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 : 03-01-16
TIME : 02:00 PM TO 05: 00 PM	2013_P2 MODEL	MAX MARKS : 180

KEY & SOLUTIONS

PHYSICS

1	BC	2	ABC	3	ABC	4	ABD	5	D	6	ABCD
7	AB	8	BD	9	B	10	D	11	B	12	C
13	A	14	A	15	A	16	A	17	A	18	B
19	B	20	B								

CHEMISTRY

21	BD	22	BD	23	ABCD	24	BD	25	AB	26	AB
27	ABCD	28	BC	29	B	30	C	31	A	32	A
33	C	34	A	35	A	36	C	37	A	38	D
39	D	40	C								

MATHEMATICS

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

PHYSICS

1. In the steady state Left part has $10g \ of \ H_2 = 5mol$

   Middle part has $10g \ of \ H_2 + 160g \ of \ O_2 + 35g \ of \ N_2 = 5 + 5 + \dfrac{5}{4} mol$

   Right part has $10g \ of \ H_2 + 35g \ of \ N_2 = 5 + \dfrac{5}{4} mol$

   Pressure in the right compartment $= \dfrac{nRT}{V} = \dfrac{25}{4} \times \dfrac{25}{3} \times \dfrac{300}{10 \times 10^{-3}} = 1.56 \times 10^6 \ p_a$

4. the gas does more work along the straight line as compared to that of the isothermal path.

   Slope = -p/2V putting this in the ideal gas equation, V^2 = (constant) T which is the equation of parabola.

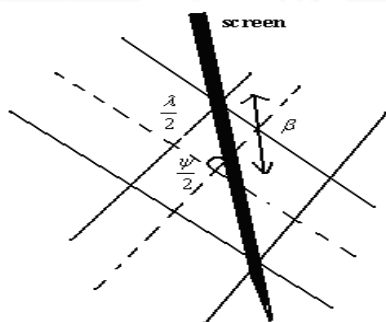   Similarly eliminating by V from ideal gas equation we get P^2 = (constant) T which is equation of a parabola
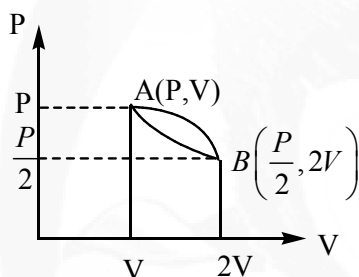
9 & 10. $\tan\theta = \dfrac{1}{\sqrt{\mu^2 - 1}} [\mu \sin\theta = 1]$

   $\dfrac{dy}{dx} = e^{-x/a}$

   $y = a\left(1 - e^{-x/a}\right)$

   At $y = a/2 \quad x = a\ln 2$
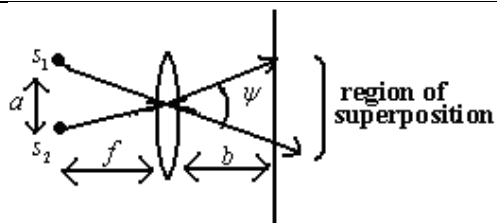
   $\tan\theta = \dfrac{1}{2}$ at $x = a\ln 2$

11.

12. $\psi = \dfrac{a}{f}$

   $\therefore \beta = \dfrac{\lambda}{4} = \dfrac{\lambda f}{a}$

No. of fringes = $\dfrac{b\psi}{\beta} = 13.3$

13 & 14.

Position of central maxima is shifted upwards by a distance $\dfrac{D(\mu_2 - 1)t}{d}$

$$\dfrac{D(\mu_2 - 1)}{d} = \dfrac{D\left(\dfrac{\mu_3}{\mu_1} - 1\right)t}{d}$$

$$\Rightarrow \quad \dfrac{\mu_3}{\mu_1} = \mu_2$$

$$\Rightarrow \quad \mu_3 = \mu_1 \mu_2$$

CHEMISTRY

21. Dissociation leads to lower molecular weight.

22. $m = \dfrac{2.4}{6.0} \times \dfrac{1000}{100} = 0.4m\,(urea)$

$0.1m\ Hg_2(NO_3)_2 \Rightarrow 3 \times 0.1m = 0.3m\,(particles)$

$\dfrac{2.4}{6.0} \times \dfrac{1000}{90} \Rightarrow m > (0.4m)$

$Hg_2(NO_3)_2$ 0.24 m urea solutions suffer depression in freezing point than 0.2 m NaCl.

23. Nernest Equation based.

24. Fact.

25. Common ion effect on HCOOH by $HCOONa\ and\ NH_4OH$ by NH_4Cl.

26. Fact.

27. Change in Vanthoff Factor. After ppt is removed.

28. Boiling point of pure water 373K. Hence Ethanol – water azoetrope is a low boiling azoetrope.

29. $10^{-2} F \Rightarrow \left[H^+\right] = 10^{-2}\,(to\ be\ developed)$

$Formed\left[H^+\right] = 5 \times 10^{-3}$