



NEET SOLUTION PAPER – 2017

PHYSICS

ANSWER KEY

1.d	2.b	3.a	4.d	5.d	6.d	7.c	8.c,d	9.b	10.
11.c	12.b	13.b	14.a	15.d	16.b	17.b	18.a	19.d	20.d
21.b	22.b	23.d	24.a	25.d	26.b	27.c	28.c	29.a	30.c
31.c	32.a	33.a	34.a	35.a	36.d	37.d	38.a	39.c	40.c
41.a	42.c	43.d	44.a	45.a					

SOLUTION:

- Fundamental frequency, $f_1 = \frac{v}{4l}$
 Next frequency possible is $f_2 = \frac{3v}{4l}$
 Difference = $\frac{2v}{4l} = 40\text{Hz} \Rightarrow f_1 = 20\text{Hz}$
- Pressure must be same at point C and B
 $\Rightarrow \rho_{oil} \times 140 \times 10^{-3} \times g = \rho_{water} \times 130 \times 10^{-3} \times g$
 $\Rightarrow \rho_0 \approx 928 \text{kgm}^{-3}$
- |acceleration| = |velocity|
 $\Rightarrow \omega^2 x = \omega \sqrt{A^2 - x^2} \Rightarrow \omega = \left(\frac{\sqrt{A^2 - x^2}}{x} \right)$
 $\Rightarrow T = \frac{2\pi}{\omega} = \frac{4\pi}{\sqrt{5}}$
- They will move towards each other due to mutual gravitational force
- $\lambda = \frac{h}{mv} = \frac{h}{\sqrt{2m(K)}} = \frac{h}{\sqrt{2m(\frac{3}{2}KT)}}$
 Here, Kinetic energy = $\frac{3}{2}kT$, $k \rightarrow$ Boltzmann's constant
- Initially, $U_i = \frac{1}{2} CV^2$
 Finally, potential = $\frac{V}{2}$ and $C_{eff} = 2C$
 $\Rightarrow U_f = \frac{1}{2} (2C) \left(\frac{V}{2} \right)^2$

7. In this case voltage $0 - (-2) = 2V = +ve$.
It is forward – biased by definition.

8. $(K.E)_{max} = \frac{hc}{\lambda} - \frac{hc}{\lambda_0}$

$$\Rightarrow v = \sqrt{\frac{2hc}{m} \left(\frac{1}{\lambda} - \frac{1}{\lambda_0} \right)} \approx 6 \times 10^5 \text{ ms}^{-1}$$

9. 16.5 ms^{-1} 22 ms^{-1}
 $\rightarrow \leftarrow$

Observer Source ($f_0 = 400 \text{ Hz}$)
 $F_{apparent} = f_0 \left[\frac{V+V_0}{V-V_s} \right] = 400 \left[\frac{340+16.5}{340-22} \right] \approx 448 \text{ Hz}$

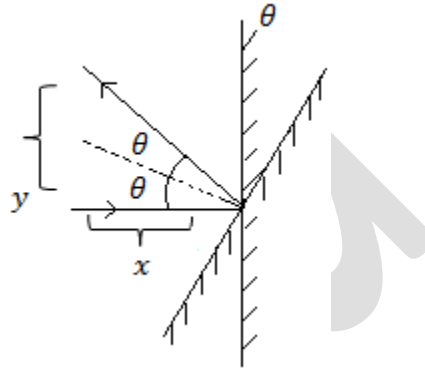
10. No answer.
As question is incomplete (capacitance value is not given).

11. When mirror rotates by θ ,

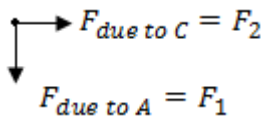
Reflected ray rotates by 2θ

$$\Rightarrow \frac{y}{x} = \tan(2\theta) \approx 2\theta$$

$$\Rightarrow \theta \approx \frac{y}{2x}$$



12. on wire B,



$$\text{But } |\vec{F}_1| = |\vec{F}_2| = \frac{\mu_0(i)^2}{2\pi d} \Rightarrow F_{res} = \sqrt{2F^2} = \sqrt{2}F = \sqrt{2} \frac{[\mu_0 i^2]}{2\pi d}$$

$$\Rightarrow F_{res} = \frac{\mu_0 i^2}{\sqrt{2}\pi d}$$

13. From data, $\frac{8 \lambda_{medium} D}{d} = \frac{[2(5)-1] \lambda_{air} D}{d}$

$$\text{But } \lambda_{med} = \frac{\lambda_{air}}{\mu} \Rightarrow \mu \approx 1.78$$

