NEET ANSWER KEY & SOLUTION

PAPER CODE :- PART TEST-3
CLASS-XI

ANSWER KEY

PHYSICS

1.	(C)	**2.**	(C)	**3.**	(A)	**4.**	(C)	**5.**	(C)	**6.**	(D)	**7.**	(D)
8.	(B)	**9.**	(C)	**10.**	(C)	**11.**	(C)	**12.**	(B)	**13.**	(C)	**14.**	(B)
15.	(A)	**16.**	(C)	**17.**	(A)	**18.**	(A)	**19.**	(C)	**20.**	(A)	**21.**	(D)
22.	(B)	**23.**	(B)	**24.**	(B)	**25.**	(C)	**26.**	(C)	**27.**	(C)	**28.**	(B)
29.	(A)	**30.**	(A)	**31.**	(D)	**32.**	(B)	**33.**	(B)	**34.**	(B)	**35.**	(C)
36.	(C)	**37.**	(D)	**38.**	(B)	**39.**	(A)	**40.**	(C)	**41.**	(D)	**42.**	(D)
43.	(C)	**44.**	(D)	**45.**	(C)	**46.**	(B)	**47.**	(B)	**48.**	(C)	**49.**	(A)
50.	(D)												

CHEMISTRY

51.	(A)	**52.**	(B)	**53.**	(D)	**54.**	(B)	**55.**	(C)	**56.**	(B)	**57.**	(D)
58.	(A)	**59.**	(D)	**60.**	(A)	**61.**	(A)	**62.**	(C)	**63.**	(D)	**64.**	(B)
65.	(D)	**66.**	(B)	**67.**	(A)	**68.**	(C)	**69.**	(A)	**70.**	(A)	**71.**	(D)
72.	(B)	**73.**	(A)	**74.**	(D)	**75.**	(B)	**76.**	(B)	**77.**	(C)	**78.**	(C)
79.	(C)	**80.**	(D)	**81.**	(C)	**82.**	(C)	**83.**	(B)	**84.**	(A)	**85.**	(B)
86.	(A)	**87.**	(D)	**88.**	(A)	**89.**	(B)	**90.**	(B)	**91.**	(C)	**92.**	(D)
93.	(D)	**94.**	(B)	**95.**	(B)	**96.**	(C)	**97.**	(A)	**98.**	(C)	**99.**	(A)
100.	(B)												

BIOLOGY

101.	(B)	**102.**	(A)	**103.**	(C)	**104.**	(B)	**105.**	(B)	**106.**	(C)	**107.**	(B)
108.	(D)	**109.**	(A)	**110.**	(B)	**111.**	(D)	**112.**	(B)	**113.**	(D)	**114.**	(B)
115.	(C)	**116.**	(B)	**117.**	(D)	**118.**	(B)	**119.**	(B)	**120.**	(D)	**121.**	(D)
122.	(B)	**123.**	(C)	**124.**	(A)	**125.**	(C)	**126.**	(C)	**127.**	(B)	**128.**	(C)
129.	(C)	**130.**	(B)	**131.**	(B)	**132.**	(A)	**133.**	(D)	**134.**	(B)	**135.**	(C)
136.	(C)	**137.**	(C)	**138.**	(A)	**139.**	(B)	**140.**	(D)	**141.**	(B)	**142.**	(B)
143.	(D)	**144.**	(D)	**145.**	(D)	**146.**	(D)	**147.**	(D)	**148.**	(C)	**149.**	(D)
150.	(C)	**151.**	(B)	**152.**	(B)	**153.**	(B)	**154.**	(B)	**155.**	(B)	**156.**	(C)
157.	(D)	**158.**	(C)	**159.**	(B)	**160.**	(C)	**161.**	(D)	**162.**	(B)	**163.**	(A)
164.	(B)	**165.**	(D)	**166.**	(B)	**167.**	(B)	**168.**	(B)	**169.**	(D)	**170.**	(B)
171.	(A)	**172.**	(A)	**173.**	(A)	**174.**	(C)	**175.**	(A)	**176.**	(D)	**177.**	(A)
178.	(D)	**179.**	(C)	**180.**	(A)	**181.**	(A)	**182.**	(C)	**183.**	(A)	**184.**	(D)
185.	(B)	**186.**	(D)	**187.**	(A)	**188.**	(A)	**189.**	(D)	**190.**	(B)	**191.**	(A)
192.	(A)	**193.**	(C)	**194.**	(A)	**195.**	(D)	**196.**	(A)	**197.**	(A)	**198.**	(A)
199.	(A)	**200.**	(C)										

