Roll No. ☐☐☐☐☐☐   Candidates must write the Set No on the title page of the answer book.

SAHODAYA PRE BOARD EXAMINATION – 2025-26

- Please check that this question paper contains **13** printed pages.

- Set number given on the right-hand side of the question paper should be written on the title page of the answer book by the candidates.

- Check that this question paper contains **39** questions.

- Write down the Serial Number of the question in the left side of the margin before attempting it.

- 15 minutes time has been allotted to read this question paper. The question paper will be distributed 15 minutes prior to the commencement of the examination. The students will read the question paper only and will not write any answer on the answer script during this period. Students should not write anything in the question paper.

CLASS- X
SUB: SCIENCE (086)

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

General Instructions:

(i)   This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(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) Students will divide the answer book in 3 sections A, B & C for writing answers.

(iv)   Replies of questions are to be written only within the space identified for the concerned section only.

(v)   Reply of a section should not be written or mixed in any other section.

(vi)   In case, if replies are mixed, these will not be evaluated and no marks will be awarded.

(vii) Such mistake will not be accepted and addressed even during verification or revaluation process after the results are declared.

SECTION - A

1. Given below is a diagram of a nephron. Which row of the following table correctly shows where filtration and selective reabsorption occur? **[1]**

	Filtration	Selective reabsorption
A.	P	Q
B.	Q	S
C.	Q	R
D.	P	R

2. Out of the following statements (s) is (are) correct. **[1]**
   (i) Pyruvate can be converted into ethanol and carbon dioxide by yeast.
   (ii) Fermentation takes place in aerobic bacteria.
   (iii) Fermentation takes place in mitochondria.
   (iv) Fermentation is a form of anaerobic respiration.
   A. (i) and (iii)   B. (ii) and (iv)
   C. (i) and (iv)   D. (ii) and (iii)

3. A student accidentally touches a hot plate and immediately withdraws his hand. The rapid response is an example of a reflex arc. What is the correct sequence of signal transmission in this reflex action? **[1]**
   A. Receptor , Spinal Cord , Effector , Motor Neuron , Sensory Neuron
   B. Receptor, Sensory Neuron , Spinal Cord, Motor Neuron , Effector
   C. Motor Neuron, Effector, Sensory Neuron, Receptor, Spinal Cord
   D. Sensory Neuron, Effector, Motor Neuron , Spinal Cord , Receptor

4. Identify the correct pair. **[1]**
   A. Pituitary-Releasing Hormone   B. Testes- Estrogen
   C. Hypothalamus- Insulin   D. Thyroid-Thyroxine

5. If a round seed pea plant is crossed with a wrinkled seed pea plant, then the phenotypic and genotypic ratio in F_2 generation will be: **[1]**

	Phenotypic Ratio	Genotypic ratio
A.	3:1(3 round:1 wrinkled)	1:3(1 round: 3 wrinkled)
B.	3:1(3 round:1 wrinkled)	1:2:1(RR:Rr:rr)
C.	1:2:1(RR:Rr:rr)	1:3(1 round: 3 dwarf)
C.	1:2:1(RR:Rr:rr)	3:1(3 round:1 wrinkled)

6. Refer to the following diagram, choose the option that gives correct identification of Z and X. **[1]**

	Z	X
A.	Primary consumer	Tertiary producer
B.	Tertiary consumer	Tertiary consumer
C.	Tertiary consumer	Primary consumer
D.	Primary producer	Primary consumer

7. In 1987, an agreement was formulated by the United Nations Environment Programme (UNEP) to freeze the production of "X" to prevent depletion of "Y". "X" and "Y" respectively referred here are: **[1]**

A.	Ozone; CFCs	B.	CFCs; rays UV
C.	CFCs; Ozone	D.	UV rays; Diatomic oxygen

The following questions consist of two statements -Assertion (A) and Reason (R).

Answer these questions by 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.

8. **Assertion (A) :** A geneticist crossed two pea plants got 50 % tall and 50 % dwarf in the progeny.

   Reason(R) : One plants was heterozygous tall and the other was dwarf. **[1]**

9. **Assertion (A):** Food chain is generally limited to three to four trophic levels.