14. Spring constant of a spring, $k\alpha \frac{1}{\text{length}}$

$$\Rightarrow K_1:K_2:K_3 = \frac{l}{6}:\frac{l}{3}:\frac{l}{2} \Rightarrow K_1 = 6K$$

$$K_2 = 3K$$

$$K_3 = 2K$$

$\Rightarrow K^{11} = 11K$ (in parallel combination)

And $K^1 = K$ (in series combination)

Ans: 1 : 11

15. Condition for dispersion without deviation,
 $\Rightarrow A_1[\mu_1 - 1] = A_2[\mu_2 - 1]$ in magnitude

$$\Rightarrow A_2 = 6^0$$

16. Total internal energy, $U = \left(\frac{f}{2}\right)nRT$

$$\Rightarrow U_{net} = \frac{5}{2}(2RT) + \frac{3}{2}(4RT) = 11RT$$

17. $W_{mg} = mgh = 10^{-3} \times 10 \times 10 = 10J$

$$\text{Also, } W_{net} = \Delta(KE) \Rightarrow W_{mg} + W_{res} = \frac{1}{2} \times 10^{-3} \times (50)^2$$

$$\Rightarrow W_{res} = -8.75J$$

18. $x = 5t - 2t^2$. $y = 10t$

$$\Rightarrow V_x = 5 - 4t, v_y = 10$$

$$\Rightarrow a_x = -4, a_y = 0$$

$$\Rightarrow a = \sqrt{a_x^2 + a_y^2} = 4ms^{-2}, \vec{a} = -4ms^{-2}\hat{i}$$

19. Applying conservation of angular momentum,

$$I(\omega_1) + I(\omega_2) = (2I)(\omega^1) \Rightarrow \omega^1 = \frac{\omega_1 + \omega_2}{2}$$

$$K_i = \frac{1}{2}I[\omega_1^2 + \omega_2^2] \text{ and } K_f = \frac{1}{2}(2I)(\omega^1)^2$$

$$\Rightarrow K_f - K_i = \text{loss in kinetic energy} = \frac{1}{4}\{\omega_1 - \omega_2\}^2$$

20. Processes – Type

1 → Isochoric

2 → Adiabatic

3 → Isothermal

4 → Isobaric

21. $\frac{\Delta V}{V} = 3\left(\frac{\Delta R}{R}\right) \Rightarrow \text{Bulk modulus, } |B| = \frac{\Delta P}{\left(\frac{3\Delta R}{R}\right)}$

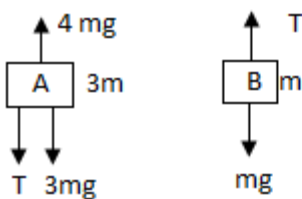
$$\Rightarrow \frac{\Delta R}{R} = \frac{P}{3B} \text{ Since } \Delta P = P$$

22. $g\left[1 - \frac{2h}{R}\right] = g\left[1 - \frac{d}{R}\right] \Rightarrow 2h = d$
 $\Rightarrow d = 2km$

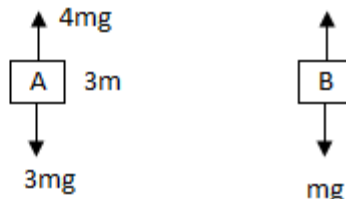
23. Since potential difference is same in all cases, work done will be same, $W = q(\Delta V)$

24. When she walks on a moving escalator, time taken, $t = \frac{l}{V_1 + V_2} = \frac{l}{\left[\frac{l}{t_1} + \frac{l}{t_2}\right]}$
 $\Rightarrow t = \frac{t_1 t_2}{t_1 + t_2}$

25. **F.B.D before**



Later



$$a_A = \frac{(4 - 3) mg}{3m} = \frac{g}{3}, \quad a_B = g$$

26. $\frac{(Power)_1}{(Power)_2} = \left[\frac{r_1}{r_2}\right]^2 \left[\frac{T_1}{T_2}\right]^4$

Substituting, we get, $(Power)_2 = 1800 \text{ W}$

27. It is equivalent to two resistances in parallel combination.

$$\Rightarrow \frac{1}{R_{eff}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$\Rightarrow \frac{K_{eff}(2A)}{l} = \frac{K_1(A)}{l} + \frac{K_2(A)}{l} \Rightarrow K_{eff} = \frac{K_1 + K_2}{2}$$

28. Tension provides the centripetal force and net force will be T.

29. Voltage gain, $A_v = \left(\frac{R_C}{R_B}\right) \beta = \left(\frac{3}{2}\right) 100 = 150$
 And Power gain is $= A_v \beta = 15 \times 10^3$

30. By definition, mechanical advantage = load/effort
 Torque of gravitational pull is zero about the point of centre of mass.