SOLUTIONS

PHYSICS

1. (C)

Sol. Apparent weight $= V(\rho-\sigma)g = \frac{m}{\rho}(\rho-\sigma)g$

where $m =$ mass of the body,

$\rho =$ density of the body

$\sigma =$ density of water

If two bodies are in equilibrium then their apparent weight must be equal.

$\therefore \frac{m_1}{\rho_1}(\rho_1-\sigma) = \frac{m_2}{\rho_2}(\rho_2-\sigma)$

$\Rightarrow \frac{36}{9}(9-1) = \frac{48}{\rho_2}(\rho_2-1)$

By solving we get $\rho_2 = 3$.

2. (C)

Sol. $\rho = \frac{\text{Total mass}}{\text{Total volume}} = \frac{2m}{V_1+V_2} = \frac{2m}{m\left(\frac{1}{\rho_1}+\frac{1}{\rho_2}\right)}$

$\therefore \rho = \frac{2\rho_1\rho_2}{\rho_1+\rho_2}$

3. (A)

4. (C)

Sol. A torque is acting on the wall of the dam trying to make it topple. The bottom is made very broad so that the dam will be stable.

5. (C)

Sol. Let the total volume of ice-berg is V and its density is ρ. If this ice-berg floats in water with volume V_{in} inside it then $V_{in}\sigma g = V\rho g$

$\Rightarrow V_{in} = \left(\frac{\rho}{\sigma}\right)V$ [$\sigma =$ density of water]

or $V_{out} = V - V_{in} = \left(\frac{\sigma-\rho}{\sigma}\right)V$

$\Rightarrow \frac{V_{out}}{V} = \left(\frac{\sigma-\rho}{\sigma}\right) = \frac{1000-900}{1000} = \frac{1}{10}$

$\therefore V_{out} = 10\%$ of *V*

6. (D)

Sol. Apparent weight

$= V(\rho-\sigma)g = l\times b\times h\times(5-1)\times g$

$= 5\times5\times5\times4\times g$ *Dyne* = $4\times5\times5\times5$ *gf*.

7. (D)

8. (B)

Sol. Upthrust = weight of body

For *A*, $\frac{V_A}{2}\times\rho_W\times g = V_A\times\rho_A\times g \Rightarrow \rho_A = \frac{\rho_W}{2}$

For *B*,

$\frac{3}{4}V_B\times\rho_W\times g = V_B\times\rho_B\times g \Rightarrow \rho_B = \frac{3}{4}\rho_W$

(Since 1/4 of volume of *B* is above the water surface)

$\therefore \frac{\rho_A}{\rho_B} = \frac{\rho_W/2}{3/4\ \rho_W} = \frac{2}{3}$

9. (C)

Sol. If the liquid is incompressible then mass of liquid entering through left end, should be equal to mass of liquid coming out from the right end.

$\therefore M = m_1 + m_2 \Rightarrow Av_1 = Av_2 + 1.5A.v$

$\Rightarrow A\times3 = A\times1.5 + 1.5A.v \Rightarrow v = 1\ m/s$

10. (C)

Sol. Time required to emptied the tank $t = \frac{A}{A_0}\sqrt{\frac{2H}{g}}$

$\therefore \frac{t_2}{t_1} = \sqrt{\frac{H_2}{H_1}} = \sqrt{\frac{4h}{h}} = 2 \quad \therefore t_2 = 2t$

11. (C)

Sol. P = hρf i.e pressure does not depend upon the area of bottom surface.

