Roll No.

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Date: 22-02-2022

QUEENS' COLLEGE, INDORE
SESSION: 2021-22
PREBOARD TERM-II

Class: X **Subject: SCIENCE**
Max. Marks : 40 **Time Allotted: 2 Hours**

General Instructions:

1. All questions are compulsory.
2. The question paper has **three sections** and **15 questions**. All questions are compulsory.
3. 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.
4. Internal choices have been provided in some questions. Students have to attempt only one of the alternatives in such questions.
5. There are 15 questions in this paper, internal choice is given in few questions.

Q.No.	Question	Marks
	SECTION – A	
1	The table shows the Atomic number of four elements.	2

Elements	Atomic No.
W	1
X	8
Y	11
Z	18

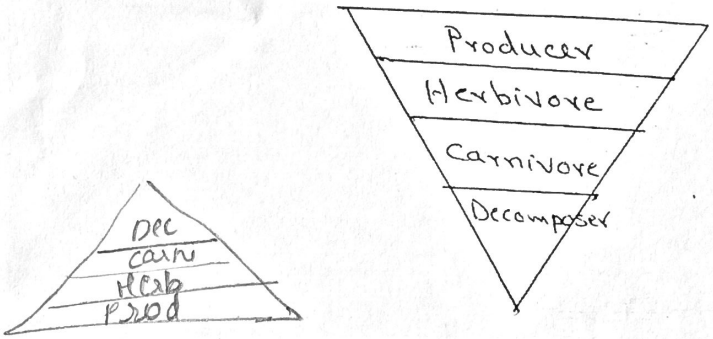
(a) Identify which element(s) will form covalent bonds with carbon.
(b) Write chemical formula of compound formed between carbon and element 'X'?

2	This question is based on the table in which the position of certain elements in the periodic table are shown below, Study the table and answer the questions that follow:	2

Group → Period ↓	1	2	3 to 12	13	14	15	16	17	18
1	G								H
2					D				I
3		A		B				C	F

(a) Which element will form only covalent compounds?
(b) Give the name of the family to which H, I and F belong?
(c) Arrange elements A, B & C in increasing order of their atomic size.

3	(i) What ensures the stability of DNA of a sexually reproducing species? (ii) Give the functions of prostate gland and seminal vesicle in a male reproductive system.	2
4	(i) Simple animals when cut regenerate to form whole organisms. How is this possible for the animal to do so? (ii) Regeneration is not same as reproduction. Justify.	2

5	(i) Define an allele. (ii) Give the alleles for the seed colour and shape of seed in pea plant. **OR** Give the genotypes and phenotypes of the children produced when a man with blood group AB marries a woman with blood group O. $I^{AB} + I^{O} = I^{ABO}$ / ABexpress	2
6	State the various ways of increasing the strength of magnetic field inside a solenoid. Turns, current increase **OR** What are magnetic lines? Write properties of magnetic field lines.	2
7	(i) Ozone layer in the stratosphere is considered as a boon and also is harmful. Justify. (ii) How is ozone layer formed? **OR** Look at the pyramid of energy drawn for an ecosystem.  (i) Identify the error in the diagram with reasons. (ii) What happens to the energy that is not passed on from one tropic level to the other? peeriare (used by)	2
	Wallis atom Beforlight **SECTION – B** Propery of isotopes	
8	Write the limitations of Mendeleev's periodic table. (Any Three) Gaps unexplaind	3
9	(a) How many isomers are possible for the compound with the molecular formula C_4H_8? Draw the electron dot structure of branched chain isomer. (b) How will you prove that C_4H_9OH and $C_5H_{11}OH$ are homologues? **OR** (i) Write the name and formula of the 2nd and 3rd member of the series of carbon compounds whose 1st member of the family is ethyne. Propyne, Butyne. (ii) Define Catenation. self linking (iii) Why carbon cannot form ionic compounds? small element, cannot spend large energy cannot hold 10 electron.	3
10	A person crossed pure-breed tall pea plants with pure-breed dwarf pea plants and obtained pea plants of F1 generation. He then performed two types of experiments. In the first, he self-crossed the plants of F1 generation and in the second, he crossed the plants of F1 with the pure-breed dwarf parent plants. (i) Make crosses to show both the experiments. Tt × Tt | Tt × tt (ii) What would be the phenotypes of the plants in the F2 generations in both the experiments? 4:0, 3:1 (iii) Give the genotypic ratios of F2 generations in both the experiments by making the crosses. 1:1:1:1 (4:0, 3:1	3
11	A hot plate of an electric oven connected to a 220 V line has two resistance coils A and B, each of 24 Ω resistance, which may be used separately; in series, or in parallel. What are the currents in the three cases? 9.166 18.33	3