31. For a hollow cylinder, $I = mR^2$
 And $\tau = I \alpha = mR^2 \alpha \rightarrow (1)$
 Also, $\tau = FR \rightarrow (2)$

$$\Rightarrow \alpha = \frac{F}{mR} = 25 \text{ rad s}^{-2}$$

$$32. \quad \frac{\Delta q}{\Delta t} = I \Rightarrow \Delta q = I \Delta t = \left[\frac{\Delta \phi}{\Delta t} \right] \frac{1}{R} \cdot \Delta t$$

$$\text{But } \frac{\Delta \phi}{\Delta t} = L \frac{\Delta i}{\Delta t} = \mu_0 (2 \times 10^4 \times 100) \pi r^2 \left(\frac{\Delta i}{\Delta t} \right)$$

$$\Rightarrow \Delta q = \frac{[4\pi \times 10^{-7} \times 2 \times 10^4 \times 100\pi \times 10^{-4}]}{10\pi^2} \left(\frac{4}{0.05} \right) (0.05)$$

$$\Rightarrow \Delta q \approx 32\mu\text{C}$$

33. Last line of Balmer series: $n = \infty \rightarrow 2$

$$\frac{1}{\lambda} = Z^2 R \left[\frac{1}{2^2} - \frac{1}{\infty^2} \right] = \frac{R}{4} \Rightarrow \lambda_1 = \frac{4}{R}$$

Last line of Lyman series: $n = \infty \rightarrow n = 1$

$$\text{Similarly, } \lambda_2 = \frac{1}{R}$$

$$\Rightarrow \frac{\lambda_1}{\lambda_2} = \frac{4}{1}$$

34. Repulsive force (electrostatic) = attractive force (gravitational)

$$\Rightarrow \frac{K[\Delta e][\Delta e]}{d^2} = \frac{Gm^2}{d^2}$$

$$\Rightarrow \Delta e = \sqrt{\frac{m^2 G}{K}} = \sqrt{\frac{(1.67 \times 10^{-27})^2 \times 6.67 \times 10^{-11}}{9 \times 10^9}} \approx 1.4 \times 10^{-37} \text{C}$$

35. At first gate, output is $\overline{A + B}$

At second gate, output is $\overline{\overline{A + B} + \overline{A + B}}$

$$= \overline{\overline{A + B}} = A + B$$

At third gate, output is $\overline{A + B}$

Ans: NOR gate

$$36. \quad \text{By definition, } \frac{Q_2}{W} = \frac{1-\eta}{\eta} \Rightarrow \frac{Q_2}{10} = \frac{1-0.1}{0.1}$$

$$\Rightarrow Q_2 = \frac{10[0.9]}{0.1} = 90\text{J}$$

$$37. \quad \text{We know that, } \frac{E_0}{B_0} = C \Rightarrow B_0 = \frac{E_0}{C} = \frac{\sqrt{2}E_{rms}}{C}$$

$$\Rightarrow B_0 = \left(\frac{6 \times \sqrt{2}}{3 \times 10^8} \right) = 2.8 \times 10^{-8} T$$

38. Intensity of light after passing through

(a) P_1 will be $\frac{I_0}{2}$

(b) P_3 will be $\left(\frac{I_0}{2}\right) \cos^2 45^\circ = \frac{I_0}{4}$

(c) P_2 will be $\left(\frac{I_0}{4}\right) \cos^2 45^\circ = \frac{I_0}{8}$

39. $\cot^2 \theta = \cot^2 \theta_1 + \cot^2 \theta_2$

40. Work done = $MB[\cos 0^\circ - \cos 180^\circ] = (NIA)B[1 - (-1)]$
 $\approx 9.1 \mu J$

41. We know that, resistance, $R = \frac{\rho l}{A} = \frac{\rho l^2}{Al}$

$Al = \text{volume} = \text{constant}$

$$\Rightarrow R \propto l^2 \Rightarrow \frac{R_2}{R_1} = n^2$$

42. $[L] = [C]^a [G]^b \left[\frac{e^{-2}}{4\pi\epsilon_0} \right]^c$

Solving, we get, $L = \frac{1}{C^2} \sqrt{\frac{Ge^2}{4\pi\epsilon_0}}$

43. $N_B = \frac{N_A}{e} \Rightarrow [N_0 e^{-\lambda t}] e = [N_0 e^{-8\lambda t}]$

$$\Rightarrow -\lambda t + 1 = -8\lambda t \Rightarrow 7\lambda t = -1 \Rightarrow t = \frac{-1}{7\lambda}$$

