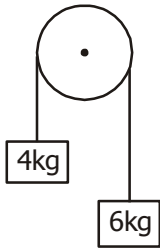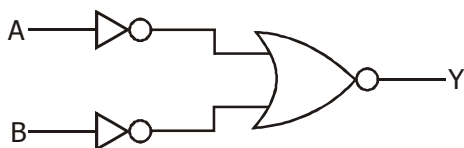# NEET (UG) 2020 Exam Paper

1. For transistor action, which of the following statements is correct -

   (1) Both emitter junction as well as the collector junction are forward biased.

   (2) The base region must be very thin and lightly doped.

   (3) Base, emitter and collector regions should have same doping concentrations.

   (4) Base, emitter and collector regions should have same size.

2. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere $\left(\dfrac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \, N\,m^2 / C^2 \right)$

   (1) 1.28×10^6 N/C

   (2) 1.28×10^7 N/C

   (3) 1.28×10^4 N/C

   (4) 1.28×10^5 N/C

3. Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is -

   (1) 7.32×10^{-7} rad

   (2) 6.00×10^{-7} rad

   (3) 3.66×10^{-7} rad

   (4) 1.83×10^{-7} rad

4. Dimension of stress are -

   (1) $[ML^0T^{-2}]$

   (2) $[ML^{-1}T^{-2}]$

   (3) $[MLT^{-2}]$

   (4) $[ML^2T^{-2}]$

5. A screw gauge has least count of 0.01 mm and there are 50 division in its circular scale. The pitch of the screw gauge is -

   (1) 0.5 mm

   (2) 1.00 mm

   (3) 0.01 mm

   (4) 0.25 mm

6. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is -

   (1) g/5

   (2) g/10

   (3) g

   (4) g/2

7. An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of the electron is 1.227×10^{-2} nm, the potential difference is :

   (1) 10^3 V

   (2) 10^4 V

   (3) 10 V

   (4) 10^2 V

8. In a certain region of space with volume 0.2 m^3, the electric potential is found to be 5V throughout. The magnitude of electric field in this region is -

   (1) 1 N/C

   (2) 5 N/C

   (3) Zero

   (4) 0.5 N/C

9. A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C. Its denisty is (R = 8.3J mol^{-1} K^{-1})

   (1) 0.1 kg/m^3

   (2) 0.02 kg/m^3

   (3) 0.5 kg/m^3

   (4) 0.2 kg/m^3

10. The mean free path for a gas, with molecular diameter d and number density n can be expressed as -

    (1) $\dfrac{1}{\sqrt{2}n^2\pi d^2}$ (2) $\dfrac{1}{\sqrt{2}n^2\pi^2 d^2}$ (3) $\dfrac{1}{\sqrt{2}n\pi d}$ (4) $\dfrac{1}{\sqrt{2}n\pi d^2}$

11. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is (g = 10 m/s^2)

    (1) 320 m

    (2) 300 m

    (3) 360 m

    (4) 340 m

12. For the logic circuit shown, the truth table is -

(1)	A	B	Y
	0	0	1
	0	1	1
	1	0	1
	1	1	0

(2)	A	B	Y
	0	0	1
	0	1	0
	1	0	0
	1	1	0

(3)	A	B	Y
	0	0	0
	0	1	0
	1	0	0
	1	1	1

| (4)	A	B	Y
	0	0	0
	0	1	1
	1	0	1
	1	1	1

13. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is $\left(\dfrac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \ Nm^2 / C^2 \right)$

(1) 400 V   (2) Zero   (3) 50 V   (4) 200 V

14. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is -

(1) 10.0 g   (2) 20.0 g   (3) 2.5 g   (4) 5.0 g

15. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper -
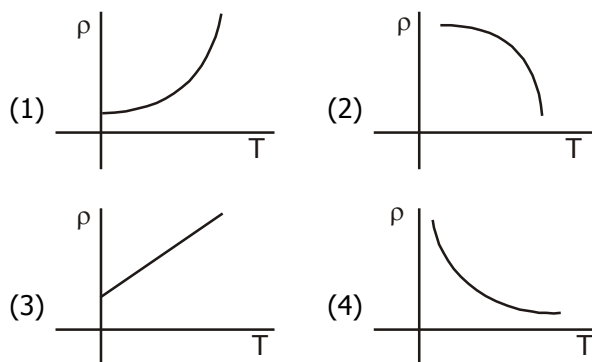
16. The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is (c = speed of electromagnetic waves)

(1) 1 : c   (2) $1 : c^2$

(3) c : 1   (4) 1 : 1

17. A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is ($\mu_0 = 4\pi \times 10^{-7}$ m A^{-1})

(1) 6.28×10^{-5} T   (2) 3.14×10^{-5} T

(3) 6.28×10^{-4} T   (4) 3.14×10^{-4} T

18. For which one of the following, Bohr model is not valid -

(1) Deuteron atom

(2) Singly ionised neon atom (Ne$^+$)

(3) Hydrogen atom

(4) Singly ionised helium atom (He$^+$)

19. The energy equivalent of 0.5 g of a substance is -

(1) 1.5×10^{13} J   (2) 0.5×10^{13} J

(3) 4.5×10^{16} J   (4) 4.5×10^{13} J

20. Taking into account of the significant figures, what is the value of 9.99 m – 0.0099 m -

(1) 9.980 m   (2) 9.9 m

(3) 9.9801 m   (4) 9.98 m

21. In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be -
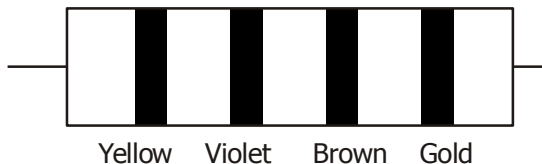
(1) 536 Hz   (2) 537 Hz

(3) 523 Hz   (4) 524 Hz

22. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is $\dfrac{\pi}{3}$. If instead C is removed from the circuit, the phase difference is again $\dfrac{\pi}{3}$ between current and voltage. the power factor of the circuit is -

(1) 1.0   (2) – 1.0

(3) zero   (4) 0.5

23. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5\,r_2$) through 1 K are in the ratio -

    (1) $\dfrac{3}{2}$ (2) $\dfrac{5}{3}$

    (3) $\dfrac{27}{8}$ (4) $\dfrac{9}{4}$

24. The brewsters angle i_b for an interface should be -

    (1) $45° < i_b < 90°$

    (2) $i_b = 90°$

    (3) $0° < i_b < 30°$

    (4) $30° < i_b < 45°$

25. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is -

    (1) isochoric   (2) isobaric

    (3) isothermal   (4) adiabatic

26. An iron rod of susceptibility 599 is subjected to a magnetising field of 1200 A m^{-1}. The permeability of the material of the rod is ($\mu_0 = 4\pi \times 10^{-7}$ T m A^{-1})

    (1) $2.4\pi \times 10^{-5}$ T m A^{-1}

    (2) $2.4\pi \times 10^{-7}$ T m A^{-1}

    (3) $2.4\pi \times 10^{-4}$ T m A^{-1}

    (4) 8.0×10^{-5} T m A^{-1}

27. The capacitance of a parallel plate capacitor with air as medium is 6 μF. With the introduction of a dielectric medium, the capacitance becomes 30 μF. The permittivity of the medium is ($\varepsilon_0 = 8.85 \times 10^{-12}$ C^2 N^{-1} m^{-2})

    (1) 0.44×10^{-10} C^2 N^{-1} m^{-2}

    (2) $5.00 \times$ C^2 N^{-1} m^{-2}

    (3) 0.44×10^{-13} C^2 N^{-1} m^{-2}

    (4) 1.77×10^{-12} C^2 N^{-1} m^{-2}

28. A charged particle having drift veloicty of 7.5×10^{-4} ms^{-1} in an electric field of 3×10^{-10} Vm^{-1} , has a mobility in m^{2}V^{-1} s^{-1} of -

    (1) 2.5×10^{-6} (2) 2.25×10^{-15}

    (3) 2.25×10^{15} (4) 2.5×10^{6}

29. The color code of a resistance is given below -

    Yellow   Violet   Brown   Gold

    The values of resistance and tolerance, respectively, are :

    (1) 4.7 kΩ, 5%   (2) 470 Ω, 5%

    (3) 470 kΩ, 5%   (4) 47 kΩ, 10%

30. The solids which have the negative temperature coefficient of resistance are -

    (1) semiconductors only

    (2) insulators and semiconductors

    (3) metals

    (4) insulators only

31. A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth -

    (1) 30 N   (2) 24 N

    (3) 48 N   (4) 32 N

32. A 40 μF capacitor is connected to a 200V, 50 Hz ac supply. The rms value of the current in the circuit is, nearly -

    (1) 2.5 A   (2) 25.1 A

    (3) 1.7 A   (4) 2.05 A

33. The phase difference between displacement and acceleration of a particle in a simple harmonic motion is -

    (1) $\dfrac{\pi}{2}$ rad   (2) zero

    (3) π rad   (4) $\dfrac{3\pi}{2}$ rad

34. The average thermal energy for a mono-atomic gas is - (k_B is Boltazmann constant and T, absolute temperature)

    (1) $\dfrac{5}{2}\,k_BT$ (2) $\dfrac{7}{2}\,k_BT$ (3) $\dfrac{1}{2}\,k_BT$ (4) $\dfrac{3}{2}\,k_BT$

35. Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled -

    (1) one-fourth   (2) zero

    (3) doubled   (4) four times

36. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to L_1 when mass M is suspended from its free end. The expression for Young's modulus is -

    (1) $\dfrac{MgL}{AL_1}$

    (2) $\dfrac{MgL}{A(L_1 - L)}$

    (3) $\dfrac{MgL_1}{AL}$

    (4) $\dfrac{Mg(L_1 - L)}{AL}$

37. A ray is incident at an angle of incidence i on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. It the refractive index of the material of the prism is μ. then the angle of incidence is nearly equal to -

