

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.
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SECTION-A

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

1. Some of the substances used in making of a modern safety match box are listed below :



1. Antimony trisulfide
2. Glass powder
3. Potassium chlorate
4. Red phosphorus

The head of modern safety match stick contains :

- (a) 1 and 4
 - (b) 2 and 3
 - (c) 3 and 4
 - (d) 3 and 1
2. Which of the following is an example of displacement reaction?
 - (a) $\text{NaOH} + \text{HNO}_3 \rightarrow \text{NaNO}_3 + \text{H}_2\text{O}$
 - (b) $\text{Cu} + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$
 - (c) $2\text{Hg} + \text{O}_2 \rightarrow 2\text{HgO}$
 - (d) $\text{FeCl}_3 + 2\text{NaOH} \rightarrow 3\text{NaCl} + \text{Fe}(\text{OH})_3$

3. Rusting of iron can be prevented by:



1. Painting
2. Galvanisation
3. Electrolytic refining
4. Alloying

Which of the above are correct?

- (a) 1, 2 and 3
- (b) 1, 2 and 4
- (c) 2, 3 and 4
- (d) 1, 2, 3 and 4

4. Which of the following is a feasible reaction?

- (a) $\text{Ba(s)} + \text{K}_2\text{SO}_4(\text{aq}) \longrightarrow \text{BaSO}_4(\text{aq}) + 2\text{K(s)}$
- (b) $\text{Zn(s)} + 2\text{AgNO}_3(\text{aq}) \longrightarrow \text{Zn(NO}_3)_2(\text{aq}) + 2\text{Ag(s)}$
- (c) $\text{Mg(s)} + \text{Na}_2\text{SO}_4(\text{aq}) \longrightarrow \text{MgSO}_4(\text{aq}) + 2\text{Na(s)}$
- (d) $\text{Cu(s)} + \text{MgSO}_4(\text{aq}) \longrightarrow \text{CuSO}_4(\text{aq}) + \text{Mg(s)}$

5. Sodium kept immersed in kerosene oil because-

- (a) Sodium is most reactive metal.
- (b) Sodium is less reactive metal.
- (c) Sodium is not a reactive metal.
- (d) None of these.

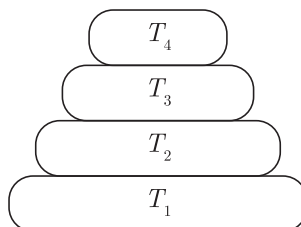
6. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

- (a) Lemon Juice
- (b) Vinegar
- (c) Common salt
- (d) An antacid

7. Identify the unsaturated compounds from the following :

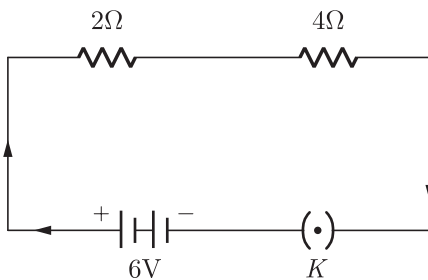
- (i) Propane
 - (ii) Propene
 - (iii) Propyne
 - (iv) Chloropropane
- (a) (i) and (ii) (b) (ii) and (iv)
 - (c) (iii) and (iv) (d) (ii) and (iii)

8. In the given figure the various trophic levels are shown in a pyramid. At which trophic level is maximum energy available ?



- (a) T_4
(b) T_2
(c) T_1
(d) T_3
9. Process of conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen in plants is known as
(a) Photosynthesis
(b) Photoperiodism
(c) Plant nutrition
(d) Plant hormone functions
10. A round, green seeded pea plant ($RR yy$) is crossed with wrinkled, yellow seeded pea plant, ($rr YY$) the seeds produced in F_1 generation are
(a) round and yellow
(b) round and green
(c) wrinkled and green
(d) wrinkled and yellow
11. Electrical impulse travels in a neuron from
(a) Dendrite \rightarrow axon \rightarrow axonal end \rightarrow cell body
(b) Cell body \rightarrow dendrite \rightarrow axon \rightarrow axonal end
(c) Dendrite \rightarrow cell body \rightarrow axon \rightarrow axonal end
(d) Axonal end \rightarrow axon \rightarrow cell body \rightarrow dendrite
12. Which among the following is not the function of testes at puberty?
(a) formation of germ cells
(b) secretion of testosterone
(c) development of placenta
(d) secretion of estrogen
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (iii) and (iv)
(d) (i) and (iv)

