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e-Learning Programme - 2020

Grade - 10 | **Science** | **Assignment - 01**

1. Nucleic acids are a group of bio-molecules which are made up of a large number of building units called **nucleotides** joined linearly to each other. These are linear polymers.

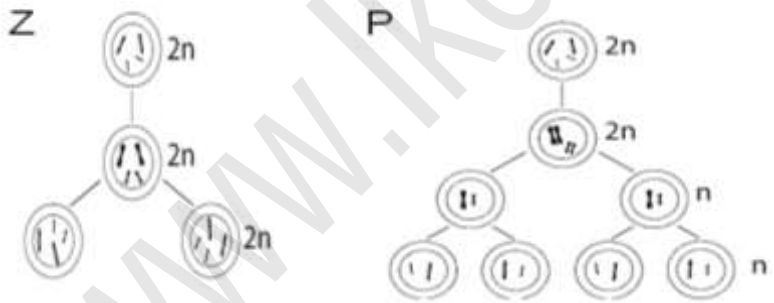
i. Name the constituents of a nucleotide.

ii. What are the elements present in nucleic acids?

iii. Name the building unit of DNA molecule.

iv. Mention the importance of nucleic acids in biological systems.

v. Living cells can grow and also multiply themselves. Accordingly a cell can multiply into two, four and eight cells and so on. Multiplication of the existing cells produces new cells.



a. Identify and name the processes Z and P.
b. Name the organelles that are found only in plant cells but not in animal cells.
c. Mention the importance of meiosis.
d. In an eukaryotic cell, name the steps of cell division in the correct order.
e. Write two differences between the processes Z and P shown in the diagram above.

2. The following table shows information of some elements.

Element	A	B	C	D	E
Number of protons	3	7	12	17	19
Number of nutrons	4	7	12	18	20

i. Which element has the valency 3 ?

ii. Write the atomic number and the mass number of A the standard way.

Question 2. Cont..

iii. Name two elements belonging to the same group.

iv. Write the chemical formula made by combining of the elements C and D.

vi. Arrange the elements C, D and E in the descending order of their ionization energies.

vii. Which of the above elements makes an ion with **+1** charge?

viii. Calculate the relative molecular mass of Ammonium sulphate. (N= 14, H=1, S=32, O=16)

ix. What is the molar mass of urea? (N-14, H-1, C-14, O-16)

x. The molar mass of carbon is 12 g Mol^{-1}. Calculate the number of moles in 0.12 g of carbon.

xi. The melting points and the boiling points of certain elements are given in the following table. (The letters given are not their real Chemical symbols)

Element	A	B	C	D
Melting point ^0C	-101	-240	-5	-
Boiling point ^0C	-35	-188	50	184

a. Out of these, name the element with
   a) the lowest melting point.
   b) the maximum boiling point.

b. In what physical state does the element C exist at room temperature?

c. Is the element C a metal or a non-metal?

d. If all the above elements belong to the same group of the periodic table, to which group are they mostly suitable?

e. What element will be on top of the group in the above question?

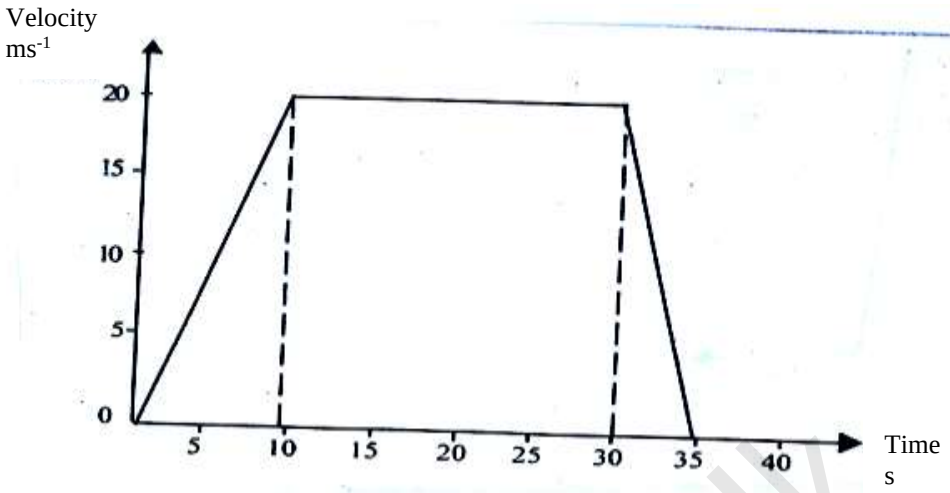
f. Mention two chemical properties of sodium metal.

