NEET ANSWER KEY & SOLUTION

PAPER CODE :- PART TEST-3
CLASS XII

ANSWER KEY

PHYSICS

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

CHEMISTRY

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

BIOLOGY

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

SOLUTIONS

PHYSICS

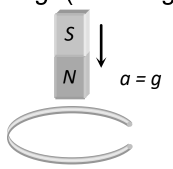
1. (D)

Sol. The energy of the field increases with the magnitude of the field. Lenz's law infers that there is an opposite field created due to increase or decrease of magnetic flux around a conductor so as to hold the law of conservation of energy.

2. (B)

Sol. When the magnet is allowed to fall vertically along the axis of loop with its north pole towards the ring. The upper face of the ring will become north pole in an attempt to oppose the approaching north pole of the magnet. Therefore the acceleration in the magnet is less than *g.*

Note : If coil is broken at any point then induced *emf* will be generated in it but no induced current will flow. In this condition the coil will not oppose the motion of magnet and the magnet will fall freely with acceleration *g*. (*i.e. a* = *g*)



3. (A)

Sol. $\phi = BA = 10\ weber$

4. (D)

Sol. According to Lenz's law.

5. (B)

6. (A)

Sol. $e = -\dfrac{N(B_2 - B_1)A\cos\theta}{\Delta t}$

$\Rightarrow 0.1 = \dfrac{-50 \times (0 - 2\times 10^{-2}) \times 100 \times 10^{-4} \times \cos 0^o}{t}$

$\Rightarrow t = 0.1 sec$.

7. (C)

8. (A)

Sol. $|e| = \dfrac{d\phi}{dt} = \dfrac{d}{dt}(5t^2 + 3t + 16) = (10t + 3)$

when $t = 3\sec,\ e_3 = (10\times 3 + 3) = 33\ V$

when $t = 4\sec,\ e_4 = (10 \times 4 + 3) = 43\ V$

Hence emf induced in fourth second $= e_4 - e_3 = 43 - 33 = 10\ V$

9. (C)

Sol. $e = Bvl = 0.5 \times 2 \times 1 = 1\ V$

10. (C)

11. (D)

Sol. $e = Bvl \Rightarrow e = 0.9 \times 7 \times 0.4 = 2.52\ V$

12. (C)

Sol. $i = \dfrac{|e|}{R} = \dfrac{N}{R}.\dfrac{\Delta B}{\Delta t} A\cos\theta = \dfrac{20}{100} \times 1000 \times (25 \times 10^{-4}) \cos 0^o$

$\Rightarrow i = 0.5\ A$

13. (D)

Sol. $L = \dfrac{e}{di/dt} = \dfrac{5}{(3-2)/10^{-3}} = \dfrac{5}{1} \times 10^{-3} = 5 milli\ henry$

14. (A)

Sol. $L \propto N^2\ i.e. \dfrac{L_1}{L_2} = \left(\dfrac{N_1}{N_2}\right)^2 \Rightarrow L_2 = L_1\left(\dfrac{N_2}{N_1}\right)^2 = 4L_1$

15. (C)

Sol. Energy $= \dfrac{1}{2}LI^2 = \dfrac{1}{2} \times 100 \times 10^{-3} \times 1^2 = 0.05\,J$

16. (A)

17. (C)

Sol. A transformer is a device to convert alternating current at high voltage into low voltage and *vice-versa.*

18. (C)

19. (B)

Sol. $\dfrac{N_s}{N_p} = \dfrac{i_p}{i_s}$ or $\dfrac{25}{1} = \dfrac{i_p}{2} \Rightarrow i_p = 50A$

20. (A)

Sol. As the coil rotates, the magnetic flux linked with the coil (being $\vec{B}\,.\,\vec{A}$) will change and emf will be induced in the loop.

21. (A)

Sol. $V = 5\cos\omega t = 5\sin\left(\omega t + \dfrac{\pi}{2}\right)$ and $i = 2\sin\omega t$

Power $= V_{r.m.s.} \times i_{r.m.s.} \times \cos\phi = 0$

(Since $\phi = \dfrac{\pi}{2}$, therefore $\cos\phi = \cos\dfrac{\pi}{2} = 0$)

22. (C)

Sol. $P = V_{r.m.s.} \times i_{r.m.s.} \times \cos\phi$

$= \frac{100}{\sqrt{2}} \times \frac{100 \times 10^{-3}}{\sqrt{2}} \times \cos\frac{\pi}{3}$

