SAHODAYA SCHOOL COMPLEX PUDUCHERRY

COMMON SAHODAYA PRE BOARD EXAMINATIONS - 2023

Roll No. | | | | | | | |

Candidates must write the code on the title page of the answer-book.

- Please check that this question paper contains **15** printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-sheet by the candidate.
- Please check that this question paper contains **39** questions.
- **Please write down the Serial Number of the question before attempting it.**

SCIENCE

Time allowed : 3 hours *Maximum Marks : 70*

General Instructions :

(*i*) *This question paper consists of **39** questions in **5** sections.*

(*ii*) *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*

(*iii*) ***Section A** consists of **20** Objective type questions carrying **1** mark each.*

(*iv*) ***Section B** consists of **6** Very Short questions carrying **2** marks each. Answers to these questions should be in the range of **30** to **50** words.*

(*v*) ***Section C** consists of **7** Short Answer type questions carrying **3** marks each. Answers to these questions should be in the range of **50** to **80** words*

(*vi*) ***Section D** consists of **3** Long Answer type questions carrying **5** marks each. Answer to these questions should be in the range of **80** to **120** words.*

(*vii*) ***Section E** consists of **3** Source-based / Case-based units of assessment of **4** marks each with sub-parts.*

SECTION - A

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

1. Read the given statements.

(i) Decomposers help in decomposing all waste.

(ii) Bacteria and fungi help in the decomposition of organic waste.

(iii) Heat is released during the process of decomposition.

(iv) The simple inorganic material formed after decomposition results in decreasing the fertility of soil.

Which of following statement/s is/are correct? 1

(a) Only (i)

(b) (i), (ii) and (iii)

(c) (ii), (iii) and (iv)

(d) (ii) and (iv)

2. Select the incorrect option.

In the domestic electric circuit 1

(a) the line wire is covered with red insulation cover.

(b) the earth wire is covered with green insulation cover.

(c) the neutral wire has black insulation.

(d) the potential difference between the positive and negative wires in our country is 120 V.

3. 180 J of heat is produced each second in 5 Ω resistance. Which of the following would be the potential difference across the resistor? 1

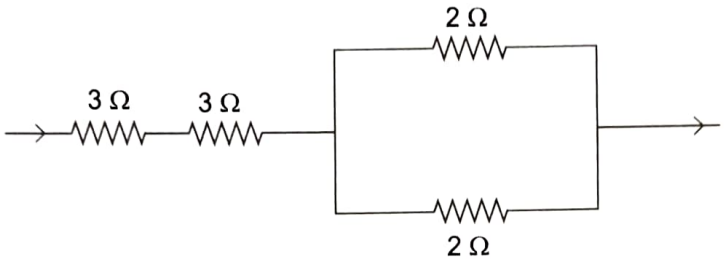
(a) 10 V (b) 20 V

(c) 30 V (d) 40 V

4. Which of the following options correctly represents the parent acid and base of sodium sulphate? 1

	Parent acid	Parent base
(a)	HCl	Na_2SO_4
(b)	H_2SO_4	NaCl
(c)	H_2SO_4	NaOH
(d)	HCl	Na_2CO_3

