

PRE-BOARD EXAMINATION TERM II (2021-22)

CLASS-X
SCIENCE (086)

MAX. MARKS:40

TIME ALLOWED: 2 HOURS

General Instructions:

- i) All questions are compulsory.
- ii) The question paper has three sections and 15 questions. All questions are compulsory.
- iii) Section–A has 7 questions of 2 marks each; Section–B has 6 questions of 3 marks each; and Section–C has 2 case based questions of 4 marks each.
- iv) Internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

SECTION-A

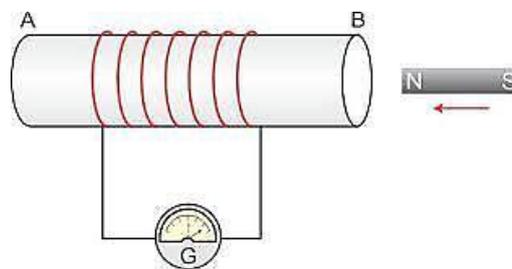
- 1 The general formula of three compounds A, B and C is C_nH_{2n} . B has highest boiling point and C has lowest boiling point. 2
 - i. Which of these has the minimum number of carbon atoms? Give reason
 - ii. Name the homologous series to which A, B and C belong. Arrange them in increasing order of their boiling point.
- 2 Two elements M and N belong to groups I and II respectively and are in the same period of the periodic table. How do the following properties of M and N vary? 2
 - (i) Sizes of their atoms.
 - (ii) Their metallic characters.
 - (iii) M's valency in forming oxides.
 - (iv) Molecular formula of N's chlorides.
- 3 Give reasons as to why the following processes are different from each other. 2
 - a. Fission in *Amoeba* and *Plasmodium*
 - b. Binary fission and Fragmentation

OR

What is the main difference between sperms and eggs of humans? Write the importance of this difference.

- 4 Explain the following terms. 2
 - a. Seminal Vesicles
 - b. Placenta
- 5 "The sex of the children is determined by what they inherit from their father and not their mother." Justify. 2

- 6 A student makes an arrangement to study electromagnetic induction, as shown
What change in the galvanometer needle would she observe when the strong bar magnet is-
- kept stationary at a distance from the coil?
 - pulled away from the coil?

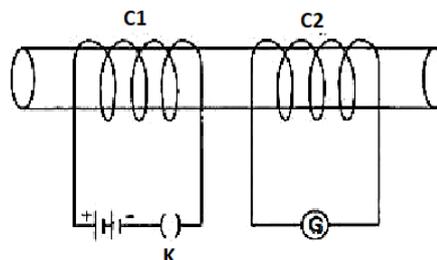


2

OR

Two circular coils—C1 and C2 are kept close to each other as shown in the diagram. Coil C1 is connected to a battery and key and coil C2 with a galvanometer.

State your observation in the galvanometer when key K is closed. Name the phenomenon involved.



- 7 How can we help in reducing the problem of waste disposal? Give any two methods.

OR

Why is energy flow in an ecosystem unidirectional?

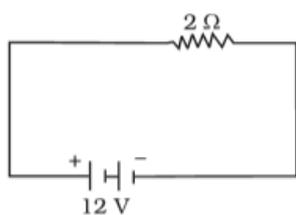
SECTION – B

- 8
- Write any one similarity and difference between cyclohexane and benzene. Also draw their structures.
 - Draw the electron dot structure of Ethene. Why such compounds have low melting and boiling points?

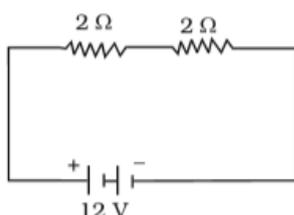
OR

An aldehyde as well as a ketone can be represented by the same molecular formula, say C_3H_6O . Write their structures and name them. State the scientific relation between the two.

