UNIT TEST-01

Subject : Chemistry

Class : XI

Q.1 (1)	**Q.2** (4)	**Q.3** (3)	**Q.4** (4)	**Q.5** (1)	**Q.6** (2)	**Q.7** (4)	**Q.8** (4)	**Q.9** (3)	**Q.10** (3)
Q.11 (1)	**Q.12** (1)	**Q.13** (2)	**Q.14** (2)	**Q.15** (2)	**Q.16** (2)	**Q.17** (1)	**Q.18** (3)	**Q.19** (3)	**Q.20** (2)
Q.21 (4)	**Q.22** (4)	**Q.23** (3)	**Q.24** (2)	**Q.25** (4)	**Q.26** (3)	**Q.27** (3)	**Q.28** (3)	**Q.29** (3)	**Q.30** (3)
Q.31 (1)	**Q.32** (3)	**Q.33** (4)	**Q.34** (3)	**Q.35** (1)	**Q.36** (2)	**Q.37** (4)	**Q.38** (2)	**Q.39** (3)	**Q.40** (1)
Q.41 (3)	**Q.42** (3)	**Q.43** (2)	**Q.44** (3)	**Q.45** (4)	**Q.46** (2)	**Q.47** (2)	**Q.48** (1)	**Q.49** (4)	**Q.50** (2)

Q.1 (1)

$CaCO_3 \rightarrow CaO + CO_2$

$\frac{56\times10^3}{56}$ mol

Moles of $CaCO_3$ = moles of CaO

$= \frac{56\times10^3}{56} = 1\times10^3$ mole

wt of $CaCO_3 = 1 \times 10^3 \times 100$ g = 100 kg

Q.2 (4)

Rxn.

$3BaCl_2 + 2Na_3PO_4 \longrightarrow Ba_3(PO_4)_2 + 6NaCl$

given mole of $BaCl_2 = 9$

given mole of $Na_3PO_4 = 8$ $\Big]$ $\rightarrow$ So L.R. = $BaCl_2$

$\therefore$ moles of $Ba_3(PO_4)_2$ for mol = $\frac{9}{3}$ = 3 moles

Q.3 (3)

mall of 1 C - atom = 12 amu

1 mass of 1 mol of C - atom

$= 12 \times 1amu \times 6.02 \times 10^{23} \times 10^3$

$= 12 \times 1000$ g = 12 kg

Q.4 (4)

Minimum mol. wt. compound with oxygen = M O

Let At. wt. of M = X

$\therefore$ mol. wt. of compound = (X+16)

Acc. to Q

$\frac{16}{(x+16)}\times100 = 3.2$

On solving value of X = 484

$\therefore$ mol. wt. = 484 + 16 = 500

Ans. = 500

Q.5 (1)

	C	H	O
Mass	24	8	32
Moles	$\frac{24}{12}$	$\frac{8}{1}$	$\frac{32}{16}$
Ratio	2	8	2
Simple integer ratio	1	4	1

Hence empirical formula is CH_4O

Q.6 (2)

$C_nH_{2n+2}\left[n+\frac{n+1}{2}\right]O_2 \longrightarrow nCO_2 + (n+1)H_2O$

$\frac{\text{Volume of } O_2 \text{ used}}{\text{Volume of } CO_2 \text{ formed}} = \frac{7}{4}$

$\xrightarrow{n+\frac{(n+1)}{2}\ /\ n} = \frac{7}{4}$

$\Rightarrow$ n = 2 and alkane is C_2H_6

Q.7 (4)

Combustion of propane takes place as follows

$\underset{\text{propane}}{C_3H_8} + \underset{\text{Oxygen}}{5O_2} \rightarrow 3CO_2 + 4H_2O$

$V \propto n$

For 1 mole propane = 5 mole of O_2

1 litre propane required volume of O_2 = 5 litre

20 litre propane required volume of $O_2 = 20 \times 5 = 100$ litre

Q.8 (4)

$Fe + 5CO \longrightarrow Fe(CO)_5$

41g 70g

mole $\frac{41}{56}$ $\frac{70}{28}$

L·R· $\frac{41}{56\times1}$ $\frac{70}{14\times2}$

So CO is L·R·m while Fe is excess Reagent

5 mol of CO reacts with 1 mol of Fe

1 mol of CO $\longrightarrow$ $\frac{1}{5}$ mol of Fe

5/2 mole of CO reacts with $\frac{\cancel{5}}{2}\times\frac{1}{\cancel{5}}$ mol of Fe

