MERITSTORE

NEET FULL PORTION **TEST ID: Day 21 - 4**

Time: 03 hrs **PCB** **Marks : 720**

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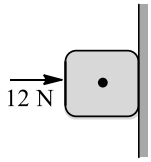
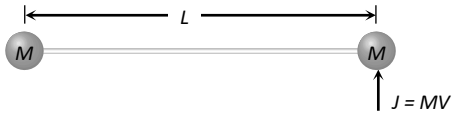
1. In the relation $P = \frac{\alpha}{\beta} e^{\frac{\alpha Z}{k\theta}} P$ is pressure, Z is the distance, k is Boltzmann's constant and θ is the temperature. The dimensional formula of β will be
   a) $[M^0L^2T^0]$ b) $[M^1L^2T^1]$
   c) $[M^1L^0T^{-1}]$ d) $[M^0L^2T^{-1}]$
2. A cube has numerically equal volume and surface area. The volume of such a cube is
   a) 216 $units$ b) 1000 $units$
   c) 2000 $units$ d) 3000 $units$
3. A person moves 30 m north and then 20 m towards east and finally $30\sqrt{2}$m in south-west direction. The displacement of the person from the origin will be
   a) 10 m along north b) 10 m along south
   c) 10 m along west d) Zero
4. A wheel is subjected to uniform angular acceleration about its axis. Initially its angular velocity is zero. In the first 2 sec, it rotates through an angle θ_1. In the next 2 sec, it rotates through an additional angle θ_2. The ratio of θ_2 / θ_1 is
   a) 1 b) 2 c) 3 d) 5
5. The angle between $\vec{A}$and $\vec{B}$ is θ, the value of the triple product $\vec{A} \cdot \vec{B} \times \vec{A}$ is
   a) A^2B b) Zero c) $A^2B \sin\theta$ d) $A^2B \cos\theta$
6. A block of weight 5N is pushed against a vertical wall by a force 12N. The coefficient of friction between the wall and block is 0.6. The magnitude of the force exerted by the wall on the block is



   a) 12 N b) 5 N c) 7.2 N d) 13 N
7. A player kicks a football of mass 0.5 kg and the football begins to move with a velocity of 10 m/s. If the contact between the leg and the football lasts for $\frac{1}{50}$s, then the force on the ball should be
   a) 2500 N b) 1250 N c) 250 N d) 625 N
8. A car of mass m is driven with an acceleration a along a straight level road against a constant external resistive force R. When the velocity of the car is v, the rate at which engine of the car is doing work, will be
   a) $R \cdot v$ b) $ma \cdot v$
   c) (R+ma)$\cdot v$ d) $(ma - R) \cdot v$
9. Consider a body, shown in figure, consisting of two identical balls, each of mass M connected by a light rigid rod. If an impulse $J = MV$ is imparted to the body at one of its ends, what would be its angular velocity



   a) V/L b) $2V/L$ c) $V/3L$ d) $V/4L$
10. Three point masses each of mass m are placed at the corners of an equilateral triangle of side 'a'. Then the moment of inertia of this system about an axis passing along one side of the triangle is
    a) ma^2 b) $3\,ma^2$
    c) $3/4\,ma^2$ d) $2/3\,ma^2$
11. An artificial satellite is moving in a circular orbit around the earth with a speed equal to half the magnitude of escape velocity from the earth. The height of the satellite above the earth's surface will be
    a) 6000 km b) 5800 km
    c) 7500 km d) 6400 km
12. A metal rod of Young's modulus 2×10^{10} Nm^{-2}undergoes an elastic strain of 0.06%. The energy per unit volume stored in J $m^{-3}$is
    a) 3600 b) 7200 c) 10800 d) 14400
13. An ice block floats in a liquid whose density is less than water. A part of block is outside the liquid. When whole of ice has melted, the liquid level will
    a) Rise
    b) Go down

c) Remain same
d) First rise then go down

14. The rate of flow of liquid through a capillary tube of radius r is V when the pressure difference across the two ends of the capillary is p. If pressure is increased by 3 p and radius is reduced to $r/2$, then the rate of flow becomes
a) $V/9$ b) $3V/8$ c) $V/4$ d) $V/3$

15. The temperatures of two bodies A and B are respectively 727°C and 327°C. The ratio $H_A : H_B$ of the rates of heat radiated by them is
a) 727 : 327 b) 5 : 3
c) 25 : 9 d) 625 : 81

16. Choose the incorrect statement from the following
S1 : The efficiency of a heat engine can be 1, but the coefficient of performance of a refrigerator can never be infinity
S2 : The first law of thermodynamics is basically the principle of conservation of energy
S3 : The second law of thermodynamics does not allow several phenomena consistent with the first law
S4 : A process, whose sole result is the transfer of heat from a colder object to a hotter object is impossible
a) S1 b) S3 c) S2 d) S4

17. A Carnot engine whose efficiency is 40%, receives heat at 500 K. If the efficiency is to be 50%, the source temperature for the same exhaust temperature is
a) 900 K b) 600 K c) 700 K d) 800 K

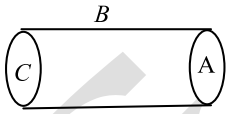
18. One litre of oxygen at a pressure of 1 atm and two litres of nitrogen at a pressure of 0.5 atm, are introduced into a vessel of volume 1 L. If there is no change in temperature, the final pressure of the mixture of gas (in atm) is
a) 1.5 b) 2.5 c) 2 d) 4

19. The period of particle in linear SHM is 8 s. At t=0, it is at the mean position. The ratio of the distances travelled by it in Its second and 2nd second is
a) 1.6 : 1
b) 2.4 : 1
c) 3.2 : 1
d) 4.2 : 1

20. A simple pendulum hanging from the ceiling of a stationary lift has time period t_1. When the lift moves downward with constant velocity, the time period is t_2, then
a) t_2 is infinity b) $t_2 > t_1$
c) $t_2 < t_1$ d) $t_2 = t_1$

21. An unknown frequency x produces 8 beats per seconds with a frequency of 250 Hz and 12 beats with 270 Hz source, then x is
a) 258 Hz b) 242 Hz c) 262 Hz d) 282 Hz

22. A hollow cylinder has a charge q coulomb within it. If ϕis the electric flux in unit of voltmeter associated with the curved surface B, the flux linked with the plane surface A in unit of voltmeter will be



a) $\frac{1}{2}\left(\frac{q}{\varepsilon_0} - \phi\right)$ b) $\frac{q}{2\varepsilon_0}$
c) $\frac{\phi}{3}$ d) $\frac{q}{\varepsilon_0} - \phi$

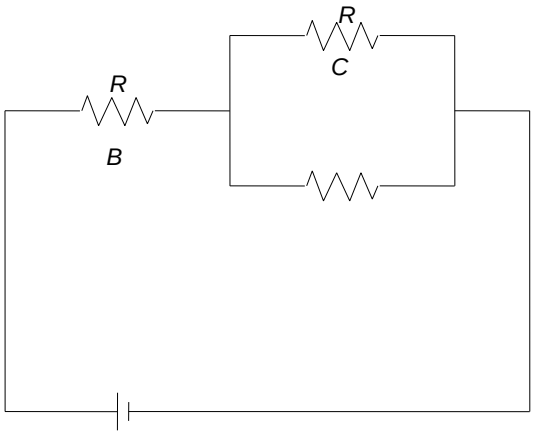
23. Positive and negative point charges of equal magnitude are kept at $\left(0,0,\frac{a}{2}\right)$ and $\left(0,0,\frac{-a}{2}\right)$, respectively. The work done by the electric field when another positive point charge is moved from $(-a, 0, 0)$ to $(0, a, 0)$ is
a) Positive
b) Negative
c) Zero
d) Depends on the path connecting the initial and final positions

24. The electric potential V at any point x, y, z (all the metre) in space is given by $V = 4x^2$ volt. The electric field at the point (1m, 0, 2m) in Vm^{-1} is
a) $-8\hat{i}$ b) $+8\hat{i}$ c) $-16\hat{i}$ d) $16\hat{k}$

25. The main supply voltage to a room is 120 V. The resistance of the lead wires is 6Ω. A 60 W bulb is already giving light. What is the decrease in voltage across the bulb when a 240 W heater is switched on?
a) No change b) 10 V
c) 20 V d) More than 10 V

26. In a conductor 4 $coulomb$ of charge flows for 2 $seconds$. The value of electric current will be
a) 4 $volt$ b) 4 $ampere$
c) 2 $ampere$ d) 2 $volt$

27. Three identical resistances A, B and C are connected as shown in figure.



The heat produced will be maximum

a) In B b) In $B$and C

c) In A d) Same for $A, B$and C

28. Uniform magnetic B is directed vertically upwards and 3 wires of equal length L, carrying equal current i are lying in a horizontal plane such that the first one is along north, second one along north-east and the third one at 60° north of east. Force exerted by magnetic field B on them is

a) Zero on the first b) $\frac{BiL}{\sqrt{2}}$ on the second

c) $\sqrt{3}\frac{BiL}{2}$ on the third d) BiL on all of them

29. A rod of ferromagnetic material with dimensions10 cm × 0.5 cm × 0.2 cm is placed in a magnetic field of strength $0.5 \times 10^4 \mathrm{A} - \mathrm{m}^{-1}$ as a result of which of which a magnetic moment of $0.5\mathrm{A} - \mathrm{m}^{-2}$is produced in rod. The value of magnetic induction will be

a) 0.54 T b) 6.28 T c) 0.358 T d) 2.591 T

30. The magnetic susceptibility is negative for

a) Paramagnetic materials

b) Diamagnetic materials

c) Ferromagnetic materials

d) Paramagnetic and ferromagnetic materials

31. In a primary coil 5A current is flowing on 220 volts. In the secondary coil 2200V voltage produces. Then ratio of number of turns in secondary coil and primary coil will be

a) 1:10 b) 10:1 c) 1:1 d) 11:1

32. A transformer is having 2100 turns in primary and 4200 turns in secondary. An AC source of 120 V, 10 A is connected to its primary. The secondary voltage and current are

a) 240 V,5 A

b) 120 V, 10 A

c) 240 V, 10 A

d) 120 V, 20 A

33. In an AC circuit, $V$and $I$are given by $V = 150\sin(150\mathrm{t})$ volt and $I = 150\sin\left(150\mathrm{t} + \frac{\pi}{3}\right)$ amp.

