NEET ANSWER KEY & SOLUTION

PAPER CODE :- PART TEST-5
CLASS-XII

ANSWER KEY

PHYSICS

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

CHEMISTRY

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

BIOLOGY

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

SOLUTIONS

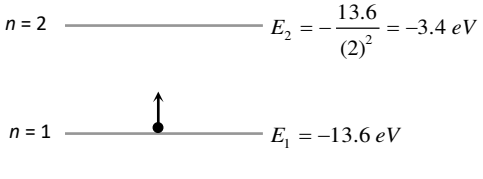
PHYSICS

1. (A)

Sol. For n=1, maximum number of states $= 2n^2 = 2$ and for n = 2, 3, 4, maximum number of states would be 8, 18, 32 respectively, Hence number of possible elements
= 2 + 8 + 18 + 32 = 60.

2. (A)

Sol.



$$E_{1\to 2} = -3.4 - (13.6) = +10.2\ eV$$

3. (C)

Sol. Lyman series lies in the UV region.

4. (B)

Sol. The size of the atom is of the order of 1Å = $10^{-10} m$.

5. (B)

Sol. Paschen series lies in the infrared region.

6. (D)

Sol. Lyman series lies in the UV region.

7. (C)

Sol. Wave number

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

8. (B)

Sol. Linear momentum

$= mv = 9.1 \times 10^{-31} \times 2.2 \times 10^6$

$= 2.0 \times 10^{-24}\ kg - m/s$

9. (C)

Sol. Energy required s

10. (C)

Sol. First excited state *i.e.* second orbit (n = 2)
Second excited state *i.e.* third orbit (n = 3)

$$\because E = -\frac{13.6}{n^2} \Rightarrow \frac{E_2}{E_3} = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

11. (A)

Sol. Ionization energy = Binding energy.

12. (B)

Sol. $r \propto n^2$. For ground state n=1 and for first excited state n=2.

13. (A)

Sol. $\frac{1}{\lambda} = R\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$

First condition $\frac{1}{\lambda} = R\left[\frac{1}{1^2} - \frac{1}{2^2}\right] \Rightarrow R = \frac{4}{3\lambda}$

Second condition $\frac{1}{\lambda'} = R\left[\frac{1}{1^2} - \frac{1}{3^2}\right]$

$$\Rightarrow \lambda' = \frac{9}{8R} \Rightarrow \lambda' = \frac{9}{8 \times \frac{4}{3\lambda}} = \frac{27\lambda}{32}$$

14. (A)

Sol. $E_n \propto Z^2 \Rightarrow \frac{(E_n)_{He}}{(E_n)_H} = \frac{Z_{He}^2}{Z_H^2} = 4$

$$\Rightarrow (E_n)_{He} = 4 \times (E_n)_H$$

15. (B)

Sol. P.E. $= 2 \times$ Total energy $= 2 \times (-13.6) = -27.2$ eV

16. (A)

17. (B)

18. (D)

Sol. In hydrogen, atomic number and mass number are equal.

19. (D)

Sol. According to Bohr's theory $mvr = n\frac{h}{2\pi}$

$\Rightarrow$ Circumference $2\pi r = n\left(\frac{h}{mv}\right) = n\lambda$

20. (D)

Sol. Energy / day $= 200 \times 10^6 \times 24 \times 3600$

$= 2 \times 2.4 \times 3.6 \times 10^{12} = 1728 \times 10^{10}\ J$

21. (C)

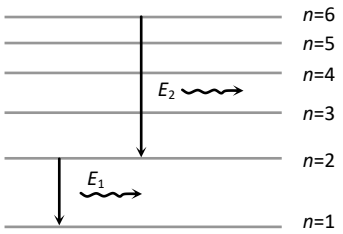
Sol. Nuclear force is stronger than coulomb force.

22. (C)

23. (A)

Sol. $\because E_1 > E_2$

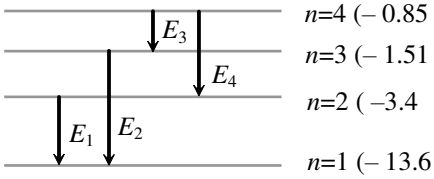
$\therefore \nu_1 > \nu_2$



i.e. photons of higher frequency will be emitted if transition takes place from n = 2 to 1.

24. (B)

Sol. From diagram



$E_1 = -13.6 - (-3.4) = -10.2\ eV$

$E_2 = -13.6 - (-1.51) = -12.09\ eV$

$E_3 = -1.51 - (-0.85) = -0.66\ eV$

$E_4 = -3.4 - (-1.51) = -1.89\ eV$

E_3 is least *i.e.* frequency is lowest.