12. (B)

Sol. $A_1V_1=A_2V_2$ (By the equation of continutity)

13. (C)

Sol. Time taken by water to reach the bottom $= t = \sqrt{\frac{2(H-D)}{g}}$

and velocity of water coming out of hole, $v = \sqrt{2gD}$

$\therefore$ Horizontal distance covered $x = v\times t$

$= \sqrt{2gD}\times\sqrt{\frac{2(H-D)}{g}} = 2\sqrt{D(H-D)}$

14. (B)

15. (A)

16. (C)

17. (A)

Sol. Height of the blood column in the human body is more at feet than at the brain. As $P = h\rho g$, therefore the blood exerts more pressure at the feet than at the brain.

18. (A)

19. (C)

Sol. The cohesive force is the force of attraction between the molecules of same substance.

20. (A)

Sol. When two droplets merge with each other, their surface energy decreases.
$W = T(\Delta A) = (\text{negative})$ *i.e.* energy is released.

21. (D)

Sol. $W = 8\pi T(R_2^2 - R_1^2) = 8\pi T[(2r)^2 - (r)^2] = 24\pi r^2 T$

22. (B)

Sol. Surface energy = surface tension × increment in area
= $T \times A$

23. (B)

Sol. $W = 8\pi R^2 T = 8\pi \times (1\times 10^{-2})^2 \times 1.9 \times 10^{-2}$
$= 15.2 \times 10^{-6}\pi J$

24. (B)

Sol. Increment in Potential energy = $T \times \Delta A$
$= 0.02 \times 2 \times 0.05 = 2 \times 10^{-2} J$

25. (C)

Sol. Angle of contact is acute.

26. (C)

Sol. Outside pressure = 1 *atm*
Pressure inside first bubble = 1.01 *atm*
Pressure inside second bubble = 1.02 *atm*
Excess pressure $\Delta P_1 = 1.01 - 1 = 0.01$ *atm*
Excess pressure $\Delta P_2 = 1.02 - 1 = 0.02$ *atm*

$$\Delta P \propto \frac{1}{r} \Rightarrow r \propto \frac{1}{\Delta P} \Rightarrow \frac{r_1}{r_2} = \frac{\Delta P_2}{\Delta P_1} = \frac{0.02}{0.01} = \frac{2}{1}$$

Since $V = \frac{4}{3}\pi r^3$ $\therefore$ $\frac{V_1}{V_2} = \left(\frac{r_1}{r_2}\right)^3 = \left(\frac{2}{1}\right)^3 = \frac{8}{1}$

27. (C)

28. (B)

Sol. $\Delta P = \frac{4T}{r} = 40\ N/m^2$

29. (A)

Sol. $l = \frac{FL}{AY} = \frac{FL}{\pi r^2 Y} \therefore l \propto \frac{FL}{r^2}$ (Y = constant)

$$\therefore \frac{l_2}{l_1} = \frac{F_2}{F_1} \times \frac{L_2}{L_1}\left(\frac{r_1}{r_2}\right)^2 = 2 \times 2 \times \left(\frac{1}{2}\right)^2 = 1$$

30. (A)

Sol. $Y = 3K(1 - 2\sigma)$ and $Y = 2\eta(1+\sigma)$

Eliminating σ we get $Y = \frac{9\eta K}{\eta + 3K}$

31. (D)

Sol. Energy stored per unit volume
$= \frac{1}{2} \times \text{Stress} \times \text{Strain}$
$= \frac{1}{2} \times \text{Young's modulus} \times (\text{Strain})^2 = \frac{1}{2} \times Y \times x^2$

32. (B)

Sol. Due to elastic fatigue its elastic property decreases.

33. (B)

Sol. $\text{strain} \propto \text{stress} \propto \frac{F}{A}$

Ratio of strain = $\frac{A_2}{A_1} = \left(\frac{r_2}{r_1}\right)^2 = \left(\frac{4}{1}\right)^2 = \frac{16}{1}$

34. (B)

Sol. Longitudinal strain $\frac{l}{L} = \frac{\text{stress}}{Y} = \frac{10^6}{10^{11}} = 10^{-5}$
Percentage increase in length
$= 10^{-5} \times 100 = 0.001\%$

35. (C)