The power dissipated in the circuit is

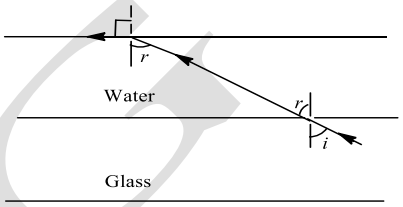
a) Zero b) 5625 W c) 150 W d) 106 W

34. A charged particle with charge q enters a region of constant, uniform and mutually orthogonal fields **E** and **B** with a velocity **v** perpendicular to both **E** and **B**, and comes out without any change in magnitude or direction of **v.** Then

a) $\mathbf{v} = \mathbf{E} \times \mathbf{B}/\mathrm{B}^2$ b) $\mathbf{v} = \mathbf{B} \times \mathbf{E}/\mathrm{B}^2$

c) $\mathbf{v} = \mathbf{E} \times \mathbf{B}/\mathrm{E}^2$ d) $\mathbf{v} = \mathbf{B} \times \mathbf{E}/\mathrm{E}^2$

35. A ray of light is incident at the glass-water interface at an angle $i$it emerges finally parallel to the surface of water, then the value of μ_g would be



a) $(4/3)\ \sin i$ b) $1/\sin i$

c) 4/3 d) 1

36. An equiconvex lens of glass of focal length 0.1 metre is cut along a plane perpendicular to principal axis into two equal parts. The ratio of focal length of new lenses formed is

a) $1:1$ b) $1:2$ c) $2:1$ d) $2:\frac{1}{2}$

37. Biological importance of Ozone layer is

a) It stops ultraviolet rays

b) Ozone rays reduce green house effect

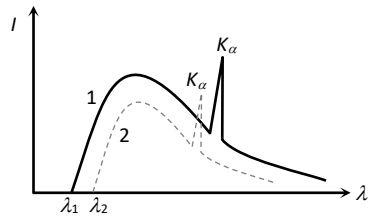
c) Ozone layer reflects radio waves

d) Ozone layer controls O_2/H_2 radio in atmosphere

38. Sodium and copper have work functions 2.3 eV and 4.5 eV respectively. Then the ratio of their threshold wavelengths is nearest to

a) 1 :2 b) 4 :1 c) 2 :1 d) 1 :4

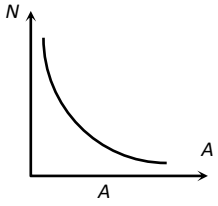
39. The intensity distribution of X-rays from two coolidge tubes operated on different voltages V_1 and V_2 and using different target materials of atomic numbers Z_1 and Z_2 is shownin the figure. Which one of the following inequalities is true

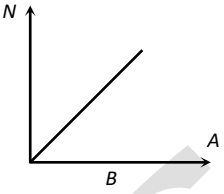


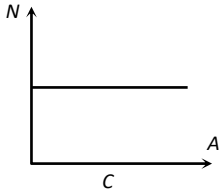
a) $V_1 > V_2, Z_1 < Z_2$ b) $V_1 > V_2, Z_1 > Z_2$
c) $V_1 < V_2, Z_1 > Z_2$ d) $V_1 = V_2, Z_1 < Z_2$

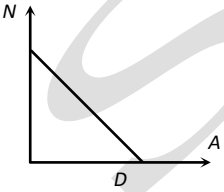
40. An electron collides with a hydrogen atom in its ground state and excites it to n=3. The energy given to hydrogen atom in this inelastic collision is(neglect the recoiling of hydrogen atom)
a) 10.2 eV b) 12.1 eV
c) 12.5 eV d) None of these

41. A radioactive material has a half-life of 8 years. The activity of the material will decrease to about 1/8 of its original value in
a) 256 years b) 128 years
c) 64 years d) 24 years

42. The plot of the number (N) of decayed atoms versus activity (A) of a radioactive substance is
a) 

b) 

c) 

d) 

43. The energy band gap is maximum in
a) Metals b) Superconductors
c) Insulators d) Semiconductors

44. In optical communication system operating at 1200 nm, only 2% of the source frequency is available for TV transmission having a bandwidth of 5 MHz. The number of TV channels that can be transmitted is
a) 2 million b) 10 million
c) 0.1 million d) 1 million

45. For good demodulation of AM signal of carrier frequency f, the value of RC should be
a) $RC = \frac{1}{f}$ b) $RC < \frac{1}{f}$ c) $RC \geq \frac{1}{f}$ d) $RC > > \frac{1}{f}$

46. A bivalent metal has an equivalent mass of 32. The molecular mass of the metal nitrate is
a) 182 b) 168 c) 192 d) 188

47. The molecular weight of air will be (the components of air given as $N_2 - 78\%, O_2 - 21\%, Ar - 09\%$ and $CO_2 - 0.1\%$)
a) 18.64 b) 24.968 c) 28.964 d) 29.864

48. The charge to mass ratio of α-particle is approximately . . . the charge to mass ratio of protons
a) Six times b) Four times
c) Half d) Two times

49. According to Bohr's theory, the angular momentum of an electron in 5th orbit is
a) $25\frac{h}{\pi}$ b) $1.0\frac{h}{\pi}$ c) $10\frac{h}{\pi}$ d) $2.5\frac{h}{\pi}$

50. A trend common to both group I and VII elements in the Periodic Table as atomic number increases is
a) Atomic radius increases
b) Oxidising power increases
c) Reactivity with water increases
d) Maximum valency increases

51. Which type of bond is present in H_2S molecule?
a) Ionic bond
b) Covalent bond
c) Coordinate
d) All of three

52. In 1 – butene number of σ - bonds is
a) 8 b) 10 c) 11 d) 12

53. A gas can be liquefied by pressure alone when its temperature is
a) Higher than its critical temperature
b) Lower than its critical temperature
c) Either (a) or (b)
d) None of the above

54. In an isochoric process, the increase in internal energy is
a) Equal to the heat absorbed
b) Equal to the heat evolved
c) Equal to the work done
d) Equal to the sum of the heat adsorbed and work done

55. Which is the correct expression, that relates changes of entropy with the change of pressure for an ideal gas at constant temperature in the following?
a) $\Delta S = nRT \ln \frac{p_2}{p_1}$
b) $\Delta S = T(p_2 - p_1)$
c) $\Delta S = nR \ln \frac{p_1}{p_2}$

d) $S = 2.303\, nRT \ln \frac{p_1}{p_2}$

56. Ammonia under a pressure of 15 atm at 27°Cis heated to 347°C in a closed vessel in the presence of catalyst. Under the conditions, NH_3 is partially decomposed according to the equation, $2NH_3 \rightleftharpoons N_2 + 3H_2$. The vessel is such that the volume remains effectively constant whereas pressure increases to 50 atm. Calculate the percentage of NH_3actually decomposed
a) 61.3% b) 63.5% c) 65.3% d) 66.6%

57. Oxidation states of the metal in the minerals haematite and magnetite, respectively, are
a) II, III in haematite and III in magnetite
b) II, III in haematite and II in magnetite
c) II in haematite and II, III in magnetite
d) III in haematite and II, III in magnetite

58. The oxidation number of Cr in K_2CrO_4 is
a) $+3$ b) -6 c) $+6$ d) -3

59. Which pair does not show hydrogen isotopes?
a) *Ortho*and *para*hydrogen
b) Protium and deuterium
c) Deuterium and tritium
d) Tritium and protium

60. Sodium thiosulphate is prepared by
a) Boiling Na_2SO_3 solution with S in alkaline medium
b) Reducing Na_2SO_4 solution with H_2S
c) Boiling Na_2SO_3 solution with S in acidic medium
d) Neutralising $H_2S_2O_3$ solution with NaOH

61. Elements of group IV used in semiconductors are
a) C, Si, Ge b) Si, Ge, Sn
c) Si, Ge d) B, Si, Ge

62. In feldspar and zeolite, Si^{4+} ions are replaced by which ions?
a) Oxide ion b) Hydroxide ion
c) Aluminium ion d) Potassium ion

63. Di-chloroacetic acid is a stronger acid than acetic acid.
This due to occurrence of
a) Mesomeric effect b) Hyperconjugation
c) Inductive effect d) Steric effect

64. Which of these process is used in synthesis of petroleum?
a) Fischer-Tropsch synthesis
b) Cannizaro reaction
c) Skraup synthesis
d) Rosenmund reaction

65. When methyl iodide is treated with sodium in ethereal solution, it gives
a) Methane
b) Ethane
c) Methyl sodium iodide
d) Sodium methoxide

66. Identify the incorrect statement from the following.
a) Oxides of nitrogen in the atmosphere can cause the depletion of ozone layer.
b) Ozone absorbs the intense ultraviolet radiations of the sun.
c) Depletion of ozone layer is because of its chemical reactions with chlorofluoro alkanes.
d) Ozone absorbs infrared radiations.

