FIITJEE INTERNAL TEST

FIRST YEAR 2020-22

JEE MAINS

19th JULY 2020

ANSWER & KEY

MATHEMATICS (Finalised by MKK)

1.	**B**	2.	**D**	3.	**B**	4.	**B**	5.	**B**
6.	**B**	7.	**D**	8.	**D**	9.	**D**	10.	**C**
11.	**D**	12.	**B**	13.	**B**	14.	**D**	15.	**B**
16.	**C**	17.	**A**	18.	**C**	19.	**B**	20.	**C**
21.	**4**	22.	**56**	23.	**3**	24.	**3**	25.	**8**

PHYSICS (Finalised by PRKH)

26.	**C**	27.	**D**	28.	**A**	29.	**C**	30.	**B**
31.	**A**	32.	**C**	33.	**A**	34.	**BONUS**	35.	**D**
36.	**C**	37.	**C**	38.	**C**	39.	**B**	40.	**C**
41.	**A**	42.	**B**	43.	**D**	44.	**A**	45.	**A**
46.	**4**	47.	**1**	48.	**9**	49.	**4**	50.	**5**

CHEMISTRY (Finalised by CCP)

51.	**D**	52.	**B**	53.	**A**	54.	**C**	55.	**C**
56.	**B**	57.	**C**	58.	**A**	59.	**D**	60.	**C**
61.	**B**	62.	**C**	63.	**C**	64.	**A**	65.	**D**
66.	**B**	67.	**C**	68.	**B**	69.	**BONUS**	70.	**C**
71.	**5**	72.	**2**	73.	**4**	74.	**2**	75.	**2**

CHEMISTRY SOLUTIONS

51. $P.E. = \dfrac{-kze^2}{r} = \dfrac{-3e^2}{4\pi\varepsilon_0 r}$

$v_1 = x$

52. $v_3 = x\left(\dfrac{1}{3}\right) = \dfrac{x}{3}$

53. $mvr = \dfrac{nh}{2\pi}$

$= \dfrac{5h}{2\pi} = \dfrac{2.5h}{\pi}$

54. $\dfrac{KE}{TE} = \dfrac{\left(\dfrac{k.ze^2}{2r}\right)}{\left(\dfrac{-kze^2}{2r}\right)} = -1$

55. $r_{2\left(Be^{3+}\right)} = 0.529 \times \dfrac{4}{4} = 0.529 = r_{1(H)}$

56. $E_n = -13.6 \times \left(\dfrac{z^2}{n^2}\right) eV/atom$

$\therefore \dfrac{(E_2 - E_1)}{(E_4 - E_3)} = 15.4$

57. $T \propto \left(\dfrac{n^3}{z^2}\right) \Rightarrow T \propto n^3$

$\dfrac{T_1}{T_2} = \dfrac{n_1^3}{n_2^3}$

59. $\dfrac{1}{\lambda} = \dfrac{1}{\lambda_1} + \dfrac{1}{\lambda_2}$

60. $E = -13.6 \times 4 = -54.4\,eV$

$\therefore IE = 54.4\,eV$

61. $\Delta x = \dfrac{h}{4\pi.m\Delta V}$

62. $r = \dfrac{n^2}{z}\left[\dfrac{h^2}{4\pi^2 mke^2}\right] = \dfrac{h^2 ao}{z}$

$\therefore v_n = \dfrac{hz}{2\pi a_0 n}$

$\therefore KE = \dfrac{1}{2}mv^2 = \dfrac{h^2 z^2}{8\pi^2 m a_0^2 n^2}$

$\therefore KE = \dfrac{h^2}{32\pi^2 m a_0^2}$

66. $\dfrac{1}{\lambda} = \dfrac{1}{\lambda_1} + \dfrac{1}{\lambda_2} \Rightarrow \dfrac{1}{\lambda} = \dfrac{\lambda_1 + \lambda_2}{\lambda_1 \lambda_2}$

$\Rightarrow \lambda = \dfrac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$

67. $hv = hv_0 + K.E$

$$\frac{hc}{\lambda}=\frac{hc}{\lambda_0}+\frac{1}{2}mv^2 \Rightarrow \frac{1}{2}mv^2=hc\left[\frac{1}{\lambda}-\frac{1}{\lambda_0}\right]$$

$$V=\sqrt{\frac{2hc}{m}\left[\frac{\lambda_0-\lambda}{\lambda\lambda_0}\right]}$$

68. $mvr=\frac{nh}{2\pi}=3.1652\times10^{-34} \Rightarrow n=3$

$$n_2=3,\ n_1=2\ ;\frac{1}{\lambda}=4R_H\left[\frac{1}{4}-\frac{1}{9}\right]\Rightarrow\frac{1}{\lambda}=4R\frac{5}{36}=\frac{5R}{9}$$