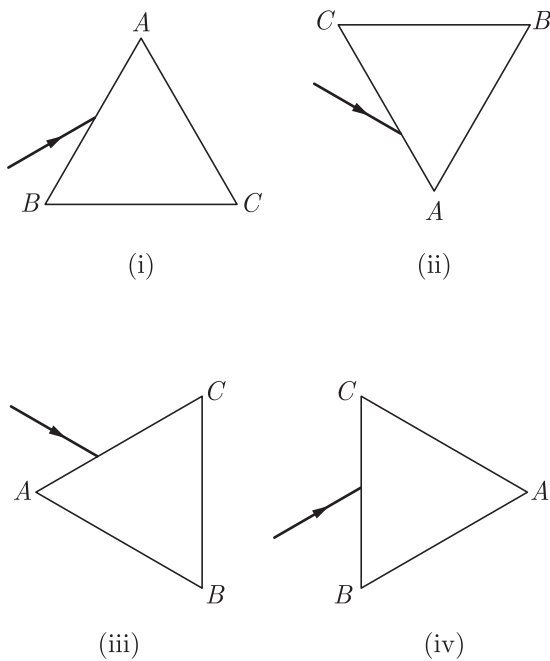
13.



In an electrical circuit two resistors of $2\ \Omega$ and $4\ \Omega$ respectively are connected in series to a $6\ \text{V}$ battery as shown in the figure. The heat dissipated by the $4\ \Omega$ resistor in $5\ \text{s}$ will be

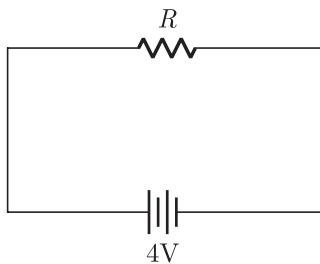
- (a) $5\ \text{J}$
- (b) $10\ \text{J}$
- (c) $20\ \text{J}$
- (d) $30\ \text{J}$

14. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in figure. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky?



- (a) (i)
- (b) (ii)
- (c) (iii)
- (d) (iv)

15. When a 4 V battery is connected across an unknown resistor, there is a current of 100 mA in the circuit. The value of the resistance of the resistor is



- (a) 4Ω (b) 40Ω
(c) 400Ω (d) 0.4Ω
16. Which one of the following statements is correct?
(a) The rainbow is produced by the reflection of white sun light by water drops in the atmosphere.
(b) The blue colour of the sky is due to scattering of light.
(c) The stars appear higher in the sky than actually are, due to scattering of light.
(d) The planets twinkle at night due to atmospheric refraction of light.

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

17. **Assertion :** Chemical equations can be made more informative.
Reason : We can write physical state of reactants and products, temperature and pressure, name of catalyst used etc.
(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 :** Traits like eye colour or height are inherited traits.
Reason : Inherited traits are not transferred from parents to young ones.
(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 :** Aerobic animals are not truly aerobic.
Reason : Anaerobically they produce lactic acid.
(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 :** Electric appliances with metallic body have three connections, whereas an electric bulb has two pin connections.
Reason : Three pin connections reduce heating of connecting wires.
- Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 - Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 - Assertion (A) is true but reason (R) is false.
 - Assertion (A) is false but reason (R) is true.

SECTION-B

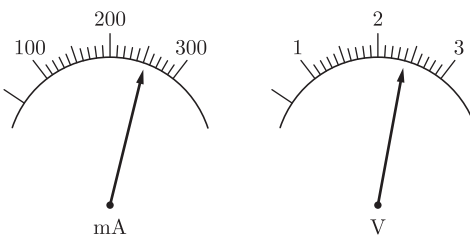
Question no. 21 to 26 are very short answer questions.

21. Name two metals that start floating after sometime when immersed in water and why ?

or

Explain how mercury is extracted from its sulphide ore (Cinnabar). Give equations of the reactions involved.