67. Which has no rotation of symmetry?
a) Hexagonal b) Orthorhombic
c) Cubic d) Triclinic

68. In a cubic structure of diamond which is made from *X*and *Y*, where *X*atoms are at the corners of the cube and *Y*at the face centres of the cube. The molecular formula of the compound is
a) X_2Y b) X_3Y c) XY_2 d) XY_3

69. A solution of two liquids boils at a temperature more than the boiling point of either them. Hence, the binary solution shows
a) Negative deviation from Raoult's law
b) Positive deviation from Raoult's law
c) No deviation from Raoult's law
d) Positive or negative deviation from Raoult's law depending upon the composition

70. 5 L of a solution contains 25 mg of $CaCO_3$. What is its concentration in ppm? (mol. wt. of $CaCO_3$is 100)
a) 25 b) 1 c) 5 d) 2500

71. A silver cup is plated with silver by passing 965 C of electricity. The amount of Ag deposited is
a) 107.89 g b) 9.89 g
c) 1.0002 g d) 1.08 g

72. The rate constant for the reaction, $2N_2O_5 \rightarrow 4NO_2 + O_2$ is $3.0 \times 10^{-5} s^{-1}$. If the rate is $2.4 \times 10^{-5} mol L^{-1} s^{-1}$ then the concentration of $N_2O_5 (in mol L^{-1})$ is
a) 0.04 b) 0.8 c) 0.07 d) 1.4

73. The velocity constant of a reaction at 290 K

was found to be 3.2×10^{-3}at 300 K, it will be

a) 6.4×10^{-3} b) 1.28×10^{-2}

c) 9.6×10^{-3} d) 3.2×10^{-4}

74. An example of dispersion of a liquid in a gas is

a) Milk b) Vegetable oil

c) Foam d) Mist

75. Which statement is correct?

a) Slag are carefully choosen to combine with the slag present in the ore to produce easily fusible gangue to carry away the impurities

b) Gangues are carefully choosen to combine with the slag present in the ore to produce easily fusible flux to carry away the impurities

c) Gangues are carefully choosen to combine with flux present in the ore to produce easily fusible slag to carry away the impurities

d) Fluxes are carefully choosen to combine with the gangue present in the ore to produce easily fusible slag to carry away the impurities

76. Gallium arsenide is purified by

a) van-Arkel method

b) Zone-refining method

c) Electrolytic method

d) Liquation

77. In fisher-Ringe's method of separation of noble gas mixture from air, ……. Is used.

a) 90% CaC_2+10%$CaCl_2$

b) Coconut charcoal

c) Soda lime +potash solution

d) 90% $CaCO_3$ +10% urea

78. Which of the following compounds volatises on heating?

a) $FeCl_3$ b) $HgCl_2$ c) $CaCl_2$ d) $MgCl_2$

79. Which pair of compounds is expected to show similar colour in aqueous medium?

a) $FeCl_3$ and $CuCl_2$ b) $VOCl_2$ and $CuCl_2$

c) $VOCl_2$ and $FeCl_2$ d) $FeCl_2$ and $MnCl_2$

80. An alkane forms isomers if minimum number of C-atom is:

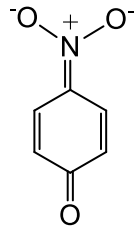
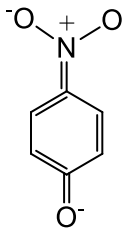
a) 1 b) 2 c) 3 d) 4

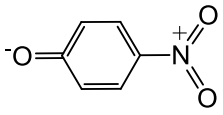
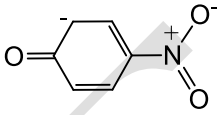
81. Chloroform, when kept open, is oxidised to

a) CO_2 b) $COCl_2$

c) CO_2, Cl_2 d) None of these

82. The most unlikely representation of resonance structures of *p*-nitrophenoxide ion is

a)  b) 

c)  d) 

83. Which reagent can distinguish C_2H_5OH and ϕ OH?

a) $SOCl_2$ b) CH_3COCl

c) $(CH_3CO)_2O$ d) CH_3COOH

84. Which of the following reactant give Tollen's reagent and Fehling's solution test?

a) CH_3CHO b) CH_3COOH

c) $CH_3 - \underset{\underset{O}{||}}{C} - CH_3$ d) $CH_3 - CH_2COOH$

85. $CHCI_3$ and KOH on heating with a compound from a bad smelling product, compound is

a) C_2H_5CN b) C_2H_5NC c) C_2H_5OH d) $C_2H_5NH_2$

86. The molecular formula C_3H_9N cannot represent

a) 1°amine b) 2°amine

c) 3°amine d) Quaternary salt

87. Which of the following is the sweetest sugar?

a) Glucose

b) Fructose

c) Lactose

d) Sucrose

88. The condensation polymer is

a) Teflon b) Polystyrene

c) Dacron d) Neoprene

89. Which is not a polyacrylate?

a) PMMA b) Acrilan

c) Poly acrylonitrile d) PCTFE

90. One of the most known antiseptic, dettol is a mixture of terpineol and

a) Bithional b) Chloroxylenol

c) *o*-cresol d) Serotonin

91. What size of herbarium sheet and label is recommended generally?

a) 30×40 cm, 6 × 12 cm b) 29×41 cm, 7 × 14 cm

c) 30×45 cm, 7 × 12 cm d) 20×30 cm, 5 × 10 cm

92. In angiosperms floral features are commonly used for identification, why?

a) Flower can be preserved easily
b) Flower are attractive to work with
c) Flower have aroma and different colour
d) Reproductive parts are more conservative

93. Metabolism can be best defined as
a) The process in which a chemical is formed inside a body
b) The process in which a chemical is destroyed inside a body
c) The sum total all of chemical reactions only occurring in a body
d) A complex construction process only

94. Which of the following kingdoms have no well defined boundaries?
a) Plantae
b) Protista
c) Monera
d) Algae

95. Which one of the following does not belong to kingdom-Monera?
a) Mycoplasma
b) Achaebacteria
c) Slime mould
d) Eubacteria

96. In *Spirogyra*,
a) Filaments in which lateral conjugation occur are homothallic
b) Filaments in which sealariform conjugation occur are homothallic
c) Filaments in which lateral conjugation occur are heterothallic
d) A sexual reproduction occurs by zoospores

97. Which type of the rhizoids are present in *Riccia*?
a) Unicellular smooth
b) Multicellular smooth
c) Unicellular smooth and tuberculated
d) Multicellular smooth and tuberculated

98. Two common characters found in centipede, cockroach and crab are
a) Compound eyes and anal cerci
b) Jointed legs and chitinous exoskeleton
c) Green gland and tracheae
d) Book lungs and antennae

99. What is common among *Planaria* and *Hydra*?
a) Both belong to phylum-Coelenterata
b) Both are diploblastic
c) Both have regenerative capacity
d) Both have a water vascular system

100. The second largest number of species containing phylum in the animal kingdom is
a) Annelida
b) Arthropoda
c) Mollusca
d) Chordata

101. I. Epicarp is thin
II. Mesocarp is fleshy and edible
III. Endocarp is strong hard
These are the probable features of
a) Coconut
b) Brinjal
c) Almond
d) Mango

102. Fibrous root system originates from the base of
a) Root
b) Stem
c) Leaves
d) Lamina

103. Nutrition is shown by
a) Root
b) Stem
c) Tendril
d) None of these

104. Structure of leaf which provide channels of transport for water, minerals and food materials is called
a) Midrib
b) Margin
c) Lamina
d) Veins

105. Atactostele type of stele is found in
a) Dicot
b) Monocots
c) Both (a) and (b)
d) Only in gymnosperm

106. Conjuctive tissue is made up of
a) Parenchymatous cells, *i.e.*, in between the xylem and phloem
b) Sclerenchymatous cells, *i.e.*, in between the xylem and phloem
c) Collenchymatous cells, *i.e.*, in between the xylem and phloem
d) Merismatic cells, *i.e.*, in between the xylem and phloem

107. Haversian lamellae are the structures found in
a) Hyaline cartilage
b) Fibrous cartilage
c) Bone marrow
d) Myelin sheath

108. Which of the following statement is incorrect regarding connective tissues?
a) They perform the function of linking and supporting the other tissues
b) They are most abundant and widely distributed in the body of animals
c) They are classified into four types
d) They include cartilage, bone, adipose and blood

109. Which one of the following statements is

incorrect about the properties of DNA?
a) DNA is denatured when heated upto 70°C
b) DNA shows high absorption of UV radiation at 260 mμ
c) DNA directly participates in protein synthesis
d) Pyrimidines of DNA are cytosine and thymine

110. In eukaryotes, the cell wall constitutes
a) Primary and secondary walls
b) Primary walls only
c) Primary wall, middle lamella and secondary
d) None of the above

111. Identify, in which of the following carbon compounds, heterocyclic rings can be found?
a) Proteins
b) Amino acids
c) Nitrogen bases
d) Lipids