    (1) μA

    (2) $\dfrac{\mu A}{2}$

    (3) $\dfrac{A}{2\mu}$

    (4) $\dfrac{2A}{\mu}$

38. Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m -

    (1) $-6\hat{i}$ Nm

    (2) $6\hat{k}$ Nm

    (3) $6\hat{i}$ Nm

    (4) $6\hat{j}$ Nm

39. In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes -

    (1) four times

    (2) one-fourth

    (3) double

    (4) Half

40. The energy required to break one bond in DNA is 10^{-20} J This value in eV is nearly -

    (1) 0.06

    (2) 0.006

    (3) 6

    (4) 0.6

41. When a uranium isotope $^{235}_{92}U$ is bombarded with a neutron, it generates $^{89}_{36}Kr$, three neutrons and -

    (1) $^{101}_{36}Kr$

    (2) $^{103}_{36}Kr$

    (3) $^{144}_{56}Ba$

    (4) $^{91}_{40}Zr$

42. Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass. The centre of mass of the system from the 5 kg particle is nearly at a distance of -

    (1) 67 cm

    (2) 80 cm

    (3) 33 cm

    (4) 50 cm

43. Light with an average flux of 20 W/cm² falls on a non-reflecting surface at normal incidence having surface area 20 cm². The energy received by the surface during time span of 1 minute is -

    (1) 24×10^3 J

    (2) 48×10^3 J

    (3) 10×10^3 J

    (4) 12×10^3 J

44. The increase in the width of the deplection region in a p-n junction diode is due to -

    (1) both forward bias and reverse bias

    (2) increase in forward current

    (3) forward bias only

    (4) reverse bias only

45. A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is -

    (1) 1.5×10^{-1} m

    (2) 1.5×10^{-2} m

    (3) 1.0×10^{-2} m

    (4) 1.0×10^{-1} m

46. Identify compound X in the fllowing sequence of reactions-

47. Identify a molecule which does not exist -
    (1) C_2
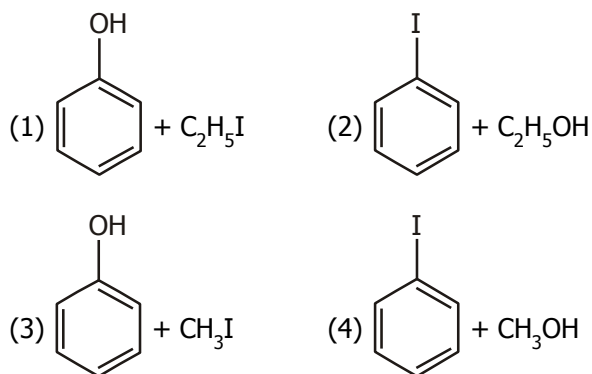   (2) O_2
    (3) He_2
    (4) Li_2

48. Which of the following is a natural polymer -
    (1) polybutadiene
    (2) poly (Butadiene-acrylonitrile)
    (3) cis-1,4-polyisoprene
    (4) poly(Butadiene-styrene)

49. An increase in the concentration of the reactants of a reaction leads to change in -
    (1) threshold energy
    (2) collision frequency
    (3) activation energy
    (4) heat of reaction

50. Anisole on cleavage with HI gives -

51. The numbrer of protons, neutrons and electrons in $^{175}_{71}Lu$, respectively, are -
    (1) 71, 71 तथा 104
    (2) 175, 104 तथा 71
    (3) 71, 104 तथा 71
    (4) 104, 71 तथा 71

52. The calculated spin only magnetic moment of Cr^{2+} ion is -
    (1) 5.92 BM (2) 2.84 BM (3) 3.87 BM (4) 4.90 BM

53. Match the following -

Oxide	Nature
(a) CO	(i) Basic
(b) BaO	(ii) Neutral
(c) Al_2O_3	(iii) Acidic
(d) Cl_2O_7	(iv) Amphoteric

    Which of the following is correct option -
    (1) a-iii, b-iv, c-i, d-ii
    (2) a-iv, b-iii, c-ii, d-i
    (3) a-i, b-ii, c-iii, d-iv
    (4) a-ii, b-i, c-iv, d-iii

54. Urea reacts with water to form A which willl decompse to form B. B when passed through Cu^{2+} (aq.), deep blue colour solution C is formed. What is the formula of C from the following -
    (1) $Cu(OH)_2$
    (2) $CuCO_3.Cu(OH)_2$
    (3) $CuSO_4$
    (4) $[Cu(NH_3)_4]^{2+}$

55. Match the following and identify the correct option -

(a) $CO_{(g)} + H_{2(g)}$	(i) $Mg(HCO_3)_2 + Ca(HCO_3)_2$
(b) Temporary hardness of water	(ii) An electron deficient hydride
(c) B_2H_6	(iii) Synthesis gas
(d) H_2O_2	(iv) Non-planar structure

    (1) a-iii, b-iv, c-ii, d-i
    (2) a-i, b-iii, c-ii, d-iv
    (3) a-iii, b-i, c-ii, d-iv
    (4) a-iii, b-ii, c-i, d-iv

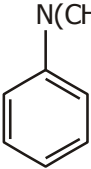56. The mixture which shows positive deviation from Raoult's law is -
    (1) Acetone + Chloroform
    (2) Chloroethane + Bromoethane
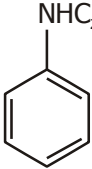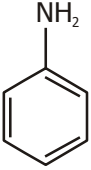   (3) Ethanol + Acetone
    (4) Benzene + Toluene

57. The freezing point depression constant (K_f) of benzene is 5.12 K kg mol^{-1}. The freezing point depression for the solution of molality 0.078 m containing a non-electrolyte solute in benzene is (rounded off upto two decimal places)
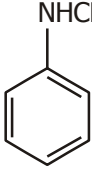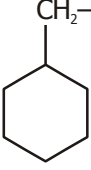   (1) 0.40 K
    (2) 0.60 K
    (3) 0.20 K
    (4) 0.80 K
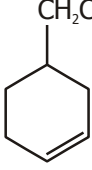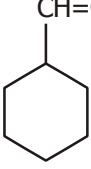
58. Which of the following set of molecules will have zero dipole moment -
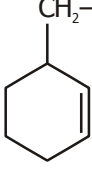   (1) Nitrogen trifluoride, beryllium difluoride, water, 1,3-dichlorobenzene
    (2) Boron trifluoride, beryllium difluoride, carbon dioxide, 1,4-dichlorobenzene
    (3) Ammonia, beryllium difluoride, water, 1,4-dichlorobenzene
    (4) Boron trifluoride, hydrogen fluoride, carbon dioxide, 1,3-dichlorobenzene

59. A tertiary butyl carbocation is more stable than a secondary butyl carbocation because of which of the following -
    (1) $- R$ effect of $- CH_3$ groups
    (2) Hyperconjugation
    (3) $- I$ effect of $- CH_3$ groups
    (4) $+ R$ effect of $- CH_3$ groups

60. Find out the solubility of $Ni(OH)_2$ in 0.1 M NaOH. Given that the ionic product of $Ni(OH)_2$ is 2×10^{-15}
    (1) 1×10^{-13} M
    (2) 1×10^8 M
    (3) 2×10^{-13} M
    (4) 2×10^{-8} M

61. Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give -
    (1) Tert. butyl alochol
    (2) Isobutyl alcohol
    (3) Isopropyl alcohol
    (4) Sec. butyl alcohol

62. Which of the following amine will give the carbylamine test-

    (1) $N(CH_3)_2$ on benzene ring

    (2) NHC_2H_5 on benzene ring

    (3) NH_2 on benzene ring

    (4) $NHCH_3$ on benzene ring

63. An alkene on ozonolysis gives methanal as one of the product. Its structure is -

    (1) $CH_2-CH=CH_2$ on cyclohexane ring

    (2) $CH_2CH_2CH_3$ on cyclohexene ring

    (3) $CH=CH-CH_3$ on cyclohexane ring

    (4) $CH_2-CH_2-CH_3$ on cyclohexene ring

64. A mixture of N_2 and Ar gases in a cylinder contains 7g of N_2 and 8g of Ar. If the total pressure of the mixture of the gases in the cylinder is 27 bar, the partial pressure of N_2 is [Use atomic masses (in g mol^{-1}) : N = 14, Ar = 40]
    (1) 15 bar
    (2) 18 bar
    (3) 9 bar
    (4) 12 bar

65. Which of the following is the correct order of increasing field strength of ligands to form coordination compounds-
    (1) $F^- < SCN^- < C_2O_4^{2-} < CN^-$
    (2) $CN^- < C_2O_4^{2-} < SCN^- < F^-$
    (3) $SCN^- < F^- < C_2O_4^{2-} < CN^-$
    (4) $SCN^- < F^- < CN^- < C_2O_4^{2-}$

66. Paper chromatography is an example of -
    (1) Thin layer chromatography
    (2) Column chromatography
    (3) Adsorption chromatography
    (4) Partition chromatography

67. Sucrose on hydrolysis gives -
    (1) α-D-Glucose + β-D-Fructose
    (2) α-D-Fructose+ β-D-Fructose
    (3) β-D-Glucose + α-D-Fructose
    (4) α-D-Glucose + β-D-Glucose

68. The rate constant for a first order reaction is $4.606 \times 10^{-3} s^{-1}$. The time required to reduce 2.0g of the reactant to 0.2g is
    (1) 500 s
    (2) 1000 s
    (3) 100 s
    (4) 200 s

69. Reaction between benzaldehyde and acetophenone is presence of dilute NaOH is known as -
    (1) Cross Cannizzaro's reaction
    (2) Cross Aldol condensation
    (3) Aldol condensation
    (4) Cannizzaro's reaction

70. Which of the following is not correct about carbon monoxide
    (1) The carboxyhaemoglobin (haemoglobin bound to CO) is less stable than oxyhaemoglobin.
    (2) It is produced due to incomplete combustion.
    (3) It forms carboxyhaemoglobin.
    (4) It reduces oxygen carrying ability of blood.

