SR Coaching Centre

Sample Paper 2023-24

SAT 3

Class 10 - Science

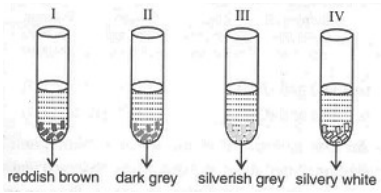
Time Allowed: 3 hours **Maximum Marks: 80**

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. A student took Cu, Al, Fe and Zn strips separately in four test tubes labelled I, II, III and IV. He added 10 mL of freshly prepared ferrous sulphate solution to each test tube as shown below: **[1]**



Black residue would be obtained in test tubes

a) II and IV
b) I, II and IV
c) II and III
d) III and IV

2. What happens when silver chloride is placed in sunlight? **[1]**

a) Silver chloride turns black
b) Silver chloride turns grey
c) Silver chloride turns blue
d) Silver chloride show no change

3. What happens when two drops of phenolphthalein are added to a dilute solution of NaOH? **[1]**

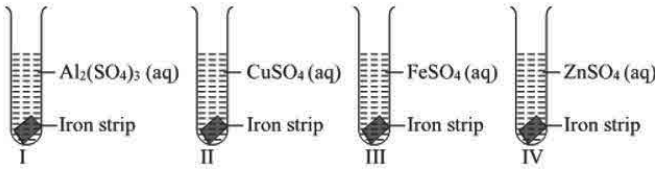
a) solution turns colourless
b) solution turns red
c) solution turns orange
d) solution turns pink

4. The heteroatoms present in $CH_3 - CH_2 - O - CH_2 - CH_2Cl$ are **[1]**

i. oxygen
ii. carbon
iii. hydrogen
iv. chlorine

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

5. A student adds one big iron nail each in four test tubes containing solution of zinc sulphate, aluminium sulphate, copper sulphate and iron sulphate. A reddish brown coating was observed only on the surface of iron nail which was added in the solution of: **[1]**



a) Aluminium sulphate
b) copper sulphate
c) Iron sulphate
d) Zinc sulphate

6. Generally, non-metals are not lustrous. Which of the following nonmetal is lustrous? **[1]**

a) Iodine
b) Nitrogen
c) Sulphur
d) Oxygen

7. The correct formula of ethanol is: **[1]**

a) CH_3OH
b) C_2H_5OH
c) C_2H_6OH
d) $CH_3CH_2CH_2OH$

8. Choose the function of the pancreatic juice from the following **[1]**

a) Trypsin digests proteins and lipase emulsified fats
b) Trypsin digests emulsified fats and lipase proteins
c) Trypsin and lipase digest fats
d) Trypsin digests proteins and lipase carbohydrates

9. A trait in an organism is influenced by **[1]**

a) Both maternal & Paternal DNA
b) Paternal DNA only
c) Neither maternal nor paternal DNA.
d) Maternal DNA only

10. In the list of organisms given below, those that reproduce by the asexual method are **[1]**

i. banana
ii. dog
iii. yeast
iv. Amoeba

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

11. Haemophilia is more commonly seen in human males than in human females because: **[1]**

a) This disease is due to an X-linked recessive mutation

b) A greater proportion of girls die in infancy

c) This disease is due to an X-linked dominant

d) This disease is due to a Y-linked recessive mutation

12. A well-stained leaf peel mount when observing under the high power of a microscope shows nuclei in **[1]**

a) only epidermal cells

b) guard cells and epidermal cells

c) guard cells, epidermal cells and stoma.

d) only guard cells

13. Strength of the magnetic field at a point in the space surrounding the magnet is measured by: **[1]**

a) Thickness of the magnet

b) Length of the magnet

c) Resistance of it

d) Number of lines crossing a given point

14. The work done in moving a unit charge across two points in an electric circuit is a measure of: **[1]**

a) Potential difference

b) Power

c) Resistance

d) Current

15. A food chain consists of: **[1]**

a) Producers, consumers and decomposers

b) Producers and primary consumers

c) Producers, herbivores and carnivores

d) Producers, carnivores and decomposers

16. Micro-organisms belong to the group of: **[1]**

a) Decomposers

b) Consumers

c) None of these

d) Producers

17. **Assertion (A):** In a reaction of copper with oxygen, copper serves as a reducing agent. **[1]**
Reason (R): The substance which gains oxygen in a chemical reaction is a reducing agents.