112. One strand of DNA has sequence of nucleotide 3' ATTCGCTAT 5' then other strand of DNA has
a) 3' TAAGCGATA 5'
b) 5' TAGCACGTA 5'
c) 5' TAGCACGTA 3'
d) 5' TAAGCGATA 3'

113. Which is correct for meiotic metaphase-I?
a) Bivalents are arranged at equator
b) Univalents are arranged at equator
c) Non-homologous chromosomes forms pair
d) Spindle fibres are attached at chromomere

114. In meiosis-I, a bivalent is an association of
a) Four chromatids and four centromeres
b) Two chromatids and two centromeres
c) Two chromatids and one centromeres
d) Four chromatids and two centromeres

115. When pea seeds and wheat grains are soaked in water, pea seeds showed more swelling than the wheat. The reason is
a) Imbibitions capacity of proteins is more than that of starch
b) Presence of less hydrophilic colloids in the wheat grains
c) Cell membrane of pea seeds is more permeable
d) Cell wall of wheat grains are less permeable

116. In mycorrhizal association, which one of the following increases the surface area available for absorption of water and minerals by roots?
a) Mycorrhiza
b) Numerous branches of root
c) Root hairs
d) None of the above

117. The value of osmotic potential of an electrolyte is always
a) More than the electrolyte
b) Less than the electrolyte
c) Same as the electrolyte
d) None of these

118. Which of the following gene clusters in bacteria is responsible for nitrogen fixtion?
a) *Nod,nif,fix*
b) *Nod,ndf,nfx*
c) *Nod, nix, nfx*
d) *Ndx, nif, fix*

119. For the limited nitrogen that is present in the soil, microbes compete with
a) Animals
b) Plants
c) Both (a) and (b)
d) None of these

120. A scientist disrupted the chloroplast and separated the stroma from lamella. For fixing CO_2 he supplied stroma with
I. ATP
II. NADPH
III. Glucose
Select the correct option
a) I and III
b) III and II
c) I and II
d) I, II and III

121. Under normal condition, which one of the following is a major limiting factor?
a) Light
b) CO_2
c) Temperature
d) Chlorophyll

122. The activity of succinate Dehydrogenase is inhibited by
a) Pyruvate
b) Glycolate
c) Melonate
d) Phosphoglycerate

123. Which of the following is a 4-carbon compound?
a) Oxaloacetic acid
b) Phosphoglyceric acid
c) Ribulose bisphosphate
d) Phosphoenol pyruvate

124. Cell elongation in intermodal regions of the green plants takes place due to
a) Indole acetic acid
b) Cytokinins
c) Gibberellins
d) Ethylene

125. Which hormone was first isolated from human urine?

a) Auxin b) ABA
c) Ethylene d) Gibberellic acid

126. 'Bakane' disease is related to (hormone and plant)

Hormone	Plant
a) Auxin	Wheat
b) Cytokinin	Corn
c) Gibberellin	Rice
d) Ethylene	Tomato

127. Which of the following symptoms is related to the deficiency of antioxidant vitamins?
a) Retrolental fibroplasia
b) Truncal and limb atoxia
c) Scurvy
d) All of these

128. The back flow of faecal matter in the large intestine is prevented by the presence of
a) Epiglottis
b) Sphincter of Oddi
c) Ileo-caecal valve
d) Pyloric sphincter

129. Aerobic respiration involves
I. external respiration
II. transport of gases
III. internal respiration
IV. cellular respiration
Choose the correct combination of options for the given statements
a) I, II and III b) II, III and IV
c) I, III and IV d) All of the above

130. Primary site of the gaseous exchange in humans is
a) Lungs b) Alveoli
c) Bronchus d) Diaphragm

131. What will happen if a Rh^- person donate blood to a Rh^+ person for the first time?
a) Rh^- person will die
b) Rh^+ person will die
c) Nothing will happen to both
d) Rh^- will line and Rh^+ would be

132. To which of the following, bundle of His passes stimulus of contraction?
a) AV-node b) SA-node
c) Purkinje fibre d) Atrium

133. Glucose, Na, and amino acid are actively transported substances, because
a) Their movement occurs according to concentration gradient
b) Their movement occurs against concentration gradient
c) ATP is not needed for transportation
d) They are transported by simple diffusion

134. Urea synthesis occurs in
a) Kidney b) Liver
c) Brain d) Muscles

135. I. Na^+ II. H_2O
III. HCO_3^- IV. H^+
V. K^+ VI. NH_3
Which of the given ions are reabsorbed and secreted DCT?

	Reabsorb	Secreted
a)	I, II and III	IV, V and VI
b)	IV, V and VI	I, II and III
c)	I, II and V	III, IV and V
d)	III, IV, and VI	I, II and V

136. Ribs attached to sternum are
a) First seven pairs b) All ten ribs
c) First ten rib pairs d) First five rib pairs

137. F-actin is a polymer of
a) G (molecular) actin
b) G (globular) actin
c) G (meromyosin) action
d) All of these

138. Gout happens due to accumulation of is joints
a) Glucose crystals b) Uric acid crystals
c) Urea crystals d) Ammonia crystals

139. Intercellular communication in multicellular organism occurs through
a) Digestive system only
b) Respiratory system only
c) Nervous system only
d) Both nervous and endocrine system

140. Reflex action involves
a) Spinal cord b) Cerebellum
c) Medulla oblongata d) Optic fibre

141. Calcium level decreases in the blood due to hyposecretion of
a) Parathyroid hormone b) Calcitonin
c) Thyroxine d) Adrenaline

142. Identify from the following, a hormone produced by the pituitary gland in both males and females but functional only in females.
a) Vasopressin
b) Relaxin
c) Prolactin
d) Somatotrophic hormone

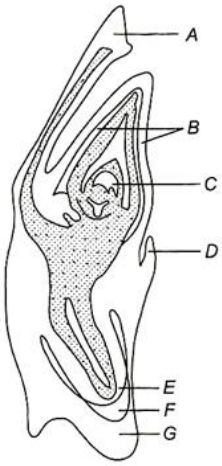
143. Vegetative propagation by leaf takes place in:
a) Ginger b) *Bryophyllum*
c) Rose d) *Duranta*

144. Which of the following require water for

gamete transfer?
a) Algae, bryophytes and pteridophyte
b) Pteriodophyles only
c) Gymnosperms
d) Angiosperms

145. Which one of the following would not lead to formation of clones?
a) Double fertilization
b) Apomixis
c) Vegetative reproduction
d) Tissue culture

146. In figure find out coleoptile, shoot apex and epiblast



a) A, B and C
b) B, C and D
c) D, F and G
d) E, F and G

147. When pollen is transferred from anther of a flower to stigma of the another of the another flower of the same plant, it is referred to as
a) Allogamy b) Xenogamy
c) Geitonogamy d) Autogamy

148. Our all bones are derived from the mesoderm. Except
a) Facial b) Femur
c) Redula d) Occipital

149. Leydig cells secretes …. hormone
a) Testosterone b) Inhibin
c) Oxytocin d) FSH

150. Cryptorchidism is a condition in which
a) Testis does not descend into scrotal sac
b) Sperm is not found
c) Male hormones are not reactive
d) Ovaries are removed

151. The epididymis leads to …A… that ascends to abdomen and loops over the …B…. Here A and B refers to
a) A-epididymis; B-vas deferens
b) A-vas deferens; B-epididymis
c) A-vas deferens; B-urinary bladder
d) A-urinary bladder; B-vas deferens

152. Spermicidal cream used on the coating of condoms, diaphragms, cervical cap and vaults are
a) For lubrication
b) For shining
c) For increasing effectiveness
d) None of the above

153. Choose the correct statement regarding the ZIFT procedure:
a) Ova collected from a female donor are transferred to the fallopian tube to facilitate zygote formation
b) Zygote is collected from a female donor and transferred to the fallopian tube
c) Zygote is collected from a female donor and transferred to the uterus
d) Ova collected from a female donor and transferred to the uterus

154. When a tall plant with round seeds (TTRR) crossed with a dwarf plant with wrinkled seeds (ttrr), the F_1-generation consists of tall plants with round seeds. What would be the proportion of dwarf plant with wrinkled seeds inF_1-generation?
a) $\frac{1}{4}$ b) $\frac{1}{16}$ c) 0 d) $\frac{1}{2}$

155. If the blood group of a child is A and of mother is B, then the genotype of mother and father may be
a) BB × AA b) AB × AB c) BO × OO d) BO × AO

156. In which one of the following combinations (a-d) of the number of the chromosomes is the present day hexaploid wheat correctly represented?

