S R Study Material

SAMPLE PAPER 2 2024-25

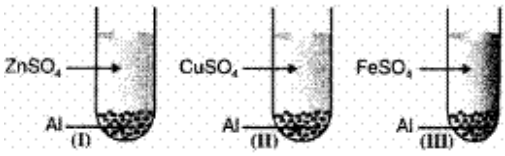
Class 10 - Science

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. 

[1]

Obseravation	**I**	**II**	**III**
Solution after reaction	Colourless	Colourless	Colourless
Metal Deposited	Zn	Cu	Fe

Which of the following is correct conclusion?

a) Al is more reactive than Cu and Fe but less reactive than Zn

b) Al is more reactive than Cu but less reactive than Zn and Fe

c) Al is more reactive than Zn and Cu but less reactive than Fe

d) Al is more reactive than Zn, Cu, Fe

2. Slaked lime is the commercial name of: **[1]**

a) Calcium carbonate

b) Calcium hydroxide

c) Calcium oxide

d) Calcium bicarbonate

3. Litmus is an example of **[1]**

a) olfactory indicator
b) artificial indicator

c) natural indicator
d) self indicator

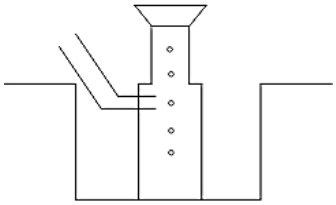
4. Metal oxides generally react with acids, but few oxides of metal also react with bases. Such metallic oxides are: **[1]**

I. MgO
II. ZnO
III. Al_2O_3
IV. CaO

a) I and IV
b) II and III

c) III and IV
d) I and II

5. A metal is heated with dil H_2SO_4. The gas evolved is collected by the method shown in the figure. Answer the following questions based on it: **[1]**



Name the gas evolved.

a) H_2 gas
b) O_2 gas

c) CO gas
d) CO_2 gas

6. Which metal is found in plants? **[1]**

a) Cr
b) Fe

c) CO
d) Mg

7. The total number of electrons shared in the formation of an ethyne molecule is: **[1]**

a) 10
b) 4

c) 3
d) 6

8. Single circulation i.e., blood flows through the heart only once during one cycle of passage through the body, is exhibited by **[1]**

a) Hippocampus, Exocoetus, Anabas
b) Whale, Dolphin, Turtle

c) Labeo, Chameleon, Salamander
d) Hyla, Rana, Draco

9. Spinal cord originates from: **[1]**

a) cerebrum
b) pons

c) cerebellum
d) medulla

10. Which of the following statements is incorrect? **[1]**

i. Placenta allows exchange of materials between mother and fetus.
ii. The fetal part of the placenta consists of the cells of the chorion which produce projections called chorionic villi.
iii. Antibody cannot cross the placenta from mother to fetus.

iv. Placenta secretes pregnancy hormones required for supporting fetal growth and metabolic changes in mother during pregnancy.

a) Statement (ii) is correct.
b) Statement (iii) is correct.
c) Statement (i) is correct.
d) Statement (iv) is correct.

11. The genotype for the height of an organism is Tt. What conclusion may be drawn from this? **[1]**

a) The allele for height has at least two different genes.
b) There are at least two different alleles for the gene for height.
c) There is one allele for height with two different forms.
d) There are two different genes for height, each having a single allele.

12. The process of photosynthesis occurs in: **[1]**

a) Dark
b) Infrared radiation
c) UV radiation
d) Visible light

13. An achromatic lens has a focal length of 10 cm. At what distance should the mirror from the lens be settling so that it forms an image at 20 cm from the lens and also calculate the amplification produced by the achromatic lens? **[1]**

a) u = 1.25 cm and m = 12.05 cm
b) u = -0.02 cm and m = 20 cm
c) u = 20 cm and m = 10 cm
d) u = -1.05 cm and m = 19.05 cm

