SOLUTIONS & ANSWERS FOR NEET 2018 VERSION – PP

[PHYSICS, CHEMISTRY & BIOLOGY]

PHYSICS

- An em wave is propagating in a medium with a 1. velocity -----
 - Ans: +z direction
 - Sol: Direction of EM wave is in the direction of $\overline{\mathsf{E}} \times \overline{\mathsf{B}}$
- 2. The refractive index of the material of a prism is
 - Ans: 45°

Sol:



iumphant Int gement Edur 3. The magnetic potential energy stored in a certain inductor -----

Sol:
$$U = \frac{1}{2}LI^{2}$$
$$25 \times 10^{-3} = \frac{1}{2}L \times (60 \times 10^{-3})^{2}$$
$$25 \times 10^{3} = \frac{1}{2} \times L \times 36 \times 10^{-4}$$
$$L = \frac{5(\times 10^{-3})}{36 \times 10^{-4}}$$
$$= 13.89 \text{ H}$$

4. An object is placed at a distance of 40 cm from a concave mirror of focal -----

Ans: 36 cm away from the mirror

Sol:
$$u_1 = -40$$

 $f = -15$

 $\frac{1}{v_1} + \frac{1}{-40} = \frac{1}{-15}$ $v_1 = -24$ cm $u_2 = -20$ $\frac{1}{v_2} - \frac{1}{20} = -\frac{1}{15}$ $v_2 = -60 \text{ cm}$ Displacement of image = 36 cm away from

5. In the combination of the following gates the output -----

Ans: $A \bullet \overline{B} + \overline{A} \bullet B$

So

mirror.

6. In the circuit shown in the figure, the input voltage -----

Ans :
$$I_B = 40 \ \mu A$$
, $I_C = 5 \ mA$, $\beta = 125$

I:
$$I_B = \frac{20}{R_B} = \frac{20}{500 \times 10^3}$$

= $4 \times 10^{-5} A$
= $40 \times 10^{-6} A$
= $40 \mu A$
 $I_C = \frac{20}{R_C} = \frac{20}{4 \times 10^3}$
= $5 \times 10^{-3} A$
= $5 mA$
 $\beta = \frac{I_C}{I_B} = \frac{5 \times 10^{-3}}{40 \times 10^{-6}}$
= 0.125×10^3
= 125

- 7. In a p-n junction diode, change in -----
 - Ans : affects the overall V - I characteristics of p-n junction



8. A small sphere of radius r falls from rest in a viscous -----

Ans: r⁵

- Sol: When sphere gains terminal velocity no change in kinetic energy. Work done per unit time by gravity is equal to rate of heat production = mgv_T $= \frac{4\pi r^3 g}{3} \times \frac{2r^2 g(p - \sigma)}{9n}$ $\propto r^5$
- 9. A sample of 0.1 g of water at 100 °C and normal
 - Ans: 208.7 J
 - Sol: $W = p\Delta V$ = 1 × 10⁵ × 167 × 10⁻⁶ \cong 16.7 J Q = 54 × 4.2 \cong 227 $\Delta V = Q - W$ = 227 - 16.7 \cong 209
- **10.** Two wires are made of the same material and have the same volume. -----
 - Ans: 9 F

Sol:
$$Y = \frac{\overline{A}}{\frac{\Delta \ell}{\ell}}$$
$$\Rightarrow \Delta \ell = \frac{F\ell}{AY} = \frac{FV}{A^2Y}$$
$$F \propto \Delta \ell A^2$$
$$F_1 \propto \Delta \ell A^2$$
$$F_2 \propto \Delta \ell \ 9A^2$$
$$F_2 = 9F_1$$

F

11. The power radiated by a black body is P and it radiates -----

riumph

Ans :
$$\frac{256}{81}$$

Sol: $\lambda T = Constant$ $\lambda_0 T = \frac{3}{4}\lambda_0 T'$ $T' = \frac{4}{3}T$ $P_1 \propto T^4$ $P_2 \propto \frac{4^4}{2^4}T^4$

$$\frac{P_2}{P_1} = \frac{256}{81}$$

12. A set of `n' equal resistors, of value `R' each, are connected -----

Ans: 10 Sol: I = $\frac{E}{nR+R}$ I' = $\frac{E}{\frac{R}{n}+R} = \frac{nE}{R+nR} = 10I$ n = 10

13. A battery consists of a variable number `n' of identical -----



14. A carbon resistor of (47 \pm 4.7) k Ω is to be marked -----

 $\mathsf{Ans}:\quad \mathsf{Yellow} \to \mathsf{violet} \to \mathsf{orange} \to \mathsf{silver}$

- Sol: Yellow $\rightarrow 4 \rightarrow$ first digit violet $\rightarrow 7 \rightarrow$ second digit Orange $\rightarrow 3 \rightarrow$ multiplier Silver $\rightarrow 10\%$
- 15. Which one of the following statements is -----
 - Ans : Coefficient of sliding friction has dimensions of length
 - Sol: Theoretical
- **16.** A moving block having mass m, collides with another stationary -----