5. What would be the total resistance in the given figure? 1



(a) 4 Ω (b) 6 Ω

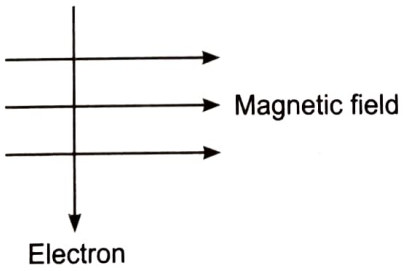
(c) 7 Ω (d) 10 Ω

6. Blood that comes out of the tissues is rich in 1

(a) oxygen (b) carbon dioxide

(c) dissolved oxygen (d) dissolved carbon dioxide

7. An electron enters a magnetic field at right angle to it, as shown in given figure.

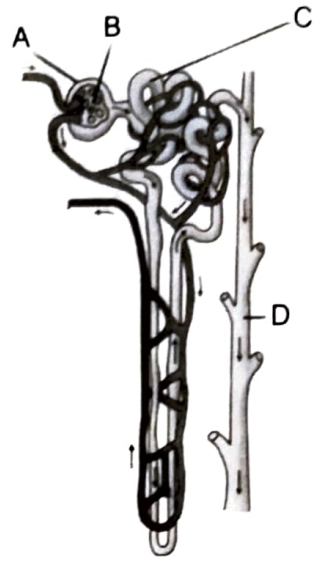


What would be the direction of force acting on the electron? 1

(a) Into the page (b) Out of the page

(c) To the right (d) To the left

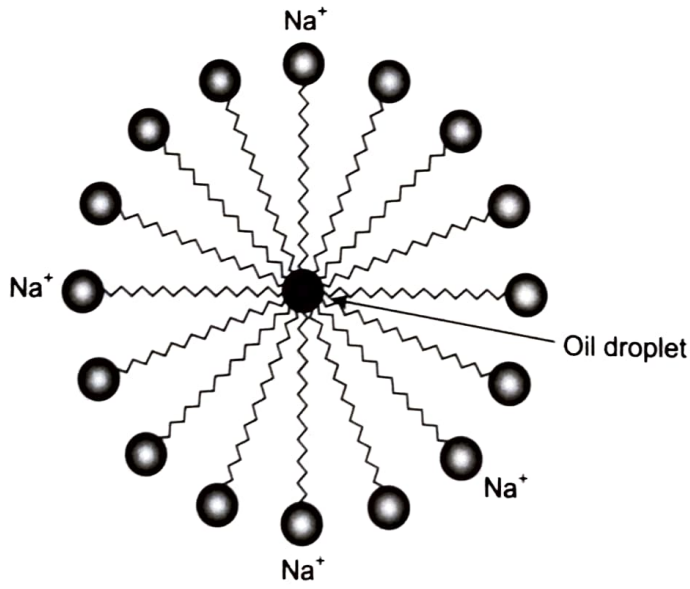
8. In the given structure of a nephron, identify the part where selective reabsorption of glucose, amino acids, salts and a major amount of water takes place when urine flows through this part. 1



(a) A (b) B

(c) C (d) D

9. The soap molecules form micelles which help in dissolving the dirt in water.



Select the incorrect option. 1

(a) Oil does not dissolve in water.

(b) Ionic end of soap dissolves in water.

(c) Carbon chain dissolves in oil.

(d) The soap molecules are sodium or ammonium salts of long chain carboxylic acids.

10. Plants absorb nitrogen from the atmosphere in the form of **1**

(i) nitrides

(ii) nitrites

(iii) nitrates

(iv) nitrogen

(a) only (iv) (b) (i) and (ii)

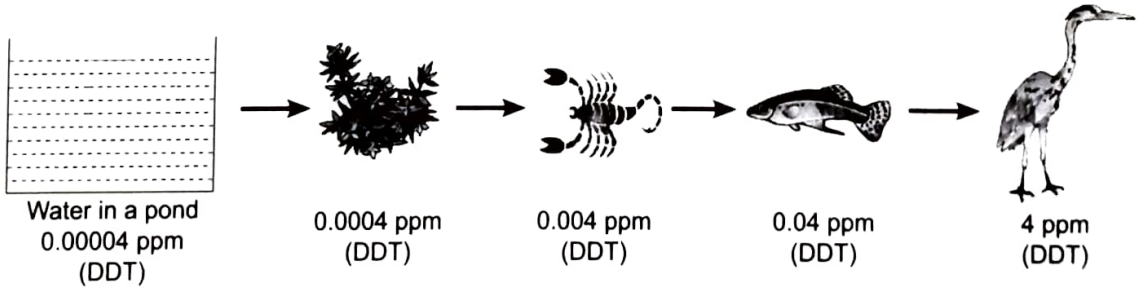
(c) (i) and (iii) (d) (ii) and (iii)

11. In human beings release of ovum from the ovary is termed as **1**

(a) gestation (b) ovulation

(c) parturition (d) menstruation

12.

