Class X Session 2024-25
Subject - Science
Sample Question Paper - 10

Time Allowed: 3 hours **Maximum 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. Answers 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

1. The copper articles turn green when kept for long due to **[1]**

a) Corrosion b) Rusting

c) Precipitation d) Rancidity

2. When iron filings are added to a solution of $CuSO_4$, the reaction taking place is a- **[1]**

a) Redox reaction b) Combination reaction

c) Displacement reaction d) Decomposition reaction

3. Which of the following salts contains water of crystallization? **[1]**

A. Gypsum

B. Epsom salt

C. Blue vitriol

D. Glauber's salt

a) C and D
b) A, B, C and D
c) A and B
d) B and D

4. When ethanol reacts with sodium two products are formed. These products are: **[1]**

a) Sodium ethanoate and oxygen
b) Sodium ethoxide and oxygen
c) Sodium ethoxide and hydrogen
d) Sodium ethanoate and hydrogen

5. Aluminum is used for making cooking utensils. Which of the following properties of aluminum are responsible for the same? **[1]**

i. Good thermal conductivity
ii. Good electrical conductivity
iii. Ductility
iv. High melting point

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

6. Which one of the following statements is true about the position of metals in the activity series of metals? **[1]**

a) Copper is below hydrogen but above lead
b) Iron is below lead and zinc
c) Zinc is below magnesium but above aluminium
d) Magnesium is below calcium but above aluminium

7. Ethane - with the molecular formula C_2H_6 has **[1]**

a) 9 covalent bonds
b) 8 covalent bonds
c) 7 covalent bonds
d) 6 covalent bonds

8. If the solute concentration of raisin is more inside then: **[1]**

a) endosmosis rate will be same
b) endosmosis rate will be less
c) endosmosis rate will be more
d) endosmosis process will not occur

9. Select the group which shares maximum number of common characters- **[1]**

a) two genera of a family
b) two individuals of a species
c) two species of a genus
d) two genera of two families

10. In human beings, fertilization of ovum takes place in: **[1]**

a) Fallopian tubes
b) Ovary
c) Uterus
d) Vagina

11. The component of a chromosome that controls heredity is **[1]**

a) Histones
b) Proteins
c) RNA
d) DNA

12. The blood leaving the tissues becomes richer in **[1]**

a) Oxygen
b) Heamoglobin
c) Water
d) Carbon dioxide

13. The strength of an electromagnet after the limit cannot be increased by increasing the current through the solenoid. What is the reason behind this phenomenon? **[1]**

a) Voltage through the solenoid gradually starts to decrease.
b) Electrons start to corrode the solenoid.
c) Resistance of the solenoid increases.
d) Current flowing through the solenoid is saturated.

14. Two LED bulbs of 12W and 6W are connected in series. If the current through 12W bulb is 0.06A the current through 6W bulb will be: **[1]**

a) 0.12A
b) 0.04A
c) 0.08A
d) 0.06A

15. Food chains generally do not exceed above 3 or 4 trophic levels because _____. **[1]**

a) A producer cannot be eaten by more than two herbivores
b) Transfer of energy from one trophic level to other is associated with energy loss
c) There are limited number of organisms in an ecosystem
d) Larger food chains increase complications of food web

16. Food web is constituted by **[1]**

a) relationship between animals and environment.
b) relationship between plants and animals
c) various interlinked food chains in an ecosystem
d) relationship between the organisms and the environment

17. **Assertion (A):** Silver articles become black after sometime when exposed to sunlight. **[1]**
Reason (R): It is because silver reacts with carbonates present in the air.

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

18. **Assertion (A):** DNA copying is necessary during reproduction. **[1]**
Reason (R): DNA copying leads to the transmission of characters from parents to offspring.

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

19. **Assertion (A):** A compass is kept near a wire carrying current gets deflected. **[1]**
Reason (R): Electric current is capable of producing a magnetic effect.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** Recycling is the way of managing plastic waste. **[1]**

Reason (R): Broken plastic articles are sent to plastic processing units where they are melted and remoulded to make new plastic articles.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section B

21. Intake of small quantity of methanol can be lethal. Comment. **[2]**

22. i. Write the names of those parts of a flower which serve the same functions as the following do in the animals. **[2]**

a. Testis

b. Sperm

c. Ovary

d. Egg

ii. State the function of flowers in the flowering plants?

