

NAVODAYA VIDYALAYA SAMITI: NOIDA

PRE BOARD EXAMINATION 2022

CLASS: X (SET-1)

SUBJECT: SCIENCE (086)

Time: 02 Hours

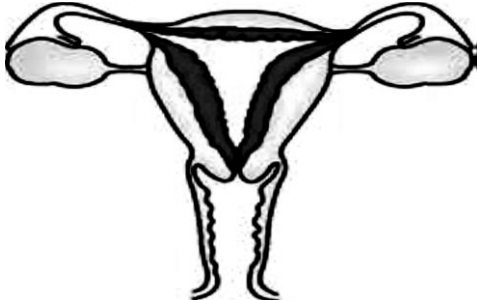
Max. Marks:40

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.
- v) The English version shall always prevail in case of any discrepancy or inconsistency between English and Hindi

SECTION - A

1	<p>What type of core is used to make electromagnets? A beam of alpha particles enters a chamber moving along the magnetic field. What is the magnetic force experienced by the beam (give justification)?</p> <p style="text-align: center;">OR</p> <p>Name the factors on which force acting on a current carrying conductor will depend. When is the force experienced by a current carrying conductor placed in a magnetic field greatest?</p>	2												
2	<p>(a) Write the electron dot structure of C_2H_2 and C_2H_6. Which of the two is saturated?</p> <p>(b) How many covalent bonds are there in a molecule of C_2H_2 and C_2H_6?</p>	2												
3	<p>The atomic numbers and electronic configuration of three elements X, Y and Z are as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Element</th> <th style="text-align: center;">Atomic number</th> <th style="text-align: center;">Electronic configuration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2,1</td> </tr> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">9</td> <td style="text-align: center;">2,7,</td> </tr> <tr> <td style="text-align: center;">Z</td> <td style="text-align: center;">11</td> <td style="text-align: center;">2,8,1</td> </tr> </tbody> </table> <p>(a) Which two of these elements will show similar chemical properties? Why?</p> <p>(b) Arrange these three elements in the increasing order of their atomic size.</p> <p style="text-align: center;">OR</p> <p>(c) What is the number of valence electrons in the atoms Y and Z?</p> <p>(d) Which two elements amongst are likely to be metals? Why?</p>	Element	Atomic number	Electronic configuration	X	3	2,1	Y	9	2,7,	Z	11	2,8,1	2
Element	Atomic number	Electronic configuration												
X	3	2,1												
Y	9	2,7,												
Z	11	2,8,1												

4	<p>DDT is a pesticide which is widely used in agriculture. Through run off it reaches to the water bodies and enters into different food chains. One of the aquatic food chains is given below.</p> <p>Water → Zooplankton → Small fish → Large fish → Fish Eating Birds</p> <p>(DDT 0.003 PPB) (DDT 0.04 PPM) (DDT 0.05 PPM) (DDT 2 PPM) (DDT 5 PPM)</p> <p>(a) Name the process responsible for increasing DDT concentration in food chain.</p> <p>(b) What is impact of DDT on fish eating birds?</p> <p style="text-align: center;">OR</p> <p>Consider the following food chains:</p> <p style="padding-left: 40px;">i) Plants → Mice → Snake → Hawks</p> <p style="padding-left: 40px;">ii) Plants → Mice → Hawks</p> <p>If energy available at the producer level of both food chains is 100 J, in which case hawks get more energy from food and by how much? Justify your answer?</p>	2			
5	<p>Name a multi-cellular organism that divides by fragmentation? Why is it not possible for all multi-cellular organisms to divide by fragmentation?</p> <p style="text-align: center;">OR</p> <p>Observe the given figure and name the organs/parts where the following processes takes place:</p> <p>(a) Production of egg</p> <p>(b) Site of fertilisation</p> <p>(c) Site of implantation</p> <p>(d) Entry of the sperms</p> <div style="text-align: center;">  </div>	2			
6	<p>(a) Which part of flower changes into seed after fertilization?</p> <p>(b) Root and shoot develops from which part of the embryo?</p>	2			
7	<p>What is the source of variation in populations of organisms? In sexual reproduction if each new generation is to be the combination of the DNA copies from two pre-existing individuals, then each new generation will end up having twice the amount of DNA that the previous generation had. How is this problem solved?</p>	2			
SECTION - B					
8	<p>What are magnetic field lines? Explain why magnetic field lines are closed curves? The given magnet is divided into three parts A, B and C as:</p> <p style="text-align: center;"> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 10px;">A</td> <td style="padding: 2px 10px;">B</td> <td style="padding: 2px 10px;">C</td> </tr> </table> </p> <p>Name the part where the strength of magnetic field is (i) maximum, (ii) minimum</p>	A	B	C	3
A	B	C			