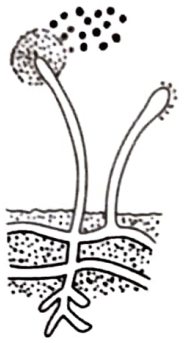


Name the process shown in the above figure. **1**

(a) Decomposition (b) Eutrophication

(c) Biological magnification (d) Algal bloom

13. Neha observed a patch of greenish black powdery mass on a stale piece of bread and drew the given diagram.



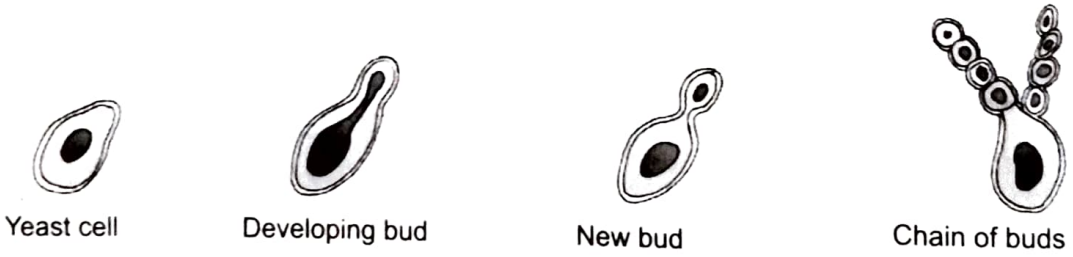
Identify the vegetative and reproductive parts. 1

	Vegetative Parts	Reproductive Parts
(a)	Spores	Hyphae
(b)	Hyphae	Sporangium
(c)	Spores	Sporangium
(d)	Sporangium	Spores

14. Reduction of metal oxide to metal can be done by a number of methods depending on the reactivity of metals. Which of the following methods is not used? 1

(a) Heating only
(b) By electrolytic reduction
(c) By electrolytic refining
(d) By heating with carbon

15. Observe the figures showing reproduction in yeast by budding.



Select the correct statements.

(i) A bud arises from a particular region on a parent body.

(ii) A parent cell divides into two or more daughter cells.

(iii) During the division, the parent identity is lost.

(iv) After detaching from the parent body, the bud grows into a new independent individual. **1**

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

16. A metal M found in nature as sulphide ore (M_2S) is one of the good conductors of heat and electricity and used in making electric wires. Identify the metal. **1**

(a) Zinc
(b) Mercury
(c) Copper
(d) Sodium

Q. no 17 to 20 are Assertion – Reasoning based questions.

These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

17. **Assertion (A):** The first level in all the food chains starts with green plants.

Reason (R): All green plants use solar energy to make their own food. **1**

18. **Assertion (A):** H_2SO_4 produces hydronium ions (H_3O^+) and sulphate ions (SO_4^{2-}) in aqueous solution.

Reason (R): In presence of water, base NaOH gives Na^+ ions and OH^- ions. **1**

19. **Assertion (A):** The ammeter which is used to measure the current is connected in parallel in an electric circuit.

Reason (R): The current gets divided when three resistors are connected in parallel. 1

20. **Assertion (A):** When a ray light travels from air to glass, the light ray bends away from the normal.

Reason (R): Light travels with different speeds in different mediums. 1

SECTION – B

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

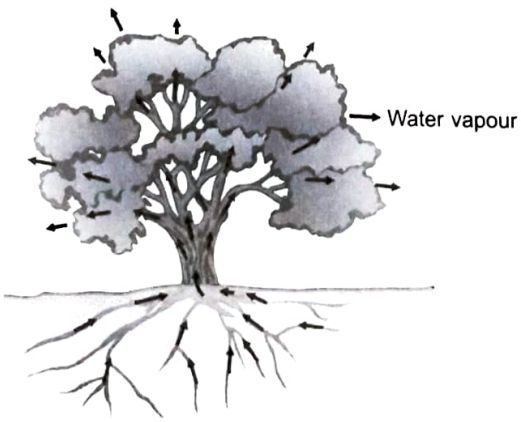
21. Give reasons

(a) Why does a compass needle get deflected when brought near a bar magnet?