g. The atomic number of the element X is 14. Draw a dot and cross diagram to show the bonding structure of the compound formed between X and hydrogen. (Use dots (.) to show the outermost shell electrons of X and crosses (x) to show the electrons of hydrogen.)

h. Write the chemical formulae of the following compounds.
   1. Aluminum nitrate
   2. Potassium permanganate
   3. Calcium chromate
   4. Sodium hydrogen carbonate

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3. The following velocity –time graph shows the motion of an object. The object has moved in a uniform acceleration during the initial 10 s and then with a uniform velocity for 20 s time and decelerated for 5 s time and finally it has stopped.



i. What is the maximum velocity obtained by the object?

ii. Calculate the acceleration of the object.

iii. Calculate the total displacement made by the object.

iv. Find the deceleration of the object.

v. If the mass of the object is 10 kg, calculate the unbalanced force acted on the object during the initial 10 s time.

vi. Calculate the kinetic energy of the object when it moves at uniform velocity.

vii. A still object starts moving whenever an unbalanced force is acted on it.

a. A sky cracker (Ahas koora) rises up and explodes when it is lighted. Which Newton's law do you use to explain this incidence?

b. Write down the above Law of Newton.

c. A force of 8N is applied on an object. If this object takes an acceleration of 2 ms^{-2} find the mass of the object.

d. A bullet with a mass of 10 g comes out of a gun and moves with a velocity of 400 ms^{-1}. Find the momentum of this bullet.

e. An object with a weight of 5 N had a momentum of 6 kg ms^{-1}. Due to an opposing force to the movement, the velocity of the object decreased up to 4 ms^{-1}. How much is the force applied on the object?

4. (A) The following table shows the displacement- time data of a motor vehicle that was moving on a straight road.

Time s	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Displacement m	0	1	2	3	4	4	4	3	2	1	0	-1	-2	-3

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a. What is the time taken by the vehicle to make a displacement of 4 m?

b. How long have the motor vehicle been still?

c. How much time has taken for the vehicle to come back to its starting place?

d. Calculate the velocity of the vehicle after 4 s time.

e. Calculate the velocity of the vehicle during the time period from 6 s to 13 s.

f. What is the overall displacement of the motor vehicle? What can you say about its motion?

g. Draw the velocity time graph for the above motion of the vehicle.

(B) The following table shows the atomic numbers of some elements of the periodic table. The letters used are not their correct chemical symbols.

Atomic Number	n-1	N	n+1	n+2	n+3	n+4	n+5
Element	A	B	C	D	E	F	G

When the element B is heated with oxygen it burns with a bright white flame and produces an oxide which is a white coloured powder.

I. Which of the above element belongs to group 2 ?

II. What is the value of n ?

III. When silver nitrate was added to a salt which was formed from two of the above elements, a white color precipitate was formed. What are the elements of this salt?

IV. What is the valancy of D ?

V. What is the element B ?

5. Fill in the blanks using suitable words.

a. The jelly like fluid inside the living cell is known as …… .

b. Four elements those are present mostly in living bodies are …….. oxygen, hydrogen and …… .

c. The main organelle in a living cell is the …… .

d. The mitochondria are known as power stations of cells because the …….. reactions take place in them to release energy for the cell.

e. In carbohydrates the elements …….. and ……. combine in a ratio of 2:1 .

f. …….. is a small organelle without a membrane present in a cell.

g. …… is known as fruit sugar.

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h. The displacement has both a magnitude and a direction. Therefore it is a ……. quantity.
i. Rough endoplasmic reticulum appears to be rough due to ribosomes present with them. The function of RER is …….. .
j. The cell growth is the …… increase of the size and the dry mass of a cell.
k. The cell division is the process of dividing of …… to produce new cells.
l. Various types of proteins are present in plants and animals. The protein present in hair is ……../ .
m. Mitosis is the process of increasing the number of cells that keeps the number of ……in the nucleus …….. .
n. There are four main organic compound present in the living matter. They are known as ……
o. A molecule of sucrose is formed by combining a molecule of fructose and a molecule of ……..
p. Proteins are complex molecules that are made by …….. of small molecules called amino acids.
q. All the bio-chemical reactions in living organisms are catalyzed by ……
r. When two monosaccharaides react, a disaccharide and a molecule of …….. is formed.
s. In animal bodies the carbohydrates are stored as ……
t. Certain amino acids cannot be produced within our body. They are known as …… amino acids.

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