25. (D)

Sol. For full wave rectifier $\eta = \dfrac{81.2}{1 + \dfrac{r_f}{R_L}}$

$\Rightarrow n_{\max} = 81.2\%$ $\quad (r_f << R_L)$

26. (B)

Sol. $m_1 v_1 = m_2 v_2$

$\dfrac{v_1}{v_2} = \dfrac{m_2}{m_1} = \dfrac{r_2^3}{r_1^3}$

$\dfrac{r_1}{r_2} = \left(\dfrac{v_2}{v_1}\right)^{1/3} = \left(\dfrac{1}{2}\right)^{1/3} = \dfrac{1}{2^{1/3}}$

$r_1 : r_2 = 1 : 2^{1/3}$

27. (A)

Sol. We know that

$R = R_0 A^{1/3}$

$\therefore\ v = \dfrac{4}{3}\pi R^3 = \dfrac{4}{3}\pi R_0^3 A$

$\rho = \dfrac{M}{v} = \dfrac{mA}{\frac{3}{4}\pi R_0^3} = \dfrac{m}{\frac{4}{3}\pi R_0^3}$

28. (C)

Sol. Vander Waal force is weak dipole-dipole interaction.

29. (B)

Sol. As n increases P.E. increases and K.E. decreases.

30. (A)

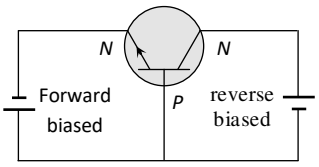
31. (B)

32. (C)

Sol. For a wide range of values of load resistance, the current in the zener diode may change but the voltage across it remains unaffected. Thus the output voltage across the zener diode is a regulated voltage.

33. (B)

Sol.



34. (B)

Sol. With temperature rise conductivity of semiconductors increases.

35. (C)

Sol. *N*-type semiconductors are neutral because neutral atoms are added during doping.

36. (B)

Sol. $\beta = \dfrac{\alpha}{1-\alpha} = \dfrac{0.96}{1-0.96} = 24.$

37. (B)

Sol. Emitter is heavily doped.

38. (D)

Sol. Ge + *Trivalent impurity* → P-*type semiconductor*

39. (A)

Sol. In *CB* amplifier Input and output voltage signal are in same phase.

40. (A)

41. (C)

Sol. Phosphorus is pentavalent.

42. (A)

Sol. In forward biased *PN*-junction, external voltage decreases the potential barrier, so current is maximum. While in reversed biased *PN*-junction, external voltage increases the potential barrier, so the current is very small.

43. (B)

Sol. In reverse biasing, width of depletion layer increases.

44. (A)

Sol. The potential of *P*-side is more negative that of *N*-side, hence diode is in reverse biasing. In reverse biasing it acts as open circuit, hence no current flows.

45. (A)

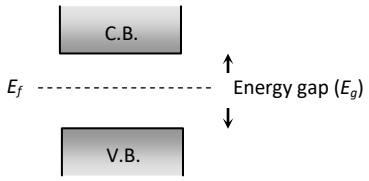
Sol. In intrinsic semiconductors, electrons and holes both are charge carriers. In *P*-type semiconductors (Extrinsic semiconductors) holes are majority charge carriers.

46. (D)

Sol. the deplection layer's consists of Immobile ions

47. (A)

Sol.



48. (B)

Sol. At 0*K* semiconductor behaves as insulator so it's resistance is infinite.

49. (B)

Sol. FET is unipolar.

50. (C)

Sol. P → d → Transistors are used in oscillators.

Q → a → Diode can act as a rectifier.

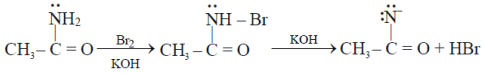
R → b → Phosphorus is a pentavalent impurity.

S → C → Bismuth is a trivalent impurity.

CHEMISTRY

51. (C)

Sol. The structure of intermediate acetyl nitrene is $CH_3 - CO - N$. It is formed by the following reaction



52. (C)

Sol. In hypobromite reaction of amide, carbonyl carbon atom is lost as CO_3^{-2} ion. The reaction takes place as follows:

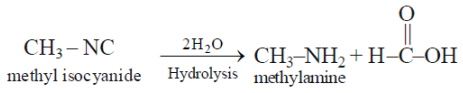
$CH_3CONH_2 + Br_2 + 4KOH$

$\longrightarrow CH_3NH_2 + 2KBr + K_2CO_3 + H_2O$

K_2CO_3 is an ionic compound and ionizes to give K^+ and CO_3^{-2} ions.