Ans : 0.25

Sol: $mv = 4mv' \Rightarrow v' = \frac{v}{4}$ Velocity of approach = v Velocity of separation = $\frac{v}{4}$

$$e = \frac{|\text{velocity of separation}|}{|\text{velocity of approach}|}$$
$$= \frac{v}{4} \cdot \frac{1}{v} = 0.25$$

17. A body initially at rest and sliding along a frictionless ------



18. Three objects, A: (a solid sphere), B : (a thin circular disk) ------

Ans :
$$W_C > W_B > W_A$$

Sol: KE:

$$A = \frac{1}{2} \frac{2}{5} mR^2 \omega^2 = 0.4 \left(\frac{1}{2} mR^2 \omega^2\right)$$
$$B = \frac{1}{2} \frac{1}{2} mR^2 \omega^2 = 0.5 \left(\frac{1}{2} mR^2 \omega^2\right)$$
$$C = \frac{1}{2} mR^2 \omega^2 = 1 \left(\frac{1}{2} mR^2 \omega^2\right)$$
$$W_C > W_B > W_A$$

19. A tuning fork is used to produce resonance in a glass tube -----

 339 m s^{-1} Ans :

- $\frac{\lambda}{2} = 73 20 = 53$ cm Sol: $\lambda = 53 \times 2 \text{ cm}$ = 1.06 m $v=\upsilon\lambda$ = 320 × 1.06 $= 339 \text{ m s}^{-1}$
- 20. An electron falls from rest through a vertical distance -----

Ans : smaller
Sol:
$$F = eE$$

 $ma = eE$
 $a = \frac{eE}{m}$
 $t = \sqrt{\frac{2h}{a}}$
 $t = \sqrt{\frac{2hm}{eE}}$
 $t \propto \sqrt{m}$

Sol:

21. A pendulum is hung from the roof of a sufficiently high -----

Ans : πs Sol: $x = A \sin \omega t$ $5 = A \sin \omega t$ $|a| = A\omega^2 \sin\omega t$ $20 = \omega^2 A \sin \omega t$ $20 = \omega^2 \times 5$ $\omega = \sqrt{4} = 2$ $T = \frac{2\pi}{2} = \pi s$

- 22. The electrostatic force between the metal -----
 - independent of he distance between the Ans : plates.

Sol: Force between plates =
$$\frac{\theta^2}{2\epsilon_0}$$

23. An electron of mass m with an initial velocity -----

Ans:
$$\frac{\lambda_0}{1+\frac{eE_0t}{mv_0}}$$

Sol:

$$v = v_{0} + \frac{eE_{0}t}{m}$$

$$\lambda = \frac{h}{mv_{0} \left[1 + \frac{eE_{0}t}{mv_{0}}\right]}$$

$$\frac{\lambda}{\lambda_{0}} = \frac{h}{mv_{0} \left[1 + \frac{eE_{0}t}{mv_{0}}\right]} \times \frac{mv_{0}}{h}$$

$$\lambda = \frac{\lambda_{0}}{1 + \frac{eE_{0}t}{mv_{0}}}$$

- 24. For a radioactive material half-life is 10 minutes -
 - Ans: 20
 - Sol: No. of nucleus left after 10 m is 300 After 20 m is 150. i.e. 450 Nuclei disintegrated and the time taken is 20 min
- **25.** When the light of frequency $2\upsilon_0$ (where υ_0 -----
 - Ans: 1:2

Sol:
$$h(2v_0 - v_0) = \frac{1}{2}mv_1^2$$

 $h(5v_0 - v_0) = \frac{1}{2}mv_2^2$
 $\frac{v_1^2}{v_2^2} = \frac{1}{4}$
 $\frac{v_1}{v_2} = \frac{1}{2}$

- 26. The ratio of kinetic energy to the total energy of an -----
 - Ans: 1:-1
 - Sol: KE = -TE $\frac{KE}{TE} = \frac{1}{-1} = 1:-1$
- 27. The moment of the force -----

Ans:
$$-7\hat{i}-4\hat{j}-8\hat{k}$$

Sol:
$$F = 4\hat{i} + 5\hat{j} - 6\hat{k}$$
$$\bar{r} = \bar{r}_2 - \bar{r}_1 = 2\hat{j} - \hat{k}$$
$$\tau = \bar{r} \times \overline{F}$$
$$\tau = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 2 & -1 \\ 4 & 5 & -6 \end{vmatrix}$$
$$\tau = -7\hat{i} - 4\hat{j} - 8\hat{k}$$

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28. A block of mass m is placed on a smooth inclined wedge -----

Ans : $a = g \tan \theta$



For the block to remain stationary ma $\cos\theta = mg \sin\theta$ a = g $tan\theta$