Combination	Monosomic	Haploid	Nullisomic	Trisomic

a) 27-28-42-43 b) 7-82-40-42
c) 21-7-42-43 d) 41-21-40-43

157. The sequence of nitrogen bases in a particular region of the non-coding strand of a DNA molecule was found to be CAT GTT TAT CGC. What would be the sequence of nitrogen bases in the *m*RNA that is synthesized the corresponding region of the coding strand in that DNA?
a) GUA CAA AUA GCC b) GTA CAA ATA GCC

c) CAU GUU UAU CGC d) CAA GAA TAU GCC

158. Splicing takes place in
a) Prokaryotes only b) Eukaryotes only
c) Protista only d) Plants only

159. The abiogenesis occurred about how many billion years ago?
a) 1.2 billion b) 1.5 billion
c) 2.5 billion d) 3.5 billion

160. Large size of pinnae in animals of warm region in comparison to animal of cold region is due to
a) Dollo's law b) Gloger's law
c) Cope's law d) Allen's rule

161. Both sickle cell anaemia and Huntington's chorea are
a) Bacteria-related diseases
b) Congenital disorders
c) Pollutant-induced disorders
d) Virus-related diseases

162. Genetic material found in Human Immunodeficiency Virus(HIV)is
a) Double stranded RNA
b) Single stranded RNA
c) Double stranded DNA
d) Single stranded DNA

163. Which of the following is not hallucinogen?
a) Heroin b) LSD
c) Marijuana d) Charas

164. Cows and buffaloes remain in heat for:
a) 24-36 hours b) 36-48 days
c) 7-10 days d) 15-20 days

165. Which of the following is considered as the root of any breeding program
a) Genetic variability
b) Cross hybridization
c) Hybrid vigour
d) Heterosis

166. Which of the following plan has been initiated by the Ministry of Environment and Forests to protect rivers from water pollution?
a) Ganga action plan
b) Yamuna action plan
c) Both (a) and (b)
d) Neither (a) nor (b)

167. Choose the minor carp from the following
a) *Cyprinus carpio*
b) *Anguilla sp*
c) *Labeo bata*
d) *Ctenopharyngodon idella*

168. Restriction enzymes may be used for:
a) Making recombinant DNA
b) Gene mapping
c) Diagnosis of genetic diseases
d) All the above

169. An example of gene therapy is:
a) Production of injectable Hepatitis B vaccine
b) Production of vaccines in food crops like potatoes which can be eaten
c) Production of test tube babies by artificial insemination and implantation of fertilized eggs
d) Introduction of gene for adenosine deaminase in persons suffering from Severe Combined Immuno-Deficiency (SCID)

170. In callus culture, roots can be induced by the supply of
a) Auxin b) Cytokinin
c) Gibberellin d) Ethylene

171. *Bt* cotton is not
a) a GM plant
b) Insect resistant
c) A bacterial gene expressing system
d) Resistant to all pesticides

172. In the initial stages of protoplast culture, sorbitol/mannitol is added
a) As an additional source of carbon
b) As an additional source of energy
c) To keep cells alive after the removal of cell wall
d) As a osmotic stabilizer

173. Plants grown on sandy soil, are grouped under
a) Lithophytes b) Psammophytes
c) Hydrophytes d) Xerophytes

174. Which one is the example of sexual parasite?
a) An male agler fish (*Photocorynus*)
b) Male *Bonellia*
c) Male *Schistosoma*
d) All of the above

175. A sequence of species or organism through which the food energy pass in a community is called
a) Pyramid of energy b) Food chain
c) Food web d) Nutrient cycle

176. The relation between producers and consumers in an ecosystem can be graphically represented in the form of a pyramid called
a) Ecological pyramid b) Tropical level
c) Pi chart d) Pyramid of biomass

177. What is the sustainable use of resources?
a) Protected strips of the land that allows organisms to migrate from one wilderness area to another

b) A law that makes it illegal to do harm to the species that are listed as endangered or threatened
c) The ability to use natural resources in a way that helps people to protect the ecosystem
d) The study of the methods to help protect biodiversity

178. One of the *ex situ* conservation method for endangered species is
a) Wildlife sanctuaries b) Biosphere reserves
c) Cryopreservation d) National parks

179. Ozone layer is being destroyed by
a) SO_2
b) NO_2
c) CFCs
d) Photochemical smog

180. Loss of forest, urbanization, increasing pollution are all due to
a) Global warming
b) Green house effect
c) Population explosion
d) Ozone depletion

MERITSTORE

Date : **NEET FULL PORTION** **TEST ID: 34**

Time: 03 hrs **PCB** **Marks : 720**

: ANSWER KEY :

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

: HINTS AND SOLUTIONS :

Single Correct Answer Type

1 **(a)**

In given equation, $\frac{\alpha z}{k\theta}$ should be dimensionless

$\therefore\ \alpha = \frac{k\theta}{z}$

$\Rightarrow [\alpha] = \frac{[ML^2T^{-2}K^{-1} \times K]}{[L]} = [MLT^{-2}]$

And $P = \frac{\alpha}{\beta}$

$\Rightarrow [\beta] = \left[\frac{\alpha}{P}\right] = \frac{[MLT^{-2}]}{[ML^{-1}T^{-2}]}$

$\Rightarrow [\beta] = [M^0L^2T^0]$

2 **(a)**

Volume of cube $= a^3$

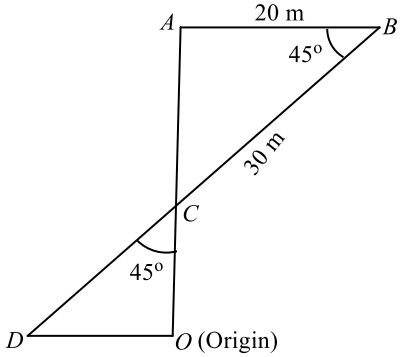
Surface area of cube $= 6a^2$

according to problem $a^3 = 6a^2 \Rightarrow a = 6$

$\therefore V = a^3 = 216\ units$

3 **(c)**

Taking the starting point as O, we have 30 m north OA, 20 m east AB, and finally $30\sqrt{2}$ m$(S-W)BD$.



From ΔCAB,

$AC = 20$ m, $OC = 10$ m

In ΔOCD,

$OD = OC, OD = 10$ m

Hence, final displacement from origin is 10 m.

4 **(c)**

Using relation $\theta = \omega_0 t + \frac{1}{2}at^2$

$\theta_1 = \frac{1}{2}(\alpha)(2)^2 = 2\alpha$ ...(i)

As $\omega_0 = 0, t = 2\ sec$

Now using same equation for $t = 4\ sec, \omega_0 = 0$

$\theta_1 + \theta_2 = \frac{1}{2}\alpha(4)^2 = 8\alpha$ ...(ii)

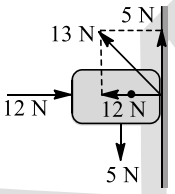
From (i) and (ii), $\theta_1 = 2\alpha$ and $\theta_2 = 6\alpha$ $\therefore \frac{\theta_2}{\theta_1} = 3$

5 **(b)**

If any two vectors are parallel or equal, then the scalar triple product is zero.

6 **(d)**

Wall applies 2 forces of the block (i) normal reaction, $R = 12$ N, and (ii) frictional force, $f_2 = mg = 5$ N tangentially upward



$\therefore$ Total force exerted by wall on block

$F = \sqrt{N^2 + f_s^2} = \sqrt{(12)^2 + (5)^2} = 13$N

7 **(c)**

Force on the football,

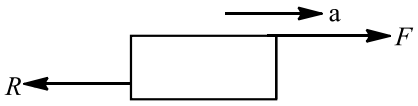
$F = \frac{mdv}{dt}$

$F = \frac{m(v_2 - v_1)}{dt} = \frac{0.5(10 - 0)}{1/50} = 250$ N

8 **(c)**

From the diagram

$F - R = ma$



$orF = R + ma$

Or Rate of doing work=power

=F· v

=(R+ma)· v

9 **(a)**

Given system of two particles will rotate about its centre of mass

Initial angular momentum $= MV\left(\frac{L}{2}\right)$

Final angular momentum $= 2I\omega = 2M\left(\frac{L}{2}\right)^2\omega$

By the law of conservation of angular momentum

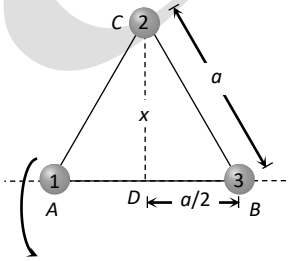
$MV\left(\frac{L}{2}\right) = 2M\left(\frac{L}{2}\right)^2\omega \Rightarrow \omega = \frac{V}{L}$

10 **(c)**

From the triangle BCD

$CD^2 = BC^2 - BD^2 = a^2 - \left(\frac{a}{2}\right)^2$

$x^2 = \frac{3a^2}{4} \Rightarrow x = \frac{\sqrt{3}a}{2}$



Moment of inertia of system along the side AB

$I_{\text{system}} = I_1 + I_2 + I_3$

$= m \times (0)^2 + m \times (x)^2 + m \times (0)^2$

$= mx^2 = m\left(\frac{\sqrt{3}a}{2}\right)^2 = \frac{3ma^2}{4}$

11 **(d)**

Given that, the orbital velocity of satellite

$= \frac{\text{escape velocity}}{2}$

$\Longrightarrow v_o = \frac{v_e}{2}$ ....(i)

But we know that,

$v_o = \sqrt{\frac{gR^2}{R+h}}$ and $v_e = \sqrt{2gR}$

On putting these values in Eq. (i)

$\sqrt{\frac{gR^2}{R+h}} = \frac{\sqrt{2gR}}{2}$

On squaring both sides, we obtain

$$\frac{gR^2}{R+h}=\frac{2gR}{4}$$

or $2gR^2 = gR(R+h)$

or $2R = R + h$ or $R = h$

or $h = R = 6400$ km

12 **(a)**

Energy / volume $= \frac{1}{2} \times$ stress $\times$ strain

$= \frac{1}{2}Y \times$ strain $\times$ strain $= \frac{1}{2}Y \times$ strain^2

$= \frac{1}{2} \times 2 \times 10^{10} \times 0.06 \times 10^{-2} \times 0.06 \times 10^{-2}$

$= 3600$ J m^{-3}

13 **(b)**

Ice is lighter than water. When ice melts, the volume occupied by water is less than that of ice. Due to which the level of water go down

