B

COMPREHENSIVE REVISION TEST (UNIT TEST) SERIES - 2023

TEST No. 4

MPUT
Std. X

CHEMISTRY - UNIT 1
| Chapters: 1, 2 |

Time : 45mts
Total Score : 20

Instructions :

- *Answer the questions based on instructions.*
- *Answer the questions according to the score and time.*

*Answer **any** TWO questions from 1 to 3. Each question carries 1 score.* (2 x 1 = 2)

1. Identify the sub shell with the highest energy.

   a) 3s b) 3p c) 3d d) 4s

2. The amount of a compound in grams equal to its molecular mass is called .....

3. The atomic mass of Sodium is given as 23 units. What does 1 unit stand for here?

*Answer **any** TWO questions from 4 to 6. Each question carries 2 scores.* (2 x 2 = 4)

4. a) Which of the following configurations do not make sense?

   ($3s^2$, $2d^1$, $3p^7$, $4f^{12}$)

   b) How will you justify this?

After analysing the table, write the values indicated by the letters 'a' and 'b.'

5. Being a transition element, Manganese forms different types of oxides. Complete the table related with the oxides of Mn. (Atomic number : Mn = 25)

Compound	Oxidation state of Manganese	Sub shell electron configuration of Manganese ion
MnO_2	+4	.....(a).....
Mn_2O_3	.....(b).....	$[Ar]3d^4$
.....(c).....	.....(d).....	$1s^2 2s^2 2p^6 3s^2 3p^6$

6. Suggest suitable ways to increase the volume of a certain mass of gas, when they are kept under the following conditions.

   Case (i) : When the pressure of the gas is kept constant.

   Case (ii) : When the temperature of the gas is kept constant.

*Answer **any** TWO questions from 7 to 9. Each question carries 3 scores.* (2 x 3 = 6)

7. When the last electron of the atom of an element, 'A' was filled in the 3d subshell, it is found to be the $3d^8$. Answer the questions based on these informations.

   a) Write down the subshell electron configuration of the atom.

   b) What is the period number and Group number of 'A'.

   c) Mention one characteristic property that 'A' may exhibit.

8. a) Give the statement of Boyle's Law.

b) The size of the air bubbles rising from the bottom of an aquarium gradually increases. Give reason.

9. Match the column 'A' with 'B' and 'C'.

A	B	C
$_{20}Ca$	$1s^2 2s^2 2p^6 3s^2 3p^6$	p block
$_{17}Cl$	[Ar] $3d^{10} 4s^2$	f block
$_{26}Fe$	[Ar] $4s^2$	d block
		s block

Answer ***any*** **TWO** *questions from 10 to 12. Each question carries 4 scores.* (2 x 4 = 8)

10. Lanthanoids and Actinoids form two series of elements, placed below the main body of the Modern Periodic Table.

a) What is the period number of these two series of elements.

b) Which is the subshell in which the last electron has been filled in Lanthanoids?

(3d, 4f, 4d, 5f)

c) Mention one characteristic property of these elements, which are shown by d-block elements also.

d) Certain elements of these series are used as nuclear fuels. Mention any two such elements.

11. a) Find the molecular mass of carbonic acid (H_2CO_3).

[Atomic mass : H = 1, C = 12, O = 16]

b) How many GMM is present in 124g of H_2CO_3?

c) Find out the following in respect of 620g of Carbonic acid.

i) The number of moles of H_2CO_3 molecules.

ii) The number of molecules of H_2CO_3.

12. The outer most electron configuration of the element 'N' is $2s^2 2p^2$.

a) Identify the group number and block of the element.

b) Write down the subshell configuration of the element, just below 'N' in the periodic table.

c) Derive the chemical formula of the compound formed by 'N' when it combines with chlorine.