(b) Soft iron core is used in making an electromagnet. 2

22. Bile juice does not have any digestive enzymes but still it is required for the process of digestion. 2

OR



Study the above figure carefully and answer the following questions.

(a) State the process shown in the figure.

(b) How is this process useful to the plants?

23. Compound X and Al are used to join railway tracks.

(a) Identify the compound X and name the reaction.

(b) Write a chemical reaction showing this reaction. **2**

OR

Show the formation of magnesium oxide. Name the ions formed during its formation.

24. Absolute refractive index of some material media are given below. In which of these does the light travel fastest and why? **2**

Material Medium	Refractive Index
Kerosene	1.44
Diamond	2.42
Water	1.33
Turpentine	1.47

25. How will you differentiate between acquired traits and inherited traits? **2**

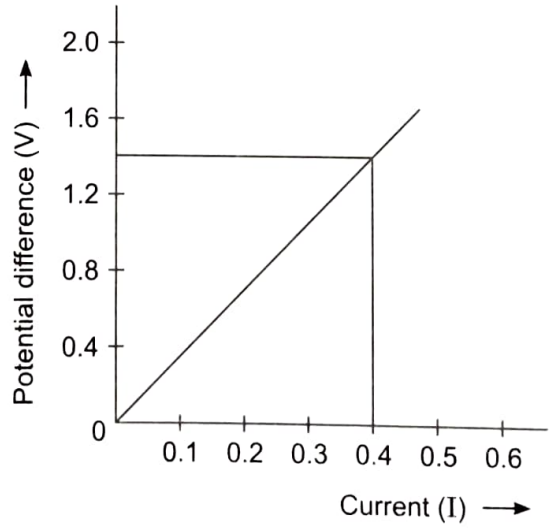
26. (a) List two main components of an ecosystem.

(b) Why is it better to use paper bags than plastic bags? **2**

SECTION - C

Q.no. 27 to 33 are Short answer questions.

27. A V-I graph for a nichrome wire is given below. What do you infer from the graph? Calculate the resistance from the given graph when current is 0.4 A. **3**



OR

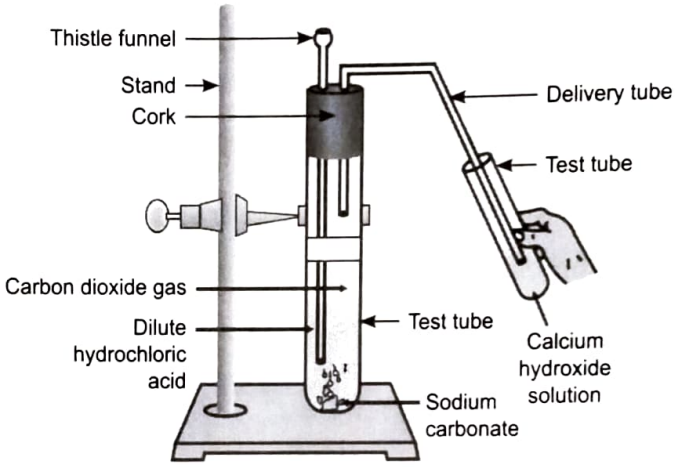
(a) Name a device that helps to maintain a potential difference across a conductor.

(b) When a 24 V battery is connected across an unknown resistor, there is a current of 4.8 mA in the circuit. Find the value of the resistance of the resistor.

28. (a) Carbon forms strong bonds with most other elements. Explain why.

(b) Catenation is exhibited by both carbon and silicon. Compare the ability of the catenation of both carbon and silicon. **3**

29.



According to the diagram given, carbon dioxide gas is passed through lime water.

(a) What change is seen in the lime water?

