S R Study Material

SAMPLE PAPER 1 2024-25

Class 10 - Science

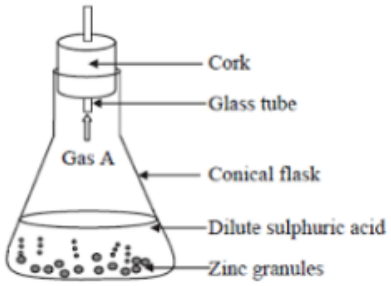
Time Allowed: 3 hours **Maximum Marks: 80**

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. Which characteristic is observed by the reaction shown in the given image? **[1]**



a) Formation of a precipitate
b) Change in temperature
c) Evolution of a gas
d) Both change in temperature and evolution of gas

2. A white precipitate formed by the reaction of barium chloride with sodium sulphate solution is due to **[1]**

a) $BaSO_3$
b) $BaSO_4$
c) BaO
d) BaS

3. The acid produced in our stomach during digestion and the base used to neutralise the excess acid during indigestion respectively are: **[1]**

a) HCl, $Mg(OH)_2$
b) Lactic acid, $Mg(OH)_2$

c) Amino acids, $Ca(OH)_2$ d) HCl, $Ca(OH)_2$

4. Which one of the following hydrocarbons is different from the others? **[1]**

a) C_2H_6 b) C_4H_{10}

c) C_7H_{14} d) C_5H_{12}

5. Aqueous solutions of zinc sulphate and iron sulphate were taken in test tubes I and II by four students A, B, C and D. Metal pieces of iron and zinc were dropped in the two solutions and observations made after several hours were recorded in the form of table as given below: **[1]**

Student	Metal	Solution	Colour change of solution	Deposit/Coating obtained
A	Fe	$ZnSO_4$	Turned green	Silvery grey coating
	Zn	$FeSO_4$	No change	No change
B	Fe	$ZnSO_4$	No change	Black deposit
	Zn	$FeSO_4$	Colour faded	Grey coating
C	Fe	$ZnSO_4$	No change	No change
	Zn	$FeSO_4$	Turned colourless	Black deposit
D	Fe	$ZnSO_4$	No change	Grey deposit
	Zn	$FeSO_4$	No change	Black deposit

The correct reporting has been made in observations:

a) Student A b) Student C

c) Student D d) Student B

6. Which of the following pairs will give displacement reactions? **[1]**

a) $FeSO_4$ solution and silver metal b) $AgNO_3$ solution and copper metal

c) NaCl solution and copper metal d) $MgCl_2$ solution and aluminum metal

7. C_{60} and C_{70} are important members of which type of allotrope of carbon? **[1]**

a) Fullerenes b) Graphite

c) Coal d) Diamond

8. Which is the correct sequence of air passage during inhalation? **[1]**

a) Nasal passage $\rightarrow$ trachea $\rightarrow$ pharynx $\rightarrow$ larynx $\rightarrow$ alveoli

b) Nostrils $\rightarrow$ larynx $\rightarrow$ pharynx $\rightarrow$ trachea $\rightarrow$ lungs

c) Nostrils $\rightarrow$ pharynx $\rightarrow$ larynx $\rightarrow$ trachea $\rightarrow$ alveoli

d) Larynx $\rightarrow$ nostrils $\rightarrow$ pharynx $\rightarrow$ lungs

9. In an experiment with pea plants, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of pure tall plant to pure short plants in F_2 generation will be **[1]**

a) 1 : 3 b) 3 : 1

c) 2 : 1 d) 1 : 1

10. A chain of Yeast cells forms because: **[1]**

A. Yeast cells do not separate after budding.

B. Daughter cells are unable to survive without parent cells.

C. Buds reproduce as soon as they are formed.

D. Daughter cells stick together with the help of mucus.

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

11. Humans inherit colour of their eyes from their parents. Brown-eyed couple has three blue-eyed children. Which of the following statements gives correct explanation of this situation? **[1]**

i. Each parent has an allele for brown eyes and an allele for blue eyes.
ii. The allele for blue eyes is recessive.
iii. The probability that their next child will have blue eyes is 75%.
iv. The probability that their next child will have brown eyes is 50%.