44. It involves condition that current through galvanometer is zero.

45. $(R.P) \propto \frac{1}{\lambda} \Rightarrow \frac{(R.P)_1}{(R.P)_2} = \frac{\lambda_2}{\lambda_1} = \frac{3}{2}$

BIOLOGY

ANSWER KEY:

46. c	47. d	48. d	49. a	50. b	51. b	52. d	53. d	54. a	55. a
56. b	57. d	58. d	59. d	60. a	61. c	62. a	63. c	64. d	65. d
66. c	67. c	68. b	69. d	70. c	71. c	72. a	73. c	74. a	75. d
76. b	77. a	78. b	79. a	80. a	81. b	82. a	83. b	84. b	85. a
86. d	87. d	88. b	89. a	90. c	91. c	92. c	93. c	94. c	95. c

96. c	97. c	98. b	99. d	100. d	101. b	102. a	103. a	104. b	105. a
106. d	107. c	108. a	109. a	110. a	111. d	112. d	113. d	114. a	115. d
116. a	117. b	118. a	119. b	120. a	121. d	122. c	123. b	124. c	125. d
126. a	127. b	128. c	129. a	130. b	131. c	132. a	133. a	134. a	135. d

SOLUTION:

46. (c) Down's syndrome is caused due to an autosomal primary non-disjunction of the 21st chromosome.
47. (d) A dioecious plant prevents Autogamy and Geitonogamy.
48. (d) Attracts and awards are required for entomophilous (insect pollinated) flowers.
49. (a) Alexander Von Humboldt described the species-area relationship. He observed that within a region, species richness gets increased when explored area is increased, but only up to a limit.
50. (b) The most prominent roles of mitochondria are to produce the energy currency of the cell, ATP (i.e., phosphorylation of ADP), through respiration, and to regulate cellular metabolism.
51. (b) A zygotic meiosis is a meiosis of a zygote immediately after karyogamy, which is the fusion of two cell nuclei. This way, the organism ends its diploid phase and produces several haploid cells. This type of life cycle can be seen in Chlamydomonas.
52. (d) Vitamin A derivatives are formed from carotene. Retinal is a derivative of Vitamin A. Retinal is a light absorbing part of all the visual photopigments
53. (d) Mendel did not consider the types of trichomes in his experiments.
54. (a) Histones are highly alkaline proteins found in eukaryotic cell nuclei that package and order the DNA into structural units called nucleosomes. They are the chief protein components of chromatin.
55. (a) The pivot joint between atlas and axis is a type of Synovial joint.
56. (b) Receptor sites for neurotransmitters are present on Post-synaptic membrane.
57. (d) GnRH (Gonadotropin releasing hormone), a hypothalamic hormone, needed in reproduction, acts on anterior pituitary gland and stimulates secretion of LH (Leutenising hormone) and FSH (Follicle Stimulating Hormone).
58. (d) Hypersecretion of Growth Hormone in adults does not cause further increase in height, because epiphyseal plates close after adolescence. The epiphyseal plate (or epiphysial plate, physis, or growth plate) is a hyaline cartilage plate in the metaphysis at each end of a long bone. The plate is found in children and adolescents; in adults, who have stopped growing, the plate is replaced by an epiphyseal line.
59. (d) Rhodospirillum is a nitrogen fixing bacterium.
60. (a) Aerosols do not cause an increase in agricultural productivity.

61. (c) Ex situ conservation literally means, "off-site conservation". It is the process of protecting an endangered species, variety or breed, of plant or animal outside of its natural habitat. Example: Wildlife Safari parks.
62. (a) Radial orientation of cellulose microfibrils in the cell wall of guard cells facilitates opening of stomatal aperture.
63. (c) Pinus is monoecious, having the male and female cones on the same tree.
64. (d) Asymptote in a logistic growth curve is obtained when $K = N$.
65. (d) The process of separation and purification of expressed protein before marketing is called Downstream processing.
66. (c) The water potential of pure water is Zero.
67. (c) The copper ions in copper releasing IUD's suppress sperm motility and fertilising capacity of sperms.
68. (b) Double fertilization is the characteristic feature of angiosperms.
69. (d) Stratification is seen in Tropical Rain Forest.
70. (c) Forest ecosystem has maximum biomass.
71. (c) Root hairs develop from the region of maturation.
72. (a) DNA replication in bacteria occurs prior to fission.
73. (c) Homozygous purelines in cattle can be obtained by inbreeding.
74. (a) The thorns in Bougainvillea are stem modifications.
75. (d) ANF is released in response to high blood volume.
76. (b) The Krebs cycle starts with condensation of acetyl group (acetyl CoA) with oxalo acetic acid to yield citric acid.
77. (a) If APC is defective in a human cell chromosomes will not segregate.
78. (b) Pancreatic juice contains lipase, amylase, trypsinogen and procarboxypeptidase.
79. (a) Life cycle of Ectocarpus and Fucus respectively are Haplodiplontic and Diplontic.
80. (a) Phellem is composed of dead cells.
81. (b) Penicillium notatum : Antibiotic penicillin, Methanobacterium : Biogas, Saccharomyces cerevisiae : Ethanol, Acetobacter acetii : Acetic acid
82. (a) Fruit and leaf drop at early stages can be prevented by the application of auxins.