   Reason (R) : There is a loss of energy at each trophic level and very little usable energy remains at fourth trophic level. **[1]**

10. How is the movement of leaves of *Chhui-mui* plant different from the movement of a shoot towards light? (Write any two differences) **[2]**

11. ***Students to attempt either option A or B.*** **[2]**

    A. (i) Name two parts of a cell where breakdown of glucose takes place in presence of oxygen.

    (ii) State the conditions on which the direction of diffusion of gases in plants depend upon.

    OR

    B. (i) State the internal energy reserve in plants and animals.

    (ii) How do desert plants perform photosynthesis if their stomata remain closed during the day?

12. A. Construct a food chain of four trophic levels comprising the following organisms.

    Zooplankton, Cranes, Fish, Algae.

    B. If 400 J of energy is available with primary consumer in the above food chain, what amount of energy will be available for tertiary consumer? **[2]**

13. A. Which part of the brain is responsible for the following activities? **[3]**

    (i) Walking in a straight line

    (ii) Salivation

    (iii) Feeling full

    (iv) Region which receives sensory impulses from various receptors

    B. What is feedback mechanism?

14. Sachin performed an experiment to study the inheritance pattern of genes. She crossed tall pea plants (TT) with short pea plants (tt) and obtained all tall plants in F_1 generation. **[3]**

    A. What will be set of genes present in the F_1 generation?

    B. Give reason why only tall plants are observed in F_1 progeny.

    C. When F_1 plants were self - pollinated, a total of 800 plants were produced. How many of these would be tall and short plants? Give the genotype of hybrid tall plant in F_2 generation.

15. Double circulation is a type of circulating system in which the blood passes through the heart twice before completing a full circuit of the body. Blood is pumped from the heart to the lungs and returns to the heart before being distributed to other organs and tissues of the body. Refer to the above passage answer the following questions given below. **[4]**
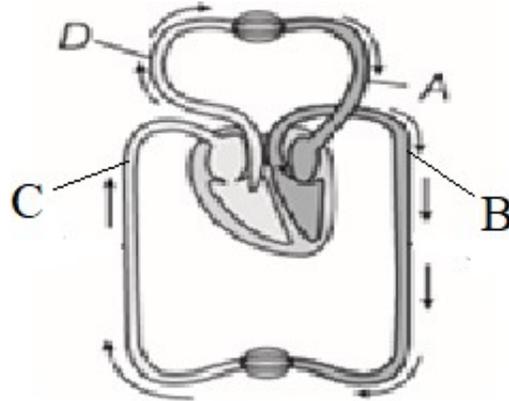

Attempt either subpart A or B.

A. Identify the parts labeled as A, B, C and D.

OR

B. Write the differences between artery and vein on the basis of thickness of wall and presence of valve.

C. Why do mammals and birds have a septum in their heart?

D. Name two groups of animals that have double circulation still they can tolerate some mixing of the oxygenated and deoxygenated blood streams.

16. *Attempt either option A or B.*

A. Observe the diagram and answer the questions given below. **[5]**
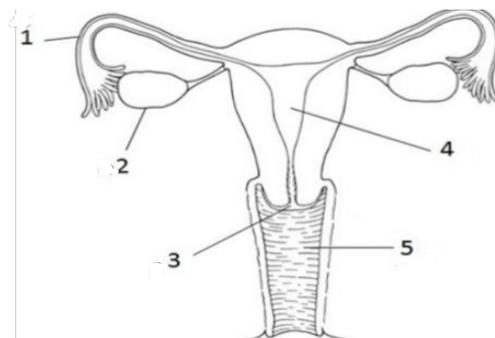
(i) Identify and state the functions of 2 and 1.

(ii) Mention the changes which the uterus undergoes, when

(a) it has to receive a zygote   (b) no fertilization takes place

(iii) State any two functions of placenta.

OR

B.

(X)   (Y)
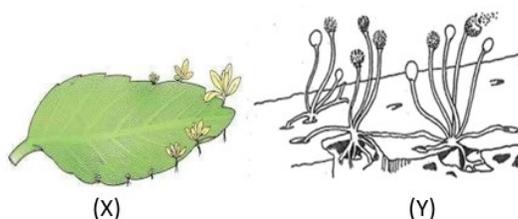
(i) Identify the organisms **X** and **Y.** Mention the mode of asexual reproduction executed by them.

(ii) How will an organism be benefitted if it reproduces through spore formation?

(iii) Mention two asexual methods by which Hydra can reproduce. Explain any one method.