9

Draw a closed circuit diagram consisting of 1m long nichrome wire XY, an ammeter, a voltmeter, four cells of 1.5 V each and a plug key.

3

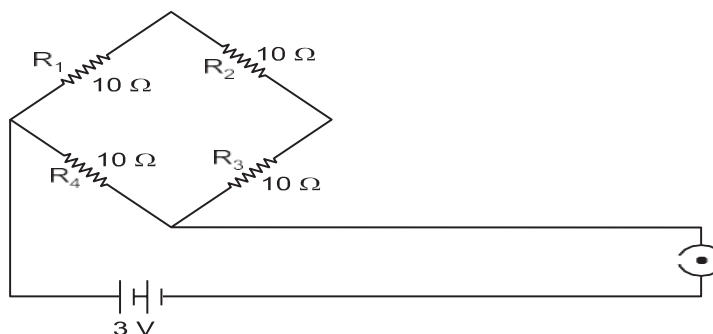
The values of current I flowing in a given resistor for the corresponding values of potential difference V across the resistor are given below:

I(amperes)	0.5	1.0	2.0	3.0	4.0
V(volts)	1.6	3.4	6.7	10.2	13.2

Plot a graph between V and I and calculate the resistance of that resistor.

OR

Find the current drawn from the battery by the network of four resistors as shown in the figure.



10

(a) How many isomers are possible for the compound with the molecular formula C_5H_{12} ? Draw the structure of all possible isomers.

3

(c) Write the next two homologues of C_5H_{12} .

11

In the following table, six elements A,B,C,D,E and F(here letters are not the usual symbols of the elements) of the modern periodic table with their atomic numbers are given:

3

Period	Group 1	Group 2
2	A(3)	D(4)
3	B(11)	E(12)
4	C(19)	F(20)

(a) What is the number of valence electrons in the atom of 'B'?

(b) If B combines with chlorine, what would be the formula of the compound formed?

(c) Write the electronic configuration of B and E.

12

In the era of industrialization some pollutant gases are increasing in our atmosphere day by day which causes global warming.

3

(a) Name the two gases responsible for Global warming.

(b) How these gases are responsible for global warming?

	(iv) Which of the following is used as a filament in electric bulbs? (a) Nichrome (b) Tungsten (c) Manganese (d) Silver	
15	<p>Savita's grandmother often blames her mother for giving birth to 3 daughters and no son and therefore wants another marriage of her son. Answer the following questions on sex determination.</p> <p>(i) How many pairs of chromosomes are there in human beings? (ii) How is the sex of the human offspring determined? (iii) Draw a diagram depicting sex determination in humans.</p> <p style="text-align: center;">OR</p> <p>A true-breeding, purple-flowered, yellow pea plant (PPYY) is crossed to a white-flowered, green pea plant (ppyy).</p> <p>A. Write out the parental cross. B. What gametes can be produced by each parent? C. What is the genotype of the F1 generation? What is the phenotype? D. What are the possible gametes that can be produced from each plant F1 plant?</p>	4