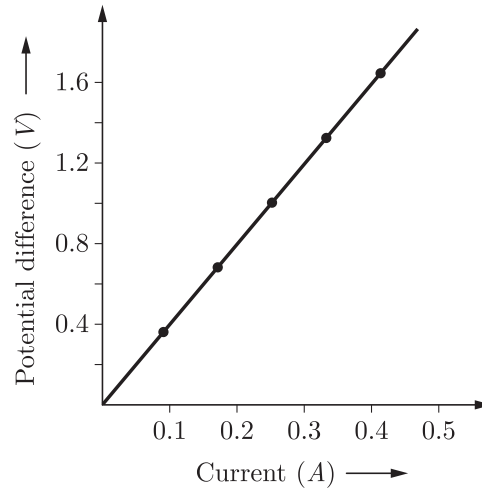
22. A certain tissue in a green plant somehow got blocked and the leaves wilted. What was the tissue that got blocked?
23. Write one function each of the salivary glands, liver and pancreas.
24. Why and how does water enter continuously into the root xylem ?
25. The current flowing through a resistor connected in a circuit and the potential difference developed across its ends are as shown in the diagram by milliammeter and voltmeter readings respectively :
- What are the least counts of these meters?
 - What is the resistance of the resistor?



Continue on next page.....

or

A V - I graph for a nichrome wire is given below. What do you infer from this graph? Draw a labelled circuit diagram to obtain such a graph.



26. Name the four types of teeth present in adult human and mention their main functions.

SECTION-C

Question no. 27 to 33 are short answer questions.

27. What does a balanced chemical equation convey ?
28. (a) An element X on reacting with oxygen forms an oxide X_2O . The oxide dissolves in water and turns blue litmus red. Predict the nature of the element whether metal or non-metal.
(b) A solution of copper sulphate was kept in an iron pot. After few days, the pot developed some holes in it. How will you account for this ?
29. Define the two main methods of reproduction in living organisms.

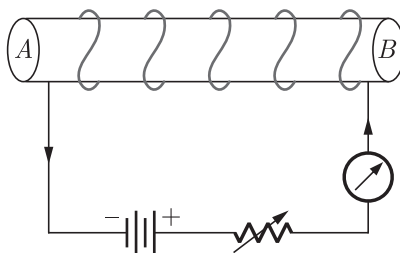
or

List six specific characteristics of sexual reproduction.

30. Ram placed an object in front of a convex lens of focal length 15 cm. The image formed is three times the size of the object. Calculate the two possible distances of the object from the lens.
31. The image of a candle flame placed at a distance of 30 cm from a mirror is formed on a screen placed in front of the mirror at a distance of 60 cm from its pole. What is the nature of the mirror ? Find its focal length, if the height of the flame is 2.4 cm, find the height of its image. State whether the image formed is erect or inverted.

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32. Diagram below shows a circuit containing a coil wound over a long and thin hollow cardboard tube. Copy the diagram.



- Show the polarity acquired by each face of the solenoid.
- Draw the magnetic field lines of force inside the coil and also show their direction.
- Mention two methods to increase the strength of the magnetic field inside the coil.

or

State the factors on which the resistance of a cylindrical conductor depends. How will resistance of a conductor change if it is stretched so that its length is doubled ?

33. (a) What is full form of (i) UNEP (ii) CFCs.
 (b) On what basis are organisms grouped as producers, consumers and decomposer ?
 (c) Write two problems that would arise if there were no decomposer in an ecosystem.

SECTION-D

Question no. 34 to 36 are Long answer questions.

34. (a) Draw electron dot structure of methane molecule.
 (b) Identify the functional groups present in the following compounds :
 (i) C_2H_6O
 (ii) C_2H_4O
 (c) A mixture of oxygen and ethyne is burnt for welding. Why do you think a mixture of ethyne and air is not used for welding ?

or

- Explain why carbon forms covalent bond? Give two reasons for carbon forming a large number of compounds.
- Explain the formation of ammonia molecule.

35. What is vegetative propagation? Briefly describe various methods of vegetative propagation.

or

- Draw diagram of human alimentary canal and label the following :
 (i) Part in which starch digestion starts.
 (ii) Part in which bile is stored.
 (iii) Part in which nutrients are absorbed.
 (iv) Part in which water is absorbed.
- Mention the role of hydrochloric acid in the stomach.
- What function is served by the following :
 (i) Gastric sphincter
 (ii) Anal sphincter

36. (a) What is an electromagnet ? List any two uses.
(b) Draw a labelled diagram to show how an electromagnet is made.
(c) State the purpose of soft iron core used in making an electromagnet.
(d) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed.