71. Hydrolysis of sucrose is given by the following reaction -

    Sucrose + H_2O $\rightleftharpoons$ Glucose + Fructose

    If the equilibrium constant (K_c) is 2×10^{13} at 300 K, the value of $\Delta_r G^0$ at the same temperature will be -

    (1) 8.314 J mol^{-1} K^{-1} × 300 K × ln(3×10^{13})

    (2) -8.314 J mol^{-1} K^{-1} × 300 K × ln(4×10^{13})

    (3) -8.314 J mol^{-1} K^{-1} × 300 K × ln(2×10^{13})

    (4) 8.314 J mol^{-1} K^{-1} × 300 K × ln(2×10^{13})

72. HCl was passed through a solution of $CaCl_2$, $MgCl_2$ and NaCl. Which of the following compound(s) crystallise(s) -

    (1) Only $MgCl_2$

    (2) NaCl, $MgCl_2$ and $CaCl_2$

    (3) Both $MgCl_2$ and $CaCl_2$

    (4) Only NaCl

73. An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is -

    (1) $\dfrac{4}{\sqrt{3}} \times 288$ pm

    (2) $\dfrac{4}{\sqrt{2}} \times 288$ pm

    (3) $\dfrac{\sqrt{3}}{4} \times 288$ pm

    (4) $\dfrac{\sqrt{2}}{4} \times 288$ pm

74. Which of the following oxoacid of sulphur has –O–O– linkage-

    (1) $H_2S_2O_8$, peroxodisulphuric acid

    (2) $H_2S_2O_7$, pyrosulphuric acid

    (3) H_2SO_3, sulphurous acid

    (4) H_2SO_4, sulphuric acid

75. Identify the incorrect statement -

    (1) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.

    (2) The oxidation states chromium in CrO_4^{2-} and $Cr_2O_7^{2-}$ are not the same.

    (3) Cr^{2+} (d^4) is a stronger reducing agent than Fe^{2+} (d^6) in water.

    (4) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.

76. Which of the following is a cationic detergent -

    (1) Cetyltrimethyl ammonium bromide

    (2) Sodium dodecylbenzene sulphonate

    (3) Sodium lauryl sulphate

    (4) Sodium stearate

77. The correct option for free expansion of an ideal gas under adiabatic condition is -

    (1) $q < 0$, $\Delta T = 0$ and $w = 0$

    (2) $q > 0$, $\Delta T > 0$ and $w > 0$

    (3) $q = 0$, $\Delta T = 0$ and $w = 0$

    (4) $q = 0$, $\Delta T < 0$ and $w > 0$

78. On electrolysis of dil.sulphuric acid using Platinum (Pt) electrode, the product obtained at anode will be -

    (1) H_2S gas

    (2) SO_2 gas

    (3) Hydrogen gas

    (4) Oxygen gas

79. Identify the correct statement from the following -

    (1) Vapour phase refining is carried out for Nickel by Van Arkel method.

    (2) Pig iron can be moulded into a variety of shapes.

    (3) Wrought iron is impure iron with 4% carbon.

    (4) Blister copper has blistered appearance due to evolution of CO_2.

80. Which of the following is a basic amino acid -

    (1) Tyrosine

    (2) Lysine

    (3) Serine

    (4) Alanine

81. Identify the incorrect match -

Name	IUPAC Official Name
(a) Unnilunium	(i) Mendelevium
(b) Unniltrium	(ii) Lawrencium
(c) Unnilhexium	(iii) Seaborgium
(d) Unununnium	(iv) Darmstadtium

    (1) (c), (iii)

    (2) (d), (iv)

    (3) (a), (i)

    (4) (b), (ii)

82. Which of the following alkane cannot be made in good yield by Wurtz reaction -

    (1) n-Heptane

    (2) n-Butane

    (3) n-Hexane

    (4) 2,3-Dimethylbutane

83. Elimination reaction of 2-Bromo-pentane to form pent-2-ene is -

    (a) β-Elimination reaction

    (b) Follows Zaitsev rule

    (c) Dehydrohalogenation reaction

    (d) Dehydration reaction

    (1) b, c, d   (2) a, b, d

    (3) a, b, c   (4) a, c, d

84. The number of Faradays(F) required to produce 20g of calcium from molten $CaCl_2$ Atomic mass of Ca = 40 g mol^{-1}) is -

    (1) 3   (2) 4   (3) 1   (4) 2

85. Which one of the followings has maximum number of atoms

    (1) 1g of $O_2(g)$ [Atomic mass of O = 16]

    (2) 1g of Li(s) [Atomic mass of Li = 7]

    (3) 1g of Ag(s) [Atomic mass of Ag = 108]

    (4) 1g of Mg(s) [Atomic mass of Mg = 24]

86. For the reaction, $2Cl(g) \rightarrow Cl_2(g)$, the correct option is -

    (1) $\Delta_r H < 0$ and $\Delta_r S > 0$

    (2) $\Delta_r H < 0$ and $\Delta_r S < 0$

    (3) $\Delta_r H > 0$ and $\Delta_r S > 0$

    (4) $\Delta_r H > 0$ and $\Delta_r S < 0$

87. Identify the correct statements from the following -

    (a) $CO_2(g)$ is used as refrigerant for ice-cream and frozen food.

    (b) The structure of C_{60} contains twelve six carbon rings and twenty five carbon rings.

    (c) ZSM-5, a type of zeolite, is used to convert alcohols into gasoline.

    (d) CO is colorless and odourless gas.

    (1) (b) and (c) only   (2) (c) and (d) only

    (3) (a), (b) and (c) only   (4) (a) and (c) only

88. Measuring Zeta potential is useful in determing which property of colloidal solution -

    (1) Stability of the colloidal particles

    (2) Size of the colloidal particles

    (3) Viscosity

    (4) Solubility

89. What is the change in oxidation number of carbon in the following reaction -

    $$CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(l) + 4HCl(g)$$

    (1) $- 4$ to $+ 4$ (2) 0 to $- 4$

    (3) $+ 4$ to $+ 4$ (4) 0 to $+ 4$

90. The following metal ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals -

    (1) Calcium   (2) Potassium (3) Iron   (4) Coppor

91. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus -

    (1) Ketonuria and Glycosuria

    (2) Renal calculi and Hyperglycaemia

    (3) Uremia and Ketonuria

    (4) Uremia and Renal Calculi

92. Match the following columns and select the correct option-

Column-I	Column-II
(a) Placenta	(i) Androgens
(b) Zona pellucida	(ii) Human Chorionic Gonadotropin (hCG)
(c) Bulbo-urethral glands	(iii) Layer of the ovum
(d) Leydig cells	(iv) Lubrication of the Penis

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(iv)	(i)
(2)	(ii)	(iii)	(iv)	(i)
(3)	(iv)	(iii)	(i)	(ii)
(4)	(i)	(iv)	(ii)	(iii)

93. Match the following columns and select the correct option-

Column-I	Column-II
(a) Bt cotton	(i) Gene therapy
(b) Adenosine deaminase deficiency	(ii) Cellular defence
(c) RNAi	(iii) Detection of HIV infection
(d) PCR	(iv) Bacillus thuringiensis

	(a)	(b)	(c)	(d)
(1)	(ii)	(iii)	(iv)	(i)
(2)	(i)	(ii)	(iii)	(iv)
(3)	(iv)	(i)	(ii)	(iii)
(4)	(iii)	(ii)	(i)	(iv)

94. The sequence that controls the copy number of the linked DNA in the vector, is termed -
    (1) Palindromic sequence
    (2) Recognition site
    (3) Selectable marker
    (4) Ori site

95. Match the following columns and select the correct option.

Column-I	Column-II
(a) 6 - 15 pairs of gill slits	(i) Trygon
(b) Heterocercal caudal fin	(ii) Cyclostomes
(c) Air Bladder	(iii) Chondrichthyes
(d) Poison sting	(iv) Osteichthyes

	(a)	(b)	(c)	(d)
(1)	(iv)	(ii)	(iii)	(i)
(2)	(i)	(iv)	(iii)	(ii)
(3)	(ii)	(iii)	(iv)	(i)
(4)	(iii)	(iv)	(i)	(ii)

96. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive
    -(1) ICSI and ZIFT
    (2) GIFT and ICSI
    (3) ZIFT and IUT
    (4) GIFT and ZIFT

97. Select the correct events that occur during inspiration -
    (a) Contraction of diaphragm
    (b) Contraction of external inter-costal muscles
    (c) Pulmonary volume decreases
    (d) Intra pulmonary pressure increases ,
    (1) (a), (b) and (d)
    (2) only (d)
    (3) (a) and (b)
    (4) (c) and (d)

98. The QRS complex in a standard ECG represents -
    (1) Depolarisation of ventricles
    (2) Repolarisation of ventricles
    (3) Repolarisation ofauricles
    (4) Depolarisation of auricles

99. The enzyme enterokinase helps in conversion of -
    (1) caseinogen into casein
    (2) pepsinogen into pepsin
    (3) protein into polypeptides
    (4) trypsinogen into trypsin

100. Identify the correct statement with reference to human digestive system -
    (1) Ileum is a highly coiled part.
    (2) Vermiform appendix arises from duodenum
    (3) Ileum opens into small intestine
    (4) Serosa is the innermost layer of the alimentary canal.

101. Ray florets have -
    (1) Hypogynous ovary
    (2) Half inferior ovary
    (3) Inferior ovary
    (4) Superior ovary

102. Which of the following is put into Anaerobic sludge digester for further sewage treatment -
    (1) Effluents of primary treatment
    (2) Activated sludge
    (3) Primary sludge
    (4) Floating debris

103. The number of substrate level phosphorylations in one turn of citric acid cycle is -
    (1) Two   (2) Three   (3) Zero   (4) One

104. Identify the correct statement with regard to G_1 phase (Gap 1) of interphase-
    (1) Cell is metabolically active, grows but does not replicate its DNA.
    (2) Nuclear Division takes place.
    (3) DNA synthesis or replication takes place.
    (4) Reorganisation of all cell components takes place.