(b) Write the chemical reaction involved in change in colour of the lime water.

(c) What happens if we pass CO_2 gas continuously through lime water? **3**

30. Name the malarial parasite. How does it reproduce? Draw a diagram showing its reproduction. **3**

OR

What is vegetative propagation? Write two advantages and two disadvantages of vegetative propagation.

31. What is rusting? Write an activity along with the diagram to investigate the conditions under which iron rusts. **3**

32. (a) How is small intestine in human beings designed to maximise absorption of food?

(b) What are the methods used by plants to get rid of waste? **3**

33. Which rule Niyati should apply to determine the direction of

(a) magnetic field produced around a straight conductor carrying current?

(b) force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it?

Support your answers with the help of diagrams. **3**

SECTION – D

Q.no. 34 to 36 are Long answer questions.

34. Akshaya added a few drops of dilute sulphuric to water before performing electrolysis of water. He switched on the current and left the apparatus *i.e.* electrolysed cell undisturbed for some time. He observed the formation of bubbles at both the electrodes.

(a) Identify the gases collected at both the electrodes.

(b) Why is the amount of gas collected in one of the test tubes is double to the amount of gas collected in the other?

(c) What is the role of dilute sulphuric acid?

(d) How will you test the gases produced in the test tubes?

(e) Write the chemical reaction involved and its type. **5**

OR

(a) On heating, the surface of copper powder becomes coated with black copper(II) oxide.

(i) Why has this black substance formed?

(ii) Write the chemical reaction involved?

(iii) What is the type of the reaction?

(b) Study the given chemical equation

$CuO + H_2 \longrightarrow Cu + H_2O$

(i) Name the substance oxidised. Name the substance reduced.

(ii) What name is given to such types of reactions?

35. (a) Answer the following:

(i) Name the endocrine gland associated with brain.

(ii) Which gland secretes digestive enzymes as well as hormones?

(iii) Name the endocrine gland associated with kidneys.

(iv) Which endocrine gland is present in males but not in females?

(b) How are blinking of eyes and heart beat different from each other? **5**

OR

(a) Answer the following:

(i) Which hormone is responsible for the changes noticed in females at puberty?

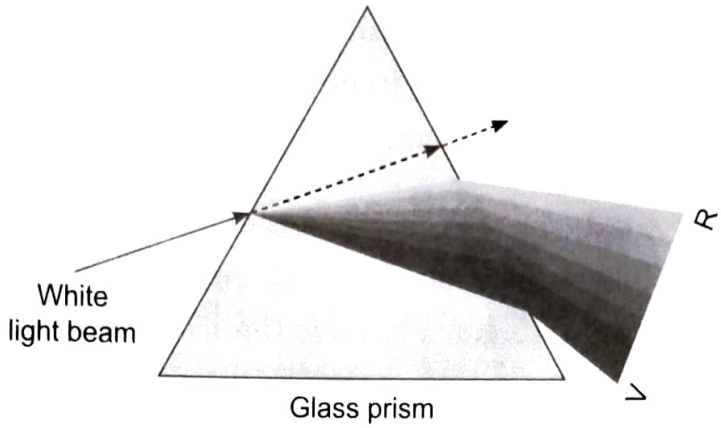
(ii) Dwarfism results due to the deficiency of which hormone?

(iii) Blood sugar level rises due to the deficiency of which hormone?

(iv) Iodine is necessary for the synthesis of which hormone?

(b) How are movement in sensitive plant and movement in sunflower different from each other?

36. Meenu observes the phenomenon as shown in the figure in the lab as a white light passes through a prism. Among many other colours, she observed the position of the two colours, red and violet.



(a) What is the phenomenon known as?

(b) Why does Meenu get these colours?

(c) What name is given to the band of the coloured components of a light beam?

(d) Which colour bends the most and why? **5**

SECTION – E

Q.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. Advitya takes a concave mirror and tries to find out the image formed by concave mirror for different positions of the object and tabulated the results in a tabular form.