23. a. Why is it important to prevent oxygenated and deoxygenated blood from mixing in birds and mammals? **[2]**

b. Which animals can tolerate some mixing of the oxygenated and deoxygenated blood streams? On what factor does the body temperature of these animals depend?

OR

Differentiate between Respiration and Photosynthesis.

24. Draw a ray diagram showing the path of rays of light when it enters with oblique incidence **[2]**

i. from air into water,

ii. from water into air.

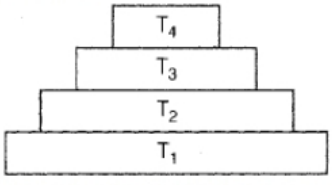
25. Your uncle has come from the village to renew the contract to supply frogs to the laboratories of the colleges of the town. While talking to you, he mentioned that cases of malaria have increased in his village. In addition population of grasshoppers has also increased who are damaging crops. **[2]**

i. What could be the reasons for such problems faced by villagers?

ii. What suggestions will you give to your uncle?

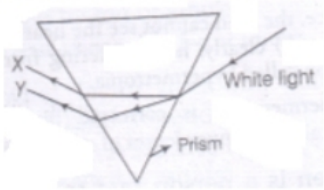
OR

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



26. When a beam of white light is passed through a triangular glass prism, it gets dispersed into its seven colour components. Why do we get these colours? In the given figure, the colours X and Y represent the extreme **[2]**

components of the spectrum. Identify X and Y.



Section C

27. 'M' is an element which may be one out of Cu, Fe, Al, Na. It shows the following properties: **[3]**

(i) One of its ore is rich in M_2O_3.

(ii) M_2O_3 is not affected by water.

(iii) It corrodes easily.

(iv) It form to chlorides MCl_2 and MCl_3. Identify 'M'.

28. i. By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound. **[3]**

ii. Ionic compounds are solids. Give reasons.

iii. With the help of a labelled diagram show the experimental set up of action of steam on a metal.

OR

i. Distinguish between ionic and covalent compounds under the following properties:

a. Strength of forces between constituent elements

b. Solubility of compounds in water

c. Electrical conduction in substances

ii. Explain how the following metals are obtained from their compounds by the reduction process:

a. Metal M which is in the middle of the reactivity series.

b. Metal N which is high up in the reactivity series. Give one example of each type.

29. Explain how deoxygenated blood travels from body to lung for purification. Draw well-labelled diagram in support of your answer. **[3]**

30. Two plants, A with white flowers and B with red flowers were crossed. The F_1 progeny shows all red flowers and F_2 has three red and one white. Categorise the trait as dominant and recessive. **[3]**

31. Differentiate between virtual image formed by a concave mirror and of a convex mirror. **[3]**

32. Derive the relation between kilowatt hour and joule. **[3]**

33. i. A wire of resistance 2 has been connected to a source of 50 V as its two ends. What is the current flowing through the wire? **[3]**

ii. An electric kettle rated at 220 V, 2.2 kW works for 3h. Calculate the energy consumed and the current drawn.

Section D

34. i. What are soaps? Explain the mechanism of cleansing action of soap with the help of a labelled diagram. **[5]**

ii. Detergents are better than soaps. Justify.

OR

a. Define the term **isomer**.

b. Two compounds have same molecular formula C_3H_6O. Write the name of these compounds and their structural formula.

c. How would you bring the following conversions:

i. Ethanol to ethene

ii. Propanol to propanoic acid

35. Explain the term fission as used in relation to reproduction. **[5]**

OR

How phototropism does occur in plants?

36. An object 4.0 cm in size, is placed 25.0 cm in front of a concave mirror of focal length 15.0 cm. **[5]**

i. At what distance from the mirror should a screen be placed in order to obtain a sharp image?

ii. Find the size of the image.

iii. Draw a ray diagram to show the formation of image in this case.