14. An old person is unable to see clearly nearby objects as well as distant object. To correct the vision, what kind of lens will he require? **[1]**

a) Bifocal lens whose upper portion is concave lens and lower portion is convex lens
b) Concave lens
c) Bifocal lens whose upper portion is convex lens and lower portion is concave lens
d) Convex lens

15. The part of seed which is a source of food during germination of seed is: **[1]**

a) Plumule
b) Cotyledon
c) Embryo
d) Radicle

16. In which of the following food chains, does the man get more energy? **[1]**

- Plant $\rightarrow$ Man
- Plant $\rightarrow$ Goat $\rightarrow$ Man

a) Plant $\rightarrow$ Man
b) Plant $\rightarrow$ Goat $\rightarrow$ Man
c) Different equal energy in both food chain
d) Equal energy in both food chain

17. **Assertion (A):** Chemical equations should be balanced. **[1]**
Reason (R): As per the law of conservation of mass, mass can neither be created nor be destroyed.

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):** Individuals produced by asexual reproduction are known as clones. **[1]**

Reason (R): They are known as clones because they are genetically identical.

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):** Iron filings are kept near a magnet it gets arranged in a particular fashion. **[1]**
Reason (R): Magnetic field is a scalar quantity.

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):** Using jute bags while shopping is more environment friendly as compared to polythene bags. **[1]**
Reason (R): Jute is biodegradable whereas polythene bag is non-biodegradable.

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. In a reaction of sodium chloride and sulphuric acid, hydrochloric acid is obtained as a gaseous product however, the evolved gas fails to turn the blue litmus paper red. What could be the reason? But, if the litmus paper to be used is made moist prior hand, the evolved gas turns the moist litmus paper to red colour. Explain the observations. **[2]**

22. How will an organism be benefited if it reproduces by spores? **[2]**

23. Write the functions of large intestine. **[2]**

OR

What is the role of saliva in the digestion of food?

24. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convex lens if the image is equal to the size of the object? Also, find the power of the lens. **[2]**

25. The magnetic field in a given region is constant. Draw a diagram to represent it. **[2]**

OR

How much energy is given to each coulomb of charge passing through a 6V battery?

26. Plants $\rightarrow$ Deer $\rightarrow$ Lion **[2]**
In the given food chain, what will be the impact of removing all the organisms of second trophic level on the first and third trophic level? Will the impact be the same for the organisms of the third trophic level in the above food chain if they were present in a food web? Justify.

Section C

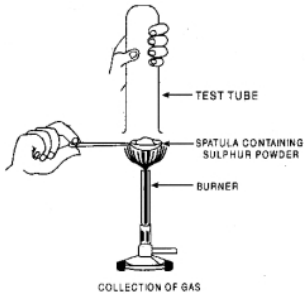
27. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below. **[3]**

a. What will be the action of gas on

i. dry litmus paper?

ii. moist litmus paper?

b. Write a balanced chemical equation for the reaction taking place.



28. You are given a hammer, a battery, a bulb, wires and switch. **[3]**

(a) How would you use them to distinguish between samples of metals and non metals?

(b) Assess the usefulness of these tests to distinguish between metals and non-metals.

OR

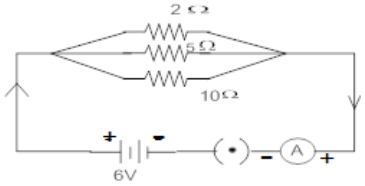
Copper coin is kept immersed in silver nitrate solution for some time. What change will take place in coin and colour of the solution? Write balanced chemical equation of the reaction involved.

29. Diffusion alone can supply all cells of a plant with oxygen. Is it true? If yes, give reason. **[3]**

30. In human beings, the statistical probability of getting either a male or female child is 50:50. Give a suitable explanation for this. **[3]**

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

32. In the circuit diagram given here,calculate- **[3]**



i. The total effective resistance and the total current

ii. The current through each resistor

33. i. Several electric bulbs designed to be used on a 220V electric supply line are rated 10W. How many lamps can be connected in parallel with each other across the two wires of 220V line if the maximum allowable current is 5A? **[3]**

ii. A heater coil connected to 200 V has a resistance of 80Ω. If the heater is plugged in for the time t such that 1 kg of water at 20°C attains a temperature of 60°C. Find the power of the heater and the heat absorbed by water.