Position of the Object	Position of the image
At infinity	At the focus F
Beyond C	Between F and C
At C	At C
Between C and F	Beyond C
At F	At infinity
Between P and F	Between the mirror

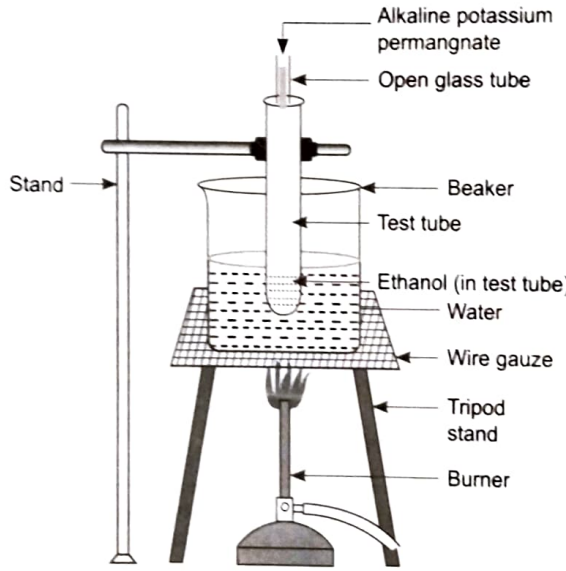
(a) In one of the cases, Advitya did not get the image on the screen. Identify the position of the object from the table and draw a ray diagram for the same.

(b) A converging mirror forms a real image of height 6 cm of an object of height 2 cm placed 25 cm away from the mirror. Calculate the image distance. What is the focal length of the mirror? 4

OR

(b) An object of height 4.5 cm is placed 12 cm away from a diverging mirror of focal length 15 cm. Find out the location of the image and the magnification. What can happen if the obejct is moved away from the mirror?

38. (a) Riya took 3 ml of ethanol in a test tube and warmed it gently in a water bath. Then she added 5% of alkaline potassium permanganate drop by drop to this solution.



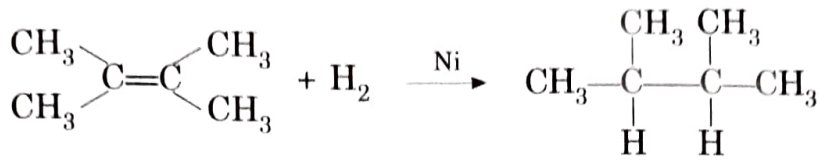
(i) Did Riya observe any colour change when potassium permangnate was added initially? Why did the colour of potassium permangnate not disappear when Riya added excess of it?

(ii) Write the chemical reaction involved in it.

(b) What is a functional group in a carbon compound? Identify the functional group present in propanone and butanoic acid. 4

OR

(b) What is the role of metal or reagent written on the arrows in the given chemical reactions?

(i) 

(ii) $CH_3CH_2CH_2OH \xrightarrow{\text{alk.}KMnO_4 + \text{Heat}} CH_3CH_2COOH$

39. Gregor Johann Mendel was an Austrian monk who studied Science and Mathematics at the University of Vienna. He conducted hybridisation experiments on garden pea plant and arrived at laws of inheritance. On the other hand, Charles Darwin believed that organisms which can utilise natural resources better than others have more chances of being successful in the struggle for existence and better chances of survival. He could give a number of examples for that but he could not explain why organisms become different. This would not have been the situation, if head seen the significance of Mendel's experiments. But then, Mendel too did not notice Darwin's work as relevant to his.

(a) A scientist crossed the F_1 generation of pure breeding parents for round and wrinkled seeds and found the number of offsprings produced is 12,420. Write the correct ratio of round seeds and wrinkled seeds (As roundness of seeds is a dominant trait and wrinkled is recessive trait).

(b) Which condition is mainly required for F_2 generation?

(c) Mendel obtained four different combinations of shape and colour. Write those phenotypic ratio with its particular combination of shape and colour. **4**

OR

(c) Who is known as father of genetics and why?