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 **JEE ADVANCED** **DATE : 06-12-15**

TIME : 02:00 AM TO 05: 00 PM **2013_P2 MODEL** **MAX MARKS : 180**

KEY & SOLUTIONS

PHYSICS

1	**ACD**	2	**AD**	3	**ABC**	4	**ABC**	5	**ABC**	6	**ACD**
7	**AD**	8	**ACD**	9	**A**	10	**B**	11	**A**	12	**D**
13	**C**	14	**B**	15	**A**	16	**A**	17	**A**	18	**B**
19	**D**	20	**A**								

CHEMISTRY

21	**ABC**	22	**BCD**	23	**AB**	24	**ABCD**	25	**ABC**	26	**BC**
27	**ABC**	28	**ABCD**	29	**C**	30	**D**	31	**A**	32	**A**
33	**A**	34	**B**	B	**A**	36	**B**	37	**A**	38	**D**
39	**B**	40	**B**								

MATHEMATICS

41	**ABCD**	42	**D**	43	**ABD**	44	**ABCD**	45	**BC**	46	**ABCD**
47	**ABD**	48	**ABD**	49	**D**	50	**D**	51	**A**	52	**B**
53	**A**	54	**B**	55	**B**	56	**C**	57	**A**	58	**A**
59	**A**	60	**A**								

30. Water vapour = 0.1 : 0.5 (moles)

$\therefore$ 1 : 5

31. $\frac{\partial\psi}{\partial x} = -\frac{2\pi}{\lambda} A\cos\frac{2\pi x}{\lambda}$

$\frac{\partial^2\psi}{\partial x^2} = -\frac{4\pi^2}{\lambda^2} A\sin\frac{2\pi x}{\lambda} = \frac{-4\pi^2}{\lambda^2}\psi$

$\lambda = \frac{h}{p}$ & $P^2 = 2mKE$

$\therefore \frac{\partial^2\psi}{\partial x^2} = \frac{-8\pi^2 m(KE)\psi}{h^2}$

32. $\psi = A\sin\frac{2\pi x}{\lambda}$

$'\sin\theta'$ range (1 to 0)

If $x = \frac{\lambda}{4}$ $\psi = A\sin\frac{\pi}{2} = A$

If $x = \frac{\lambda}{2}, \frac{2\pi x}{\lambda} = \pi \Rightarrow \sin\pi = 0$

33. Let $C_3H_8 = xcc$

$CO = ycc$

$\therefore O_2 = 100 - x - y$

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

x + 5x 0 0

0 0 3x

And $\underset{y}{CO} + \frac{1}{2}\underset{y/2}{O_2} \rightarrow \underset{0}{CO_2}$

Loss in volume = $\left(x + 5x + y + \frac{y}{2}\right) - (3x + y)$

$= 3x + \frac{y}{2} = 100 - 65 = 35cc$

Left $O_2 = 100 - x - y - \left(5x + \frac{y}{2}\right) = 25cc$

$6x + \frac{3}{2}y = 75cc$

Solving : x = 10cc, y = 10cc

34. To consume 30cc O_2 10cc C_2H_4 is required

$C_2H_4 + 3O_2 \rightarrow 2CO_2 + 2H_2O$

35. $FeCl_3$ in hot water gives a +ve sol.

$\therefore \left[Fe(CN)_6\right]^{-4}$ is most effective

36. $AS_2O_3 + 3H_2S \rightarrow As_2S_3 + 3H_2O$ (- ve sol)

$\therefore Al^{+3}$ is most effective

37. Farthest balmer line from UV $\Rightarrow 3 \rightarrow 2 \Rightarrow 1.88ev$

Lyman line closest to visible $\Rightarrow 2 \rightarrow 1 \Rightarrow 10.2ev$

KE = $\frac{13.6 \times 2^2}{2^2} = 13.6ev$ in He^+

Limiting Balmer line $\alpha \rightarrow 2$

E = $\frac{13.6}{2^2} = 3.4ev$

38. a) $H_2S \rightarrow SO_2\left(6e^- \text{ less}\right)$

$Pb_3O_4 \rightarrow Pb^{+2}\left(2e^- \text{gain}\right)$

$\therefore O : R \Rightarrow 3:1$

b) $C_2H_2 \rightarrow C_2O_4^{-2}(-8e)$

$MnO_4^- \rightarrow Mn(OH)O \ (+4e)$

c) $Al \rightarrow Al^{+3} \ (3e^-)$

$NO_2^- \rightarrow NH_4^+ \ (+6e^-)$

d) $P_4 \rightarrow PH_3 \ \left(+12e^-\right)$

$P_4 \rightarrow H_2PO_2^- \ \left(-4e^-\right)$

39. a) $Cl_2 \rightarrow Cl^- + Cl^+ \ \left(1e^- \text{ transfer}\right) \Rightarrow M$

b) $NH_4NO_3 \rightarrow N_2O + 2H_2O \ \left(4e^- \text{ transfer}\right) \Rightarrow \frac{M}{4}, \frac{2M}{4}$

c) $OF_2 + H_2O \rightarrow 2HF + O_2 \ (2e^- \text{ transfer}) \Rightarrow \frac{M}{2}$

d) $2NO_2 + H_2O \rightarrow HNO_2 + HNO_3 \ \left(1e \text{ transfer}\right) \Rightarrow \frac{2M}{1}$

40. Factual curves