105. Which of the following pairs is of unicellular algae -
    (1) Anabaena and Volvox
    (2) Chlorella and Spirulina
    (3) Lantinaria and Sargassum
    (4) Gelidium and Gracilaria

106. Identify the wrong statement with reference to immunity-
    (1) Active immunity is quick and gives full response.
    (2) Foetus receives some antibodies from mother, it is an example for passive immunity.
    (3) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
    (4) When ready-made antibodies are directly given, it is called "Passive immunity".

107. Match the following columns and select the correct option-

Column-I	Column-II
(a) Floating Ribs	(i) Located between second and seventh ribs
(b) Acromion	(ii) Head of the Humerus
(c) Scapula	(iii) Clavicle
(d) Glenoid cavity	(iv) Do not connect with the sternun

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(iv)	(i)
(2)	(iv)	(iii)	(i)	(ii)
(3)	(ii)	(iv)	(i)	(iii)
(4)	(i)	(iii)	(ii)	(iv)

108. Identify the basic amino acid from the following -
    (1) Lysine
    (2) Valine
    (3) Tyrosine
    (4) Glutamic Acid

109. The plant parts which consist of two generations . one within the other -
    (a) Pollen grains inside the anther
    (b) Germinated pollen grain with two male gametes
    (c) Seed inside the fruit
    (d) Embryo sac inside the ovule
    (1) (c) and (d)
    (2) (a) and (d)
    (3) (a) only
    (4) (a), (b) and (c)

110. Identify the wrong statement with reference to transport of oxygen.
    (1) Higher H^+ conc. in alveoli favours the formation of oxyhaemoglobin.
    (2) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin.
    (3) Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2
    (4) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.

111. Match the following columns and select the correct option.

Column-I	Column-II
(a) Organ of Corti	(i) Connects middle ear and pharynx
(b) Cochlea	(ii) Coiled part of the labyrinth
(c) Eustachian tube	(iii) Attached to the oval window
(d) Stapes	(iv) Located on the basilar membrane

	(a)	(b)	(c)	(d)
(1)	(iv)	(ii)	(i)	(iii)
(2)	(iv)	(ii)	(iv)	(iii)
(3)	(ii)	(iii)	(i)	(iv)
(4)	(iii)	(i)	(iv)	(ii)

112. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop-
    (1) Ethylene
    (2) Abscisic acid
    (3) Cytokinin
    (4) Gibberellin

113. The roots that originate from the base of the stem are -
    (1) Prop roots
    (2) Lateral roots
    (3) Fibrous roots
    (4) Primary roots

114. If the head of cockroach is removed, it may live for few days because -
    (1) The head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.
    (2) The head holds a 1/3rd of a nervous system while the rest is situated along the dorsal part of its body.
    (3) The supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.
    (4) The cockroach does not have nervous system.

115. Strobili or cones are found in -
    (1) Marchantia
    (2) Equisetum
    (3) Salvinia
    (4) Pteris

116. Dissolution of the synaptonemal complex occurs during -
    (1) Diplotene
    (2) Leptotene
    (3) Pachytene
    (4) Zygotene

117. Match the following diseases with the causative organism and select the correct option -

Column-I	Column-II
(a) Typhoid	(i) Wuchereria
(b) Pneumonia	(ii) Plasmodium
(c) Filariasis	(iii) Salmonella
(d) Malaria	(iv) Haemophilus

	(a)	(b)	(c)	(d)
(1)	(ii)	(i)	(iii)	(iv)
(2)	(iv)	(i)	(ii)	(iii)
(3)	(i)	(iii)	(ii)	(iv)
(4)	(iii)	(iv)	(i)	(ii)

118. The first phase of translation is -
   (1) Aminoacylation of tRNA
   (2) Recognition of an anti-codon
   (3) Binding of mRNA to ribosome
   (4) Recognition of DNA molecule

119. Match the following columns and select the correct option-

Column-I	Column-II
(a) Clostridium butylicum	(i) Cyclosporin-A
(b) Trichoderma polysporum	(ii) Butyric Acid
(c) Monascus purpureus	(iii) Citric Acid
(d) Aspergillus niger	(iv) Blood cholesterol lowering agent

	(a)	(b)	(c)	(d)
(1)	(i)	(ii)	(iv)	(iii)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(iii)	(iv)	(ii)	(i)
(4)	(ii)	(i)	(iv)	(iii)

120. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of -
   (1) 1 molecule of 6-C compound
   (2) 1 molecule of 4-C compound and 1 molecule of 2-C compound
   (3) 2 molecules of 3-C compound
   (4) 1 molecule of 3-C compound

121. Match the following concerning essential elements and their functions in plants -

(a) Iron	(i) Photolysis of water
(b) Zinc	(ii) Pollen germination
(c) Boron	(iii) Required for chlorophyll biosynthesis
(d) Manganese	(iv) IAA biosynthesis

Select the correct option -

	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(ii)	(i)
(2)	(iv)	(i)	(ii)	(iii)
(3)	(ii)	(i)	(iv)	(iii)
(4)	(iv)	(iii)	(ii)	(i)

122. Name the enzyme that facilitates opening of DNA helix during transcription -
   (1) DNA polymerase
   (2) RNA polymerase
   (3) DNA ligase
   (4) DNA helicase

123. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask
   (1) CH_4, H_2, NH_3 and water vapor at 600°C
   (2) CH_3, H_2, NH_3 and water vapor at 600°C
   (3) CH_4, H_2, NH_3 and water vapor at 800°C
   (4) CH_3, H_2, NH_4 and water vapor at 800°C

124. Goblet cells of alimentary canal are modified from -
   (1) Chondrocytes
   (2) Compound epithelial cells
   (3) Squamous epithelial cells
   (4) Columnar epithelial cells

125. Cuboidal epithelium with brush border of microvilli is found in -
   (1) Proximal convoluted tubule of nephron
   (2) Eustachian tube
   (3) lining of intestine
   (4) ducts of salivary glands

126. In light reaction, plastoquinone facilitates the transfer of electrons from -
   (1) PS-I to $NADP^+$
   (2) PS-I to ATP synthase
   (3) PS-II to $Cytb_6f$ complex
   (4) $Cytb_6f$ complex to PS-I

127. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately -
    (1) 2.2 meters   (2) 2.7 meters
    (3) 2.0 meters   (4) 2.5 meters

128. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells -
    (1) Golgi bodies   (2) Polysomes
    (3) Endoplasmic reticulum (4) Peroxisomes

129. Which of the following statements is not correct -
    (1) The functional insulin has A and B chains linked together by hydrogen bonds
    (2) Genetically engineered insulin is produced in E-Coli.
    (3) In man insulin is synthesised as a proinsulin.
    (4) The proinsulin has an extra peptide called C-peptide.

130. Identify the incorrect statement-
    (1) Sapwood is the innermost secondary xylem and is lighter in colour.
    (2) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour.
    (3) Heart wood does not conduct water but gives mechanical support.
    (4) Sapwood is involved in conduction of water and minerals from root to leaf.

131. Floridean starch has structure similar to -
    (1) Mannitol and algin   (2) Laminarin and cellulose
    (3) Starch and cellulose   (4) Amylopectin and glycogen

132. Match the following with respect to meiosis -
    (a) Zygotene   (i) Terminalization
    (b) Pachytene   (ii) Chiasmata
    (c) Diplotene   (iii) Crossing over
    (d) Diakinesis   (iv) Synapsis
    Select the correct option from the following -

	(a)	(b)	(c)	(d)
(1)	(i)	(ii)	(iv)	(iii)
(2)	(ii)	(iv)	(iii)	(i)
(3)	(iii)	(iv)	(i)	(ii)
(4)	(iv)	(iii)	(ii)	(i)

133. Match the following columns and select the correct option-
    Column-I   **Column-II**
    (a) Eosinophils   (i) Immune response
    (b) Basophils   (ii) Phagocytosis
    (c) Neutrophils   (iii) Release histaminase, destructive enzymes
    (d) Lymphocytes   (iv) Release granules containing histamine

	(a)	(b)	(c)	(d)
(1)	(i)	(ii)	(iv)	(iii)
(2)	(ii)	(i)	(iii)	(iv)
(3)	(iii)	(iv)	(ii)	(i)
(4)	(iv)	(i)	(ii)	(iii)

134. The process of growth is maximum during :
    (1) Senescence   (2) Dormancy
    (3) Log phase   (4) Lag phase

135. Match the following -
    (a) Inhibitor of catalytic activity   (i) Ricin
    (b) Possess peptide bonds   (ii) Malonate
    (c) Cell wall material in fungi   (iii) Chitin
    (d) Secondary metabolite   (iv) Collagen
    Choose the correct option from the following -

	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(i)	(ii)
(2)	(ii)	(iii)	(i)	(iv)
(3)	(ii)	(iv)	(iii)	(i)
(4)	(iii)	(i)	(iv)	(ii)

136. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of -
    (1) S phase   (2) G_2 phase
    (3) M phase   (4) G_1 phase

137. Which of the following would help in prevention of diuresis
    (1) Atrial natriuretic factor causes vasoconstriction
    (2) Decrease in secretion of renin by JG cells
    (3) More water reabsorption due to undersecretion of ADH
    (4) Reabsorption of Na^+ and water from renal tubules due to aldosterone

138. Which of the following is correct about viroids -
    (1) They have DNA with protein coat.
    (2) They have free DNA without protein coat.
    (3) They have RNA with protein coat.
    (4) They have free RNA without protein coat.

139. The infectious stage of Plasmodium that enters the human body is -
    (1) Female gametocytes   (2) Male gametocytes
    (3) Trophozoites   (4) Sporozoites

140. Which of the following statements is correct -
    (1) Adenine pairs with thymine through three H-bonds.
    (2) Adenine does not pair with thymine.
    (3) Adenine pairs with thymine through two H-bonds.
    (4) Adenine pairs with thymine through one H-bond.