14 **(c)**

$V = \frac{\pi p r^4}{8\eta l}$ and $V' = \frac{\pi(3p+p)(r/2)^4}{8\eta l}$

$\therefore \frac{V'}{V} = 4 \times (1/2)^4 = \frac{1}{4}$ or $V' = \frac{V}{4}$

15 **(d)**

$$Q \propto T^4 \Rightarrow \frac{H_A}{H_B} = \left(\frac{273+727}{273+327}\right)^4 = \left(\frac{10}{6}\right)^4 = \left(\frac{5}{3}\right)^4 = \frac{625}{81}$$

16 **(a)**

Efficiency of a heat engine, $\eta = 1 - \frac{T_2}{T_1}$

For $\eta = 1 (i.e., 100\%)$ either $T_1 = \infty$ or $T_2 = 0\ K$

As source at infinite temperature or sink at $0\ K$ are not attainable, therefore heat engine cannot have efficiency 1

18 **(c)**

Ideal gas equation is given by

$pV = nRT$ ...(i)

For oxygen, $p = 1$ atm, $V = 1$ L, $n = n_{O_2}$

Therefore, Eq. (i) becomes

$\therefore \quad 1 \times 1 = n_{O_2} RT$

$\Rightarrow \quad n_{O_2} = \frac{1}{RT}$

For nitrogen p =0.5 atm, V =2 L, $n = n_N$

$\therefore \quad 0.5 \times 2 = n_{N_2} RT$

$\Rightarrow \quad n_{N_2} = \frac{1}{RT}$

For mixture of gas

$p_{\text{mix}} V_{\text{mix}} = n_{\text{mix}} RT$

Here, $n_{\text{mix}} = n_{O_2} + n_{N_2}$

$\therefore \quad \frac{p_{\text{mix}} V_{\text{mix}}}{RT} = \frac{1}{RT} + \frac{1}{RT}$

$\Rightarrow \quad p_{\text{mix}} V_{\text{mix}} = 2 (V_{\text{mix}} = 1)$

19 **(b)**

$x_1 = a \sin(\omega \times 1) = a \sin \omega$

and $x_2 = a \sin(\omega \times 2) - a \sin \omega$

$\frac{x_2}{x_1} = \frac{\sin(2\omega) - \sin \omega}{\sin \omega}$

$= \sin 2 \times (2\pi/8) - \sin 2\pi/8$

$= \frac{1 - (1/\sqrt{2})}{(1/\sqrt{2})} = \frac{\sqrt{2}-1}{1}$

Or $\frac{x_1}{x_2} = \frac{1}{\sqrt{2}-1} = \frac{\sqrt{2}+1}{(\sqrt{2}-1)(\sqrt{2}+1)}$

$= \frac{\sqrt{2}+1}{2-1}$

$= 2.414 = 2.4$

20 **(d)**

The lift is moving with constant velocity so, there will be no change in the acceleration hence time period will remain same.

21 **(a)**

Since sources of frequency x gives 8 beats per second with frequency 250 Hz, it's possible frequencies are 258 or 242. As source of frequency x gives 12 beats per second with a frequency 270 Hz, it's possible frequencies are 282 and 258 Hz. The only possible frequencies of x which gives 8 beats with frequency 250 Hz also 12 beats per second with 270 Hz is 258 Hz

22 **(a)**

According to Gauss law, $\phi_{\text{total}} = \frac{q}{\varepsilon_0}$

Let electric flux linked with surfaces A, $B$and$C$ areϕ_A, $\phi_B$andϕ_C respectively.That is

$\phi_{\text{total}} = \phi_A + \phi_B + \phi_C$

Since $\phi_C = \phi_A$

$\therefore 2\phi_A + \phi_B = \phi_{\text{total}} = \frac{q}{\varepsilon_0}$

or$\phi_A = \frac{1}{2}\left(\frac{q}{\varepsilon_0} - \phi_B\right)$

But $\phi_B = \phi$(given)

Hence,

$\phi_A = \frac{1}{2}\left(\frac{q}{\varepsilon_0} - \phi\right)$

24 **(a)**

$\because \quad V = 4x^2$

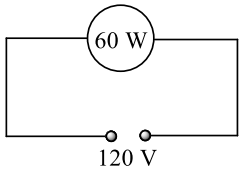
Hence,$\vec{E} = -\frac{dV}{dr} = -8x\hat{i}$

Hence, value of $\vec{E}$ at (1m, 0, 2m) will be

$\vec{E} = -8 \times 1\hat{i} = -8\hat{i}\ \text{Vm}^{-1}$

25 **(d)**

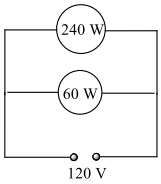
$R_{60} = \dfrac{120 \times 120}{60} = 240\Omega$



Current $= \frac{120}{240+6}\text{A} = \frac{120}{246}\text{A}$

Voltage across bulb

$= \dfrac{120}{246} \times 240$ volt $= 117.1$ volt



$R_{240} = \dfrac{120 \times 120}{240} 60\Omega$

Resistance of parallel combination

$= \dfrac{60 \times 240}{60 + 240} = 48\Omega.$

Total resistance $= (48 + 6)\Omega = 54\Omega.$

Current $I = \frac{120}{54}\text{A}$

Voltage across parallel combination

$= \dfrac{120}{54} \times 48$ volt $= 106.7$ volt

Change in voltage $= (117.1 - 106.7) = 10.4$ V.

26 **(c)**

$i = \dfrac{q}{t} = \dfrac{4}{2} = 2\ ampere$

27 **(c)**

Let resistors $A, B$and C have equal resistance R.

Let I be the total current then the current in resistor $A$is I and in resistor B and C are I/2.

So, heat produced in resistor A is

$H_A = I^2R$ ... (i)

and heat produced in resistor B is

$H_B = \left(\dfrac{I}{2}\right)^2 R = \dfrac{I^2R}{4}$ ... (ii)

and heat produced in resistor C is

$H_C = \dfrac{I^2R}{4}$ ... (iii)

Hence, it is clear that the heat produced will be maximum in A.

28 **(d)**

$F = I.(L_{eff})B$

$L_{eff} = L + L\cos 45° + L\sin 60°$

$= L + L \times \dfrac{1}{\sqrt{2}} + L \times \dfrac{\sqrt{3}}{2}$

$= L\left(\dfrac{2 + \sqrt{2} + \sqrt{3}}{2}\right)$

Force on each wire $= I.L.B\sin\theta$ [Because angle between current element and magnetic field $= 90°$]

$= I.L.B.\sin 90° = I.L.B.$

29 **(b)**

Here,$V = (10 \times 0.5 \times 0.2)\text{cm}^3$

$= 1\ \text{cm}^3 = 10^{-6}\text{m}^3$

$H = 0.5 \times 10^4\text{Am}^{-1}, M = 5\ \text{Am}^2, B = ?$

$I = \frac{M}{V} = \frac{5}{10^{-6}} = 5 \times 10^6$ Am

From $B = \mu_0(I/+H)$

$B = 4\pi \times 10^{-7}(5 \times 10^6 + 0.5 \times 10^4) = 6.28$ T

31 **(b)**

$\dfrac{N_s}{N_p} = \dfrac{V_s}{V_p} = \dfrac{2200}{220} = \dfrac{10}{1}$

32 **(a)**

$E_s = \frac{n_s}{n_P}E_P = \frac{4200}{2100} \times 120 = 240\text{V}$

$i_s = \frac{n_s}{n_P}i_P = \frac{2100}{4200} \times 10 = 5$ A

33 **(b)**

Power$P = \dfrac{1}{2}V_0I_0\cos\phi$

$= 0.5 \times 150 \times 150 \times \cos 60° = \dfrac{22500}{4}$

$= 5625$ W

34 **(a)**

As **v** of charged particle is remaining constant, it means force acting on charged particle is zero.

So, $q(\mathbf{v} \times \mathbf{B}) = q\mathbf{E}$

$\Rightarrow \quad \mathbf{v} \times \mathbf{B} = \mathbf{E}$

$\Rightarrow \quad \mathbf{v} = \dfrac{\boldsymbol{E} \times \boldsymbol{B}}{B^2}$

35 **(b)**

For glass-water interface $\quad {}_g\mu_w = \frac{\sin i}{\sin r}$

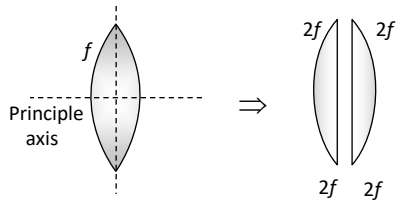
For water air interface $\quad {}_w\mu_a = \frac{\sin r}{\sin 90°}$

$\Rightarrow \quad {}_g\mu_w \times {}_w\mu_a = \dfrac{\sin i}{\sin r} \times \dfrac{\sin r}{\sin 90°} = \sin i$

or $\quad \frac{\mu_w}{\mu_g} \times \frac{\mu_a}{\mu_w} = \sin i$

$\Rightarrow \mu_g = \dfrac{1}{\sin i}$

36 **(a)**



Ratio of focal length of new plano convex lenses is 1:1

38 **(c)**

$W_0 \propto \frac{1}{\lambda} \Rightarrow \frac{\lambda_1}{\lambda_2} = \frac{(W_0)_2}{(W_0)_1} = \frac{4.5}{2.3} = \frac{2}{1}$

39 **(a)**

$\lambda_{\min} = \frac{hc}{eV} \Rightarrow \lambda \propto \frac{1}{V}$

$\because \lambda_2 > \lambda_1$ (see graph) $\Rightarrow V_1 > V_2$

$\sqrt{v} = a(Z-b)$Moseley's law

$v \propto (Z-1)^2 \Rightarrow \lambda \propto \frac{1}{(Z-1)^2}\left[\because v \propto \frac{1}{\lambda}\right]$

$\lambda_1 > \lambda_2$ [see graph for characteristic lines] $\Rightarrow$ $Z_2 > Z_1$

40 **(b)**

The energy taken by hydrogen atom corresponds to its transition from

n =1 to n =3 state.