SECTION – B

17. $PbO_2 + 4HCl \rightarrow PbCl_2 + Cl_2 + 2H_2O$ **[1]**

Choose the reducing agent for the given reaction.

A. Pb   B. HCl   C. Cl_2 D. PbO_2

18. $\textbf{p}\ Fe\ (s) + \textbf{q}\ H_2O\ (g) \rightarrow \textbf{r}\ Fe_3O_4(s) + \textbf{s}\ H_2(g)$ **[1]**
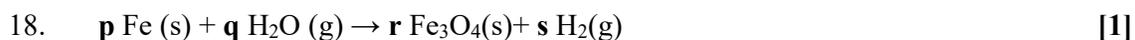
Choose the correct values of **p, q, r** and **s** to balance the above equation.

A. 3, 4,1, 4   B. 1, 4, 3, 4

C. 1, 3, 3, 4   D. 3, 1, 3, 4

19. A student takes 2 mL dilute Hydrochloric acid in a dry test tube and adds zinc granules to it. He makes the following observations: **[1]**

(I) A colourless and odourless gas evolves with a brisk effervescence.

(II) The gas turns lime water milky when passed through it.

(III) The gas burns with an explosion when a burning splinter is brought near it.

(IV) The gas changes the colour of litmus paper.

The incorrect observations are:

A. I, II and III   B. II, III and IV

C. III, IV and I   D. I , II and IV

20.	A visually challenged student has to perform a lab test to detect the presence of acid in a given solution. The acid-base indicator preferred by the student will be:	**[1]**

    A.	Blue litmus	B.	Clove oil

    C.	Red cabbage extract	D.	Hibiscus extract

21.	Which of the following(s) will conduct electricity?	**[1]**

    (i)	Glucose (aq)

    (ii)	Distilled water

    (iii)	Alcohol

    (iv)	Dil. Sulphuric acid

    A.	(ii) only	B.	(iv) only

    C.	(ii) and (iv) only	D.	(ii), (iii) and (iv)

22.	Deepak had kept two metallic coins one of silver and another of copper since long in a piggy-bank. He found that both of them are covered with black and green coating respectively. State the chemicals so formed as the coating over silver and copper respectively.	**[1]**

    A.	Silver sulphide and Copper oxide

    B.	Silver oxide and Copper carbonate

    C.	Silver sulphide and basic copper carbonate

    D.	Silver oxide and copper hydroxide

23.	Solder is an alloy of	**[1]**

    A.	Copper + Mercury	B.	Lead + Zinc

    C.	Iron + Nickel	D.	Lead + Tin

The following question consist of two statements – Assertion (A) and Reason (R). Answer these questions by 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.

24.	**Assertion (A):** The process of dissolving an acid or a base in water is highly endothermic process.

    Reason (R):	Mixing an acid or base with water results in decrease in the concentration of hydronium ions per unit volume.	**[1]**

25. Show the formation of the ionic compound, Sodium oxide through transfer of electrons. *(Atomic number of Na = 11, O = 8)* **[2]**

26. When the green coloured aqueous solution of a metal sulphate X is treated with $BaCl_2$ solution, a white precipitate Y is formed. **[3]**

    A. Identify X and Y.

    B. Write the chemical reaction involved in the above process.

    C. Write the chemical reaction when the metal sulphate X is heated strongly.

27. Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where these metals are placed in the reactivity series? How are these metals obtained from their ores? Write the chemical equations for the extraction of sodium. **[3]**

<center>**OR**</center>

Illustrate the refining of Copper by electrolytic refining. Also draw well labelled diagram.

28. ***Answer the questions based on the paragraph given below and the related studied concepts.*** **[4]**

    The teacher while conducting practical in the laboratory divided the students in three groups and gave them various solutions to find 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, baking soda, lime water

    A. For the solutions provided, which group is/are likely to have pH value

    (i)   Less than 7   and   (ii)   greater than 7

    B. Identify a substance from the above which can be used if a person is suffering from indigestion. Justify your answer.

    Attempt either C or D

    C. Write the name and state the chemical nature of the salt formed when vinegar reacts with solution of sodium hydroxide. Write the balanced chemical equation for this reaction.

<center>**OR**</center>

    D. Name the gas evolved when baking soda reacts with vinegar. Write the observation when the same gas is passed through lime water. Write the balanced chemical equation for the reaction when excess of this gas is passed through lime water.