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

12. Choose the event that does not occur in photosynthesis. **[1]**

a) Oxidation of carbon to carbon dioxide
b) Absorption of light energy by chlorophyll
c) Conversion of light energy to chemical energy
d) Reduction of carbon dioxide to carbohydrates

13. The process of inducing a current in a coil of wire by placing it in a region of changing magnetic field is: **[1]**

a) Electrical effect
b) Magnetic effect of current
c) Electromagnetic induction
d) Heating effect of current

14. At a given time, a house is supplied with 100 A at 220 V. How many 75 W, 220 V light bulbs could be switched on in the house at the same times if they are all connected in parallel? **[1]**

a) 93
b) 293
c) 193
d) 393

15. Exposure to ultraviolet radiation causes eye disease like: **[1]**

a) Conjunctivitis
b) Cataract
c) Short-sightedness
d) Colour blindness

16. The decomposers in an ecosystem**:** **[1]**

a) Do not breakdown organic compounds
b) Convert inorganic material to simpler forms
c) Convert organic material to inorganic forms
d) Convert inorganic materials into organic compounds

17. **Assertion (A):** A lead nitrate on thermal decomposition gives lead oxide, brown coloured nitrogen dioxide and oxygen gas. **[1]**
Reason (R): Lead nitrate reacts with potassium iodide to form yellow ppt. of lead iodide and the reaction is double displacement as well as precipitation reaction.

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):** Plasmodium reproduces by multiple fission. **[1]**

Reason (R): Multiple fission is a type of asexual reproduction.

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):** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns in it. **[1]**

Reason (R): The current in each circular turn has the same direction and the magnetic field due to each turn then just adds up.

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):** Ozone is both beneficial and damaging. **[1]**

Reason (R): Stop the release of chlorofluorocarbons to protect the ozone.

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. Carbon, a member of group 14, forms a large number of carbon compounds estimated to be about three million. Why is this property not exhibited by other elements of this group? Explain. **[2]**
22. How does binary fission differ from multiple fissions? **[2]**
23. What are the functions of gastric glands present in the wall of the stomach? **[2]**

OR

What is the role of glomerulus in the mechanism of excretion?

24. Draw the ray diagram of ray entering a glass slab. Label angle of incidence, refraction and emergence. **[2]**
25. Draw a sequence of suitable methods of disposal of waste produced at your home to minimise environmental pollution. **[2]**

OR

Explain how some harmful chemicals enter our bodies through the food chain. Why is the concentration of these harmful chemicals found to be maximum in human beings?

26. Does myopia or hypermetropia imply that the eye has partially lost its accommodation ability? If not, what cause these defects of vision? **[2]**

Section C

27. Nikita took Zn, Al, Cu, Fe, Mg and Na metal and put each metal in cold water and then hot water. She reacted the metal with steam **[3]**

(i) Name the metal which reacts with cold water.
(ii) Which of the above metals react with steam?
(iii) Name the metal which reacts with hot water.
(iv) Arrange these metals in order of increasing reactivity.

28. There are 3 unknown metals - A, B and C. C displaces B from its oxide while with oxide of A, there is no reaction. Give the reactivity order of A, B and C. **[3]**

OR

A metal 'X' is found in the form of filings which burns vigorously when sprinkled on flame. When these filings are treated with sulphur a black coloured compound 'Y' is formed which is not attracted by magnet. 'X' reacts with dil HCI to liberate hydrogen gas. 'X' reacts with steam to form 'Z' along with hydrogen gas. Identify 'X', 'Y', and 'Z'. Write the reaction involved.

29. "If there were no algae there would be no fish in the sea." Comment. **[3]**

30. A red-eyed individual is crossed with a white-eyed individual to produce F_1 progeny with red eyes. When F_1 individuals are intercrossed, F_2 progeny is formed with both red as well as white-eyed individuals. **[3]**

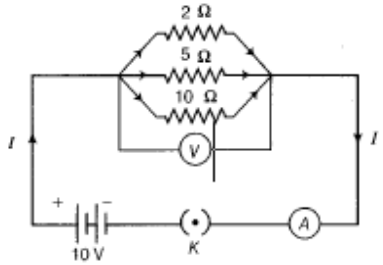
a. How is the dominant trait identified?

b. What are recessive traits?

c. If 12 individuals are produced in F_2 generation, then how many white-eyed individuals would be obtained? Calculate the ratio of red-eyed individuals to white-eyed individuals.

31. What should be the position of an object with respect to focus of a convex lens of focal length 20cm, so that its real and magnified image is obtained? **[3]**

32. A circuit diagram is given as shown below: **[3]**



Calculate

i. the total effective resistance of the circuit.

ii. the total current in the circuit and the current through each resistor.