$R + R = 24 + 24 = 48$

$\frac{1}{R} + \frac{1}{R} = \frac{2}{R} = \frac{2}{24} = \frac{24}{2}$ 12

$V = IR$

$\frac{220}{12} = I$

12 An electric heater rated 800 W operates 6 hours/day. Find the cost of energy to operate it for 30 days at Rs. 3.00 per unit. 3

OR

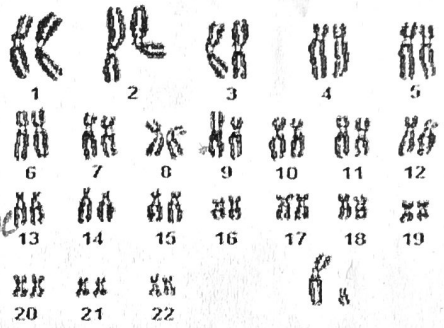
Explain the following: High Melting point, Low Resis

(a) Why is the tungsten used almost exclusively for filament of electric lamps?
(b) Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal? No oxidation on High temp
(c) Why is the series arrangement not used for domestic circuits? One did not work others stop.

13 (i) Will the impact of removing all the organisms from a tropic level be different for different tropic levels? Yes, ecological disBalance. 3
(ii) Can the organisms of any tropic level be removed without causing any damage to the ecosystem? No

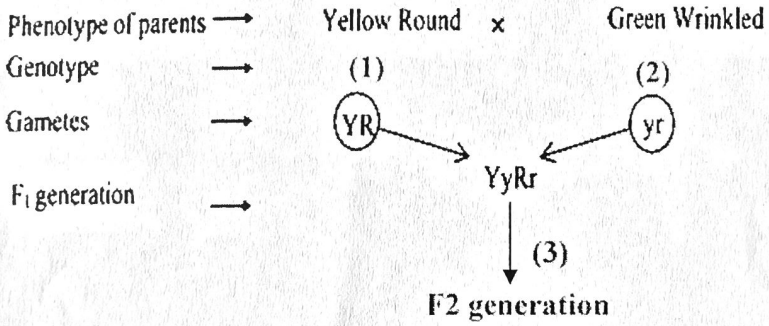
SECTION C

14 This is a karyotype of humans showing all the 46 chromosomes in a cell. Observe it and answer the questions that follow: 4



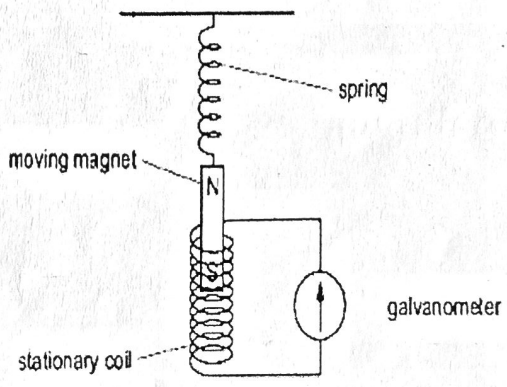
(i) How many homologous pairs of chromosomes are present in the individual?
(ii) Define a homologous chromosome. same Gene
(iii) This cell belongs to a male or a female? Justify with reason. 23rd pair

OR



(i) Label 1 and 2.
(ii) Name the process shown as 3.How is the process carried out?
(iii) Continue the cross as shown and create the F2 generation. (Genotypes needed).
(iv) State and explain the law that this example follows.

15 Amit was demonstrating an experiment in his class with the setup as shown in the figure below. 4



A magnet is attached to a spring. The magnet can go in and out of the stationary coil. He lifted the magnet and released it to make it oscillate through the coil. Based on your understanding of the phenomenon, answer the following questions.

(a) What will be observed when the

Induced current

magnet starts oscillating through the coil? Explain the reason behind this observation. deflection in Galvanometer

(b) What is the principle which Amit is trying to demonstrate? ~~the~~ Electromagnetic Induction

(c) Consider the situation where the magnet goes in and out of the coil. State two changes which could be made to increase the deflection in the galvanometer. Motion, coil turns

Motion, turns in coil

OR

Is there any difference in the observations in the galvanometer when the magnet swings in and then out of the stationary coil? Justify your answer.

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OR By setting a electromagnet circuit near it