W_{Fe} reacted = $\frac{1}{2}\times56 = 28$g

W_{Fe} left = 41 – 28 = 13g

Q.9 (3)

$4H_2 + O_2 \longrightarrow 2H_2O$

4 g 32 g 36g

When 4 g of H_2 reacts with 32 g of O_2 gives 36 g of H_2O.
Now present oxygen is 20 g
$\therefore$ O_2 will be the limiting reagent and H_2O will be calculated from O_2
$\therefore$ 32 g of O_2 given = 36g of H_2O

$$20 \text{ g of } O_2 \text{ given} = \frac{36}{32} \times 20 = 22.5 \text{ g } H_2O$$

Q.10 (3)

Q.11 (1)

Sol. $C_{(s)} + O_2(g) \longrightarrow CO_2(g)$

$$^{n}O_2 \text{ needed} = n_c = \frac{10^3}{12} \Rightarrow {}^{v}O_2 = \frac{10^3}{12} \times 22.4L$$

$$\text{in air } O_2 \text{ is } 20\%\left(\frac{v}{v}\right) \text{ thus } V_{air} = V_{O_2} \times \frac{100}{20}$$

$$= \frac{10^3}{12} \times 22.4 \times 5 = 9333.33\,L$$

Q.12 (1)

Sol.

H_2	+	O_2
2 gm		32 gm
1 mol	+	1 mol

$= 2 \text{ mol } (H_2 + O_2)$
$V = 2 \times 22.4$
$V = 44.8$ lit.

Q.13 (2)

Q.14 (2)

Let, $n_{H_2O} = n_{NaCl} = n$

$$m = \frac{\text{Mole of solute}}{\text{wt. of solvent (kg)}} = \frac{n}{n \times 18} \times 1000$$

$$= \frac{1}{18} \times 1000 = 55.55 \text{ m.}$$

Q.15 (2)

Q.16 (2)

1000 mL solution contain 2 mole of ethanol or 1000 × 1.025 g solution contain 2 mole of ethanol
wt. of solvent = 1000 × 1.025 – 2 × 46

$$m = \frac{2}{1000 \times 1.025 - 2 \times 46} \times 1000$$

$$m = \frac{2}{933} \times 1000 = 2.143$$

Q.17 (1)

MCl is the compound V.F. of metal(m) = 1
Molar mass of MCl = 32.7 + 35.5 = 68.2

Q.18 (3)

Q.19 (3)

$_1T^3$ atomic No.(2) = 1 = no of protons
mass No. (A) =3
number of neutron (n) = A-Z = 3-1 = 2

Q.20 (2)

Q.21 (4)

Q.22 (4)

fact based

Q.23 (3)

Sol. Velocity = 10% of speed of light

$$\lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34}}{9.1 \times 10^{-31} \times 3 \times 10^8 \times 10/100}$$

$$= 2.4 \times 10^{-9} \text{ cm}$$

Q.24 (2)

$$r_H = \frac{0.529n^2}{Z} = \frac{0.529(3)^2}{1} = 0.529 \times 9$$

(For 2nd excited state n = 3)

$$r_{Li}^{2+} = \frac{0.529(2)^2}{3} = \frac{0.529 \times 4}{3}$$

$$\text{Ratio} = \frac{9 \times 3}{4} = \frac{27}{4} \text{ Ans.}$$

Q.25 (4)

Q.26 (3)

Q.27 (3)

$\underline{\lambda} = \frac{h}{P}$ (debroglie) lyman $\rightarrow$ uv region

$\Delta n \cdot \Delta p \geq \frac{h}{4\pi}$ (Heisen berg) paschen $\rightarrow$ IR region

Q.28 (3)

Q.29 (3)

$$\lambda = \frac{h}{mv}$$

$$\lambda = \frac{6.634 \times 10^{-34}}{9.1 \times 10^{-31} \times 2.19 \times 10^6}$$

$\lambda = 3.32 \times 10^{-10}$ m

Q.30 (3)

Q.31 (1)

Q.32 (3)
no. of orbitals = n^2
$= (4)^2 = 16$

Q.33 (4)
Aufbau & then is Rule as ns subshell is not completely filled & unpaired e^- has opposite spin.

