



INDIAN SCHOOL SOHAR  
PRE-BOARD EXAMINATION (2021 - 22)  
SCIENCE (086)

No. Of Printed Pages: 4

CLASS: X

DATE: 28.02.2022

MAX. MARKS: 40

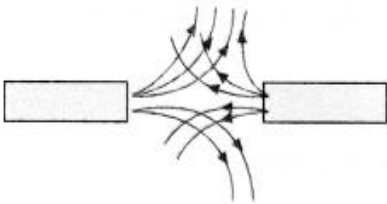
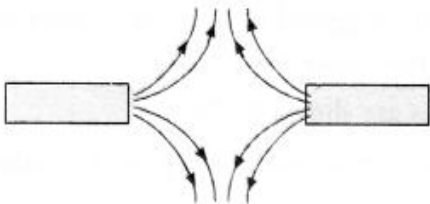
TIME: 2 HOURS

**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.	a. What is meant by homologous series of a carbon compound? b. Write the IUPAC name of the next homologous of $\text{CH}_3\text{OH}$ and $\text{CH}_2=\text{CH}_2$ .	2																																				
2.	A part of the periodic table is given below. The elements sodium, carbon, and argon have been placed in their correct positions. The position of other elements is represented by hypothetical letters. <table border="1"><thead><tr><th>Group→</th><th>1</th><th>2</th><th>13</th><th>14</th><th>15</th><th>16</th><th>17</th><th>18</th></tr></thead><tbody><tr><th>Period↓</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td>A</td><td>B</td><td>C</td><td>Carbon</td><td>D</td><td>E</td><td>F</td><td>G</td></tr><tr><td>3</td><td>Sodium</td><td>H</td><td></td><td>I</td><td></td><td></td><td>J</td><td>Argon</td></tr></tbody></table> <p>With reference to the table answer the following:</p> <ol style="list-style-type: none"><li>a. Write the trend of non-metallic character in the horizontal row A to F.</li><li>b. Write the formula of a compound formed between H and E.</li></ol>	Group→	1	2	13	14	15	16	17	18	Period↓									2	A	B	C	Carbon	D	E	F	G	3	Sodium	H		I			J	Argon	2
Group→	1	2	13	14	15	16	17	18																														
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3.	a. Complete the path travelled by the pollen after pollination. <table border="1"><tbody><tr><td>The landing of the pollen of the same species on the stigma</td></tr><tr><td style="text-align: center;">↓</td></tr><tr><td>i) .....</td></tr><tr><td style="text-align: center;">↓</td></tr><tr><td>ii) .....</td></tr><tr><td style="text-align: center;">↓</td></tr><tr><td>Within the ovary the male nuclei then fuses with the female germ cell bringing about fertilization.</td></tr></tbody></table> <p>b. Enumerate two post-fertilisation changes seen in a flower.</p>	The landing of the pollen of the same species on the stigma	↓	i) .....	↓	ii) .....	↓	Within the ovary the male nuclei then fuses with the female germ cell bringing about fertilization.	2																													
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4.	a. What happens when <i>Planaria</i> is cut into three different pieces? b. Horticulturists raise ornamental plants through tissue culture. Justify.	2																																				
5.	In a cross between pea plants with purple flowers and pea plants with white flowers, the offspring of $F_1$ generation had all purple flowers. When $F_1$ generation individuals were self-bred, the $F_2$ generation gave rise to 100 individuals, 25 of which had white flowers,	2																																				

	<p>(Purple is dominant). Work out the cross and answer the following:</p> <p>a. What is the phenotypic ratio obtained in F<sub>2</sub> generation?</p> <p>b. Why does the F<sub>1</sub> progeny in the above cross always bear purple flowers?</p> <p style="text-align: center;"><b>OR</b></p> <p>‘It is a matter of chance whether a couple will have a male or a female child’. Justify this statement with the help of a flowchart.</p>	
6.	<p>a. What is a solenoid? Draw a sketch to show the magnetic field pattern produced by a current-carrying solenoid.</p> <p>b. Name the type of magnet with which the magnetic field pattern of a current-carrying solenoid resembles.</p> <p>c. What is the shape of field lines inside a current-carrying solenoid? What does the pattern of field lines inside a current-carrying solenoid indicate?</p> <p style="text-align: center;"><b>OR</b></p> <p>Magnetic lines of force of two pairs of magnets are shown in figure A and B. Out of these two figures, which one represents the correct pattern of field lines. Name the poles of magnets facing each other.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div>	2
7.	<p>Construct a food chain using the given organisms and answer the following question:</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;">       Grass hopper, Snake, Frog, Grass, Hawk     </div> <p>To which of the two consumers, snake/frog, will more energy be available and Why?</p> <p style="text-align: center;"><b>OR</b></p> <p>A lake inhabiting the following organisms-Small fish, zooplanktons, big fish, phytoplankton, and water birds was found contaminated with pesticides, as DDT was regularly sprayed to check mosquito growth for many years.</p> <p>a. Which one of the following organisms living in the lake will have maximum amount of pesticide and why? Name the process cited above.</p> <p>b. Zooplanktons are critical parts of a freshwater ecosystem. What would happen if zooplanktons were removed from the ecosystem?</p>	2
<b>SECTION - B</b>		
8.	<p>An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide.</p> <p>a. Where in the periodic table are elements X and Y placed?</p> <p>b. What will be the nature of the oxide of element Y? Identify the nature of bonding in the compound formed.</p> <p>c. Which among these is a metal? Why?</p>	3
9.	<p>a. State the reason, why carbon can neither form C<sup>4+</sup> cation nor C<sup>4-</sup> anion but forms covalent compounds?</p> <p>b. Write the structural formula of the following:</p> <p>(i) Propanoic acid,                      (ii) Butanone</p>	3