53. (D)

Sol. Alkyl isocyanide on hydrolysis produces a primary amine. The reaction takes place as follows.



54. (A)

Sol. Formaldoxime on reaction with Na/EtOH gives 1° amine. The reaction is representated as follows :

$H - CH = N - OH \xrightarrow[4H]{Na/EtOH} CH_3NH_2 + H_2O$

Formaldoxime Methylamine

This method is used for the preparation of primary amines.

55. (C)

Sol. Primary amine and HNO_2 produces nitrogen gas.

$RNH_2 + HNO_2 \longrightarrow ROH + N_2 + H_2O$

56. (A)

Sol. All aldehydes e.g. HCHO, C_6H_5CHO and CH_3CHO on reaction with alkylamine gives schiff's base

$C_6H_5CHO + H_2NCH_3 \longrightarrow$

Benzaldehyde Methylamine

$C_6H_5CH = N - CH_3 + H_2O$

Schiff's base

57. (D)

Sol. $CH_3CH_2COOH + SOCl_2 \longrightarrow CH_3CH_2COCl$

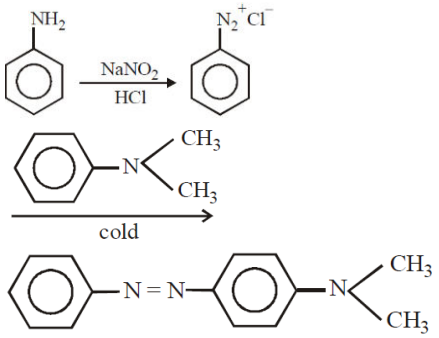
$+NH_3 \longrightarrow CH_3CH_2CONH_2 + Br_2 + KOH \longrightarrow CH_3CH_2NH_2$

58. (A)

Sol. Alkyl isocyanides on reduction with lithium aluminium hydride forms secondary amines containing methyl as one of the alkyl groups.

59. (B)

Sol.



60. (B)

Sol. Secondary amine with ($NaNO_2$ + HCl) gives a nitroso product.

61. (D)

Sol. (i) Presence of electron withdrawing substituent decreases the basicity while the presence of electron releasing substituent like, $-CH_3$, $-C_2H_5$ etc. increases the acidity.

(ii) HNO_2 converts $-NH_2$ group of aliphatic amine into –OH while that of aromatic amines into – N = NCl.

Since, phenyl group is a electron withdrawing group, it decreases the basicity. Alkyl group, on the other hand, being electron releasing, increases the basicity. Thus, alkyl amines are more basic as compared to aryl amines as well as ammonia.

$R-NH_2 \xrightarrow{HNO_2} R-OH$

Thus, HNO_2 (nitrous acid) converts alkyl amines to alcohols.

But $C_6H_5NH_2 \xrightarrow{HNO_2} C_6H_5N \equiv NCl$

Benzene diazonium chloride

Thus, HNO_2 does not convert aryl amines into phenol.

62. (B)

Sol. The reagent which can convert $-CONH_2$ group into $-NH_2$ group is used for this reaction.

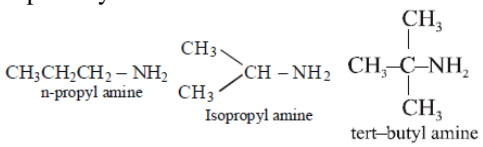
Among the given reagents only $NaOH/Br_2$ converts $-CONH_3$ group to $-NH_2$ group, thus it is used for converting acetamide to methyl amine. This reaction is called Hoffmann bromamide reaction.

$CH_3CONH_2 + NaOH + Br_2 \longrightarrow CH_3NH_2 + NaBr + Na_2CO_3 + H_2O$

methylamine

63. (D)

Sol. All the compounds given above are examples of primary amine.



64. (A)

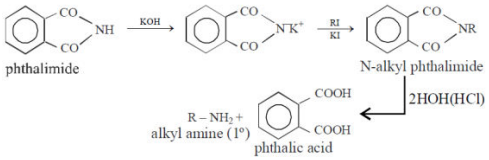
Sol. For the formation of RNH_2 from $RCONH_2$, NaOH and Br_2 are used as reagent. It is called Hoffmann hypobromite reaction.

65. (B)

Sol. The products of the reaction 1, 2, 3 and 4 respectively are : 1° amine, methyl ketone, 1° amine and alcohol.

66. (A)

Sol. Gabriel phthalimide reaction is used to prepare primary amine.