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) :** Lumen of fallopian tube is lined by ciliated epithelium.. **[1]**
Reason (R) : Ciliated epithelium helps in moving the zygote towards uterus for implantation.

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):** On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed. **[1]**
Reason (R): The direction of magnetic field around a conductor can be given in accordance with left-hand thumb rule.

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):** Energy available at each trophic level gets diminished progressively. **[1]**

Reason (R): Little usable energy remains after four trophic levels.

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. What is the role of metal or reagents written on arrows in the given chemical reactions? **[2]**

i. $\overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} = \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} + H_2 \xrightarrow{Ni} CH_3 - \overset{CH_3}{\underset{H}{\overset{|}{\underset{|}{C}}}} - \overset{CH_3}{\underset{H}{\overset{|}{\underset{|}{C}}}} - CH_3$

ii. $CH_3COOH + CH_3CH_2OH \xrightarrow{Conc.H_2SO_4} CH_3COOC_2H_5 + H_2O$

iii. $CH_3CH_2OH \xrightarrow[Heat]{Alk.KMnO_4} CH_3COOH$

22. Reproduction is essentially a phenomenon that is not for survival of an individual but for continuation of a species. Justify. **[2]**

23. Name any three glands associated with digestion in humans. Write the name of enzymes secreted by them? **[2]**

OR

Why is less energy produced during anaerobic respiration than in aerobic respiration?

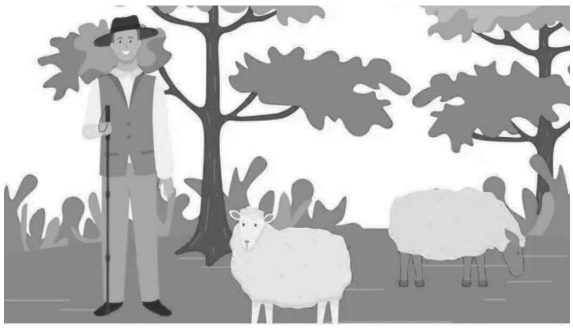
24. Draw ray diagram showing the image formation by a concave mirror when an object placed between focus and centre of curvature of the mirror. **[2]**

25. Explain, how pesticides get accumulated in the environment. **[2]**

OR

In the following food chain, 5 J of energy is available to man. How much energy was available at producer level?

Plants → Sheep → Man



26. What happens when elasticity of the lens is reduced to zero ? **[2]**

Section C

27. A zinc plate was kept in a glass container having copper sulphate solution. On examining it was found that the blue colour of the solution is fading slowly. After a few days when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give chemical equation of the reaction involved. **[3]**

28. An alkali metal A gives a compound B (molecular mass = 40) on reacting with water. The compound B gives a soluble compound C on treatment with aluminium oxide. Identify A, B and C and give the reactions involved. **[3]**

OR

Name a metal/non-metal:

i. Which makes iron hard and strong?

ii. Which is alloyed with any other metal to make an amalgam?

iii. Which is used to galvanize iron articles?

iv. Whose articles when exposed to air form a black coating?