OR

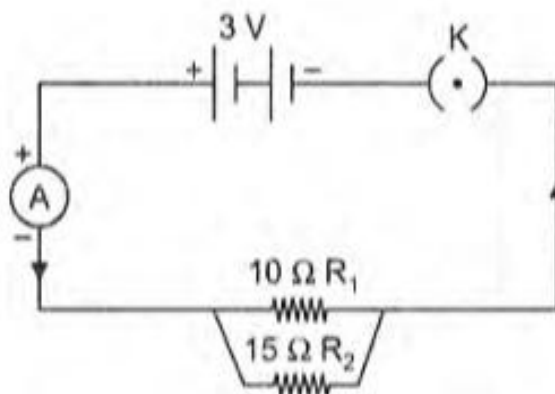
Some information about elements D, E, F, G and H is given in the tabular form:

Element	Mass number	Atomic number	Electronic configuration
D	9	4	2,2
E	19	9	2,7
F	23	11	2,8,1
G	28	14	2,8,4
H	40	18	2,8,8

- Which element can be described as unreactive and why?
- Draw an electron dot diagram of the molecule  $E_2$  between E and E.
- Catenation is the ability of an atom to form bonds with other atoms of the element. Compare the catenation property of carbon with the element G.

10. a. Draw a neat diagram of the female reproductive system and label the following parts where the:
- development of egg takes place.
  - fertilised egg gets implanted.
- b. Surgical methods are generally advised for the male and female partner as a terminal method to prevent pregnancy. What is this sterilisation procedure called in males?

11. a. Calculate the work done in moving a charge of 4 coulombs from a point at 220 volts to another point at 230 volts
- b. Study the following circuit and answer the following questions:



- State the type of combination of the two resistors in the circuit.
- How much current would flow through: (1) 10-ohm resistor and (2) 15-ohm resistor?
- What would be the ammeter reading?

12. Two lamps, one rated 40 W at 220 V and the other 60 W at 220 V, are connected in parallel to the electric supply at 220 V.
- Draw a circuit diagram to show the connections.
  - Calculate the current drawn from the electric supply.
  - Calculate the total energy consumed by the two lamps together when they operate for one hour.

OR

How does the resistance of a wire change when its:

- length is tripled.
- diameter is tripled.
- material is changed to one whose resistivity is three times.

13. The truth today is that, we will be adding tons of CFC's and carbon to the atmosphere. Tonight the earth will be a little hotter, the water more acidic and the fabric of life more threadbare. Today people are increasingly aware about their impact on ecological issues like ozone depletion, global warming etc.
- How is ozone formed in the stratosphere?
  - Damage to the ozone layer is a cause of concern. Justify.
  - As responsible citizens, mention two steps that you would take to limit this damage?

**SECTION – C**

This section has 2 case-based questions (14 and 15). Each case is followed by three sub-questions (a, b and c). Parts a and b are compulsory. However, an internal choice has been provided in part c.

14. Mendel crossed a pure breeding pea plants that are tall with round seeds and a dwarf plant with wrinkled seeds. In the  $F_1$  all the plants were tall and had round seeds and the following combinations of plants were obtained in the  $F_2$ .

PLANTS	NUMBER
Tall Plants, Round seeds	315
Tall Plants, Wrinkled seeds	108
Dwarf Plants, Round seeds	101
Dwarf Plants, Wrinkled seeds	32

- Write the genotype of the  $F_1$  progeny. (1 Mark)
- Mention the phenotypic ratios obtained in the above cross. (1 Mark)
- Analyse the result given in the table above using Mendel's Laws of inheritance and describe the mechanism of inheritance which explains these result (2 Marks)

**OR**

How do germ cells make a single set of genes from the normal two copies that all other cells in the body have?

15. a. A coil is connected to a galvanometer. When the N-pole of a magnet is pushed into the coil, the galvanometer deflected to the right. What deflection, if any, is observed when:

Faradays Law of Induction



- the N-pole is removed?
  - the S-pole is inserted?
- What does the direction of thumb indicate in the right-hand thumb rule?
  - State two ways of increasing the deflection on the galvanometer.

**OR**

Explain the function of the following parts of an electric motor.

- (i) Armature, (ii) Brushes.

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