67. (A)

Sol. The given reaction is represented as :

$RCOOH + N_3H \xrightarrow{Conc.H_2SO_4} RNH_2 + CO_2 + N_2$

alkanoic acid hydrazoic acid alkylamine

68. (D)

Sol. Primary and secondary amines react with HNO_2,while tertiary amines do not react with HNO_2. Since N, N-Dimethyl ethanamine $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!N-CH_2-CH_3$ is a tertiary amine, hence it will not react with HNO_2.

69. (A)

Sol. In the given sequence of reactions, the product B, will be ethanol. The reaction takes place as

$C_2H_5MgBr \xrightarrow[MgBrCl]{Cl-NH_2} \underset{'A'}{C_2H_5NH_2}$

$\xrightarrow[NaNO_2/HCl]{HONO} \underset{'B'}{C_2H_5OH} + N_2 + H_2O$

70. (C)

Sol. In Schotten-Baumann reaction a sulphur compound is not produced with a 1° amine

$R-NH_2 + Cl-CO-C_6H_5 \xrightarrow{NaOH} R-NHCOC_6H_5 + HCl$

Alkyl amine Benzoyl chloride

N-alkyl benzamide

71. (C)

Sol. A primary amine condenses with CS_2 in the presence of $HgCl_2$ to form an alkyl isothiocyanate. This compound has a smell resembling that of mustard oil. It is called as Hoffmann's mustard oil reaction.

$$R - NH_2 + S = C = S + HgCl_2 \longrightarrow R - N = C = S + HgS\downarrow + 2HCl$$

Alkyl Amine Alkyl isothiocyanate

72. (C)

Sol. Triethylamine is tertiary amine. It does not react with Hinsberg reagent.

73. (C)

Sol. In the 3rd reaction sequence the end product is a 3° nitro compound. $(CH_3)_3C–NO_2$ It does not have α–hydrogen because of which tautomerism is not possible.

74. (A)

Sol. The acid used is H_2PtCl_6. It is a solution of platonic chloride, $PtCl_4$ in con. HCl

$$2R - NH_2 + H_2[PtCl_6] \longrightarrow [R\,NH_3]_2 + [PtCl_6]^{-2}$$

Alkylamine platinichloride

Chloroplatinates on ignition leave a residue of metallic Pt. This reaction is employed in determining molecular weight of amines.

75. (B)

Sol. Biochemical reaction takes place at body temperature (37°C) & at pH = 7

76. (A)

Sol. Disaccharides, polysaccharides and starches

77. (D)

Sol. Glucose on heating with dilute sodium hydroxide undergoes in a reversible isomerisation (known as Lobry de Bruynvan Ekenstein rearrangement) and gives D-glucose, D-mannose and D-fructose.

78. (A)

Sol. Change in optical rotation towards an equilibium value is called mutarotation.

79. (B)

Sol. Inversion

80. (D)

Sol. Methyl α-D-glucoside and methyl β-D-glucoside do not reduce fehling solution and also do not react with hydrogen cyandide.

81. (A)

Sol. Due to different spatial arrangement of (–H & –OH) group at C–1 carbon of glucose form anomer.

82. (A)

Sol. RD Haworth

83. (A)

Sol. Lactose

84. (C)

Sol. In maltose two glucose molecule are linked through α–1, 4–glycosidic linkage.

85. (A)

Sol. Simplest amino acid is glycine (α–amino acetic acid $H_2N – CH_2 – COOH$).

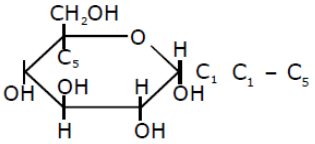
86. (C)

Sol. The main structural feature of proteins is the presence of peptide linkage.

87. (B)

Sol. DNA has nucleotide unit, i.e., Sugar + base + H_3PO_4 .

88. (A)

Sol. 

$C_1 - C_5$

89. (A)

Sol. Glucose is monosacchoride

90. (D)

Sol. Secondary structure of protein is regular folding pattern of continuous portion of the polypeptide chain

91. (D)

Sol. End product of protein digestion is α–amino acid because Amino acids are structural unit of protein

92. (B)

Sol. Cod liver oil is good source of vitamin A & D

93. (C)

Sol. Calorific value order is fat > carbohydrate > protein

94. (C)

Sol. Amino acid are linked through peptide linkage in protein structure.

95. (B)

Sol. Isoelectric point is the pH at which structure of amino acid has no charge.

96. (D)

Sol. Essential amino acid

97. (C)

Sol. Proteins

98. (B)

Sol. Riboflavin deficiency causes pellagra.

99. (C)

Sol. Acetic acid has the same general formula but not a saccharides.

100. (D)

Sol. Glyptal is a synthetic fibre and used in fabric.