29. A toy car with charge q moves on a frictionless horizontal -----

Ans: 1 m /s, 3 m/s

Sol:

$$\begin{array}{c}
 u = 0 S_1 & 6 & 0 \\
 A & t = 1 S & B & t = 1 S & 0 \\
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$$\begin{split} \overline{v}_{(av)} &= \frac{Total \ displacement}{Total \ time} \\ S_1 &= \frac{1}{2} \times 6 \times 1^2 = 3 \ m \\ \overline{v}_{av} &= \frac{3}{3} = 1 \ m \ s^{-1} \\ v_{ave} &= \frac{S_1 + 2S_2}{3} \\ v_{ave} &= \frac{9}{3} = 3 \ m \ s^{-1} \end{split}$$

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1 s

- **30.** A student measured the diameter of a small steel ball -----
 - Ans: 0.529 cm
 - Sol: $S = MSR + (HSR \times LC) \pm error$ $S = 5 + (25 \times 0.01) + 0.04$ When error is -ve correction is +ve
- **31.** Unpolarised light is incident from air on a plane surface -----
 - Ans : Reflected light is polarised with its electric vector perpendicular to the plane of incidence.
 - Sol: Conceptual

- 32. In Young's double slit experiment the separation d between -----
 - Ans : 1.9 mm

Sol:

$$\theta = \frac{2\lambda}{d}$$

$$\theta_1 = \frac{2\lambda}{d_1}$$

$$\theta_2 = \frac{2\lambda}{d_2}$$

$$\frac{\theta_1}{\theta_2} = \frac{0.2}{0.21} = \frac{d_2}{d_1}$$

$$\frac{20}{21} = \frac{d_2}{2 \times 10^{-3}}$$

$$d_2 = 1.9 \text{ mm}$$

- 33. An astronomical refracting telescope will have large ----
 - large focal length and large diameter Ans :
 - Sol: Conceptual
- 34. The volume (V) of monoatomic gas varies with its -----
 - 2 5 Ans :
 - Sol: dW = pdV = RdT $dQ = \dot{C}_p dT$ dW RdT CpdT dQ dW R $\frac{\overline{5}}{2}R$ dQ $=\frac{2}{5}$
- 35. The fundamental frequency in an open organ pipe -----
 - Ans : 13.2 cm

 $n_0 = \frac{v}{2\ell_0}$ Sol: $n_{c} = \frac{3v}{4\ell_{c}}$ $n_0 = n_c$ $\frac{\alpha}{2\ell_0} = \frac{3\alpha}{4\ell_c}$ $\ell_0 = \frac{40}{3} = 13.3$ ≈ 13.2 cm

36. The efficiency of an ideal heat engine working -----

Sol:
$$\eta = \frac{T_1 - T_2}{T_1} \times 100$$

= $\frac{373 - 273}{373} \times 100$
= 26.8%

37. At what temperature will the rms speed of oxygen -----

 $8.360 \times 10^4 \text{ K}$ Ans :

Sol:
$$v_e^2 = \frac{3K_bT}{M}$$

 $T = \frac{v_e^2 \times M}{3k_b}$
 $T = \frac{(11.2)^2 \times 10^6 \times 2.76 \times 10^{-26}}{3 \times 1.38 \times 10^{-23}}$
 $T = 8.360 \times 10^4 \text{ K}$

38. A metallic rod of mass per unit length of 0.5 kg m⁻¹ -----....

Ans : = 11.32 A
Sol: Magnetic force
F = mg sin
$$\theta$$

 $i\ell B \cos \theta$ = mg sin θ
 $i = \frac{mg \sin \theta}{\ell B \cos \theta}$
 $= \frac{0.5 \times 10 \times 0.577}{0.25}$
= 11.32 A

Ans: 0.79 W

Triumphant emented 39. An inductor 20 mH, a capacitor 100 μF and a resistor -----

Sol: Power loss =
$$\frac{V_{rms}^2}{Z} \cos \phi$$

= $\frac{V_{rms}^2}{Z} \frac{R}{Z}$
= $\frac{\left(\frac{10}{\sqrt{2}}\right)^2 \times 50}{R^2 + \left(\frac{1}{C\omega} - \omega L\right)^2}$
= $\frac{2500}{50^2 + \left(\frac{1}{100 \times 10^{-6} \times 314} - 314 \times 20 \times 10^{-3}\right)^2}$

$$= \frac{2500}{2500 + 676} = \frac{2500}{3176}$$
$$= 0.79 \text{ W}$$

- **40.** A thin diamagnetic rod is placed vertically between the poles -----
 - Ans : The induced electric field due to the changing magnetic field.
 - Sol: When the current in the electromagnet is switched on, emf is induced due to change in magnetic field
- **41.** Current sensitivity of a moving coil galvanometer is -----
 - Ans : 250Ω
 - Sol: Current sensitity, $I_S = \frac{\phi}{I} = \frac{NAB}{K}$ Voltage sensitivity, $V_S = \frac{\phi}{V} = \frac{NAB}{KR}$ Resistance of the galvanometer, $R = \frac{I_S}{V_S} = \frac{5 \text{ div} / \text{mA}}{20 \text{ div} / V}$ $= 250 \Omega$
- **42.** If the mass of the Sun were ten times smaller and the universal -----
 - Ans : `g' on the Earth will not change
 - Sol: Acceleration due to gravity, $g = \frac{GM}{R^2}$ will change if G changes.
- **43.** A solid sphere is in rolling motion. In rolling motion -----
 - Ans: 5:7

$$K_{t} + K_{r} = \frac{1}{2}mv^{2} \left[1 + \frac{K^{2}}{R^{2}} \right]$$
$$\frac{K_{t}}{K_{t} + K_{r}} = \frac{1}{1 + \frac{K^{2}}{R^{2}}}$$
$$= \frac{1}{1 + \frac{2}{5}\frac{R^{2}}{R^{2}}}$$