141. Flippers of Penguins and Dolphins are examples of -
    (1) Industrial melanism
    (2) Natural selection
    (3) Adaptive radiation
    (4) Convergent evolution

142. Montreal protocol was signed in 1987 for control of -
    (1) Release of Green House gases
    (2) Disposal of e-wastes
    (3) Transport of Genetically modified organisms from one country to another
    (4) Emission of ozone depleting substances

143. Identify the wrong statement with regard to Restriction Enzymes -
    (1) They are useful in genetic engineering
    (2) Sticky ends can be joined by using DNA ligases
    (3) Each restriction enzyme functions by inspecting the length of a DNA sequence
    (4) They cut the strand of DNA at palindromic sites.

144. By which method was a new breed `Hisardale' of sheep formed by using Bikaneri ewes and Marino rams -
    (1) Cross breeding
    (2) Inbreeding
    (3) Out crossing
    (4) Mutational breeding

145. Which of the following refer to correct example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action -
    (a) Darwin's Finches of Galapagos islands.
    (b) Herbicide resistant weeds.
    (c) Drug resistant eukaryotes.
    (d) Man-created breeds of domesticated animals like dogs.
    (1) (b), (c) and (d)   (2) only (d)
    (3) only (a)   (4) (a) and (c)

146. Meiotic division of the secondary oocyte is completed -
    (1) After zygote formation
    (2) At the time of fusion of a sperm with an ovum
    (3) Prior to ovulation
    (4) At the time of copulation

147. In relation to Gross primary productivity and Net primary productivity of an ecosystem, Which one of the following statements is correct -
    (1) Gross primary productivity and Net primary productivity are one and same.
    (2) There is no relationship between Gross primary productivity and Net primary productivity.
    (3) Gross primary productivity is always less than net primary productivity.
    (4) Gross primary productivity is always more than net primary productivity.

148. Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups -
    (1) When I^A and I^B are present together, they express same type of sugar.
    (2) Allele 'i' does not produce any sugar.
    (3) The gene (I) has three alleles.
    (4) A person will have only two of the three alleles.

149. Match the following columns and select the correct option-

Column-I	Column-II
(a) Pituitary gland	(i) Grave's disease
(b) Thyroid gland	(ii) Diabetes mellitus
(c) Adrenal gland	(iii) Diabetes insipidus
(d) Pancreas	(iv) Addison's disease

(a)	(b)	(c)	(d)
(1) (iii)	(i)	(iv)	(ii)
(2) (ii)	(i)	(iv)	(iii)
(3) (iv)	(iii)	(i)	(ii)
(4) (iii)	(ii)	(i)	(iv)

150. According to Robert May, the global species diversity is about -
   (1) 50 million
   (2) 7 million
   (3) 1.5 million
   (4) 20 million

151. The body of the ovule is fused within the funicle at -
   (1) Nucellus
   (2) Chalaza
   (3) Hilum
   (4) Micropyle

152. Match the following columns and select the correct option-

Column-I	Column-II
(a) Gregarious, polyphagous pest	(i) Asterias
(b) Adult with radial symmetry and larva with bilateral symmetry	(ii) Scorpion
(c) Book lungs	(iii) Ctenoplana
(d) Bioluminescence	(iv) Locusta

(a)	(b)	(c)	(d)
(1) (iii)	(ii)	(i)	(iv)
(2) (ii)	(i)	(iii)	(iv)
(3) (i)	(iii)	(ii)	(iv)
(4) (iv)	(i)	(ii)	(iii)

153. Embryological support for evolution was disapproved by -
   (1) Charles Darwin
   (2) Oparin
   (3) Karl Ernst von Baer
   (4) Alfred Wallace

154. Match the organism with its use in biotechnology -

(a) Bacillus thuringiensis	(i) Cloning vector
(b) Thermus aquaticus	(ii) Construction of first rDNA molecule
(c) Agrobacteriurn tumefaciens	(iii) DNA polymerase
(d) Salmonella typhimurium	(iv) Cry proteins

Select the correct option from the following -

(a)	(b)	(c)	(d)
(1) (iii)	(ii)	(iv)	(i)
(2) (iii)	(iv)	(i)	(ii)
(3) (ii)	(iv)	(iii)	(i)
(4) (iv)	(iii)	(i)	(ii)

155. Which of the following is not an inhibitory substance governing seed dormancy -
   (1) Phenolic acid
   (2) Para-ascorbic add
   (3) Gibberellic acid
   (4) Abscisic acid

156. Which of the following statements about inclusion bodies is incorrect -
   (1) They lie free in the cytoplasm.
   (2) These represent reserve material in cytoplasm.
   (3) They are not bound by any membrane.
   (4) These are involved in ingestion of food particles.

157. The ovary is half inferior in -
   (1) Sunflower
   (2) Plum
   (3) Brinjal
   (4) Mustard

158. Match the trophic levels with their correct species examples in grassland ecosystem -

(a) Fourth trophic level	(i) Crow
(b) Second trophic level	(ii) Vulture
(c) First trophic level	(iii) Rabbit
(d) Third trophic level	(iv) Grass

Select the correct option -

(a)	(b)	(c)	(d)
(1) (iv)	(iii)	(ii)	(i)
(2) (i)	(ii)	(iii)	(iv)
(3) (ii)	(iii)	(iv)	(i)
(4) (iii)	(ii)	(i)	(iv)

159. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is -
   (1) Imbibition
   (2) Plasmolysis
   (3) Transpiration
   (4) Root pressure

160. Choose the correct pair from the following -

(1) Nucleases -	Separate the two strands of DNA
(2) Exonucleases -	Make cuts at specific positions within DNA
(3) Ligases -	Join the two DNA molecules
(4) Polymerases -	Break the DNA into fragments

161. The transverse section of a plant shows following anatomical features -

(a) Large number of scattered vascular bundles surrounded by bundle sheath.

(b) Large conspicuous parenchymatous ground tissue.

(c) Vascular bundles conjoint and closed.

(d) Phloem parenchyma absent.

Identify the category of plant and its part -

(1) Dicotyledonous stem

(2) Dicotyledonous root

(3) Monocotyledonous stem

(4) Monocotyledonous root

162. Experimental verification of the chromosomal theory of inheritance was done by -

(1) Boveri   (2) Morgan

(3) Mendel   (4) Sutton

163. Bt cotton variety that was developed by the introduction of toxin gene of Bacillus thuringiensis (Bt) is resistant to -

(1) Plant nematodes   (2) Insect predators

(3) Insect pests   (4) Fungal diseases

164. Select the correct statement -

(1) Insulin acts on pancreatic cells and adipocytes.

(2) Insulin is associated with hyperglycemia.

(3) Glucocorticoids stimulate gluconeogenesis.

(4) Glucagon is associated with hypoglycemia

165. The specific palindromic sequence which is recognized by EcoRI is -

(1) 5' - CTTAAG - 3'   (2) 5' - GGATCC - 3'
   3' - GAATTC - 5'   3' - CCTAGG - 5'

(3) 5' - GAATTC - 3'   (4) 5' - GGAACC - 3'
   3' - CTTAAG - 5'   3' - CCTTGG - 5'

166. Identify the substances having glycosidic bond and peptide bond, respectively in their structure -

(1) Cellulose, lecithin

(2) Inulin, insulin

(3) Chitin, cholesterol

(4) Glycerol, trypsin

167. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are -

(1) Ammonia and oxygen

(2) Ammonia and hydrogen

(3) Ammonia alone

(4) Nitrate alone

168. Which of the following hormone levels will cause release of ovum (ovulation) from the graffian follicle -

(1) Low concentration of LH

(2) Low concentration of FSH

(3) High concentration of Estrogen

(4) High concentration of Progesterone

169. Which of the following statements are true for the phylum-Chordata -

(a) In Urochordata notochord extends from head to tail and it is present throughout their life.

(b) In Vertebrata notochord is present during the embryonic period only.

(c) Central nervous system is dorsal and hollow.

(d) Chordata is divided into 3 subphyla Hemichordata, Tunicata and Cephalochordata.

(1) (a) and (b)   (2) (b) and (c)

(3) (d) and (c)   (4) (c) and (a)

170. Bilaterally symmetrical and acoelomate animal are exemplified by -

(1) Aschelminthes   (2) Annelida

(3) Ctenophora   (4) Platyhelminthes

171. Which of the following regions of the globe exhibit highest species diversity -

(1) Himalayas

(2) Amazon forests

(3) Western Ghats of India

(4) Madagascar

172. Select the correct match -

    (1) Sickle cell anaemia - Autosomal recessive trait, chromosome-11

    (2) Thalassemia - X linked

    (3) Haemophilia - Y linked

    (4) Phenylketonuria - Autosomal dominant trait

173. Which one of the following is the most abundant protein in the animals -

    (1) Lectin

    (2) Insulin

    (3) Haemoglobin

    (4) Collagen

174. Select the option including all sexually transmitted diseases-

    (1) AIDS, Malaria, Filaria

    (2) Cancer, AIDS, Syphilis

    (3) Gonorrhoea, Syphilis, Genital herpes

    (4) Gonorrhoea, Malaria, Genital herpes

175. In water hyacinth and water lily, pollination takes place by-

    (1) Wind and water

    (2) Insects and water

    (3) Insects or wind

    (4) Water currents only

176. In gel electrophoresis, separated DNA fragments can be visualized with the help of -

    (1) Acetocarmine in UV radiation

    (2) Ethidium bromide in infrared radiation

    (3) Acetocarmine in bright blue light

    (4) Ethidium bromide in UV radiation

177. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their -

    (1) Defence action

    (2) Effect on reproduction

    (3) Nutritive value

    (4) Growth response

178. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits -

    (1) 14   (2) 8   (3) 4   (4) 2

179. Which of the following is not an attribute of a population-

    (1) Mortality   (2) Species interaction

    (3) Sex ratio   (4) Natality

180. Snow-blindness in Antarctic region is due to -

    (1) High reflection of light from snow

    (2) Damage to retina caused by infra-red rays

    (3) Freezing of fluids in the eye by low temperature

    (4) Inflammation of cornea due to high dose of UV-B radiation

Hint Sheet

1. To minimise recombination of charge carriers reaching in base region from emitter.

2. $E = \dfrac{KQ}{r^2} = \dfrac{9 \times 10^9 \times 3.2 \times 10^{-7}}{(15 \times 10^{-2})^2} = 1.28 \times 10^5 \, N/C$