$= \frac{10^4 \times 10^{-3}}{2} \times \frac{1}{2} = \frac{10}{4} = 2.5\ watt$

23. (C)

Sol. Peak value = $220\sqrt{2} = 311\ V$

24. (B)

25. (D)

Sol. Phase angle $\phi = 90^o$, so power $P = Vi\cos\phi = 0$

26. (B)

Sol. $V_{rms} = \frac{V_0}{\sqrt{2}} = \frac{120}{1.414} = 84.8\ V$

27. (B)

Sol. $P = \frac{1}{2} V_o i_o \cos\phi \Rightarrow P = P_{Peak}.\cos\phi$

$\Rightarrow \frac{1}{2}(P_{peak}) = P_{peak}\cos\phi \Rightarrow \cos\phi = \frac{1}{2} \Rightarrow \phi = \frac{\pi}{3}$

28. (D)

29. (B)

30. (C)

Sol. Hot wire ammeter reads *rms* value of current. Hence its peak value $= i_{rms} \times \sqrt{2} = 14.14\ amp$

31. (B)

Sol. Reading of ammeter $= i_{rms} = \frac{V_{rms}}{X_C} = \frac{V_0 \omega C}{\sqrt{2}}$

$= \frac{200\sqrt{2} \times 100 \times (1 \times 10^{-6})}{\sqrt{2}} = 2 \times 10^{-2} A = 20\ mA$

32. (C)

Sol. For series *R-L-C* circuit, $Z = \sqrt{R^2 + (X_L - X_C)^2}$

$= \sqrt{(300)^2 + \left(1000 \times 0.9 - \frac{10^6}{1000 \times 2}\right)^2} = 500\,\Omega$

33. (D)

34. (C)

Sol. Impedance

$Z = \sqrt{R^2 + X^2} = \sqrt{(8)^2 + (6)^2} = 10\Omega$

35. (B)

Sol. $X_C = \frac{1}{2\pi\nu C} \Rightarrow X_C \propto \frac{1}{\nu}$

36. (C)

Sol. $P = E_{rms} i_{rms} \cos\phi = \frac{E_0}{\sqrt{2}} \times \frac{i_0}{\sqrt{2}} \times \frac{R}{Z}$

$\Rightarrow \frac{E_0}{\sqrt{2}} \times \frac{E_0}{Z\sqrt{2}} \times \frac{R}{Z} \Rightarrow P = \frac{E_0^2 R}{2Z^2}$

Given $X_L = R$ so, $Z = \sqrt{2}R \Rightarrow P = \frac{E_0^2}{4R}$

37. (D)

Sol. $X_L = 2\pi\nu L \Rightarrow L = \frac{X_L}{2\pi\nu} = \frac{50}{2 \times 3.14 \times 50} = 0.16\ H$

38. (B)

Sol. In *RC* series circuit voltage across the capacitor leads the voltage across the resistance by $\frac{\pi}{2}$

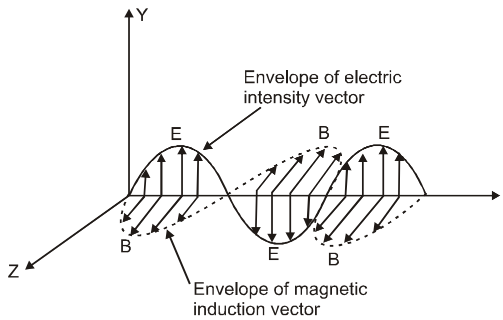
39. (A)

Sol. When frequency of alternating current is increased, the effective resistance of the inductive coil increases. Current $(X_L = \omega L = 2\pi f L)$ in the circuit containing inductor is given by $I = \frac{V}{X_L} = \frac{V}{2\pi f L}$. As inductive resistance of the inductor increases, current in the circuit decreases.

40. (D)

Sol. The amplitudes of the electric and magnetic fields in free space are related by

$\frac{E_0}{B_0} = c$



In figure, electric field vector $(\vec{E})$ and magnetic field vector $(\vec{B})$ are vibrating along Y and Z directions and propagation of electromagnetic wave is shown in X-direction.

Hence, electric and magnetic fields are in phase and perpendicular to each other.

41. (C)

Sol. Velocity of electromagnetic radiation is the velocity of light (C), ie,

$$\frac{1}{\sqrt{\mu_0 \varepsilon_0}}$$

where μ_0 is the permeability and ε_0 is the permittivity of free space.