 $K_t = \frac{1}{2}mv^2$

$$\therefore \quad K^2 = \frac{2R^2}{7} \text{ for solid sphere}$$
$$= 5:7$$

44. The kinetic energies of a planet in an elliptical orbit -----

Ans :
$$K_A > K_B > K_C$$

- Sol: mvr = constant vr = constant $r_A < r_B < r_C$ $v_A > v_B > v_C$ $K_A > K_B > K_C$
- **45.** A solid sphere is rotating freely about its symmetry -----

Ans : Angular momentum

Sol: Conceptual

CHEMISTRY

46. A mixture of 2.3 g of formic acid and 4.5 g oxalic acid is ----

Ans: 2.8

Sol: HCOOH
$$\xrightarrow{\text{conc.H}_2SO_4}$$
 $\xrightarrow{\text{CO}}$ $\xrightarrow{\text{CO}}$ $+$ H₂O
 $\stackrel{\text{COOH}}{\stackrel{\text{conc.H}_2SO_4}{\stackrel{\text{conc.H}$

 CO_2 is absorbed by KOH pellets Number of moles of CO formed = 0.1 ∴ Weight of CO formed = 2.8 g

- **47.** Nitration of aniline in strong acidic medium also gives mnitroaniline ----
 - Ans: In acidic (strong) medium aniline is present as anilinium ion
 - Sol: In acidic medium, aniline exists as $C_6H_5 \overset{\oplus}{N}H_3 = \overset{\oplus}{N}H_3$ is deactivating and meta directing
- **48.** Which of the following oxides is most acidic in nature? ----

Ans: BeO

Sol: Down the group, acidic character of oxides decreases

- **49.** The difference between amylose and amylopectin is ----
 - Ans: Amylopectin have 1 \rightarrow 4 α -linkage and 1 \rightarrow 6 α -linkage
 - Sol: Amylopectin is a branched chain polymer of α -D-glucose in which chain is formed by C1-C4 linkage whereas branching occurs by C1-C6 linkage
- **50.** Regarding cross-linked or network polymers, which of the following----
 - Ans: They contain strong covalent bonds in their polymer chains

Sol:

51. In the reaction + CHCl₃+ NaOH $\rightarrow ----$

OH

- Ans: dichlorocarbene (:CCl₂)
- Sol: Electrophile involved in Reimer-Tiemann reaction is dichlorocarbenes
- 52. Carboxylic acids have higher boiling point ----
 - Ans: formation of intermolecular H-bonding
 - Sol: Very strong intermolecular H-bonding is formed in carboxylic acids
- 53. Compound A, C₈H₁₀O, is found to react---

Ans: $-CH-CH_3$ and I_2

- Sol: Compounds containing CH₃–CHOH group give yellow precipitate of iodoform
- **54.** The correct difference between first and second order----
 - Ans: the half-life of a first-order reactions does not depend on $[A]_0$; the half-life of a second-order reactions does depend on $[A]_0$

Sol:
$$t_{1/2} \propto \frac{1}{[R]_0^{n-1}}$$

- 55. Among CaH₂, BeH₂, BaH₂, ----
 - Ans: $BeH_2 < CaH_2 < BaH_2$
 - Sol: Down the group ionic character of hydrides increases

56. Consider the change in oxidation state ----

Ans: HBrO

Sol:
$$\begin{array}{ll} HBrO \rightarrow BrO_3^- + Br_2 \\ +1 & +5 & 0 \\ E_{cell} = E_{cathode} - E_{anode} \\ = 1.595 - 1.5 \\ = 0.095 \\ E_{cell} \text{ is positive and the cell reaction is} \\ \text{spontaneous} \end{array}$$

57. In which case is the number of molecules ----

Ans: 18 mL of water

- Sol: 18 mL water 1 mole 0.18 g water – 0.01 mole 0.00224 L water – 10⁻⁴ mol
- **58.** Magnesium reacts with an element (X) to form ----
 - Ans: Mg₃X₂
 - Sol: Element X is nitrogen. Therefore the formula of the compound Mg_3X_2
- **59.** Iron exhibits bcc structure at room temperature ----



- 60. Which one is the wrong statement ----
 - Ans: The electronic configuration of N atom is

_1s ²	2s ²	2 _ 2p	1 2p	$^{1}_{v} 2p_{z}^{1}$
11	4	1	1	· /

- Sol: The configuration violates Hund's rule
- 61. Consider the following species: ----