Q.34 (3)
$_{19}K \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$
no. of e^- when $\ell = 1$, $6 + 6 = 12$
p subshell.
spherical orbit is symmelrical having zero angular node.
10 e^- are present in d-subshell

Q.35 (1)
$Cr \rightarrow Ar\ 3d^5\ 4s^1$
$Cr^{2+} \rightarrow Ar\ 3d^4\ 4s^0$
So 4 unpared e^-.

Q.36 (2)
100 mL of 1 M $AgNO_3 \equiv 0.1$ mol $AgNO_3$
100 mL of 1 M $CuSO_4 = 0.1$ mol $CuSO_4$
$2AgNO_3 + H_2S \rightarrow Ag_2S + 2HNO_3$
2 mol 1 mol
0.1 mol 0.05 mol
$CuSO_4 + H_2S \rightarrow CuS + H_2SO_4$
2 mol 1 mol
0.1 mol 0.05 mol
$\therefore$ Ratio of the amounts of H_2S needed = 0.05 :0.1 = 1 : 2

Q.37 (4)
As water is liquid its density = 1 g/mL
i.e., 1 g of H_2O have volume = 1 mL

Mass of one molecule = $\frac{18}{6.023\times10^{23}}$ g

$\therefore$ $\frac{18}{6.023\times10^{23}}$ g of H_2O have volume

$= \frac{18}{6.022\times10^{23}}$ mL $= 3.0\times10^{-23}$ mL $= 3\times10^{-23}$ c–c

Q.38 (2)
M : O = 50 : 50 = 32 : 32 (given) for the first oxide.
Atomic weight of M = 32
M : O = 40 : 60 = 32 : x

$$x = \frac{60\times32}{40} = 48$$

$\therefore$ Number of O atoms = $\frac{48}{16} = 3$

Hence, formula of the second oxide = MO_3
$\therefore$ (2)

Q.39 (3)
Let atomic weight of x is A_X and y is A_Y

$$n_{xy_2} = 0.1 = \frac{10}{A_x + 2A_y}$$

$A_x + 2A_y = 100$ ...(i)

$$n_{x_3y_2} = 0.05 = \frac{9}{3A_x + 2A_y}$$

$3A_x + 2A_y = 180$ ...(ii)

on solving eq. (i) and (ii)

$A_x = 40,\ A_y = 30$

Q.40 (1)
$N_2(g) + 3H_2(g)\ 2NH_3(g)$
If we take 3 volume of each N_2 and H_2, then 3 volume of H_2 will react with only 1 volume of N_2 out of 3 volume, so H_2 will react or consumed completely therefore H_2 will be Limiting reagent.

Q.41 (3)

$$\text{Molarity} = \frac{6.02\times10^{22}}{6.02\times10^{23}} \times \frac{1}{1/2} = 0.2$$

Q.42 (3)

Moles of NaOH = $\frac{8}{40} = 0.2$

Moles of H_2O = $\frac{18}{18} = 1$

Moles fraction of NaOH = $\frac{0.2}{1.2} = 0.167$

Molality = $\frac{8}{40}\times\frac{1000}{18} = 11.11$

Q.43 (2)

Q.44 (3)

Q.45 (4)

$$E = \frac{hc}{\lambda}$$

$$E \propto \frac{1}{\lambda}$$

$$\frac{E_1}{E_2} = \frac{4000}{2000} \Rightarrow \text{i.e. } \frac{\lambda_2}{\lambda_1} = 2$$

Q.46 (2)

Q.47 (2)

$$-3.4 = -13.6 \times \frac{z^2}{n^2}$$

$n^2 = 4$

$n = 2$ (Angular momentum $= \frac{nh}{2\pi} = \frac{2h}{2\pi} = \frac{h}{\pi}$)

$\frac{h}{\pi}$ **Ans.**

Q.48 (1)

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

$$\lambda = \frac{6.6\times10^{-34}\,kg\,m^2s^{-1}}{25\times10^{-3}\,kg\times6.6\times10^{2}\,ms^{-1}}$$

$$\lambda = \frac{1}{25}\times10^{-33}\,m = \frac{100\times10^{-33}}{25}\,cm = 4\times10^{-33}\,cm$$

Ans. 4×10^{-33} cm

Q.49 (4)

s-subshell has only one orbital and that is spherical, hence, s-orbitals are non-directional.

Q.50 (2)

According to Aufbau Principle, correct order of energy of ordital

1s < 2s < 2p < 3s < 3p < 4s < 3d < 4p < 5s