33. How many 176Ω resistors (in parallel) are required to carry 5A on a 220V line? **[3]**

Section D

34. a. Name the gas evolved during fermentation process. **[5]**

b. What role is played by yeast in the conversion of cane sugar ($C_{12}H_{22}O_{11}$) to ethanol?

c. How can the following be obtained from pure ethanol? Express chemical reactions by the chemical equations.

i. Sodium ethoxide

ii. Ethyl ethanoate

iii. Ethanal

OR

a. A compound **X** undergoes addition reaction with H_2 to form a compound **Y** having molecular mass 30 g mol^{-1}. **X** decolorises bromine water and burns with a smoky flame. Identify **X** and **Y** and write chemical equations of the reactions involved.

b. 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.

35. Describe regeneration in Planaria. **[5]**

OR

i. Leaves of **chhui-mui** plant begin to fold up and droop in response to a stimulus. Name the stimulus and write the cause for such a rapid movement. Is there any growth involved in the movement?

ii. Define geotropism in plants. What is meant by positive and negative geotropism? Give one example of each type.

36. An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm. **[5]**

i. Use the lens formula to find the distance of the image from the lens.

ii. List four characteristics of the image (nature, position, size, erect/inverted) formed by the lens in this case.

iii. Draw a ray diagram to justify your answer to the part(ii).

OR

An object 1 cm high is placed on the axis and 15 cm from a concave mirror of focal length 10 cm. Find the position, nature, magnification and size of the image.

Section E

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

The teacher while conducting practicals in the laboratory divided the students into three groups and gave them various solutions to find out their pH and classify them into acidic, basic and neutral solutions.

Group A - Lemon juice, vinegar, colourless aerated drink

Group B - Tomato juice, coffee, ginger juice

Group C - Sodium hydroxide, sodium chloride, lime water

i. For the solutions provided, which group is/are likely to have pH value (i) less than 7, and (ii) greater than 7? (1)

ii. List two ways of determining pH of a solution. (1)

iii. Explain, why the sour substances such as lemon juice are effective in cleaning the tarnished copper vessels. (2)

OR

pH has great importance in our daily life. Justify this statement by giving two examples. (2)

38. Following questions are based on the two tables given below. Study these tables related to blood sugar levels: **[4]**

Table A (Blood glucose chart)

	Mean Blood Glucose Level (mg/dL)
Doctor's advice needed	380
	350
	315
	280
	250
	215
Good	180
	150
Excellent	115
	80
	50

Table B (Blood Report of Patient X and Y)

Time of check	**Blood Glucose ranges** (mg/dL)	
	Patient X	Patient Y
Before breakfast (Fasting)	<100	70-130
Before lunch, supper and snack	<110	70-130
Two hours after meals	<140	<180
Bedtime	<120	90-15

i. Refer to Table B showing the blood report of the levels of glucose of patients X and Y. Infer the disease which can be diagnosed from the given data. (1)

ii. Identify the hormone whose level in the blood is responsible for the above disease. (1)

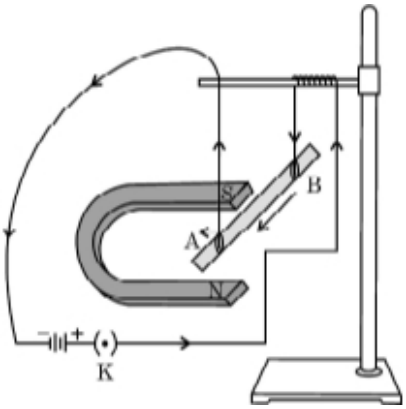
iii. High/low sugar and a low/high-fat diet What would you recommend to the affected patient? (2)

OR

Refer to Table A and suggest the value of the mean blood glucose level beyond which doctor's advice is necessary. (2)

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



i. i. In the above experimented set up, when current is passed through the rod, it gets displaced towards the left. What will happen to the displacement if the polarity of the magnet and the direction of current both are reversed?

ii. Name any two devices that use current carrying conductors and magnetic field. (1)

ii. Why does the rod get displaced on passing a current through it? (1)

iii. State the rule that determines the direction of the force on the conductor AB. (2)

OR

Draw the pattern of magnetic field lines produced around a current carrying straight conductor held vertically on a horizontal cardboard. Indicate the direction of the field lines as well as the direction of current flowing through the conductor. (2)