Sri Chaitanya IIT Academy, India

A.P, TELANGANA, KARNATAKA, TAMILNADU, MAHARASHTRA, DELHI, RANCHI

A right Choice for the Real Aspirant

ICON CENTRAL OFFICE, MADHAPUR-HYD

Sec: Sr. IPLCO **Date: 12-12-15**

Time: 9:00 AM to 12:00 Noon **RPTM-14** **Max.Marks: 360**

KEY SHEET

PHYSICS		CHEMISTRY		MATHS	
Q.NO	ANSWER	Q.NO	ANSWER	Q.NO	ANSWER
1	4	31	2	61	3
2	1	32	1	62	2
3	3	33	1	63	4
4	3	34	2	64	2
5	4	35	3	65	3
6	3	36	2	66	4
7	1	37	1	67	3
8	4	38	2	68	2
9	1	39	2	69	4
10	4	40	1	70	1
11	4	41	1	71	3
12	1	42	1	72	4
13	2	43	1	73	3
14	3	44	1	74	4
15	2	45	4	75	2
16	3	46	1	76	1
17	2	47	3	77	3
18	1	48	4	78	2
19	2	49	3	79	4
20	1	50	3	80	2
21	1	51	3	81	2
22	2	52	1	82	3
23	1	53	3	83	1
24	3	54	1	84	3
25	4	55	2	85	4
26	2	56	2	86	1
27	1	57	3	87	4
28	2	58	4	88	2
29	3	59	4	89	4
30	3	60	3	90	1

CHEMISTRY

31. $P=\frac{1}{3}\frac{mnc^2}{v},\ K.E=\frac{1}{2}mnc^2$

32. $\frac{P_CV_C}{T_C}=\frac{3}{8}R$

33. Check with $Pv = nRT$

34. Initial no of moles in vessel 'A'

$$\frac{100}{10^3}\times 1 = niRT$$
$$ni=\frac{0.1}{RT}$$

Final no of moles in vessel 'A'

$$\frac{100}{10^3}\times 0.6 = n_fRT$$
$$ni=\frac{0.1}{RT}$$
$$n_f=\frac{0.6}{10RT}=\frac{0.06}{RT}$$

$\therefore$ no of moles in the vessel 'B'$=\frac{0.1}{RT}-\frac{0.06}{RT}=\frac{0.04}{RT}$

P in vessel 'B' = $\rho\times\frac{160}{10^3}=\frac{0.04}{RT}\times RT=\frac{40}{160}=0.25$

35. Average m.wt of the mixture = 1.67 x 22.4 = 37.4

$$37.4 = x\times 2P+(1-x)56$$
$$x=0.66\Rightarrow C_2H_4$$
$$0.33\Rightarrow C_4H_8$$
$$x=$$

$37.4 = x \times 2P + (1-x)56$

$x = 0.66 \Rightarrow C_2H_4$

$0.33 \Rightarrow C_4H_8$

$x = mass$

$mass\%\ C_4H_8 = \dfrac{0.33 \times 56}{0.33 \times 56 + 0.66 \times 28} \times 100 = 50\%$

$N_2 + 3H_2 \rightarrow 2NH_3$

$1-1 \quad 6-3 \quad 2$

36. $\quad = 3 \quad 2$

$Pv = nRT \quad \Rightarrow \quad NH_3$

$III_4 \quad \Rightarrow \quad N_2$

$n_1 = n_2 \quad at \quad same \quad T$

$P_1v_1 = P_2v_2$

37. $75 \times v_1 = 50 \times V_2$

$\dfrac{v_2}{v_1} = \dfrac{75}{50} = 1.5$

38. Conceptual

39.