Sol. $Y = 3K(1 - 2\sigma)$

$$\sigma = \frac{3K - Y}{6K} = \frac{3 \times 11 \times 10^{10} - 7.25 \times 10^{10}}{6 \times 11 \times 10^{10}}$$

$\Rightarrow \sigma = 0.39$

36. (C)

37. (D)

Sol. $L_2 = l_2(1 + \alpha_2 \Delta\theta)$ and $L_1 = l_1(1 + \alpha_1 \Delta\theta)$
$\Rightarrow (L_2 - L_1) = (l_2 - l_1) + \Delta\theta(l_2\alpha_2 - l_1\alpha_1)$
Now $(L_2 - L_1) = (l_2 - l_1)$ so, $l_2\alpha_2 - l_1\alpha_1 = 0$

38. (B)

39. (A)

40. (C)

41. (D)

Sol. Strain = $\frac{\ell}{L}$, stress = $\frac{Mg}{A}$

Energy = $\frac{1}{2}$ × stress × strain × volume
$= \frac{1}{2} \times \frac{Mg}{A} \times \frac{\ell}{L} \times A \times L$
$= \frac{1}{2} Mg\ell$

42. (D)

Sol. $\frac{r_1}{r_2} = \frac{1}{2}$

PE (per unit volume) = $\frac{1}{2y}\left(\frac{F}{A}\right)^2$

PE $\propto 1/A^2$ $\frac{PE_1}{PE_2} = \frac{A_2^2}{A_1^2} = 16 : 1$

43. (C)

Sol. (C) $\frac{1}{K}$ = compressibility $=\left(\frac{-\Delta V/V}{\Delta P}\right)$

44. (D)

Sol. Modulus of rigidity is the property of material.

45. (C)

46. (B)

Sol. Angle of shear $\phi=\frac{r\theta}{L}$

$=\frac{4\times10^{-1}}{100}\times30^{o}=0.12^{o}$

47. (B)

48. (C)

Sol. $W=\frac{YAl^{2}}{2L}=\frac{2\times10^{10}\times10^{-6}\times(10^{-3})^{2}}{2\times50\times10^{-2}}$

$=2\times10^{-2}\ J$

49. (A)

50. (D)

CHEMISTRY

51. (A)

Sol. If n > 0, is the condition

i.e. configuration : – $4s^2$ $4p^6$ and such are not possible

$\therefore$ out of 114 (total elements), there are 60 elements which are possible with configuration

(n < 0)

52. (B)

Sol. Alpha particle (He^{+2}) as $\lambda\,\alpha\,\frac{1}{m}$

53. (D)

Sol. (A) $r=\left[\frac{n^2h^2}{4\pi^2me^2}\right]$: For radius of hydrogen atom

(B) K.E. of the electron $=\frac{-1}{2}\left(\text{P.E. of } e^-\right):\frac{Ze^2}{r}$

$=\text{K.E. and P.E.}=\frac{-1}{2}\ \frac{Ze^2}{r}$

(C) Angular momentum (L) $=n\left(\frac{h}{2\pi}\right)$

$\therefore$ All three are correct about Bohr's orbit of hydrogen atom.

54. (B)

Sol. For hydrogen,

$\frac{E_2-E_1}{E_4-E_3}=\frac{-3.4-(-13.6)}{-0.85-(-1.5)}=\frac{-3.4+13.6}{-0.85+1.5}=\frac{10.2}{0.65}$

$\therefore$ as $E_2=-3.4$

$\therefore E_1=-13.6\quad E_4=-0.85\quad E_3=-1.5$

$\therefore$ The ratio is approximately 15

55. (C)

$\pi=5.09\times10^{4}\ \sec^{-1}\qquad \lambda=?$

Sol.