ΔE (given to hydrogen atom)

$= 13.6\left(1 - \frac{1}{9}\right)$

$=13.6 \times \frac{8}{9} = 12.1$ eV

41 **(d)**

$\frac{A}{A_0} = \left(\frac{1}{2}\right)^{t/T_{1/2}} \Rightarrow \frac{1}{8} = \left(\frac{1}{2}\right)^{t/8} \Rightarrow t = 24\ years$

42 **(d)**

$N = N_0 e^{-\lambda t}$ and $A = A_0 e^{-\lambda t} = \lambda N_0 e^{-\lambda t}$

$\therefore N_{\text{decayed}} = N_0 - N = N_0 - N_0 e^{-\lambda t} \Rightarrow N_{\text{decayed}}$

$= N_0 - \frac{A}{\lambda}$

This is equation of straight line with negative slope

44 **(d)**

The frequency optical communication

$\text{v} = \frac{c}{\lambda}$ or $\text{v} = \frac{3 \times 10^8}{1200 \times 10^{-9}}$

$\text{v} = 25 \times 10^{13}$ Hz

But only 2% of the source frequency is available for TV transmission

$v' = 2.5 \times 10^{14} \times 2\%$

Or $v' = 2.5 \times 10^{14} \times \frac{2}{100}$

Or $v' = 5 \times 10^{12}$Hz

$\therefore$ Member of channels $= \frac{\text{v}'}{\text{bond width}}$

Or No of channels $= \frac{5 \times 10^{12}}{5 \times 10^6} = 10^6 = 1$ million

45 **(d)**

For good demodulation,

$\frac{1}{f} << RC$ or , $RC >> \frac{1}{f}$

46 **(d)**

Atomic mass of the metal=$32 \times 2 = 64$

Formula of metal nitrate=$M(\text{NO}_3)_2$

$\therefore$ Molecular mass=64+28+96=188

47 **(c)**

In air

Molecular weight of $N_2 = \frac{28 \times 78}{100} = 21.84$

Molecular weight of $O_2 = \frac{32 \times 21}{100} = 6.72$

Molecular weight of $Ar = \frac{18 \times 0.9}{100} = 0.162$

Molecular weight of $CO_2 = \frac{44 \times 0.1}{100} = 0.044$

So, molecular weight of air $= 21.84 + 6.72 + 0.162 + 0.044$

$= 28.766$

48 **(c)**

The charge on α-particles is twice the charge on proton, and mass of $\alpha -$ particle is four times the mass of proton

49 **(d)**

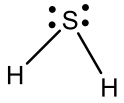
Angular momentum of an electron

$= mvr = \frac{nh}{2\pi}$ (n is orbit number)

in 5th orbit $= \frac{5h}{2\pi} = \frac{2.5h}{\pi}$

51 **(b)**

H_2Scontain only covalent bonds, as the electronegativity difference between H and S is only (2.6 – 2.1 = 0.5).



52 **(c)**

HHHH

||||

H − C = C − C − C − H

||

HH

Number of σ bonds in 1-butene are 11.

53 **(b)**

A gas can be liquified by pressure along when its temperature is either higher than its critical temperature or lower than its critical temperature

54 **(a)**

For isochoric process, $\Delta V = 0$ so, $q_v = \Delta E ie$, heat given to a system under constant volume is used up in increasing ΔE

55 **(c)**

In going from initial to final state, the entropy change, ΔS for an ideal gas is given by the following reactions

$$\Delta S = nC_V \ln\frac{T_2}{T_1} + nR \ln\frac{V_2}{V_1}$$

or $\Delta S = nC_P \ln\frac{T_2}{T_1} + nR \ln\frac{P_2}{P_1}$

But at constant temperature,

$$\Delta S = nR \ln\frac{V_2}{V_1}$$

$$i.e., \ \Delta S = nR \ln\frac{P_1}{P_2}$$

56 **(a)**

$2NH_3 \rightleftharpoons N_2 + 3H_2$

Initial moles a 0 0

At equilibrium$(a-2x)x$ $3x$

Initial pressure of NH_3 of 'a'mole = 15 atm at 27°C. The pressure of 'a' mole of NH_3 = $p$atm at 347°C

$$\therefore \frac{15}{300} = \frac{p}{620}$$

$\therefore p = 31$ atm

At constant volume and at 347°C,

mole $\propto$ pressure

$a \propto 31$ (before equilibrium)

$\therefore (a-2x) \propto 50$ (after equilibrium)

$$\therefore \frac{(a-2x)}{a} = \frac{50}{31}$$

$$\therefore x = \frac{19}{62}a$$

$\therefore$ % of NH_3 decomposed $= \frac{2x}{a} \times 100$

$$= \frac{2 \times 19a}{62 \times a} \times 100$$

$= 61.33\%$

57 **(d)**

Haematite is Fe_2O_3, in which oxidation number of iron is III.

Magnetite is Fe_3O_4 which is infact a mixed oxide ($FeO.Fe_2O_3$.), hence iron is present in both II and III oxidation state.

58 **(c)**

Let the oxidation number of Cr in K_2CrO_4 is x.

$2(+1) + x + 4(-2) = 0$

$2 + x - 8 = 0$

$x = +6$

59 **(a)**

Ortho and *para* hydrogens are two forms of hydrogen which differ only in direction of spin of proton.

Protium (^1_1H), deuterium (^2_1D) and tritium (^3_1T)are three isotopes of hydrogen. All of them have one proton and electron each. Protium has no neutron, deuterium has one neutron and tritium has two neutrons.

60 **(a)**

$$Na_2SO_3 + S \xrightarrow{NaOH} Na_2S_2O_3$$

sodium thiosulphate

62 **(c)**

Generally, the ion exchange tendency of a material depends on the extent of isomorphous substitution in the tetrahedral framework. Thus, the Si^{4+} ions of feldspar and zeolite are replaced by Al^{3+} (aluminium ion).

63 **(c)**

Di-chloro acetic acid due to presence of two electron with drawing chloro groups ($-I$ showing group)is more acidic than acetic acid($+I$showing $-CH_3$group).

64 **(a)**

Synthetic petroleum is synthesized by Fischer-Tropsch synthesis

$$XCO + YH_2 \xrightarrow[300°C]{\text{Oxide of Cu,Cr and Zn}}$$

Oily mixture of hydrocarbons$+H_2O$.

65 **(b)**

$$2CH_3I + 2Na \xrightarrow{Ether} C_2H_6 + 2NaI$$

66 **(d)**

(a)$NO + O_3 \rightarrow NO_2 + O_2$

$O_3 + h\nu \rightarrow O_2 + O$

$NO_2 + O \rightarrow NO + O_2$

Net reaction $2O_3 + h\nu \rightarrow 3O_2$

Thus, ozone layer is depleted by oxides of nitrogen.

(b)Ozone layer is a protective layer and absorbs harmful UV rays coming from the sun.

(c)$Cl + O_3 \rightarrow ClO + O_2$

$O_3 + h\nu \rightarrow O + O_2$

$ClO + O \rightarrow Cl + O_2$

Net reaction $2O_3 + h\nu \rightarrow 3O_2$

Thus, ozone layer is also depleted by reaction with freons.

(d)is a incorrect statement as

67 **(d)**
In triclinic lattice, the eight lattice points are located, one each at the corners of triclinic lattice. Also $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma$. There is no planes and no axes. Thus, triclinic lattice has no rotation of symmetry.

68 **(d)**
Number of atoms at corner $= 8 \times \frac{1}{8} = 1$
Number of atoms at face centres $= 6 \times \frac{1}{2} = 3$
$\therefore$ The formula of the compound is XY_3.

70 **(c)**
$\text{ppm} = \frac{\text{weight of solute} \times 10^6}{\text{weight of solution}}$
$= \frac{25 \times 10^{-3} \times 10^6}{5000} = 5$

71 **(d)**
$Ag^+ + e^- \longrightarrow Ag$
$\because$ 96500 C are required to deposite Ag = 108 g
$\therefore$ 965 C are required to deposite Ag
$= \frac{108}{96500} \times 965 = 1.08\ g$

72 **(b)**
For the first order reaction,
$2N_2O_5 \rightarrow 2NO_2 + O_2$
$rate\ \frac{dx}{dt} = k(N_2O_5) \quad \ldots(i)$
Given,
$\frac{dx}{dt} = 2.400 \times 10^{-5} molL^{-1}s^{-1}$
$k = 3.0 \times 10^{-5} s^{-1}$
$[N_2O_5] = ?$
Substituting these values in (i)
$2.4 \times 10^{-5} = 3.0 \times 10^{-5}[N_2O_5]$
$or [N_2O_5] = \frac{2.4 \times 10^{-5}}{3.0 \times 10^{-5}}$
$= 0.8 molL^{-1}$

73 **(a)**
The ratio of rate constant when temperature is raised 10°C, is called temperature coefficient. For most of the reaction, it has a value of 2.
Hence, for the given reaction,
Rate constant at 290 K=3.2×10^{-3}
$\therefore$ Rate constant at 300 K=$2 \times 3.2 \times 10^{-3}$
$= 6.4 \times 10^{-3}$

74 **(d)**

Colloid	Dispersed phase	Dispersion medium
Milk	Liquid	Liquid
Foam	Gas	Liquid
Mist	Liquid	Gas
Vegetable oil	Liquid	Liquid

$\therefore$ Foam is colloid which has liquid dispersed in gas.