SECTION-E

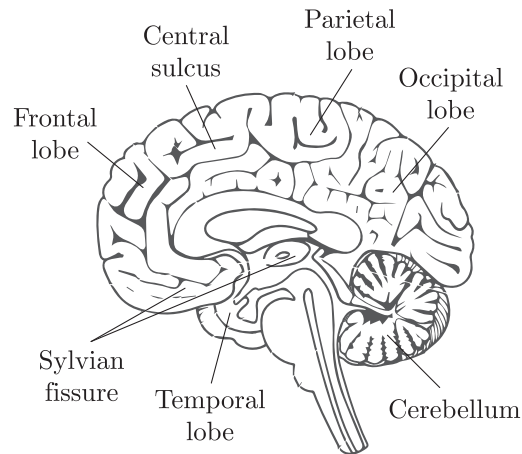
Question no. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. When a metal is attacked by substances around it such as moisture, acids, etc., it is said to corrode, and this process is called corrosion. The black coating on silver, green coating on copper and reddish-brown powder on iron surface are some examples of corrosion.



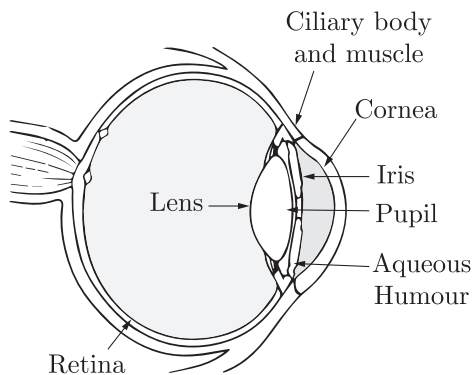
- (i) What is the name given to the corrosion of iron?
(ii) What is the formula of green colour coating on copper?
(iii) Name two methods to prevent corrosion of iron.
- or**
- (iv) Is corrosion a redox reaction?
38. The human brain is the central organ of the human nervous system and with the spinal cord makes up the central nervous system. The brain consists of the cerebrum, the brain-stem and the cerebellum. It controls most of the activities of the body, processing, integrating and coordinating the information it receives from the sense organs and making decisions as to the instructions sent to the rest of the body. The brain is contained in and protected by, the skull bones of the head. The cerebrum is the largest part of the human brain. It is divided into two cerebral hemispheres. The cerebral cortex is an outer layer of grey matter, covering the core of white matter. The cortex is split into the neocortex and the much smaller allocortex. The neocortex is made up of six neuronal layers, while the allocortex has three or four. Each hemisphere is conventionally divided into four lobes – the frontal, temporal, parietal and occipital lobes. The frontal lobe is associated with executive functions including self-control, planning, reasoning and abstract thought, while the occipital lobe is dedicated to vision. The brain is protected by the skull, suspended in cerebrospinal fluid and isolated from the bloodstream by the blood brain barrier. However, the brain is still susceptible to damage, disease and infection. Damage can be caused by trauma, or a loss of blood supply known as a stroke. The brain is susceptible to degenerative disorders, such as Parkinson's disease, dementias including Alzheimer's disease and multiple sclerosis. Psychiatric condition, including schizophrenia and clinical depression, are thought to be associated with brain dysfunctions. The brain can also be the site of tumours, both

benign and malignant; these mostly originate from other sites in the body. The study of the anatomy of the brain is neuroanatomy, while the study of its function is neuroscience.



- (i) Which is the central part of the nervous system?
 - (ii) What is the largest part of the human brain?
 - (iii) What are the functions of the brain?
- or**
- (iv) What is the branch which studies the anatomy of brain?

39. The human eye is like a camera. Its lens system forms an image on a light-sensitive screen called the retina. Light enters the eye through a thin membrane called the cornea. It forms the transparent bulge on the front surface of the eyeball as shown in the figure. The crystalline lens merely provides the finer adjustment of focal length required to focus objects at different distances on the retina. We find a structure called iris behind the cornea. Iris is a dark muscular diaphragm that controls the size of the pupil. The pupil regulates and controls the amount of light entering the eye.



The Human Eye

There are mainly three common refractive defects of vision. These are (i) myopia or near-sightedness, (ii) hypermetropia or far-sightedness, and (iii) Presbyopia. These defects can be corrected by the use of suitable spherical lenses.

- (i) What is the function of pupil in the human eye ?
- (ii) What is the far point and near point of human eye with normal vision ?
- (iii) A student has difficulty reading the blackboard while sitting in the last row. What could be the defect the child is suffering from ?

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or

(iv) What is the function of iris in human eye ?

□□□□□□