83. (b) Viroids differ from viruses in having RNA molecules without protein coat.
84. (b) Lipids are not polymeric.
85. (a) The corpus luteum is a temporary endocrine gland that develops after ovulation from the ruptured follicle during the luteal phase.
86. (d) PEP is the primary carbon dioxide acceptor in C_4 plants.
87. (d) Halophytes or mangrove plants growing in the tidal marshes are met with the phenomenon of 'vivipary' which is defined as the germination of seeds while the fruits are still attached to mother plants.
88. (b) A mycorrhiza is a symbiotic association between a fungus and the roots of a vascular host plant.
89. (a) If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, 33 codons will be altered.
90. (c) A selectable marker is a gene introduced into a cell that confers a trait suitable for artificial selection.
91. (c) Some archaeobacteria can survive hypersaline environments.
92. (c) Out of 12 pairs of ribs in humans only 7 pairs are true ribs. True ribs are attached dorsally to vertebral column and ventrally to the sternum.
93. (c) The mucosa-associated lymphoid tissue (MALT) is a diffuse system of small concentrations of lymphoid tissue found in various sub-mucosa membrane sites of the body, such as the gastrointestinal tract, thyroid, breast, lung, salivary glands, eye, and skin. It constitutes about 50% of the lymphoid tissue in human body.
94. (c) Gregor Mendel, conducted hybridisation experiments on garden peas for seven years (1856-1863) and proposed the laws of inheritance in living organisms.
95. (c) RBCs have nuclei during early phases of erythropoiesis but extrude them during development as they mature in order to provide more space for haemoglobin.
96. (c) The myelin membranes originate from and are a part of the Schwann cells in the peripheral nervous system (PNS) and the oligodendroglial cells in the central nervous system (CNS).
97. (c) The ascending limb is impermeable to water but allows transport of electrolytes actively or passively.
98. (b) During DNA replication, Okazaki fragments are used to elongate the lagging strand away from the replication fork.
99. (d) A holoenzyme is a biochemically active compound formed by the combination of an enzyme with a coenzyme.

100. (d)The phosphate backbone of the DNA molecule is negatively charged.
101. (b)Ethidium bromide is an intercalating agent commonly used as a fluorescent tag (nucleic acid stain) in molecular biology laboratories for techniques such as agarose gel electrophoresis.
102. (a)Mycoplasmas are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen.
103. (a)Endosperm is the edible part of the coconut.
104. (b)The correct route for the passage of sperms in male frogs is from Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca
105. (a)Heartwood does not conduct water.
106. (d)Cell - mediated immune response is responsible for failure of tissues or organs after transplantation.
107. (c)The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as the core zone.
108. (a)Thalassemia is an inherited blood disorder in which the body makes an abnormal form of hemoglobin. Hemoglobin is the protein molecule in red blood cells that carries oxygen. The disorder results in excessive destruction of red blood cells, which leads to anemia.
109. (a)Flowers which have single ovule in the ovary and are packed into inflorescence are usually wind pollinated.
110. (a)An important characteristic that Hemichordates share with Chordates is the presence of pharynx with gill slits.
111. (d)The correct sequence of events during mitosis is Condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase
112. (d)The Hershey–Chase experiments were a series of experiments conducted in 1952 by Alfred Hershey and Martha Chase that helped to confirm that DNA is genetic material.
113. (d)Gel electrophoresis is a method for separation and analysis of macromolecules (DNA, RNA and proteins) and their fragments, based on their size and charge. The smaller the fragment size, the farther it moves.
114. (a) C_4 plants respond to higher temperatures with enhanced photosynthesis while C_3 plants have much lower temperature optimum.
115. (d)Artificial selection to obtain cows yielding higher milk output represents stabilizing selection as it stabilizes this character in the population.
116. (a)Primary treatment removes suspended solids in sewage treatment.
117. (b)Spliceosomes are not found in prokaryotic cells.