$\upsilon=\frac{c}{\lambda}\qquad \therefore$ Formula

$5.09\times10^{14}=\frac{3\times10^{3}}{\lambda}$

$\lambda=\frac{3\times10^{8}}{5.09\times10^{14}}=\frac{300\times10^{8}}{509\times10^{14}}$

$=\frac{3000\times10^{7}}{509\times10^{14}}=\frac{3000\times10^{7}\times10^{-14}}{509}$

$=5.89\times10^{-7}=589$

56. (B)

Sol. $r_n=0.529\times10^{-10}$m

we have to convert it into cm

1m = 100 cm

1 m = 10^2 cm

$r_n=0.529\times10^{-8}$cm

57. (D)

Sol. $E_n=\frac{-Ze^2}{Zr}\qquad r_n=\frac{n^2h^2}{4\pi^2mkZe^2}$

$E_n=\frac{-1}{2}\times\frac{\frac{Ze^2}{n^2h^2}}{4\pi^2mkZe^2}$

$=\frac{-1}{2}\frac{ze^2\times4\pi^2\times mk\times Ze^2}{n^2h^2}=\frac{-2\pi^2mkZe^4}{n^2h^2}$

constant : 2; π , m, k, e, h

$E_n=-13.6\times\frac{Z^2}{n^2}\ \text{eV}\quad E_n=\frac{-2\pi^2me^4}{n^2h^2}$

58. (A)

Sol. I.E_1 = 13.6 ev

This means that energy of

1st orbital = –13.6 ev

energy of 2nd $=\frac{-13.6}{4}=-3.4$

The lowest excited state of H atom has electrons in its 2nd orbital

Thus I.E. required is between 3.4 or less 3.4 or less

59. (D)
Sol. Formula,

$$\bar{\upsilon} = R \times Z^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$$

since $\bar{\upsilon}$ = 15200 cm^{-1}

$$15200 = R\left[\frac{1}{2^2} - \frac{1}{3^2}\right]^{\text{......For z = 1 (for H) and}}_{n_1 = 2 \,\&\, n_1 = 3 \text{For balmer series}}$$

$$15200 = R\left[\frac{9-4}{36}\right] \quad 15200 = R\left[\frac{5}{36}\right]$$

$$R = \frac{15200 \times 36}{5} \qquad R = 3040 \times 36 ....(1)$$

Also,

$$\bar{\upsilon} = R\left[\frac{1}{2^2} - \frac{1}{3^2}\right] \times (3)^2 ....\text{For } Z = 3$$

$$\bar{\upsilon} = R\left[\frac{5}{36}\right] \times 9$$

From (1)

$$\bar{\upsilon} = \frac{3040 \times 36 \times 5}{4} = 3040 \times 45 = 136800 \text{ cm}^{-1}$$

Ans = $\bar{\upsilon} = 136800 \text{ cm}^{-1}$

60. (A)
Sol. For He^+ spectrum and H-spectrum with same wavelength,

$$\lambda_1 = \lambda_0 \quad \frac{1}{\lambda_1} = \frac{1}{\lambda_0}$$

Thus, (For H)

$$R \times (2)^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right] = (\text{For He}^+)$$

$$R \times (2)^2\left[\frac{3}{16}\right]$$

$$R \times (1)^2\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right] = R \times 4 \times \frac{3}{16}$$

$$\frac{1}{n_1^2} - \frac{1}{n_2^2} = \frac{3}{4}$$

$$\frac{1}{4n_1^2} = \frac{1}{n_2^2} = n_2{}^2 = 4n_1{}^2 = \frac{n^2}{n^1} = \frac{2}{1}$$

$\boxed{n_2 = 2 \text{ and } n_1 = 1}$ for Lyman series

61. (A)
Sol. $n = 1,\ \ell = 1,\ m = 1,\ s = s + \frac{1}{2}$

n always greater than 'ℓ' and 'm' Hence it is not applicable.

62. (C)
Sol. ΔKE = –q. Δv= e.v

$\therefore \frac{\text{In}}{\lambda} = \sqrt{2.\text{m}}$ (ΔKE)

= $\sqrt{2\text{meV}}$

63. (D)
Sol. Assertion is false but reason is true. Atomic orbital is designated by n, l and m_l while state of an electron in an atom is specified by four quantum numbers n, l, m_l and m_s.

64. (B)
Sol. Both assertion and reason are true but reason is not the correct explanation of assertion. The difference between the energies of adjacent energy levels decreases as we move away from the nucleus. Thus in H atom

$$E_2 - E_1 > E_3 - E_2 > E_4 - E_3 ......$$

65. (D)
Sol. Have the same no. of e^- in the outer shell.

