Sri Chaitanya IIT Academy, India

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A right Choice for the Real Aspirant

ICON CENTRAL OFFICE, MADHAPUR-HYD

Sec: Sr.IPLCO **JEE–ADVANCE** **Date: 18-10-15**
Time: 3 Hours **2011-P1-Model** **Max Marks: 240**

PAPER-I

KEY & SOLUTIONS

CHEMISTRY

1	**D**	2	**C**	3	**A**	4	**B**	5	**C**	6	**C**
7	**B**	8	**CD**	9	**BC**	10	**ABC**	11	**ABD**	12	**B**
13	**A**	14	**B**	15	**D**	16	**C**	17	**2**	18	**6**
19	**2**	20	**2**	21	**6**	22	**3**	23	**8**		

PHYSICS

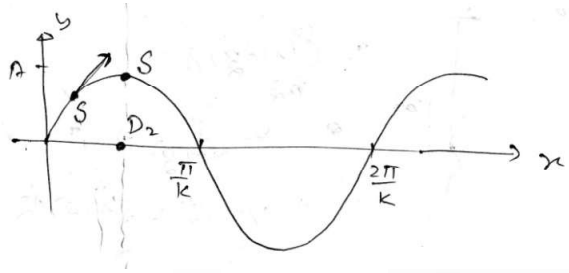
24	**B**	25	**C**	26	**A**	27	**D**	28	**B**	29	**C**
30	**D**	31	**C**	32	**AD**	33	**CD**	34	**BC**	35	**B**
36	**B**	37	**B**	38	**A**	39	**B**	40	**5**	41	**7**
42	**4**	43	**5**	44	**4**	45	**3**	46	**6**		

MATHS

47	**C**	48	**A**	49	**C**	50	**A**	51	**B**	52	**C**
53	**C**	54	**AC**	55	**BCD**	56	**BD**	57	**AB**	58	**C**
59	**D**	60	**B**	61	**D**	62	**B**	63	**2**	64	**6**
65	**2**	66	**3**	67	**0**	68	**1**	69	**8**		

PHYSICS

24. $D_3\left(\frac{\pi}{2k},10A\right)$



$D_1\left(\frac{\pi}{2k},10A\right)$ f_3 is maximum

F_2 is minimum

Hence $f_3>f_2>f_1$

25.

$$PE = \frac{1}{2}(T)\left(\frac{dy}{dx}\right)^2 dx.$$

$$KE = \frac{1}{2}(\mu dx)v^2.$$

$$PE+KE = \frac{1}{2}\mu a^2\omega^2\left[\int_0^{\lambda/2}[3\sin kx\cos\omega t - a\cos kx(\cos\omega t)]^2 dx + \int_0^{\lambda/2}[3\cos kx\ t - \sin kx\sin\omega t]^2 dx\right]$$

$$= \frac{1}{2}\mu a^2\omega^2\left[\frac{5\lambda}{2}\right].$$

$$= \frac{5\pi a^2\omega^2}{2k}.$$

26. $T = \left(\int_z^8 \mu d_z\right)g =$

$$V = \sqrt{\frac{T}{\mu(z)}} \Rightarrow T = V^2\mu(z)$$

$$\Rightarrow V^2\mu(z) = \int_z^{\alpha}\mu(z)d_z.g$$

$$V^2\frac{d\mu}{dz}=\{\mu(z)\}g$$

$$\Rightarrow\int_{\mu}^{\mu}\frac{d\mu}{-\mu}=\int_{0}^{z}\frac{g}{V^2}dz$$

$$-ln\left(\frac{\mu}{-\mu_0}\right)=\frac{gz}{V^2}$$

27. Conceptual

28. $f_2-f_1=2$

$$\frac{A_{max}}{A_{min}}=49$$

29. Conceptual

30. Conceptual

31. Conceptual

32. $\xi=(0.3mm)\cos\frac{2\pi}{0.8}(z+0.01)\cos(400)t$

End correction is 1cm. so at y=-1 cm.

$$\xi=(0.3mm)\cos\frac{2\pi}{80}(-1cm+1cm)=(0.3mm)\cos(0)=Antinode$$

So upper end is open.

At lower end z=99 cm

$$\xi=(0.3mm)\cos\frac{2\pi}{80}(99+1)$$

$$=0.01\cos\frac{5\pi}{2}(99+1)$$

$$=0.01\cos\frac{5\pi}{2}=0 \qquad \Rightarrow \text{Node}$$

Tube is closed at lower end

So tube is open closed.

33. Conceptual

34. Conceptual

35

The pressure wave is detected at a time $T = \frac{80}{400} + \frac{32}{4\times 400} = 220ms$

36. the Pulse is detected between $x = 8\,to\,46\,and\,92\,to\,16$

38. Conceptual

39. Conceptual

40. $f_1 - f_2 = 85\left(\frac{340+10}{340-10+10}\right) - 85\left(\frac{340-10}{340-10+10}\right) = 5$

41. $\frac{l_a}{l_b} = \left(\frac{n_a}{n_b}\right)\left(\sqrt{\frac{\mu_b}{\mu_a}}\right)$

$\Rightarrow 5n_a = 3n_b$

Hence minimum values of n_a and n_b are 3 and 5 hence the total number of nodes are 9 and antinodes are 8

42. SOL: $\Delta t = \frac{vx}{c(v-v_o)} = 4s$

43. $l_2 - l_1 = \frac{\lambda}{2}$

$\frac{\lambda}{4} = l_1 + e$ hence $e = \frac{1}{40} = 25mm$

45. $\frac{n}{2f}\left(\sqrt{\frac{T}{9\mu}}\right) = \frac{2}{2f}\sqrt{\frac{T}{4\mu}}$

$\Rightarrow n = 3$

46. $U\alpha\ \cos^2\omega t$