118. (a) The functional megaspore in angiosperms develops into the embryo sac.
119. (b) Some bacteria have an additional layer outside of the cell wall called the glycocalyx. This sticky coating of macromolecules protects the cell and helps it adhere to surfaces.
120. (a) Whales, Dolphins and Seals are aquatic mammals.
121. (d) Horse belongs to the Order Perissodactyla.
122. (c) Residual Volume is important because it prevents the lungs from collapsing. Even after expelling as much air as possible (expiratory reserve volume) gaseous exchange still occurs by residual volume in the lungs. It also prevents the inner surfaces of the lungs sticking together.
123. (b) Sperm capacitation refers to the physiological changes spermatozoa must undergo in order to have the ability to penetrate and fertilize an egg. It takes place in the female genital tract.
124. (c) The most abundant form of RNA is rRNA or ribosomal RNA because it's responsible for coding and producing all of the proteins in cells. rRNA is found in the cytoplasm of cells and is associated with ribosomes.
125. (d) Paneth cells produce large amounts of α -defensins and other antimicrobial peptides, such as lysozymes.
126. (a) Artificial insemination is suitable for fertilisation when the male is having very low sperm count.
127. (b) Frog's heart when taken out of the body continues to beat for sometime because it is myogenic and autoexcitable.
128. (c) Gonorrhoea – Neisseria
Syphilis – Treponema
Genital warts – Human papilloma virus
AIDS – HIV
129. (a) The genotypes of a husband and Wife are $I^A I^B$ and $I^A i$. Among the blood types of their children, 4 genotypes ($I^A I^A$, $I^A i$, $I^A I^B$, $I^A i$); 3 phenotypes (A, B and AB) are possible.
130. (b) The hepatic portal vein is a blood vessel that carries blood from the gastrointestinal tract, gallbladder, pancreas and spleen to the liver.
131. (c) Coconut fruit is a drupe.
132. (a) The vascular cambium gives rise to the secondary xylem.
133. (a) Choanocytes are flagellated cells with a collar of protoplasm at the base of the flagellum, which line the spongocoel sponges.
134. (a) Pre-molars are absent in deciduous teeth.

135. (d) Volvox is an example of colonial alga.

CHEMISTRY

ANSWER KEY:

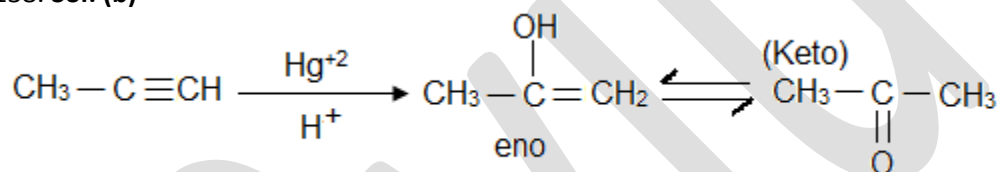
136. d	137. d	138. b	139. c	140. b	141. d	142. bqc	143. d	144. a	145. b
146. a	147. c	148. b	149. d	150. d	151. b	152. a	153. d	154. b	155. b
156. b	157. a	158. b	159. d	160. d	161. d	162. d	163. d	164. a	165. d
166. b	167. c	168. a	169. c	170. c	171. d	172. a	173. d	174. a	175. a
176. b	177. a	178. a	179. b	180. b					

SOLUTION:

136. **Sol: (d)** R – MgX is example for σ -bonded complex.

137. **Sol: (d)** Alkyne > Alkene > Alkane
 \because CH \equiv CH has two acidic hydrogens

138. **Sol: (b)**



139. **Sol: (c)** Sn⁺² gets oxidised to Sn⁺⁴ but Pb⁺⁴ should be reduce to Pb⁺²

140. **Sol: (b)** Smaller the ion, higher is the hydration.

141. **Sol: (d)** Conceptual
 ACC to VSEPR theory

142. **Sol: (b)(q) (c)**
 Frenkel defect is favoured for those small sized cations.

143. **Sol: (d)** When a catalyst is added the 'K_c' value doesn't change.

