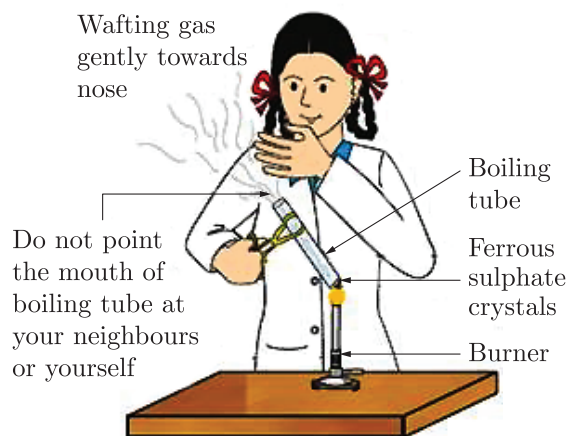
- (i) What is a fuse? Write the material used in fuse wires. How is a fuse connected in an electric circuit ?
- (ii) State the ratings of fuse used in electric circuits.
- (iii) What is the function of a fuse ? How does it perform its function ?
- (iv) A device uses 1 kW electric power when operated at 220 V. Calculate the rating of the fuse to be used.

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SECTION-E

Question 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.



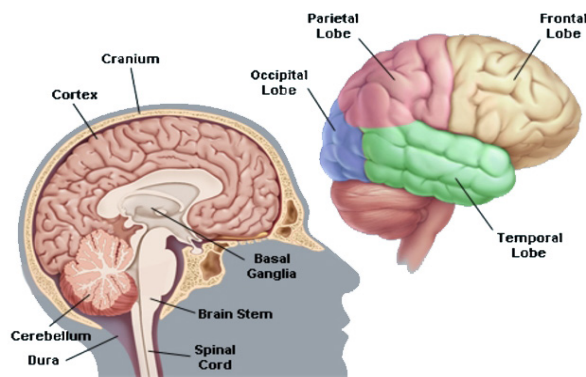
After seeing the above image answer the following questions.

- What was the colour of the crystals before heating and after heating?
- Write the chemical equation for the reaction.
- Which pungent smelling gas is evolved during the reaction ? What is the nature of this gas?

or

- Write the name of the solid substance formed.

38. The communication between the central nervous system and the other parts of the body is facilitated by the peripheral nervous system consisting of cranial nerves arising from the brain and spinal nerves arising from the spinal cord. The brain thus allows us to think and take actions based on that thinking. The brain has three such major parts or regions, namely the fore-brain, mid-brain and hind-brain. The fore-brain is the main thinking part of the brain. It has regions which receive sensory impulses from various receptors. Separate areas of the fore-brain are specialised for hearing, smell, sight and so on. There are separate areas of association where this sensory information is interpreted by putting it together with information from other receptors as well as with information that is already stored in the brain. Based on all this, a decision is made about how to respond and the information is passed on to the motor areas which control the movement of voluntary muscles.



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- (i) Which system facilitates the communication between the central nervous system and the other parts of the body ?
- (ii) What is the role of the brain ?
- (iii) What are three parts of the human brain ?

or

- (iv) Which is the main thinking part of the brain ?

39. Study the following table for a convex lens for different positions of object and answer the following questions:

Position of object	Position of image	Relative size of image
At infinity	At focus F_2	Highly diminished point sized
Beyond $2F_1$	Between F_2 and $2F_2$	Diminished
At $2F_1$	At $2F_2$	Same size
Between F_1 and $2F_1$	Beyond $2F_2$	Enlarged
At focus F_1	At infinity	Infinitely large or highly enlarged
Between focus F_1 and optical centre O	On the same side of the lens as the object	Enlarged

- (i) What is the nature of the image, if an object is placed at infinity ?
- (ii) Identify the nature of the image for which the object is between focus and optical centre.
- (iii) What is position of image, when object is placed at focus (f_1) ?

or

- (iv) What is the focal length of a lens for an object placed 50 cm from the lens producing virtual image at a distance of 10 cm in front of the lens?

□□□□□□□