Ans: CN⁻

62. Which of the following statements is not true ----

Ans: All are oxidising agents

- Sol: I2 cannot act as an oxidising agent
- 63. Which one of the following elements ----

Ans: B

- Sol: The maximum covalency of boron is 4
- 64. In the structure of CIF_3 the number of ----

Ans: two

- Sol: $CIF_3 sp^3 d$ hybridisation 3 bp and 2 lp
- 65. Consider Ellingham diagram, which of ----
 - Ans: Mg
 - Sol: According to Ellingham diagram, Mg can reduce Al₂O₃ below 1350°C
- 66. The correct order of atomic radii in group 13 ----
 - Ans: B < Ga < AI < In < TI
 - Sol: The atomic radii of group 13 elements are B – 88 pm Al – 143 pm Ga – 135 pm In – 167 pm TI – 170 pm
- 67. The correct order of N compounds in its ---
 - Ans: HNO3, NO, N2, NH4CI
 - Sol: The oxidation state of N is HNO₃ \rightarrow +5 NO \rightarrow +2 N₂ \rightarrow 0 NH₄Cl \rightarrow -3
- **68.** On which of the following properties does coagulating ----
 - Ans: Both magnitude and sign of the charge the ion
 - Sol: Coagulating power of an ion depends on both magnitude and sign of the charge on the ion
- 69. Following solution were prepared by mixing ----

Ans: c

Sol:
$$[H^+] = \frac{75 \times 0.2 - 25 \times 0.2}{100}$$

$$=\frac{15-5}{100}=0.1$$

∴ pH = 1

70. The solubility of BaSO₄ in water ----

Sol:
$$S = \frac{2.42 \times 10^{-3}}{233} \cong 10^{-5}$$

 $\therefore K_{sp} = S^2 = 10^{-10}$

71. Given vander Waals constant for NH₃ ----

Ans: NH₃

- Sol: Higher the value of a, vander Waal's constant, greater will be the attraction and easier the liquefaction
- 72. The compound A on treatment with Na ----
 - Ans: C₂H₅OH, C₂H₅ONa, C₂H₅CI

Sol:
$$C_2H_5OH \xrightarrow{PCl_5} C_2H_5ONa$$

- 73. Hydrocarbon (A) reacts with bromine by ----
 - Ans: CH₄

Sol:
$$CH_4 \xrightarrow[h_0]{Br_2} CH_3Br \xrightarrow[dry ether]{Na} CH_3 - CH_3$$

- 74. The compound C₇H₈ undergoes the ----
 - Ans: m-bromotoluene



75. Which oxides of nitrogen is not a common ----

Ans: N₂O₅

Sol:

- 76. For the redox reaction ----
 - Ans: 2 5 16
 - Sol: $2MnO_4^- + 5C_2O_4^{2-} + 16H^+ \longrightarrow 2Mn^{2+} + 10CO_2 + 8H_2O_2$
- 77. Which one of the following conditions will favour ----
 - Ans: Low temperature and high pressure
 - Sol: Reaction is exothermic and Δn_g is negative. Hence low temperature and pressure favours the forward reaction
- 78. The correction factor 'a' to the ideal gas ----
 - Ans: forces of attraction between the gas molecules
 - Sol: 'a' is the measure of the attraction between the gas molecules
- 79. When initial concentration of the reactant ----
 - Ans: is doubled
 - Sol: $t_{1/2}$ of a zero order reaction is directly proportional to the initial concentration of the reaction
- **80.** The bond dissociation energies of X_2 , Y_2 and XY ----

Ans: 800 kJ mol⁻¹

Sol:
$$\frac{1}{2} X_2 + \frac{1}{2} Y_2 \rightarrow XY_x$$
$$-200 = \frac{x}{4} + \frac{x}{2} - x$$
$$-200 = \frac{-x}{4}$$
$$x = 800$$

81. Identify the major product P, Q and R ----





82. Which of the following compounds ----

Ans: Glycine

Sol: $H_2N - CH_2 - COOH \implies$ glycine

$$H_3 \overset{\oplus}{N} - CH_2 - COO^{\Theta}$$

- 83. The type of isomerism shown by ----
 - Ans: Geometrical isomerism
 - Sol: [CoCl₂(en)₂] can exists as cis and trans isomers
- 84. Which one of the following ions exhibit ----

Ans: MnO₄²⁻

- Sol: The oxidation state of Mn in MnO_4^{2-} is 6. \therefore It has d' configuration
- 85. The geometry and magnetic behaviour of ----
 - Ans: tetrahedral geometry and diamagnetic
 - Sol: In Ni(CO)₄, the central atom Ni is sp³ hybridised with d¹⁰ configuration. Hence the geometry is tetrahedral and is diamagnetic in nature
- **86.** Iron carbonyl, Fe(CO)₅ is ----
 - Ans: mononuclear
 - Sol: Fe(CO)₅ is mononuclear
- 87. Match the metal ions given in column I ----

Ans: (iv), (v), (ii) (i)