3. $\theta = \dfrac{1.22\lambda}{2a} = \dfrac{1.22 \times 600 \times 10^{-9}}{2} = 3.66 \times 10^{-7}$

4. $Stress = \dfrac{F}{A} = ML^{-1}T^{-2}$

5. $Pitch = LC \times division = 0.01 \, mm \times 50 = 0.5 \, mm$

6. $T = \left(\dfrac{m_1 - m_2}{m_1 + m_2}\right)g = \dfrac{g}{5}$

7. $\lambda = \dfrac{12.27}{\sqrt{V}} \, Å$

   $1.227 \times 10^{-2} \times 10^{-9} = \dfrac{12.27 \times 10^{-10}}{\sqrt{V}}$

   $V = 10^4 \, volt$

8. $E = -\dfrac{dv}{dr}$

   As ($V \to constant$)

   E = zero

9. $P = \dfrac{\rho RT}{M} \Rightarrow \rho = \dfrac{PM}{RT} = \dfrac{249 \times 10^3 \times 2 \times 10^{-3}}{8.3 \times 300}$

   $\rho = 0.2 \, kg/m^3$

10. $Mean \; free \; path = \dfrac{1}{\sqrt{2} \, n\pi d^2}$

11. Taking downward direction as positive

    $u = 20 \, m/s; \quad v = 80 \, m/s; \quad a = 10 \, m/s^2$

    $v^2 = u^2 + 2as \Rightarrow (80)^2 = (20)^2 + 2(10) \, h$

    $h = \dfrac{6000}{20} = 300 \, m$

12. $Y = \overline{\overline{A} + \overline{B}} = \overline{\overline{A}}.\overline{\overline{B}} = A.B$

13. $V = \dfrac{KP}{r^2}\cos\theta \, ; \quad V = \dfrac{9 \times 10^9 \times 16 \times 10^{-9} \cos 60°}{(0.6)^2}$
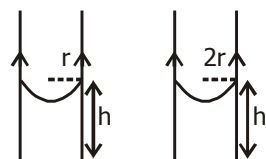
    $V = \dfrac{9 \times 16}{0.36} \times \dfrac{1}{2} = 200 \, volt$

14. $h = \dfrac{2T}{r\rho g}$

    $h' = \dfrac{h}{2}$

    $m = (\pi r^2) \, h\rho = 5g$

    $m' = (\pi(2r)^2) \, \dfrac{h}{2} \, \rho = 10 \, g$

15. NCERT P. No. 104, figure number 3.9.

16. $\dfrac{U_E}{U_B} = \dfrac{\frac{1}{2}\varepsilon_0 E^2}{\frac{1}{2}\frac{B^2}{\mu_0}} = \mu_0 \varepsilon_0 \dfrac{E^2}{B^2} = \dfrac{1}{C^2} \times C^2 = \dfrac{1}{1}$

17. $B = \dfrac{\mu_0 Ni}{L} = 4\pi \times 10^{-7} \times \dfrac{100}{0.5} \times 2.5$

    $= 2\pi \times 10^{-4} = 6.28 \times 10^{-4} \, T$

18. Bohr's model is applicable only for single electron system.

19. $E = mc^2 = 0.5 \times 10^{-3} \times (3 \times 10^8)^2 = 4.5 \times 10^{13} \, J$

20. In substraction, number of significant digits equals to the minimum number of significant digit in given measurement.

21. The frequency of string A = 530 Hz

    So original frequency of string B may be $f_B = (530 \pm 6)$

    On decreasing tension frequency decreases so beat frequency increases.

    Hence original frequency of B will be 530 − 6 = 524 Hz

22. $\tan\phi = \dfrac{X_C}{R}$ (when L is removed)

    $\tan 60° = \dfrac{X_C}{R}$

    $X_C = \sqrt{3} \, R$

    Similarly, $\tan 60° = \dfrac{X_L}{R}$ (when C is removed)

    $X_L = \sqrt{3} \, R$

    $X_L = X_C$ i.e. LCR circuit is at resosance so power factor is one.

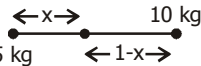23. $Q = ms\Delta T = \rho vs\Delta T$

    $Q \propto v \propto r^3$

    $\dfrac{Q_1}{Q_2} = \left(\dfrac{r_1}{r_2}\right)^3 = \left(\dfrac{3}{2}\right)^3 = \dfrac{27}{8}$

24. $i_b = \tan^{-1} \mu$

As μ is always greater than 1 for any medium

Hence, $45° < i_B < 90°$

25. It is free expansion of ideal gas by sudden opening of stop cock so it is adiabatic process.

26. $\chi = 599$

$\mu_r = 1 + \chi = 600$

$\mu = \mu_0 \mu_r = 4\pi \times 10^{-7} \times 600$

27. $\varepsilon_r = C_{med.}/C_{air} = 5$

$\varepsilon = \varepsilon_0 \varepsilon_r = 8.85 \times 10^{-12} \times 5$

$\varepsilon = 0.44 \times 10^{-10} \ C^2 \ N^{-1} \ m^{-2}$

28. $\mu = \dfrac{V_d}{E} = \dfrac{7.5 \times 10^{-4}}{3 \times 10^{-10}} = 2.5 \times 10^6$

29.

Colour →	B	B	R	O	Y	G	B	V
Code →	0	1	2	3	4	5	6	7

Resistance = $47 \times 10^1 \pm 5\%$

Resistance = $470 \pm 5\%$

30. As, temperature increases $\Rightarrow$ number of free electron in conduction band increases.

So, resistance decreases and hence temperature coefficient of resistance is negative for semiconductor and insulator.

31. On surface of earth $\dfrac{GMm}{R^2} = 72$

At height $\dfrac{R}{2}$

Weight $= \dfrac{GMm}{\left(R + \dfrac{R}{2}\right)^2} = \dfrac{4GMm}{9R^2} = \dfrac{4}{9} \times 72 = 32$ N

32. $V = IX_c$; $I = \dfrac{V}{X_c} = V\omega c$

$200 \times 2\pi \times 2000 \times 10^{-6} \Rightarrow I = 2.5$ A

33. Displacement $x = A \sin \omega t$.

Acceleration $a = -A\omega^2 \sin \omega t$ both are in opposite phase.

Hence $\Delta \phi = \pi$

34. Thermal energy for a mono-atomic gas is $\dfrac{3}{2} k_B T$

35. As incident frequency is less than threshold frequency. Hence photoelectric current is zero.

36. $Y = \dfrac{FL}{A\Delta l} \Rightarrow Y = \dfrac{MgL}{A(L_1 - L)}$

37.

$i = \mu A$
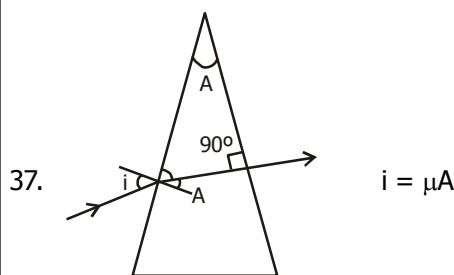
38. $\tau = \vec{r} \times \vec{F} \quad = (2\hat{k}) \times (3\hat{j})$

$= 6\hat{k} \times \hat{j} \quad \Rightarrow \tau = -6\hat{i}$

39. $\beta = \dfrac{\lambda D}{d}$

D is doubled twice and d is halved, so β is 4 times.

40. $1 eV = 1.6 \times 10^{-19}$ Joule

Energy = 10^{-20} J

$= \dfrac{10^{-20} \ eV}{1.6 \times 10^{-19}} = 0.06$ eV

41. $_{92}U^{235} + _0n^1 \rightarrow \ _{36}K^{89} + 3_0n^1 + _Z x^A$

$92 + 0 = 36 + 0 + Z$

$Z = 56$

and $235 + 1 = 89 + 3(1) + A$

$A = 144$

So, element is $_{56}Ba^{144}$

42.

$5x = 10(1 - x)$

$x = 2 - 2x \Rightarrow x = 2/3 = 67$ cm

43. $I = 20 \ \dfrac{W}{cm^2}$; $I = \dfrac{E}{A \times t}$

$E = IAt = 20 \times 20 \times 60$

$E = 24 \times 10^3$ J

44. On reverse biasing depletion region increases.

45. From meter bridge $\dfrac{R}{l} = \dfrac{S}{(100 - l)}$

$\dfrac{R}{60} = \dfrac{10}{40} \Rightarrow R = 15 \ \Omega$

$\because 15 \ \Omega \rightarrow 1.5$

$\therefore 1 \ \Omega \rightarrow \dfrac{1.5}{15} = 1.0 \times 10^{-1} m$

46.
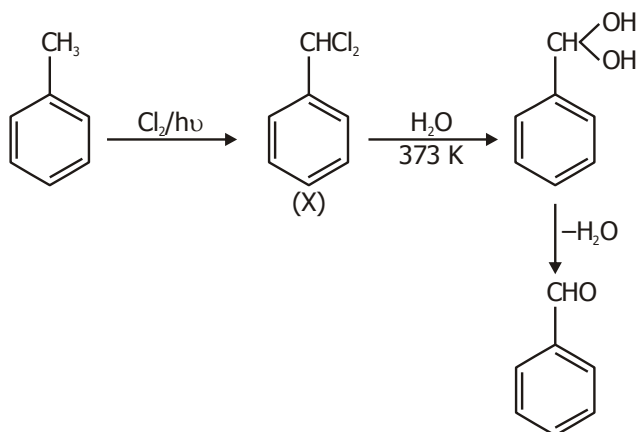
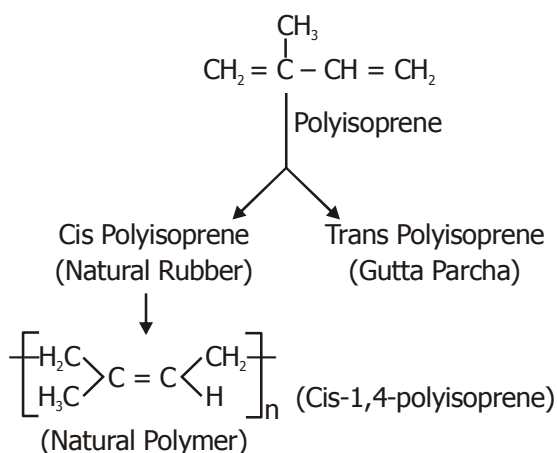