144. **Sol: (a)**

$$E_{cell}^o = E_{cell}^o - \frac{0.059}{n} \log \frac{[\text{Zn}^{+2}]}{[\text{Cu}^{+2}]}$$

$$= E_{cell}^o - \frac{0.06}{2} \log \frac{0.01}{1}$$

$$= E_{cell}^{\circ} + \frac{0.06}{2} \times 2 \log 10$$

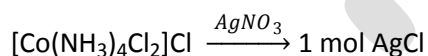
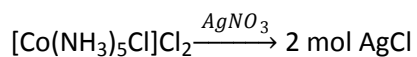
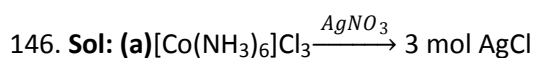
$$E_1 = E_{cell}^{\circ} + 0.06V$$

$$\text{But } E_2 = E_{cell}^{\circ} - \frac{0.06}{2} \log \frac{1}{10^{-2}}$$

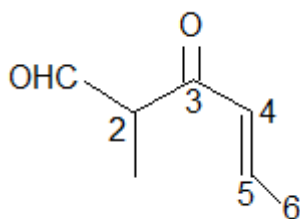
$$= E_{cell}^{\circ} - 0.06V$$

$$\therefore E_1 > E_2$$

145. Sol: (b) Conceptual

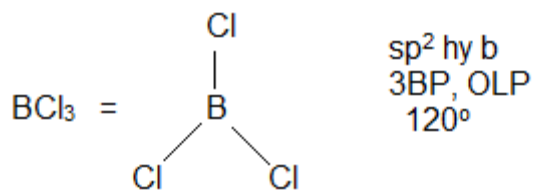


147. Sol: (c)



3 - keto - 2 Methyl but-4 - enal

148. Sol: (b)



149. Sol: (d) Eqn. (iii) $\times 3$ + eqn(ii) - eqn(i) will give

$$= \frac{K_2 K_3^3}{K_1}$$

150. Sol: (d) ' SO_2 ' can reduce $\text{KMnO}_4 \xrightarrow{\text{H}^+} \text{Mn}^{+2}$ g

(Pink)

151. **Sol: (b)** O-nitrophenol is more volatile due to intra molecular hydrogen bond152. **Sol: (a)** Since actinides have 5f, 6d, 7s levels having comparable energy.153. **Sol: (d)** Conceptual154. **Sol: (b)** From R.D.S

$$\text{Rate} = k[X][Y_2] \quad \dots\dots(1)$$

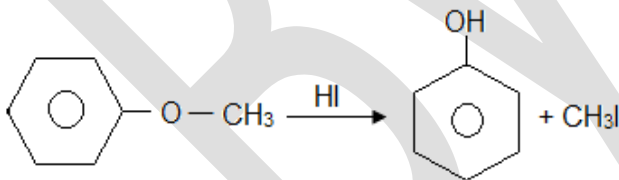
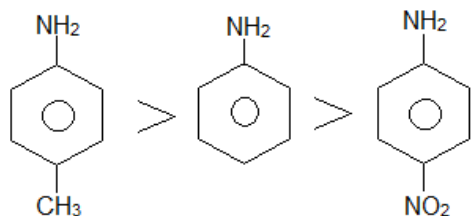
$$\text{From (i)} \quad K_{eq} = \frac{[X]^2}{[Y]^2} \quad \dots\dots(2)$$

Sub (2) in (1)

$$\text{Rate} = k_1[X_2]^{\frac{1}{2}} [Y_2]^1$$

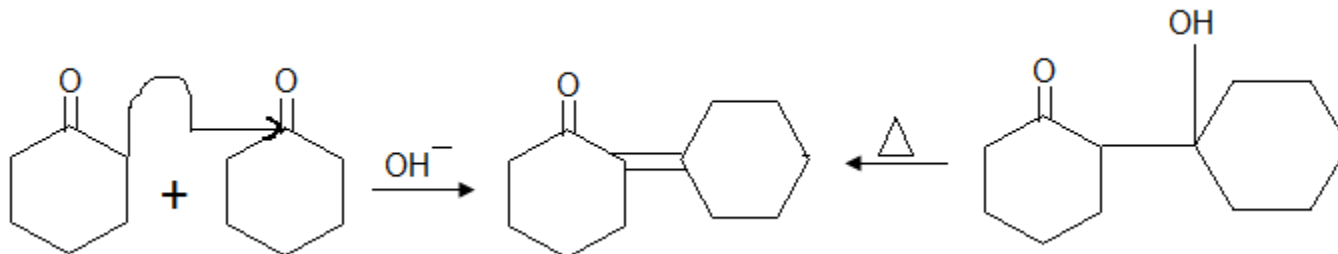
155. **Sol: (b)** ∴ Colligative property

$$\Delta T_f = K_f \times \text{molality}$$

If molality is doubled 'k_f' doesn't change156. **Sol: (b)** Conceptual157. **Sol: (a)**158. **Sol: (b)**159. **Sol: (d)** Conceptual160. **Sol: (d)** $M = \frac{n}{V}$