66. (B)
Sol. [Ga, Ge]

67. (A)
Sol. [106]

68. (C)

69. (A)
Sol. N $\rightarrow$ 2nd Period S, Cl is 3rd Period br $\rightarrow$ 4 period]

70. (A)
Sol. [Covalent Radi is less then vander wall's Radi]

71. (D)
Sol. [$Al^+ = 3s^2$, $Al^{+2} = 3s^1$ $Al^{+3} = 2p^6$]

72. (B)
Sol. $(IP) = IP_1 + IP_2$
Mg^{+2} = 176+348 = 526 KCal

73. (A)
Sol. [Li]

74. (D)
Sol. By theory

75. (B)
Sol. $r_{c-x} = r_{x_2} + r_{c_2} - 0.09(\Delta EN)$

$$= \frac{1}{2} + \frac{1.54}{2} - 0.09(3-2)$$

$= 1.16$

76. (B)
Sol. C_2H_2 , H-C$\equiv$C-H carbon has 4 covalency in this structure

77. (C)
Sol. Minimum potential energy and maximum attraction

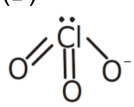
78. (C)
Sol.
$$\begin{array}{c}\sigma\\ C\equiv C\\ 2\pi\end{array}$$

79. (C)
Sol. p orbital is half filled and d orbital has 2 electrons

80. (D)
Sol. Coordinate bond in $(C_2H_5)_3$ B & $(CH_3)_3N$ and BF_3 & NH_3

81. (C)
Sol. Electro negativity order sp>sp^2 > sp^3

82. (C)
Sol. XeF_4 has square planar structure.

83. (B)
Sol.  -Pyramidal shape

84. (A)
Sol. sp^3d hybridization involves d_{x2-y2} orbital.

85. (B)
Sol. Bond length $\propto \frac{1}{\text{Bond order}}$
Bond order of NO^+ = 3
Bond order of NO = 2.5
Bond order of NO^- = 2
Bond length order = $NO^+ < NO < NO^-$

86. (A)
Sol. Paramagnetic property is shown by oxygen due to unpaired electron in the antibonding molecular orbital.

87. (D)
Sol. $0.5 < 1.5 < 2 < 2.5$
$H_2^+ < O_2^- < C_2 < NO$

88. (A)
Sol. Born Haber cycle is mainly used to determine lattice energy

89. (B)
Sol. $E = \frac{hc}{\lambda}; \frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1} = \frac{25}{50}; \lambda_1 = 2\lambda_2$

90. (B)
Sol. The number of sub shell is (2ℓ + 1). The maximum number of electrons in the sub shell is 2 (2ℓ + 1) = (4ℓ + 2).

91. (C)
Sol. Orbital angular momentum of a p-electron is given by = $\sqrt{\ell(\ell+1)}\,\frac{h}{2\pi}$ = $\sqrt{1(1+1)}\,\frac{h}{2\pi}$ = $\sqrt{2}\,\frac{h}{2\pi} = \frac{1}{\sqrt{2}}\,\frac{h}{\pi}$

92. (D)
Sol. p_x and p_y orbitals do not have proper orientation to overlap.

93. (D)
Sol. A/c to MOT concept
No. Bond order = 2.5
C_2 Bond order = 2.0
O_2^- Bond order = 1.5
He_2^+ Bond order = 0.5

94. (B)
Sol. Smallest atom having half filled p-sub shell has highest I_0 value.

95. (B)
Sol. L $\rightarrow$ R size $\downarrow$ IE $\uparrow$

96. (C)
Sol. Al_2O_3 is highly stable.

97. (A)
Sol. $B(OH)_3$ is e- deficient.

98. (C)
Sol. $(R_2SiO)_n$

99. (A)
Sol. The tendency to show '+2' oxidation state increases as we move down the group. This is due to inert pair effect which causes the inability of ns^2 electrons of valence shell to participate in bonding. Thus, stability of elemens in '+2' oxidation state increases as we move down the group.

100. (B)
Sol. Tetrahalides are e– deficient.