 $\begin{array}{ll} \mbox{Sol:} & \mbox{Co}^{3+} \rightarrow d^6 - 4 \mbox{ unpaired } e^-s \\ & \mbox{Cr}^{3+} \rightarrow d^3 - 3 \mbox{ unpaired } e^-s \\ & \mbox{Fe}^{3+} \rightarrow d^5 - 5 \mbox{ unpaired } e^-s \\ & \mbox{Ni}^{2+} \rightarrow d^8 - 2 \mbox{ unpaired } e^-s \end{array}$

88. Which of the following is correct with respect to -I effect ----

Ans:
$$-NH_2 < OR < F \& NR_2 < OR < F$$

Sol:

89. Which of the following carbocations is ----



- Sol: In the carbocation (3), no resonance structure bearing positive charge on carbon is possible. So it is the most stable
- 90. Which of the following molecules represents ----
 - Ans: $CH_2=CH-C\equiv CH$
 - Sol: $CH_2 = CH_{sp^2} = CH_{sp} = CH_{sp}$

BIOLOGY

- 91. The experimental proof for semiconservative
 - Ans: Bacterium
 - Sol: *Escherichia coli* (bacterium) is first used to show semi-conservative replication of DNA
- **92.** Select the correct statement: (1) Franklin Stahl
 - Ans: Punnett square was developed by a British scientist.
 - Sol: British geneticist, Reginald C. Punnett developed Punnett square
- 93. Offsets are produced by
 - Ans: Mitotic divisions
 - Sol: Offsets are lateral branches seen in water hyacinth. It forms by mitosis
- **94.** Which of the following pairs is wrongly matched?
 - Ans: Starch synthesis in pea : Multiple alleles
 - Sol: Starch synthesis in Pea exhibit single gene effect known as pleiotropy

- **95.** Which of the following flowers only once in its
 - Ans: Bamboo species
 - Sol: Bamboo species flowers only once in the life-time, hence known as monocarpic.
- 96. Select the correct match:
 - Ans: Francois Jacob and Jacques Monod – Lac operon
 - Sol: Francois Jacob and Jacques Monod proposed lac operon in *Escherichia coli.*
- **97.** Which of the following has proved helpful in
 - Ans: Sporopollenin
 - Sol: Sporopollenin is present in the exine of pollen grain. It is the most resistant substance, hence pollens are preserved as fossils.
- **98.** Stomatal movement is not affected by
 - Ans: O₂ concentration
 - Sol: Oxygen concentration does not affect the stomatal movement.
- 99. The stage during which separation of
 - Ans: Diplotene

Sol:

- Separation of homologous chromosomes, after crossing over, starts in diplotene stage.
- **100.** The two functional groups characteristic
 - Ans: Carbonyl and hydroxyl
 - Sol: Hydroxyl and carbonyl groups of sugars are functional.
- **101.** Which of the following is not a product of
 - Ans: NADH
 - Sol: NADH is formed in glycolysis and Krebs' cycle.
- **102.** Stomata in grass leaf
 - Ans: Dumb-bell shaped
 - Sol: Grass leaf (Monocot) stomata are of dumb-bell shaped.

- **103.** Which among the following is not a prokaryote?
 - Ans: Saccharomyces
 - Sol: Saccharomyces (yeast) is unicellular fungus and belongs to eukaryote
- **104.** Which of the following is true for nucleolus
 - Ans: It is a site for active ribosomal RNA synthesis.
 - Sol: rRNA synthesis takes place at nucleolus.
- 105. The Golgi complex participate in
 - Ans: Formation of secretory vesicles
 - Sol: Secretory vesicles are formed from Golgi apparatus.
- **106.** In stratosphere, which of the following

Ans: Cl

- Sol: Active CI formed from CFCs acts as calalysts in the degradation of O_3 and release molecular oxygen.
- **107.** Which of the following is a secondary pollutant?
 - Ans: O₃
 - Sol: O₃ is secondary pollutant and mainly seen in photochemical smog.
- 108. Niche is
 - Ans: The functional role played by the organism where it lives.
 - Sol: Niche provides functional role and nutrients to an organism.
- **109.** Natality refers to
 - Ans: Birth rate
 - Sol: Natality is births which are added to the initial density.
- **110.** What type of ecological pyramid would
 - Ans: Inverted pyramid of biomass
 - Sol: The give that data in grams and increasing from the primary producer to the secondarv consumer through primarv consumer and results inverted pyramid of biomass

111. World Ozone Day

Ans: 16th September

- Sol: World Ozone Day is celebrated on 16th September.
- **112.** Which of the following is commonly used as

Ans: Retrovirus

- Sol: Retrovirus is used as a vector in animals to introduce foreign DNA
- **113.** In India, the organization responsible
 - Ans: Genetic Engineering Appraisal Committee (GEAC)
 - Sol: GEAC will make decisions regarding the validity of GM organisms
- **114.** A 'new' variety of rice was patented by a foreign
 - Ans: Basmati
 - Sol: Basmati was grown in India for a long time.
- **115.** Select the correct match: (1) Ribozyme – Nucleic acid
 - Ans: Ribozyme Nucleic acid
 - Sol: RNA with catalytic activity is called Ribozyme
- **116.** Use of bioresources by multinational companies
 - Ans: Biopiracy
 - Sol: Use of bioresources by multinational companies without authorisation is biopiray.
- **117.** The correct order of steps in Polymerase Chain
 - Ans: Denaturation, Annealing, Extension
 - Sol: The correct of order of steps is denaturation, annealing and extension
- **118.** Secondary xylem and phloem in dicot stem are
 - Ans: Vascular cambium
 - Sol: Secondary xylem and phloem produced from vascular cambium