Temperature dependent

161. Sol: (d)



162. Sol: (d) Mixture of chloroxylenol and terpineol is – Dettol

163. Sol: (d) $\Delta G = \Delta H - T\Delta S$

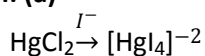
Reaction to be spontaneous

$$\Delta G = -ve$$

$$(i.e.) \Delta H < T\Delta S$$

$$\therefore T > \frac{\Delta H}{\Delta S} = \frac{35.5 \times 10^3}{83.6} > 42$$

164. Sol: (a)



165. Sol: (d)

$$t = \frac{2.303}{10^{-2}} \log \frac{20}{5}$$

$$= 2.303 \times 100 \log 4$$

$$= 2.303 \times 100 \times 0.6$$

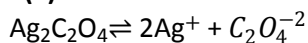
$$= 138.6 \text{ sec}$$

166. Sol: (b) 2, 4, 6- trinitrophenol (picric acid) is most acid

167. Sol: (c) A strong field ligand can make Δ_0 value

\therefore to promote the \bar{e} from t_{2g} to e_g level, light having high energy and low λ is required

168. Sol: (a)



$\therefore A_2B$ type salt

$$K_{sp} = 4s^3$$

$$\text{But } [\text{C}_2\text{O}_4^{2-}] = \frac{2.2 \times 10^{-4}}{2}$$

$$= 1.1 \times 10^{-4}$$

$$\therefore K_{sp} = [2.2 \times 10^{-4}]^2 [1.1 \times 10^{-4}]$$

$$= 5.3 \times 10^{-12} \text{ M}^3$$

169. **Sol: (c)** $\text{SrCO}_3(s) \rightarrow \text{SrO}(s) + \text{CO}_2(g)$

$$\therefore K_p = P_{(\text{CO})_2} = 1.6 \text{ atm}$$

$$\text{vol} = \frac{nRT}{P}$$

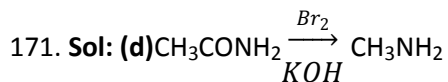
'n' is cast and

$$n = \frac{PV}{RT} = \frac{0.4 \times 20}{RT}$$

substituting 'n' value

$$V = 5\text{L}$$

170. **Sol: (c)** Happens through benzene mechanism



Hoffmann – bromamide synthesis

172. **Sol: (a)** Total no. of valence electrons are equal and both are linear.

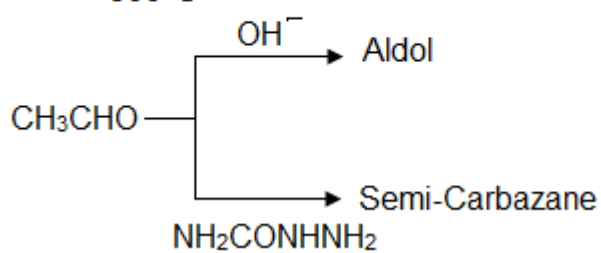
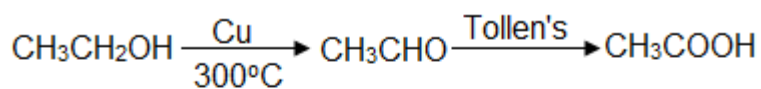
173. **Sol: (d)** Conceptual

174. **Sol: (a)** Both CN^- CO have bond order = 3.0

175. **Sol: (a)** $\Delta U = q + w$
 For adiabatic, $q = 0$,
 $\therefore \Delta U = w$
 $= -P\Delta V$
 $= -2.5 \times 2$
 $= -5 \text{ lit-atm}$
 $= -5 \times 101.3 \text{ J}$
 $= -506 \text{ J}$

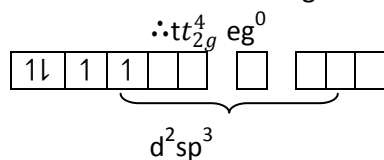
176. **Sol: (b)** Leaching of Ag, Au conceptual

177. **Sol: (a)**



178. Sol: (a) $\text{Mn}^{+3} \rightarrow [\text{Ar}] 3d^4$

CN^- is a strong field ligand



179. Sol: (b) Conceptual

180. Sol: (b) Conceptual