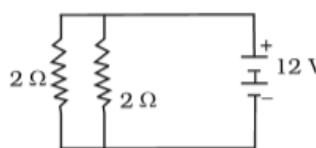
- 9 An element 'X' belongs to 3rd period and group 16 of the Modern Periodic Table.
- Determine the number of valence electrons and the valency of 'X'.
 - Molecular formula of the compound when 'X' reacts with hydrogen and write its electron dot structure.
 - Name the element 'X' and state whether it is metallic or non-metallic.
- 10 A pea plant with violet flowers (VV) was crossed with another pea plant with white flowers (vv). F1 generation was allowed to self-pollinate and F2 generation was obtained. Based on this, answer the following questions.
- What would be the phenotype of plants in the F1 generation?
 - What would be the percentage of white-flowered plants in the F2 generation?
 - What would be the ratio of vv:Vv in F2 generation?
- 11 (i) Identify the circuit from the following circuit diagrams in which heat produced in the resistor or combination of resistors connected to a 12 V battery will be –



CIRCUIT 1



CIRCUIT 2

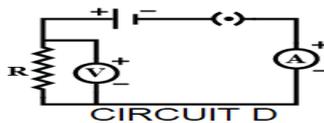
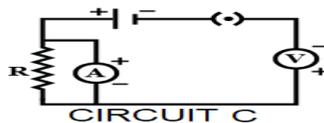
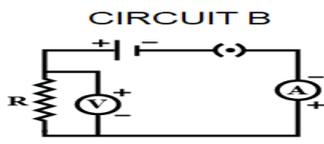
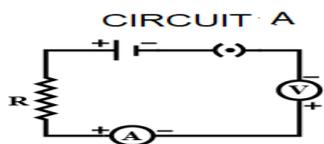


CIRCUIT 3

(a) Maximum

(b) Minimum

(ii) Identify the circuit from the following circuit diagrams in which the electrical components have been properly connected-



- 12 How you would connect three resistors each of resistance 6 ohm so that the combination has a resistance of (i) 9 ohm (ii) 4 ohm
Draw diagrams to justify your answers.

OR

How can three resistors of resistances 2 Ohm, 3 Ohm and 6 Ohm be connected to give a total resistance of (a) 4 Ohm, (b) 1 Ohm?
Draw diagrams to justify your answers.

- 13 What is meant by a food chain? "The number of trophic levels in a food chain is limited." Give reason to justify this statement.

SECTION – C

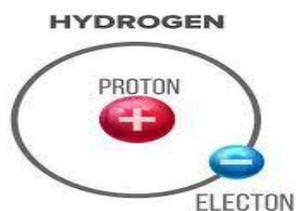
This section has 02 case-based questions (14 and 15). Each case is followed by 03 sub-questions (a, b and c). Parts **a** and **b** are compulsory. However, an internal choice has been provided in part **c**

- 14 An angiospermic plant having red flowers when crossed with another having the same coloured flowers, produced 40 progenies, out of which 30 plants were with red flowers and 10 plants were with white flowers. If gene for red flower is R and gene for white flower is r, then find out:
- What is the possible genotype of parent plants? (1)
 - Which are the dominant and recessive traits? (1)
 - Mention the ratio of red-flowered plants to white-flowered plants in F₂ generation. Which type of cross is this? (2)

OR

What will be the possible colours of flowers in the offsprings produced if one of the parent plants in the above mentioned cross is cross-pollinated with a white-flowered pea plant? Which type of cross is this? (2)

- 15 In a model of the Hydrogen atom, the electron moves in a circular orbit around the proton. The electron passes by a particular point on the loop in a certain time so that we can calculate a current $I = Q/t$.



An electron that orbits a proton in a hydrogen atom is, therefore, similar to current flowing through a circular wire. A current carrying conductor has a magnetic field associated with it. It is, therefore, reasonable to conclude that a hydrogen atom produces a magnetic field and interacts with other magnetic fields.

- Draw the magnetic field lines around a circular coil carrying current, also show the direction of the current in the coil.
- Magnetic field lines never cross each other, why?

c. What happens when an iron core is inserted into a current carrying solenoid?

OR

What is indicated by crowding of magnetic field lines in a given region?