OR

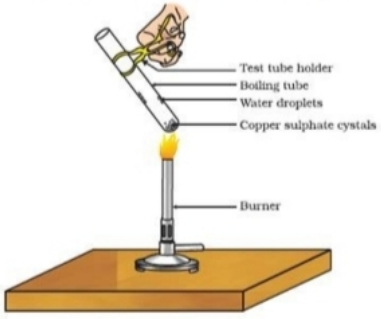
i. One half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30 cm from the lens? Draw a ray diagram to justify your answer.

ii. A 4 cm tall object is placed perpendicular to principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find the nature, position and the size of the image.

Section E

37. **Read the text carefully and answer the questions:** **[4]**

Copper sulphate crystal contains water of crystallisation when the crystal is heated the water is removed and salt turns white. The crystal can be moistened again with water. The water of crystallisation is the fixed number of water molecules present in 1 formula unit of copper sulphate. On heating gypsum at 373K, it loses water molecules and became calcium sulphate hemihydrate.



(a) If the crystal is moistened with water, then which colour of the crystal reappears?

(b) What is the commercial name of calcium sulphate hemihydrate?

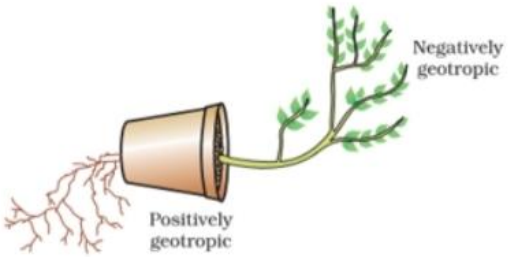
OR

How many water molecules are present in one formula unit of copper sulphate?

38. **Read the text carefully and answer the questions:** **[4]**

Environmental triggers such as light, or gravity will change the directions that plant parts grow in. These directional, or tropic, movements can be either towards the stimulus or away from it. So, in two different kinds of phototropic movement, shoots respond by bending towards light while roots respond by bending away from it. How does this help the plant? Plants show tropism in response to other stimuli as well. The roots of a plant always grow downwards while the shoots usually grow upwards and away from the earth. This upward and downward growth of shoots and roots, respectively, in response to the pull of earth or gravity, is, obviously, geotropism. If 'hydro' means water and 'chemo' refers to chemicals, what would 'hydrotropism' and 'chemotropism' mean? Can we think of examples of these kinds of directional growth movements? One example of chemotropism is the growth of pollen tubes towards ovules, about which we will learn more when

we examine the reproductive processes of living organisms.



(a) Where does negative phototropism occur in plants?

(b) Phototropism in shoots is attributed due to which plant hormone?

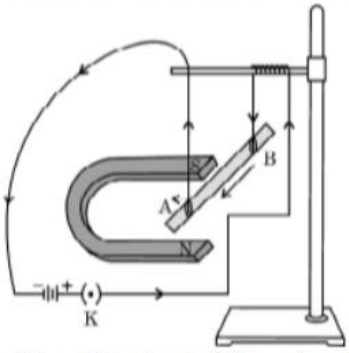
(c) Tendrils exhibit/ twining of tendrils show which type of tropic movement?

OR

If the stem grows towards sunlight and the root grows just opposite to it, then what type of movement of the stem is it?

39. **Read the text carefully and answer the questions:** **[4]**

A student was asked to perform an experiment to study the force on a current carrying conductor in a magnetic field. He took a small aluminum rod AB, a strong horse shoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod gets displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions :



(a) State the condition under which the displacement of the rod is largest for the same magnitude of current flowing through it.

(b) State the rule that determines the direction of the force on the conductor AB.

(c) i. If the U shaped magnet is held vertically and the aluminum rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will the rod be displaced?

ii. Name any two devices that use current carrying conductors and magnetic field.

OR

Draw the pattern of magnetic field lines produced around a current-carrying straight conductor held vertically on horizontal cardboard. Indicate the direction of the field lines as well as the direction of the current flowing through the conductor.