42. (B)

43. (A)

Sol. For electron to pass undeflected,
electric force on electron **=** magnetic force on electron

i.e., $eE = evB$ or $v = \frac{E}{B}$

or $v = \frac{|\vec{E}|}{|\vec{B}|}$

44. (D)

Sol. Energy $E \propto E = hv = \frac{hc}{\lambda} \propto \frac{L}{\lambda}$

we know that $\lambda_{infrared} > \lambda_{visible}$

$\therefore E_{infrared} < E_{visible}$

45. (B)

Sol. Electromagnetic wave require no medium for their propagation.

46. (C)

Sol. Here : Velocity of electromagnetic waves in free space and wavelength

$v = 3\ 10^8$ ms and $\lambda = 150$ m

Using the relation for the frequency of radio waves is given by

$v = \frac{v}{\lambda}\frac{3\times10^8}{150} = 2 \times 10^6$ Hz - 2 MHz

47. (A)

Sol. $\omega = 6 \times 10^{8z}$

$k = \frac{\omega}{v} = \frac{6\times10^8}{3\times10^8} = 2m^{-1}$

48. (B)

Sol. $U = \frac{1}{2}\varepsilon_0 E^2 = \frac{1}{2}\frac{B^2}{\mu_0}$

$\varepsilon_0\mu_0 = \frac{B^2}{E^2}$

$\frac{B}{E} = \sqrt{\varepsilon_0\mu_0} = \frac{1}{c}$

49. (A)

Sol. Correct option is **(A)-(II),(B)-(I),(C)-(IV),(D)-(III)**

AC generator converts mechanical energy into electrical energy.

Galvanometer shows deflection when current passes through it so it is used to show presence of current in any wire

Transformer is used to step up or step down the voltage. Metals detectors contain inductor coils and use principle of induction and resonance in AC circuit.

50. (A)

CHEMISTRY

51. (C)

Sol. The coordination number of the central atom in the coordination compound refers to the total number of sigma bonds through which the ligands are bound to the coordination centre. Here 6 fluorine atom is coordinated to Cobalt atom.

52. (D)

Sol. C.N= 4 (2×2)

O.N = + 2

$[Co(en)_3]_2 (SO_4)_3$

53. (D)

Sol. Complex Compound or Coordination Compound

54. (B)

Sol. $M (CO)_x$

Ni = X= 4 then, E.A.N = 28-0+8=36

Fe = X=5 then, E.A.N = 26-0+10=36

Cr=X= 6 then, E.A.N = 24-0+12=36

55. (D)

Sol. By IUPAC rule,

Tetraammineaquabromocobalt(III) nitrate.

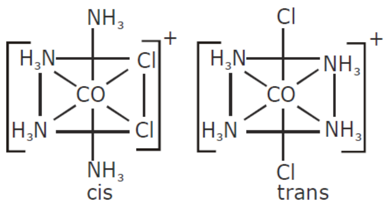
56. (A)

Sol. $Fe_4 [Fe(CN)_6]_3$

Prussian blue or Turnbull's blue.

57. (A)

Sol.



58. (D)

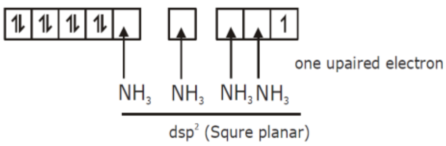
Sol. Linkage due to NO_2 and ONO

59. (A)

Sol. C.N $\longrightarrow$ 4

O.N $\longrightarrow$ 2

$[Cu^{+2}(NH_3)_4]^{+2} \longrightarrow$



60. (C)

Sol. $[Ni(CO)_4]^{-2} \Rightarrow$ no unpaired e^-

$[Ni(CN)_4]^{-2} \Rightarrow$ no unparied e^- due to strong field ligand

$[Ni(Cl)_4]^{-2} \Rightarrow$ contains unpaired e^- , due to Cl^- weak filed ligand.

61. (A)

Sol. $FeSO_4 + NO + 5H_2O \longrightarrow [Fe(H_2O)_5NO]SO_4$

Brown ring

62. (B)

Sol. AgBr is sensitive to light which turns darks on contact with it, so it is used in photography.

63. (B)

Sol. $Al(C_2H_5)_3 + TiCl_4$

64. (C)

Sol. It is correct statement that NF_3 is a weaker ligand than $N(CH_3)_3$, the reason is that fluorine is highly electronegative therefore, it with draw electrons from nitrogen atom. Hence, the lone pair of nitrogen atom cannot be ligated. While $N(CH_3)_3$ is a strong ligand because CH_3 has electron releasing group.