29. Write a note on lymphatic system in human beings stating two major functions of lymph. **[3]**

30. Study the following cross that shows the self-pollination in F_1, fill in the blank the genotype and phenotype in the F1 generation. What type of cross it is? **[3]**

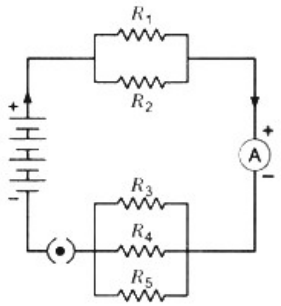
Parents	RRYY	x	rryy
	Round, yellow		wrinkled, green
F_1 —	Rr Yy	x	?
	Round, yellow		

31. The refractive indices 1.0003, 1.31 1.5 respectively of Air, Ice and Benzine in which of these does the light travels fastest? **[3]**

32. If in the figure R_1= 10Ω, R_2 = 40Ω, R_3 = 30Ω, R_4 = 20Ω, R_5 = 60Ω, and a 12 V battery is connected to the arrangement.Calculate **[3]**

i. the total resistance in the circuit ,and

ii. the total current flowing in the circuit.



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. Calculate the cost of seeing 2 movies on colour T.V. daily for the month of September.
Given wattage of colour T.V. = 60 W, duration of each movie is 2 hours 30 min and 1kWh costs Rs. 4

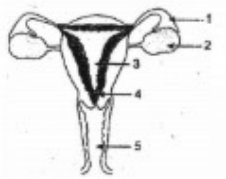
Section D

34. Write the structural formulae of all the isomers of hexane. **[5]**

OR

Explain the mechanism of the cleansing action of detergents.

35. a. Identify the given diagram, Name the parts 1 to 5. **[5]**



b. What is contraception? List three advantages of adopting contraceptive measures.

OR

Draw a labelled diagram of human brain and mention the functions of the following: Medulla oblongata, cerebellum and forebrain.

36. a. List four characteristics of the images formed by plane mirrors. **[5]**

b. A 5 cm tall object is placed at a distance of 20 cm from a concave mirror of focal length 30 cm. Use mirror formula to determine the position and size of the image formed.

OR

What are the rules to form image of an object by concave lens? Form the images of an object when it is moved from infinity to the lens.

Section E

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

Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloride and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salt, bed of rock salt was formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, and bleaching powder.

(i) If given acids are phosphoric acid, carbonic acid, hydrochloric acid and sulphuric acid, then which acid does not form an acidic salt?

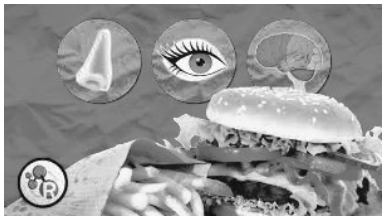
(ii) What is the formula of baking soda?

OR

Name the substance which on treatment with chlorine to obtain bleaching powder.

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

We have seen that the different parts of our body have specific functions. Our mouth waters when we see the food we like without our meaning to. Our heart's beat without our thinking about it. In fact, we cannot control these actions easily by thinking about them even if we wanted to. So, in between the simple reflex actions like change in the size of the pupil, and the thought out actions such as moving a chair, there is another set of muscle movements over which we do not have any thinking control. Many of these involuntary actions are controlled by the mid-brain and hind-brain. All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain. Think about activities like walking in a straight line, riding a bicycle, picking up a pencil. These are possible due to a part of the hind-brain called the cerebellum. It is responsible for the precision of voluntary actions and maintaining the posture and balance of the body. Imagine what would happen if each of these events failed to take place if we were not thinking about it.



(i) Identify the part of the nervous system which controls the reflex action.

(ii) Does reflex action involve all parts of the voluntary nervous system?

(iii) Identify the part of the autonomic nervous system which controls involuntary actions.

OR

Beating of heart muscles, which type of action is this? Out of voluntary and involuntary action which is slower?

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

A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt sprinkler.

On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.

(i) What does this pattern of iron filings demonstrate?

(ii) Draw a diagram to show this pattern of iron filings.

(iii) How is the direction of the magnetic field at a point determined using the field lines? Why do two magnetic field lines not cross each other?

OR

How are the magnetic field lines of a bar magnet drawn using a small compass needle ? Draw one magnetic field line each on both sides of the magnet.