WEEKLY TEST MEDICAL PLUS -03 TEST - 02 RAJPUR SOLUTION Date 14-07-2019

[CHEMISTRY]

46.

47. (c) Nucleus of helium is $_2He^4$ mean 2 neutrons and 2 protons.

48. (c) Proton is the nucleus of $H -$ atom (atom devoid of its electron).

49. (b) Cathode rays are made up of negatively charged particles (electrons, e^-)

50. (c) Size of nucleus is measured in *Fermi* (1 Fermi $= 10^{-15} m$).

51. (a) Charge on proton $= +1$ unit, charge on α particle = + 2 units, 2 : 1.

52. (a) Na^+ and *Ne* are isoelectronic which contain 10 electrons.

53 (b) *CO* and CN^- are isoelectronic.

$CO = 6 + 8 = 14$ and $CN^- = 6 + 7 + 1 = 14$.

54. (b) $_{26}X^{56}$ $A = P + N = Z + N = E + N$

$N = A - E = 56 - 26 = 30$

55. (c) $P_{15} = 2,8,5$

56. (a) $K^+ = 1s^2 2s^2 2p^6 3s^2 3p^6$

$Cl^- = 1s^2 2s^2 2p^6 3s^2 3p^6$.

57. D

58. C

59. A

60. (a) The central part consisting whole of the positive charge and most of the mass caused by nucleus, is extremely small in size compared to the size of the atom.

61. (b) According to the Bohr model atoms or ions contain one electron.

81.

(a) 10 g $O_2 = \dfrac{\mathbf{6.023 \times 10^{23} \times 10}}{\mathbf{32}}$ **molecules**

(b) 15 L $H_2 = \dfrac{\mathbf{6.023 \times 10^{23} \times 15}}{\mathbf{22.4}}$ **molecules (Largest)**

(c) 5 L $N_2 = \dfrac{\mathbf{6.023 \times 10^{23} \times 5}}{\mathbf{22.4}}$ **molecules**

(d) 0.5 g $H_2 = \dfrac{\mathbf{6.023 \times 10^{23} \times 0.5}}{\mathbf{2}}$ **molecules**

82.

Number of electrons involved in the redox reaction is five.
Therefore, equivalent weight is **M/5**.

83.

$44\,g\ CO_2 = 1\ \text{mol} = 6.02 \times 10^{23}$ molecules

$48\,g\ O_2 = \frac{48}{32} = 1.5\ \text{mol} = 1.5 \times 6.02 \times 10^{23}$ molecules

$8\,g\ H_2 = \frac{8}{2} = 4\ \text{mol} = 4 \times 6.02 \times 10^{23}$ molecules

$64\,g\ SO_2 = \frac{64}{32} = 2\ \text{mol} = 2 \times 6.02 \times 10^{23}$ molecules

$\therefore$ $8\,g\ H_2$ has maximum number of molecules.

84.

Number of moles in $0.018\,g$ water $= \frac{0.018}{18} = 1 \times 10^{-3}$ moles

$\therefore$ Number of molecules in 10^{-3} moles $= N_A \times 10^{-3}$.

$= 6.022 \times 10^{23} \times 10^{-3} = \mathbf{6.022 \times 10^{20}}$

85.

$$\underset{\substack{1\ \text{mol} \\ 100\ g}}{CaCO_3} + 2HCl \longrightarrow CaCl_2 + H_2O + \underset{\substack{1\ \text{mol} \\ 6.023 \times 10^{23} \\ \text{molecules}}}{CO_2}$$

Thus, 100 g of pure $CaCO_3$ gives 1 mol or 6.023×10^{23} molecules

1 mg or $10^{-3}\,g$ of pure $CaCO_3$ gives .

86.

$$\underset{\text{(Original)}}{M_1V_1} = \underset{\text{(Diluted)}}{M_2V_2}$$

$5 \times 1 = M_2 \times 10$

$M_2 = \frac{5}{10} = 0.5\ M = \mathbf{1N}$ [$\because$ H_2SO_4 is a dibasic acid]

87.

$N_1V_1 = N_2V_2$

$0.5 \times 100 = 0.1 \times V_2$

$V_2 = \frac{0.5 \times 100}{0.1} = 500\ \text{mL}$

Water to be added $= 500 - 100 =$ **400 mL**

88.

Let the mass of oxygen be $x\ g$ and that of nitrogen be $4x\ g$

Number of molecules of $O_2 = \frac{x}{32} \times N_A$

Number of molecules of $N_2 = \frac{4x}{28} \times N_A$

Ratio of the number of molecules $= \frac{x}{32} : \frac{4x}{28}$

or $\frac{x}{32} : \frac{x}{7}$ or **7 : 32**

89.

90.

In exponential notation, only the numerical portion gives the number of significant figures. Hence, 6.023×10^{23} has four significant figures.