65. (A)

Sol. Both assertion and reason are true and reason is the correct explanation of assertion. When a monodentate ligand has two possible donor atoms and attached in two ways to the central metal atom are called ambidentate ligands.

66. (C)

Sol. Assertion is true but reason is false. Tetrahedral complexes do not show geometrical isomerism because the relative position of the atoms with respect to each other will be the same.

67. (D)

Sol. Zn $(3d^{10}\ 4s^2)$

No. of unpaired electrons in d-orbital are responsible for metallic bonding.

68. (D)

Sol. Ag & Zr are 2nd transition series elements.

69. (C)

Sol. Cr(+3) oxidation state is stable because of t_{2g} half filled.

70. (C)

Sol. $[MnCl_4]^-$

$x + 4(-1) = -1$

$x = +3$

71. (A)

Sol. d^7 | ⇅ | ⇅ | ↑ | ↑ | ↑ | n 3; $m = \sqrt{3(3+2)}$ BM

$= \sqrt{15}$ BM

72. (C)

Sol. Potassium chromate

$$\underset{\text{Yellow}}{2CrO_4^{-2}} \longrightarrow \underset{\text{(orange red)}}{Cr_2O_7^{-2}} + H_2O$$

73. (D)

Sol. General electronic configuration of Lanthanide is $(n-2)f^{1-14}\ (n-1)d^{0-1}\ ns^2$.

74. (B)

Sol. $$\underset{\text{Dark Green}}{3MnO_4^{-2}} + 4H^+ \longrightarrow \underset{\text{Purple}}{2MnO_4^-} + MnO_2 + 2H_2O$$

75. (A)

Sol. In $K_2Cr_2O_7$, Cr has + 6 oxidation state.

76. (C)

Sol. Increased screening effect to nullify increased nuclear charge.

77. (D)

Sol. Ti^{+4} and Cu^+ have no unpaired e^-

78. (B)
Sol. $Cr^{+3} \rightarrow 3$ unpaired e^-

79. (C)
Sol. $K_3[Cu(CN)_4]$ More stable
$K_2[Cd(CN)_4]$ Less stable

80. (C)
Sol. dsp^2 due to strong field ligand nature of CN^-

81. (C)
Sol. Ma_3b_3–type, no optical isomerism.

82. (D)
Sol. $MnO_4^{2-} = Mn^{6+} = [Ar]3d^1$
Unpaired election(n) = 1, Paramagnetic

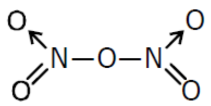
83. (B)
Sol. $\underset{\text{yellow}}{2CrO_4^{2-}} + 2H^+ \longrightarrow \underset{\text{Orange red}}{Cr_2O_7^{2-}} + H_2O$

84. (C)
Sol. Common oxidation state of Ce is +3 and +4

85. (B)
Sol. $2CuSO_4 + 4KI \longrightarrow Cu_2I_2 + I_2 + 2K_2SO_4$
$I_2 + 2Na_2S_2O_3 \longrightarrow 2NaI + Na_2S_4O_6$

86. (A)
Sol. $\underset{\text{Calomel}}{Hg_2Cl_2} + 2NH_3 \longrightarrow \underbrace{Hg + HgNH_2Cl}_{\text{Brownish-black}} + NH_4Cl$

87. (D)
Sol. 5f are poorly sheilded as 5f orbitals are away from the nucleus.
Also 5f has poor sheilding effect than 4f due to the large size of f orbital, it is more diffused.

88. (D)
Sol. 

89. (A)
Sol. Aqua regia 3 mol HCl & 1 mol HNO_3

90. (A)
Sol. CrO_2 is a metallic compound and shows ferromagnetism.

91. (B)
Sol. Due to large size of P

92. (B)
Sol. O_2 is paramagnetic in nature.

93. (C)
Sol. Covalent character remains the same.

94. (D)
Sol. ICl_2^- , dsp^2, T.B. (Trigonal Bipyramidal)

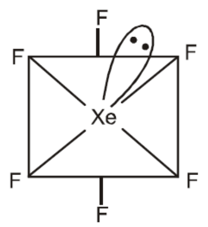
95. (C)
Sol. Fe^{3+} is more easily hydrolysed than Fe^{2+}

96. (B)
Sol. Top to bottom electronegative character decreases

97. (D)
Sol. The actinoids exhibits more number of oxidation state because the 5f-orbitals extend further from the nucleus than the 4f orbitals.

98. (D)
Sol. Dipole induced dipole force

99. (B)
Sol. Ma_4XeO_6 sodium perxanate

100. (A)
Sol. 

Distorted octahedral