29. ***Attempt either A or B***

    A.   (i)   Soap is ineffective in hard water. State the reason.   **[5]**

            (ii)   Differentiate between saturated and unsaturated hydrocarbons.

            (iii)   Write the name and draw the structures of the isomers having the molecular formula C_3H_6O.

<p align="center">OR</p>

    B.   (i)   Convert Ethanol to sodium ethoxide. Write the balanced chemical equation for it.

            (ii)   Define saponification reaction. Write the balanced chemical equation for the same.

            (iii) $A \xrightarrow[Ni]{H_2} B \xrightarrow[Sun\ light]{Cl_2} C$

                  If C is chloroethane, write the name and draw the structure of A and B.

<p align="center">SECTION – C</p>

30.   A student is analysing the types of images formed by spherical mirrors and makes the following statements:

    I.   A convex mirror can form a real image if the object is placed at its focus.

    II.   A concave mirror can form a virtual image if the object is placed between the pole and focus.

    III.   A concave mirror forms a magnified image when the object is at the center of curvature.

    Choose from the following the correct option that lists the correct statements.   **[1]**

    A.   I and II   B.   I and III

    C.   I, II and III   D.   II only

31.   During a laboratory experiment, a student observes that the path of light through a rectangular glass slab is bent twice. Choose the correct option that describes this phenomenon.   **[1]**

    A.   Light undergoes two refractions: at the entry surface and at the exit surface.

    B.   Light undergoes one reflection and one refraction.

    C.   The bending of light is due to scattering by the glass molecules.

    D.   The path of light is bent due to dispersion and reflection.

The following question consists of two statements –Assertion (A) and Reason (R).

Answer these questions by 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.

32.   **Assertion (A):** A ray of light passing through the centre of curvature of a mirror is reflected along the same path.

    Reason (R): $i = r = 90^0$ **[1]**

33.   A.   Draw a labelled diagram showing the phenomena of refraction of light though a rectangular glass slab.   **[2]**

    B.   Define lateral displacement.

34.   *Attempt either option A or B*

    A.   Draw a circuit diagram for three resistors of 6Ω, 2Ω and x connected in series to 3 cells each of 1.5 V. If the current reading in the ammeter is 1/3 A. Calculate the value of x.   **[2]**

<div align="center">OR</div>

    B.   A Potential difference of 24 V from a battery is applied to the network of resistors shown below.
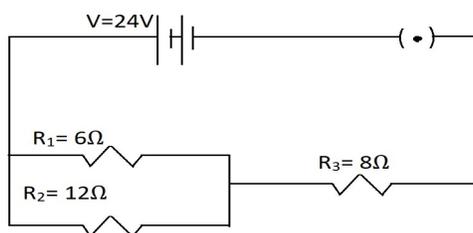
        How much current flows through the 8 Ω resistor?

35.   Study the diagram given below and answer the questions that follow.   **[3]**
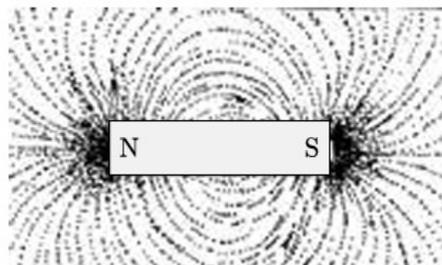
    A.   Justify the arrangement of iron filings around the magnet.

    B.   What does this pattern demonstrate?

    C.   Why do the iron filings near the bar magnet seem to align in the shape of closed curves?

36.   A.   State Joule's law of heating.   [3]

       B.   An electric iron consumes energy at a rate of 840 watt when heating is at the maximum rate and 360 watt when the heating is at the minimum. The voltage is 220 V. Calculate the current and resistance in each case?

37.   [3]

Rays from distant object — Retina
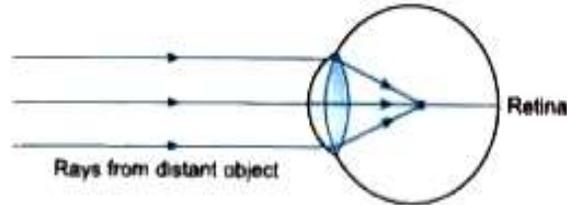
       A.   Name the defect shown in the figure.