$NO + Br_2 \xrightarrow{K_1} NOBr_2\ (fast) \qquad NOBr_2 + NO \xrightarrow{K_2} 2NOBr\ (slow)$

$K_1 = \dfrac{[NOBr_2]}{[NO][Br_2]}$ hence $[NOBr_2] = K_1[NO][Br_2]$

Rate = $K_2[NOBr_2][NO]$

$= K_2[K_1(NO)(Br_2)][NO]$

Rate = $K[NO]^2[Br_2]$

[K_1=Eq. constant ; K_2 = rate constant]

K = rate constant]

40. $K = Ae^{-Ea/RT}$ if $Ea = 0 \quad K = A$

41. $\frac{Ea}{500} = \frac{Ea - 20}{400}$

42. Time requires of the completion of a particular fraction a substance is constant, in first order reaction.

43. (A) $4a \xrightarrow{5\min} 2a \xrightarrow{5\min} a \xrightarrow{5\min} a/2$

(B) $a \xrightarrow{15\min} a/2$

44. $\frac{r_1}{r_2} = \sqrt{\frac{m_2}{m_1}}\frac{a_1}{a_2}$

$\frac{r_1}{r_2} = \sqrt{\frac{2m}{m}}\frac{\pi r^2}{r^2}$

45. Isolation method

46. 4x58.5 g Nacl Contains 1

100g ?

47. $\left(P + \frac{a}{V^2}\right)(V) = RT$

$PV^2 - RTV + a = 0$

$V = \frac{+RT \pm \sqrt{(RT)^2 - 4aP}}{2P}$

V is single valued, $(RT)^2 - 4aP = 0$

$$P = \frac{R^2T^2}{4a}$$

48.

d(density) = 3.35 gm/cm3

a = 4.80 A^0

Mol.wt of CaO = (40 + 16) = 56

$\because d = \frac{n \times M}{a^3 \times N_A}$ = where n = no. of molecules per unit cell,

$$\because s = 3.35 \times \left(4.8 \times 10^{-8}\right)^3 \times \frac{6.023 \times 10^{23}}{56}$$

n = 3.98

or n = 4

So, 4-molecules of CaO are present in 1 unit cell

So, no. of Ca^{2+} ion = 4

No. of O^{2-} ion = 4

Total = 4 + 4 = 8

49. Conceptual

50. Informative

51. $d = \frac{Zm}{N_A \times a^3}$ $Z = \frac{d \times N_A \times a^3}{m} = \frac{2 \times 6 \times 10^{23} \times 5 \times 5 \times 5 \times 10^{-24}}{75} = 20 \times 10^{-1} = 2$

Therefore the cubic lattice will be body centered.

For BCC lattice: $\sqrt{3}a = 4r \therefore r = \frac{\sqrt{3}}{4}a$

$= \frac{1.732 \times 5 \times 10^2}{4} = 2.165 \times 10^2 = 216.5 \approx$ **217 pm**

52. We have

$$b = \frac{T_C R}{P_C \times 8} = \frac{(273+33.7)\times 0.0821}{12.4\times 8} = 0.0253$$

$$Z = \frac{Pv}{nRt} = 1.90 = 1\times 800/n\times R\times 330$$

$$\therefore 1\times 800/1.90\times R\times 300$$

$$Z = 1.10 = \frac{V\times 200}{n\times R\times 570};\ 1.10 = V\times 200\times 1.90\times r\times 330/800\times r\times 570$$

$$\therefore v = 4\ Lts$$

53. NCERT=>page.no.2

54.

$$K = 0.0693\ Min^{-1}$$

$$\therefore unit \Rightarrow 1st\ order\ reaction$$

$$\therefore r = K[A]$$

$$t_{1/2} = \frac{0.693}{K} = \frac{0.693}{0.0693} = 10\ Min$$

After half life (10 Min) , concentration becomes half and hence the rate

$$r = k\left[\frac{[A]_0}{2}\right]$$

$$= 0.0693\text{min}^{-1}\times\frac{5mol}{2} = 0.17325\ mol/\text{min}$$

55. one unit cell has 2 potassium atoms.

56. Conceptual

57. Aquesous tension increases exponentially with the increase in temperature

58. NCERT table of crystal systems

59. Data based from NCERT book

60. Hydrolysis of esters follows the first order kinetics $K = \frac{2.303}{t}\log\frac{v_\infty - v_0}{v_\infty - v_t}$

$$\therefore K = \frac{2.303}{75}\log\frac{42.03-19.24}{42.03-24.20} = \frac{2.303}{75}\log\frac{22.79}{17.83}$$

$$= 0.00327\,\text{min}^{-1}$$

$$t_{1/2} = \frac{0.693}{0.00327}$$