47. Diatomic molecule having bond order zero is does not exist. $He_2 \rightarrow$ Total electrons = 4

$\sigma 1s^2 \sigma^* 1s^2$

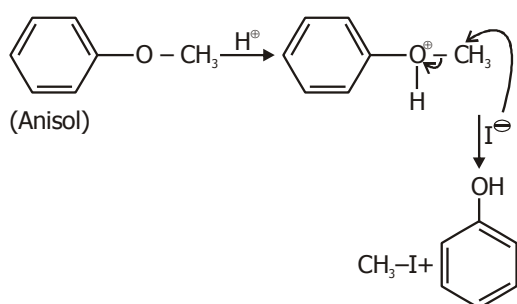B.O. = $\dfrac{2-2}{2} = 0$

48.

$$CH_2 = \underset{\underset{CH_3}{|}}{C} - CH = CH_2$$

Polyisoprene

Cis Polyisoprene   Trans Polyisoprene
(Natural Rubber)   (Gutta Parcha)

(Natural Polymer)

49. Collision frequency $\propto$ Concentration

50.

51. $^{175}_{71}Lu \qquad \rightarrow$ No. of electrons = 71

$\rightarrow$ No. of protons = 71

$\rightarrow$ No. of neutrons = 175 − 71 = 104

52. $Cr^{2+} \rightarrow d^4 \rightarrow$ unpaired electrons = 4

$\mu = \sqrt{n(n+2)} = \sqrt{4(4+2)} = 4.90$ BM

53. $CO \rightarrow$ Neutral oxide

$BaO \rightarrow$ Basic oxide

$Al_2O_3 \rightarrow$ Amphoteric oxide

$Cl_2O_7 \rightarrow$ Acidic oxide

54. $NH_2CONH_2 + H_2O \longrightarrow 2(NH_4)_2CO_3$

$(NH_4)_2CO_3 \xrightarrow{\Delta} \underset{(B)}{2NH_3} + CO_2 + H_2O$

$Cu^{2+}_{(aq.)} + 4NH_3 \longrightarrow [Cu(NH_3)_4]^{2+}$

Deep blue solution

55. $CO + H_2 \rightarrow$ Synthesis gas

$\rightarrow$ Temporary hardness is due to bicarbonate salt of Ca^{2+} and Mg^{2+}.

$\rightarrow B_2H_6$ is an electron deficient covalent hydride.

$\rightarrow H_2O_2$ non-planar molecule

56. Ethanol + Acetone

Because due to addition of acetone intermolecular attraction forces (H-bonding) decreases in ethanol.
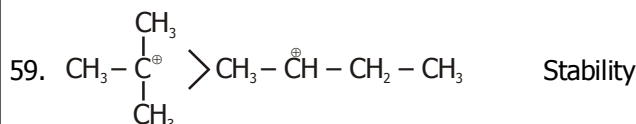
57. $\Delta T_f = i \times K_f \times m$

$= 1 \times 5.12 \times 0.078 = 0.40$ K

58. $BF_3 \rightarrow$ Symmetrical molecule, μ = zero

$BeF_2 \rightarrow$ Symmetrical molecule, μ = zero

$CO_2 \rightarrow$ Symmetrical molecule, μ = zero

1,4-dichlorobenzene $\rightarrow$ Symmetrical molecule, μ = zero

59. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}^{\oplus} > CH_3 - \overset{\oplus}{C}H - CH_2 - CH_3$ Stability

Explained by Hyperconjugation

60. $NaOH(aq) \rightarrow Na^+(aq) + OH^-(aq)$

0.1

—   0.1   0.1

$Ni(OH)_2(s) \rightleftharpoons Ni^{+2}(aq) + 2OH^-(aq)$
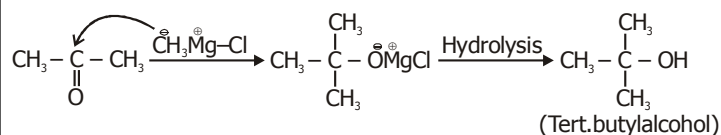
s $2s + 0.1 \approx 0.1$
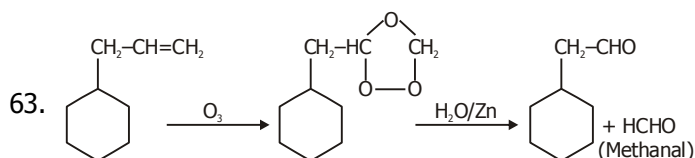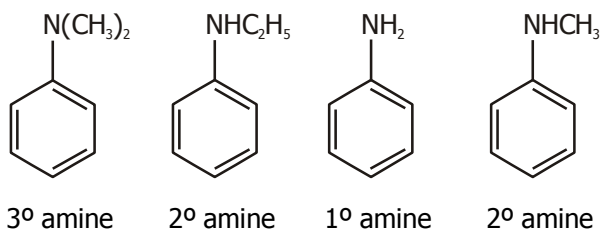
$\Rightarrow K_{sp} = [Ni^{+2}][OH^-]^2 \Rightarrow K_{sp} = s \times (0.1)^2$

$\Rightarrow 2 \times 10^{-15} = s \times 10^{-2} \Rightarrow s = 2 \times 10^{-13}$

61.

62. Only primary amines will give carbylamine test.

N(CH₃)₂ — 3º amine
NHC₂H₅ — 2º amine
NH₂ — 1º amine
NHCH₃ — 2º amine

63.

$CH_2-CH=CH_2 \xrightarrow{O_3} \xrightarrow{H_2O/Zn} CH_2-CHO + HCHO$ (Methanal)

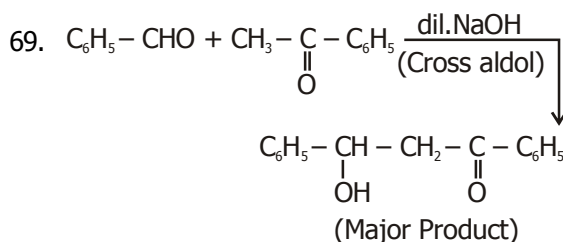64. No. of moles of $N_2 = \dfrac{7}{28} = 0.25$

No. of moles of $Ar = \dfrac{8}{40} = 0.20$

$P_{N_2} = X_{N_2} \times P_T$

$= \dfrac{0.25}{0.20 + 0.25} \times 27$

$= \dfrac{0.25}{0.45} \times 27 = 15$ bar

65. Correct order of increasing field strength of ligand is -
$SCN^- < F^- < C_2O_4^{2-} < CN^-$

66. Paper chromatography an example of Partition chromatography.

67. Sucrose $\xrightarrow{\text{Hydrolysis}}$ α-D-Glucose + β-D-Fructose

68. $t_{90\%} = \dfrac{10}{3} \times t_{50\%} = \dfrac{10}{3} \times \dfrac{0.693}{4.606 \times 10^{-3}} = 500$ s

69. $C_6H_5 - CHO + CH_3 - \underset{\underset{O}{\|}}{C} - C_6H_5 \xrightarrow[\text{(Cross aldol)}]{\text{dil.NaOH}}$

$C_6H_5 - \underset{\underset{OH}{|}}{CH} - CH_2 - \underset{\underset{O}{\|}}{C} - C_6H_5$
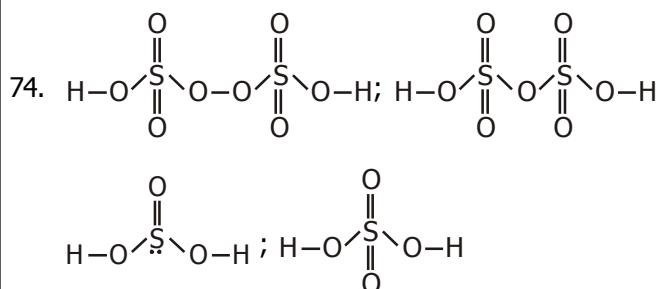(Major Product)

70. Carboxyhaemoglobin is 300 times more stable then oxyhaemoglobin so it reduces oxygen carrying ability of blood.

71. $\Delta G^0 = -RT \ln K_c$
$= -8.314 \text{ J mol}^{-1} \text{ K}^{-1} \times 300 \text{ K} \times \ln(2 \times 10^{13})$

72. HCl was passed through a solution of $CaCl_2, MgCl_2$ and NaCl, then NaCl is crystallise(s).
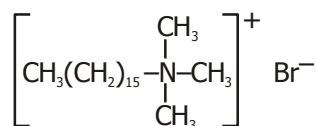Ca and Mg chloride, being more soluble than NaCl, remain in solution.

73. $\sqrt{3} \times a = 4R \Rightarrow R = \dfrac{\sqrt{3}}{4} \times 288$ pm

74.