119. Pneumatophores occur in

Ans:	Halophytes
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- Sol: Pneumatophores are negatively geotropic roots produced in halophytes
- 120. Sweet potato is a modified
 - Ans: Adventitious roots
 - Sol: Adventitious roots are modified for storage of food in sweet potato
- 121. Which of the following statements is correct? (1) Ovules are not enclosed
 - Ans: Ovules are not enclosed by ovary wall in gymnosperms.
 - Sol: Salvinia is heterosporous
- 122. Select the wrong statement
 - Pseudopodia are locomotory and Ans: feeding structures in Sporozoans.
 - Sol: Pseudopodia are locomotory structures in amoeba
- 123. Casparian strips occur in
 - Ans: Endodermis
 - Sol: Casparian strips are present in endodermal wall
- 124. Plants having little or no
 - Ans: Grasses
 - Sol: Grasses are monocots
- 125. Which one is wrongly matched?
 - Ans: Uniflagellate gametes Polysiphonia
 - Sol: Polysiphonia is a red algae, flagella is absent
- 126. Match the items given in column I with
 - Ans: (a) - (iii), (b) - (iv), (c) - (i), (d) - (ii)
 - Sol: Keys contain dissimilar characters
- 127. Winged pollen grains are present in
 - Ans: Pinus
 - Sol: Pollen grains are winged in Pinus
- 128. After karyogamy followed by
 - Agaricus Ans:

- Sol: Spores are exogenously produced in basidiomycetes
- 129

129.	What is the role of NAD+		
	Ans:	It functions as an electron carrier	
	Sol:	NAD+ acts as an electron carrier	
130.	Oxygen i	s not produced during	
	Ans:	Green sulphur bacteria	
	Sol:	Green sulphur bacteria release sulphur	
131.	Pollen grains can be stored for several		
	Ans:	–196°C	
	Sol:	It is stored by cryopreservation	
132.	In which of the following forms is iron		
	Ans:	Ferric	
	Sol:	Plants obtain iron in the form of ferric ions	
133.	Double fertilisation is		
	Ans:	Syngamy and triple fusion	
	Sol:	Double fertilization is a process that takes place only in angiosperms	
134.	Which of the following elements is responsible		
	Ans:	Potassium	
69,	Sol:	Potassium involved in closing and opening of stomata.	
135.	Which one of the following plants shows		
	Ans:	Yucca	
	Sol:	Yucca and moth shows a mutual relationship to complete its life cycle.	
136.	Hormones secreted by		
	Ans:	hCG, hPL, progestogens, estrogens	
	Sol:	Protactin, oxytocin and glucocorticoids are not the hormones of placenta.	
137.	The cont	The contraceptive 'SAHELI'	

Blocks estrogen receptors in the Ans: uterus, preventing eggs from getting implanted.

- Sol: Saheli prevents implantation through localised action at the uterine environment.
- **138.** The difference between spermatogenesis
 - Ans: In Spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.
 - Sol: Spermiogenesis is the transformation of spermatid to spermatozoa. In spermiation sperms are released from sertoli cells
- **139.** The amnion of mammalian embryo
 - Ans: Ectoderm and mesoderm
 - Sol: Amnion is derived from ectoderm and mesoderm
- **140.** In the a growing population of a country
 - Ans: pre-reproductive individuals are more than reproductive individuals.
 - Sol: In growing population prereproductive individuals are more than reproductive individuals
- **141.** All of the following are included in 'ex-situ
 - Ans: Sacred groves
 - Sol: Sacred groves are insite conservation
- **142.** Which part of poppy plant
 - Ans: Latex
 - Sol: Smack is obtained from the latex of poppy plant
- 143. Match the item given in column I with those
 - Ans: iii iv i ii
 - Sol: UV-B radiation causes snow blindness.
- **144.** Which one of the following population
 - Ans: Amensalism
 - Sol: One is harmed and the other is neither benefited nor harmed.
- **145.** Which of the following events does not occur in rough
 - Ans: Phospholipid synthesis

Sol: RER is involved in protein synthesis

- 146. Which of the statements is incorrect?(1) Enzyme of TCA
 - Ans: Oxidative phosphorylation takes place in outer mitochondrial membrane
 - Sol: Oxidative phosphorytation takes place in the inner mitochondrial membrane
- 147. Many ribosomes may associate with
 - Ans: Polysome
 - Sol: Many ribosomes are associated with single mRNA in polyribosome or polysome
- 148.
 Select the incorrect match:

 (1)
 Lampbrush Diplotene bivalents
 - Ans: Polytene Oocytes of amphibians chromosomes.
 - Sol: Polytene chromosomes are reported from salivary glands of diptera
- 149. Nissl bodies are
 - Ans: Free ribosomes and RER
 - Sol: Nissl bodies are composed of RER
- **150.** Which of the following terms describe
 - Ans: Thecodont, Diphyodont, Heterodont
 - Sol: Human dentition is thecodont, diphyodont and heterodont
- **151.** Match the items in (a) Glycosuria (i) Accumulation of

Ans: iv i ii iiii

- Sol: Both columns correctly matched in option 4
- 152. Match the items (a) Ultrafiltration (i) Henle's loop
 - Ans: iv i ii iii
 - Sol: Both columns correctly matched in option 2
- 153. The similarly of bone structure
 - Ans: Homology

- Sol: Homologous structurally similar, functionally different found in related organisms
- **154.** Which of the following is not an autoimmune
 - Ans: Alzheimer's disease
 - Sol: Recently Alzheimer's disease is also considered as auto immune disease
- 155. Among the following sets of examples for
 - Ans: Eye of octopus, bat and man
 - Sol: Eye of octopus, bat and man are examples of analogous organs (convergent evolution)
- **156.** Which of the following characteristics represent 'Inheritance of blood
 - Ans: a, b and c
 - Sol: $I^A > i$ $I^A = I^B$
- 157. In which disease does mosquito transmitted
 - Ans: Elephantiasis
 - Sol: Elephantiasis is caused by the filarial worm Wucherenia bancrofti
- **158.** Conversion of milk to curd improves its
 - Ans: Vitamin B₁₂
 - Sol: Curd is the main source of cobalamin Vit. B12
- **159.** Which of the following is an amino acid derived
 - Ans: Epinephrine
 - Sol: Epirephrine is derived from amino acid tyrosine
- 160. Which of the following structures or regions(1) Medulla oblongata Controls
 - Ans: Limbic System: Consists of fibre tracts that interconnect different regions of brain; controls movement.
 - Sol: Limbic system is involved in regulation of sexual behaviour, excitement, rage pleasure, etc.
- **161.** Which of the following hormones can play
 - Ans: Estrogen and parathyroid hormone

- Sol: Estrogen and parathyroid hormone maintain calcium level in the body
- 162. The transparent lens in the human eye is
 - Ans: ligaments attached to the ciliary body
 - Sol: The lens of the eye is held in its place by suspensory ligaments.
- 163. Which of the following animals does not
 - Ans: Earthworm
 - Sol: Earthworm has no larval stage, so it does not undergo metamorphosis
- **164.** Identify the vertebrate group of animals
 - Ans: Aves
 - Sol: Crop and gizzard are found in the alimentary canal of birds
- 165. Which of the following organisms are
 - Ans: Diatoms
 - Sol: Diatoms are the most common form of phytoplankton
- 166. Which one of the these animals is not
 - Ans: Chelone
 - Sol: Chelone is a reptile, it is poikilothermous
- 167. Ciliates differ from all other protozoans
 - Ans: having two types of nuclei
 - Sol: Ciliates have two types of nuclei, macro and micro
- 168. Which of the following features is used
 - Ans: Presence of caudal styles
 - Sol: Male cockroach possess caudal style (Anal style)
- **169.** Which of the following options correctly
 - Ans: Inflammation of bronchioles, Decreased respiratory surface
 - Sol: Asthma is due to inflammation of bronchioles. Emphysema leads to decreased respiratory surface
- **170.** Match the items given in

Ans: iii i ii

- Sol: Both columns are correctly matched in option 1
- 171. Match the items given in
 - Ans: iii i iv ii
 - Sol: columns are correctly Both matched in option 2
- 172. AGGTATCGCAT is a sequence
 - AGGUAUCGCAU Ans:
 - Sol: DNA strand sequence is complementary to mRNA.
- 173. According to Hugo
 - Saltation Ans:
 - Sol: Hugo de vries proposed mutation theory of organic evolution
- 174. Match the items given
 - Ans: ii
 - Sol: Both columns are correctly matched in option 3.
- 175. A woman has an X-linked condition on o

iii

- Ans: Both sons and daughters
- Ans Sol: Sol: Triumonant Fourcation Sol: X chromosome from a woman can be passed to both daughters and sons.

- All of the following are part of an operon 176.
 - Ans: enhancer
 - Sol: An operon does not contain an enhancer.
- 177. Which of the following gastric cells
 - Parietal cells Ans:
 - Sol: Parietal cells secrete intrinsic factor required for absorption of cobalamin.
- 178. Match the items given
 - Ans: ii iii i
 - Sol: columns correctly Both are matched in the option 4.
- 179. Calcium is important in skeletal muscle
 - Ans: binds to troponin to remove the masking of active sites on actin for myosin.
 - Sol: Calcium helps in muscle contraction by binding to troponin.
- 180. Which of the following is an occupational
 - Ans: Silicosis
 - Silicosis caused by the inhalation of dust containing silica.