Section D

34. i. Name a commercially important carbon compound having functional group -OH and write its molecular formula. **[5]**

ii. Write chemical equation to show its reaction with

1. Sodium metal
2. Excess conc. sulphuric acid
3. Ethanoic acid in the presence of an acid catalyst
4. Acidified potassium dichromate

iii. Also write the name of the product formed in each case.

OR

An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. This

compound reacts with ethanol to form a sweet smelling compound B.

i. Identify the compound A.

ii. Write the chemical equation for its reaction with ethanol to form compound B.

iii. How can we get compound A form B?

iv. Name the process and write corresponding chemical equation.

v. Which gas is produced when compound A reacts with washing soda? Write the chemical equation.

35. Describe the structure of a flower. **[5]**

OR

Explain briefly movements in plants.

36. A student places a candle flame at a distance of about 60 cm from a convex lens of focal length 10 cm and focuses the image of the flame on a screen. After that he gradually moves the flame towards the lens and each time focuses the image on the screen. **[5]**

i. In which direction: toward or away from the lens, does he move the screen to focus the image?

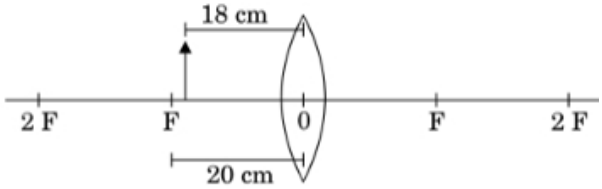
ii. How does the size of the image change?

iii. How does the intensity of the image change as the flame moves towards the lens?

iv. Approximately for what distance between the flame and the lens, the image formed on the screen is inverted and of the same size?

OR

a. Complete the following ray diagram:



b. Find the nature, position and size of the image formed.

c. Use lens formula to determine the magnification in this case.

Section E

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

Carbon compounds can be easily oxidised on combustion. In addition to this complete oxidation, we have reactions in which alcohols are converted to carboxylic acids.We see that some substances are capable of adding oxygen to others. These substances are known as oxidising agents. Also some compounds are capable of adding hydrogen. These substances are known as reducing agents.

i. Give any two examples of good oxidising agent. (1)

ii. Complete the reaction: (1)

$CH_3CH_2CH_2OH$ + Alk. $KMnO_4 \rightarrow$

iii. Give some uses of Alcohol. (2)

OR

Why Acidified potassium dichromate is called an oxidising agent? (2)

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

In humans, the allele for brown eyes (B) is dominant over that for blue eyes (b). A brown-eyed woman marries a blue-eyed man, and they have six children. Four of the children are brown-eyed and two of them are blue-eyed.

i. What is the genotype of blue-eyed offspring? (1)

ii. What is the woman's genotype? (1)

iii. What is the gene carried by the mother's ovum regarding eye color? (2)

OR

What is the gene carried by the man's sperm regarding eye color? (2)

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

When electric current flows in a purely resistive circuit electrical energy gets fully converted into heat energy. The amount of heat produced (H) in the circuit is found to be directly proportional to (i) the square of current I^2 (ii) the resistance (R) of the conductor and (iii) the time (t) for which current flows. In other words $H=I^2Rt$. Electrical devices such an electric fuse, electric heater, electric iron etc. are all based on this effect called heating effect of electric current.

a. List two properties of heating elements. **(1)**

b. List two properties of electric fuse. **(1)**

c. Name the principle on which an electric fuse works. Explain how a fuse wire is capable of saving electrical appliances from getting damaged due to accidently produced high currents. **(2)**

OR

The power of an electric heater is 1100 W . If the potential difference between the two terminals of the heater is 220 V , find the current flowing in the circuit. What will happen to an electric fuse of rating 5 A connected in this circuit? **(2)**