75. Oxidation state of Cr in $CrO_4^{2-} = +6$
Oxidation state of Cr in $Cr_2O_7^{2-} = +6$

76. Cetyltrimethyl ammonium bromide

77. For adiabatic process : q = 0
For free expansion : w = 0
According to FLOT
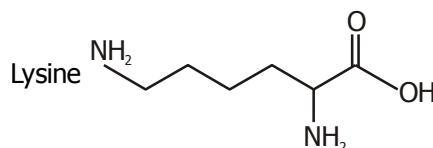$\Rightarrow \Delta U = q + W = 0 \Rightarrow \Delta T = 0$

78. Anode : $2H_2O(l) \rightarrow O_2(g) + 4H^+(aq) + 4e^-$

79. (1) Vapour phase refining is carried out for Ni by **mond process**
(2) Wrought iron is the **purest form of iron**
(4) Blistter copper has blistered due to **evolution of SO₂**
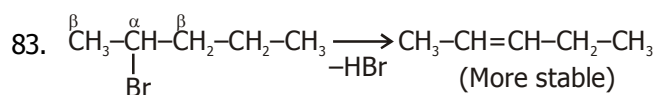
80. Basic amino acid -

Lysine

81. Unnilunium = 101 = Mendelevium
Unniltrium = 103 = Lawrencium
Unnilhexium = 106 = Seaborgium
Unununnium= 111 = Roentgenium

82. Wurtz reaction is not suitable for unsymmetrical alkane (n-heptane).

83. $\overset{\beta}{C}H_3-\overset{\alpha}{C}H-\overset{\beta}{C}H_2-CH_2-CH_3 \xrightarrow[-HBr]{} CH_3-CH=CH-CH_2-CH_3$ (More stable)
    |
    Br

    (a) β-Elimination reaction

    (b) Follows Zaitsev rule

    (c) Dehydrohalogenation reaction

84. No. of faradays = no. of equivalents

    = no. of moles × v.f

    $= \dfrac{20}{40} \times 2 = 1F$

85. No. of atoms $\propto$ no. of moles $\propto \dfrac{1}{\text{Atomic Mass}}$

    (Since mass is same)

    Since molar mass of Li is minimum so it contains maximum no. of atoms.

86. $\Delta n_g = 1 - 2 = -1 \Rightarrow \Delta_r S < 0$

    Since bond is formed so $\Delta_r H < 0$

87. **CO_2(solid)** is used as refrigerant for ice-cream and frozen food.

    The structure of C_{60} contains **twelve five carbon rings** and **twenty six carbon** rings.

88. Zeta potential is useful in determining stability of the colloidal particles (Electrical double layer).

89. $CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(l) + 4HCl(g)$

    Oxidation state of carbon atom in $CH_4 = -4$

    Oxidation state of carbon atom in $CCl_4 = +4$

90. Potassium ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals.

94. Ori site or the site of origin controls replication in circular plasmid DNA and also the copy number of linked DNA in the vector.

96. Zygote or embryo till 16 cells is transfer to fallopian tubes while embryo with more cells is transfer to uterus.

99. Enterokinase activates inactive pancreatic enzymes.

101. Ray florets are neuter flowers of capitulum inflorescence of the family Asteraceae. Both the ray florets and disc florets have inferior ovary. The ray florets are sterile female flowers while the disc florets are bisexual flowers that produce seeds.

102. Activated sludge is put into anaerobic digester for further sewage treatment. It contains biological flocs that contain bacteria and fungi for further digestion of organic wastes under aerobic conditions.

103. During Krebs' or citric acid cycle, succinyl-CoA is acted upon by enzyme succinyl-CoA synthetase to form succinate (a 4C compound). The reaction releases sufficient energy to form ATP (in plants) or GTP (in animals) by substrate-level phosphorylation. Therefore, only one number of substrate-level phosphorylation in one turn of the citric acid cycle.

104. The G_1 phase of interphase includes synthesis of various proteins, duplication of organelles, synthesis of various enzymes etc as a preparation for the synthesis phase and cell division. Therefore, it is metabolically very active but DNA replication does not take place in this phase

105. Chlorella and Spirulina are unicellular green algae, which are commercially very important.

    Anabaena is Cyanobacteria, Laminaria, Sargassum, Gelidium, Gracilaria are multicellular algae.

    Volvox is colonial alga.

109. Pollen grains (n) inside the anther (2n), Embryo sac (n) inside the ovule (2n) are consists of two generations i.e. haploids inside diploids.

113. The fibrous roots originate from the base of the stem. The primary root originates at the germination stage from the radicle of the seed.

114. In cockroach nervous system is present through out the body, only small part is located in head.

115. Strobili or cones are the dense and compact structures present in equisetum.

116. The dissolution of the synaptonemal complex takes place in the diplotene stage of meiosis.

    The beginning of diplotene is recognised by the dissolution of the synaptonemal complex and the tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the sites of crossovers.

120. The oxygenation of RuBisCo enzyme during photorespiration leads to the formation of 1 molecule of 3-C compound PGA and 1 molecule of 2-C compound Phosphoglycolate.

122. RNA polymerase synthesizes RNA by following a strand of DNA. RNA polymerase is an enzyme that is responsible for copying a DNA sequence into an RNA sequence, during the process of transcription.

126. In light reaction, PQ facilitates the transfer of electrons from PS-II to $Cytb_6f$ complex, which then reduces plastocyanin.

128. Golgi apparatus has may functions. It produces materials for secretion, takes part in the transformation of membranes, the formation of a number of glycoproteins glycolipids, acrosome of human sperm and lysosomes.

    Peroxisomes are the storage organelles of the peroxidase enzyme.

    Polysomes are a cluster of ribosomes used for the translation process.

    Endoplasmic reticulum is the organelle that completes the post-translational modification of a protein.

130. The peripheral region of the secondary xylem is lighter in colour. This is termed as sapwood. In the trunk and older branches of large trees, only the outer secondary xylem which is sapwood serves in water conduction, while the inner part which is heartwood is composed of dead but structurally strong xylem.

131. Floridean starch is a storage glucan found in red algae or rhodophyceae and is similar to amylopectin and glycogen.

134. Growth occurs in three phases namely lag phase (slow growth phase), Log phase or exponential growth phase and steady or plateau or stationary phase.

    Thus, maximum growth occurs in the log phase in a sigmoid growth curve.

142. The Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol) is an international agreement made in 1987. It was designed to stop the production and import of ozone depleting substances and reduce their concentration in the atmosphere to help protect the earth's ozone layer.

143. Sticky ends contain free or hanging or unpaired nitrogen bases which can pair to complementary bases present on other DNA segment required to create a recombinant DNA.

A ligase is required in absence of sticky ends to join together two segments of DNA.

147. Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis.

    Net primary productivity (NPP) is GPP – Respiration.

    Hence gross primary productivity is always more than NPP

148. ABO blood groups are controlled by the gene I. The gene I has three alleles I^A, I^B and i. The alleles I^A and I^B produce a slightly different form of the sugar while allele i does not produce any sugar. Because humans are diploid organisms, each person can possess at the most any two of the three I gene alleles.

150. Robert May estimated global species diversity at about 7 million.

    Although some extreme estimates range from 20 to 50 million.

151. The attachment point of funicle and body of ovule is known as hilum.

154. (a) Bacillus thuringiensis is a source of Cry-proteins.

    (b) Thermus aquaticus is a source of thermostable DNA polymerase (Taq polymerase) used in PCR.

    (c) Agrobacterium tumefaciens is a cloning vector.

    (d) The construction of 1st recombinant DNA molecule was performed using native plasmid of Salmonella typhimurium.

155. Gibberellic acid break seed dormancy.

    It activate synthesis of α-amylase which breakdown starch into simple sugar.

156. These are not involved in ingestion of food particles.

157. The ovary is half inferior in Plum.

158. Grassland ecosystem is a terrestrial ecosystem. It includes various trophic levels

    First trophic level (T_1) – Grass

    Second trophic level (T_2) – Rabbit

    Third trophic level (T_3) – Crow

    Fourth trophic level (T_4) – Vulture

159. Root pressure is positive hydrostatic pressure.

    It develops in tracheary element at night and in early morning.

160. Ligases join the two DNA molecules.

161. All features are related to monocotyledonous stems

162. Experimental verification of the chromosomal theory of inheritance was done by Morgan.

Note: Sutton and Boveri proposed chromosomal theory of inheritance but it was experimentally verified by T.H. Morgan.

163. Bt cotton is resistant to cotton bollworm (Insect pest).

cry I Ac and cry II Ab genes have been introduced in cotton to protect it from cotton bollworm. This makes Bt cotton as biopesticide.
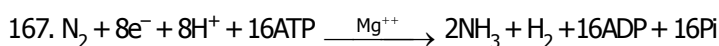
165. The specific palindromic sequence which is recognised by EcoRI is -

5' - GAATTC - 3'

3' - CTTAAG - 5'

166. Inulin is a fructan (polysaccharide of fructose). Adjacent fructose units are linked through glycosidic bond.

Insulin is a protein composed of 51 aminoacids. Adjacent aminoacids are attached through peptide bond.

167. $N_2 + 8e^- + 8H^+ + 16ATP \xrightarrow{Mg^{++}} 2NH_3 + H_2 + 16ADP + 16Pi$

171. The largely tropical Amazonian rain forest in South America has the greatest biodiversity on earth.

175. In majority of aquatic plants, the flowers emerge above the level of water.

These may be pollinated by insects or wind

eg.: Water hyacinth and water lily

179. Natality   —   Population attribute

Mortality   —   Population attribute

Species interaction   —   Population interaction

Sex ratio   —   Population attribute

180. UV-B radiations damage DNA and mutations may occur.

In human eye, cornea absorbs UV-B radiations, and a high dose of UV-B causes inflammation of cornea called snow blindness, cataract, etc.

ANSWER KEY

Qus.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	4	3	2	1	1	2	3	4	4	2	3	4	1	1	4	3	2	4	4
Qus.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	1	3	1	4	3	1	4	2	2	4	1	3	4	2	2	1	1	1	1
Qus.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	3	1	1	4	4	1	3	3	2	3	3	4	4	4	3	3	1	2	2	3
Qus.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	1	3	1	1	3	4	1	1	2	1	3	4	3	1	2	1	3	4	2	2
Qus.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	2	1	3	3	2	2	2	1	1	2	1	2	3	4	3	3	1	3	4	1
Qus.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	3	2	4	1	2	1	2	1	2	1	1	4	3	1	2	1	4	1	4	4
Qus.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	1	2	3	4	1	3	1	1	1	1	4	4	3	3	3	4	4	4	4	3
Qus.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	4	4	2	1	1	2	4	1	1	2	3	4	3	4	3	4	2	3	4	3
Qus.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	3	2	3	3	3	2	2	3	2	4	2	1	4	3	3	4	1	1	2	4