       B.   State the causes of this defect.

       C.   Draw a ray diagram showing how this defect can be corrected.

38.   [4]
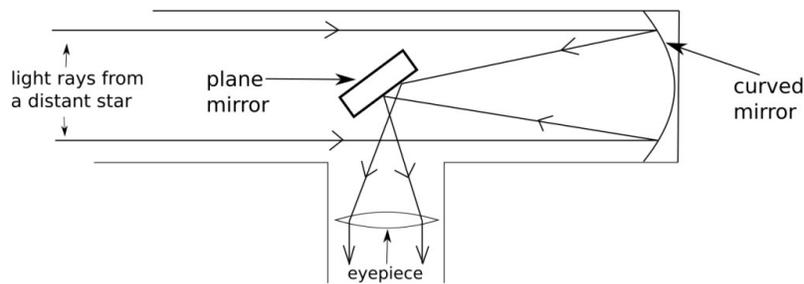
The above image is that of a reflecting telescope. Reflecting telescopes revolutionized our ways of looking into the sky. They employ mirrors to gather and focus light, rather than relying solely on lenses as in their refracting counterparts. These telescopes utilize precisely shaped and polished mirrors to capture incoming light and reflect it to a focal point, where it forms an image for observation.

       A.   What is the nature of image of the star seen by the observer at the eyepiece?

       B.   Name the type of mirror is used in this reflecting telescope?

Attempt either subpart C or D.

       C.   A photographer is using a camera with a lens of focal length f = 50 mm to take a close-up photograph of a small object. The lens projects an image onto the camera sensor that is located 60 mm behind the lens. Calculate the object distance (i.e., the distance between the object and the lens).

OR

D. A photographer is using a camera to take a picture of a flower. The flower is positioned 150 mm away from the camera lens. The actual height of the flower is 80 mm, and the image height formed on the camera's sensor is measured to be 20 mm. Calculate the focal length of the camera lens.

39. *__Attempt either option A or B.__*

A. (i) You have three resistors of resistance R_1, R_2 and R_3. If the equivalent resistance of parallel combination of the three resistors is R_p. Derive the relationship to determine R_p in terms of R_1, R_2 and R_3. **[5]**

(ii) On the basis of the given circuit answer the questions given below:
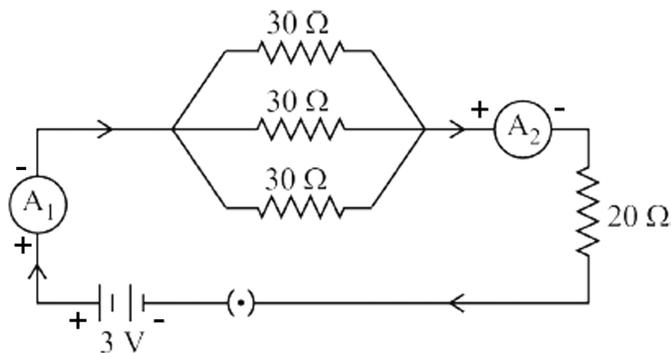
(a) Write the relationship between the readings of the two ammeters A_1 and A_2. Give reason for your answer.

(b) What is the equivalent resistance of the parallel combination of three resistors?

(c) What is the value of current flowing in the circuit?

OR

B. (i) List two factors on which the resistance of a conductor in the shape of a straight cylinder depends.

(ii) Write the relation between resistance (R) and the resistivity (ρ) of the conductor. Use this relation to obtain the SI unit of resistivity.

(iii) Consider the following circuit diagrams. If $R_1 = R_2 = R_3 = R_5 = 1\Omega$ and $R_4 = 2\ \Omega$. The supply voltage is 12V in the circuit, then answer the following questions.
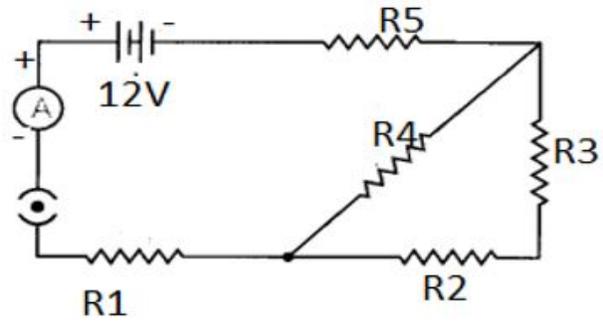
(a)   Find the equivalent resistance of the circuit.

(b)   Total current in the circuit.

(c)   Voltage across R_1.

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