75 **(d)**
Flux is a substance with combine with gangue that present in the roasted or calcined ore to form fusible product, called slag

76 **(b)**
Gallium arsenide is purified by zone refining method

77 **(a)**
In Fischer Ringe's method, air free from moisture and CO_2 is passed over a heated mixture of (800°C) of 90% CaC_2 +10% $CaCl_2$ in an iron tube , when following reactions take place
$CaC_2 + N_2 \xrightarrow{800°C} CaCN_2 + C$
$2C + O \longrightarrow 2CO$
$C + O_2 \longrightarrow CO_2$
$2CaC_2 + 3CO_2 \longrightarrow 2\ CaCO_3 + 5C$
$CuO + CO \longrightarrow Cu + CO_2$
CO_2 gas is now absorbed by KOH solution .Thus, a mixture inert gases is obtained.

78 **(b)**
$HgCl_2$ is easily volatile. It is insoluble in water and soluble in acids

79 **(b)**
Colour of transition metal ion salt is due to $d - d$transition of unpaired electrons of d-orbital.
Metal ion salt having similar number of unpaired electrons in d-orbitals shows similar colour in aqueous medium.
In $VOCl_2$ vanadium is present as V^{4+} and in $CuCl_2$, copper is present as Cu^{2+}.
So, $_{23}V = 1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^3, 4s^2$
$V^{4+} = 1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^1$
$3d^1$

1				

Number of unpaired electrons =1
and $_{29}Cu = 1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^1$
$Cu^{2+} = 1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^9$
$3d^9$

↿⇂	↿⇂	↿⇂	↿⇂	1

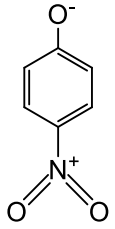
Number of unpaired electron =1
Hence, $VOCI_2$ and $CuCI_2$ show similar colour.

80 **(d)**
Except alkynes, chain isomerism is observed when the number of carbon atoms is four or more than four

81 **(b)**
Chloroform is oxidised to a poisonous gas, phosgene ($COCl_2$) by atmospheric oxidation.

$CHCl_3 + O \rightarrow COCl_2 + HCl$

82 **(c)**



is not a resonating structure of *p*-nitrophenoxide

Since, N being an element of second period can't contain more than 10 electrons in its valence shell

84 **(a)**

Only aldehydes react with both Tollen's reagent and Fehling's solution

CH_3CHO CH_3COOH

(a) (b)

Aldehyde acid

CH_3COCH_3 CH_3CH_2COOH

(c) (d)

Ketone acid

CH_3CHO (ethanal) is the only aldehyde in given choices.

So, it reacts with both Tollen's reagent and Fehling solution.

CH_3CHO +Ammoniacal $AgNO_3 \rightarrow$ Ag mirror (Tollen's reagent)

$CH_3CHO + Cu^{2+}$ ions complexed$\rightarrow Cu_2O$

With tartarate anion red ppt.

85 **(b)**

This is carbylamine reaction which is used to distinguish 1° amines from other amines. The reaction is given by 1° amines only.

$C_2H_5NH_2 + CHCl_3 + 3KOH$

$\rightarrow C_2H_5N \overset{=}{\rightarrow} C + 3KCl + 3H_2O$

$RNH_2 + CHCl_3 + 3KOH$

$\rightarrow R - N \overset{=}{\rightarrow} C + 3KCl + 3H_2O$

1°amine chloroform isocyanide (bad smelling)

86 **(d)**

C_3H_9N represent following structures

$CH_3CH_2CH_2NH_2$

Propanamine

(1°amine)

H

|

$CH_3CH_2 - N - CH_3$

N-methyl ethanamine

(2°amine)

CH_3

|

$CH_3 - N - CH_3$

N,N-dimethyl methanamine

(3°amine)

87 **(b)**

Sugar:	Lactose	glucose	sucrose	fructose
Relative sweetness:	16	74	100	173

89 **(d)**

PCTFE (poly monochloro tetrafluoro ethylene), $\left(CIFC-CF_2\right)_n$ is not a polyacrylate.

91 **(c)**

Generally size of a herbarium sheet is 30 × 45 cm. Which is slightly small than the size of American herbarium (29 × 41 cm) and label size is 7 × 12

92 **(d)**

Flower is a specialized, modified shoot. Which has evolved due to progressive specialization of sporophyll. Sexual reproduction in angiosperm is performed by these conservative part of flowers. Hence, flower feature are commonly used for identification

93 **(c)**

Metabolism is the sum of all the metabolic activities in body, i.e., anabolism and catabolism. Anabolism is constructive process, while catabolism is a destructive process

94 **(b)**

Protista.

The kingdom- Protista was proposed by Ernst Haeckel (1866). Although all single celled eukaryotes are placed in kingdom-Protista yet its boundaries are not well defined

95 **(c)**

Slime mould do not belong to kingdom-Monera. These belong to kingdom-Fungi and division-Myxomycota.

96 **(a)**

In *Spirogyra*, lateral conjugation occurs in homothallic filament.

97 **(c)**

Unicellular smooth and tuberculated rhizoids are present in the region of midrib at ventral surface of *Riccia*.

98 **(b)**

Crab, centipede and cockroach belongs to

phylum-Arthropoda. These have jointed appendages and chitinous exoskeleton.

99 **(c)**
Planaria and *hydra* both possess regenerative capacity

100 **(c)**
Phylum-Arthropoda is the first largest, having most successful invertebrates in terms of number of species (about 900,000). Phylum-Mollusca is the second largest containing more then 100,000 species and probably the most sophisticated in all invertebrates.

101 **(d)**
In mango and coconut, the fruit is known as a drupe. In mango the pericarp is well differentiated into an outer thin pericarp, a middle fleshy edible mesocarp and an inner stony hard endocarp. In coconut which is also a drupe, the mesocarp is fibrous

102 **(b)**
In monocotyledonous plant, the primary root is short lived and is replaced by large number of roots. Those roots originate from the base of the stem and constitutes the fibrous root system, as seen in the wheat or rice plant

103 **(a)**
Nutation movements are shown by tendrils, which get spirally coiled due to more growth on outer side.

104 **(d)**
The lamina or the leaf blade is the green expanded part of the leaf with veins and veinlets. There is usually, a middle prominent vein, which is known as the midrib. Veins provide rigidity to the leaf blade and acts as channels of transport for water, minerals and food materials, the shape, margin, apex, surface and extent of incision of lamina varies in different leaves

105 **(b)**
Monocots have atactostele, in which vascular bundles are arranged into more than one ring and they are usually found at the centre of the stem

106 **(a)**
The parenchymatous cells which lies between the xylem and the phloem are called conjuctive tissue

107 **(c)**
The Haversian canals are vertical canals present parallel to the length of bones. About 4-20 concentric rings of Haversian lamellae normally surround one Haversian canal. This complete system of lamella along with one Haversian canal is called one osteon and is found in the bone marrow of mammals.

108 **(c)**
Connective tissues are classified into three types loose connective tissue, dense connective tissue and specialised connective tissue

109 **(c)**
DNA does not directly participate in protein synthesis.

110 **(c)**
In eukaryotic cell, a cell wall can have upto three parts-middle lamella, primary wall and secondary wall

111 **(c)**
Living organisms have a number of carbon compound in which heterocyclic rings can be found. Some of these are nitrogen bases-adenine, guanine, cytosine, uracil and thymine

112 **(d)**
In a double stranded DNA, the sequence of nucleotides is complementary to each other, *i*. *e*., A pair with T and G pair with C. So, the sequence of nucleotide for 3' ATTCGCTAT 5' will be 5' TAAGCGATA 3'.

113 **(a)**
In meiotic division metaphase-I spindle apparatus starts appearing and bivalents become attached to spindle through centromeres. Bivalents then appear in the form of an equatorial plate due to the movement known as 'congression'.

114 **(d)**
Meiosis is a double division, which occurs in a diploid cell (nucleus) and gives rise to four haploid cells (nuclei), each having half the number of chromosomes as compared to the parent cell. In meiosis-I, bivalent is an association of four chromatids and two centromeres.

115 **(a)**
Pea seeds contain protein, while wheat contains starch, the imbibition capacity of proteins is more than that of starch. That is why, pea seeds imbibe more water and show more swelling than those of wheat grains.

116 **(a)**
In mycorrhizal association, a large number of fungal hyphae are associated with the roots of

higher plants in which hyphae extend to sufficient distance into soil and have a large surface area. These hyphae absorb water and mineral from the soil and pass them to roots. Roots provide sugar and nitrogen compound to the fungal hyphae

117 **(a)**
The value of osmotic potential of an electrolyte will be greater by the degree of its dissociation into ions at a given temperature and dilution over the one calculated by Van't Hoffs formula
$P = CRT \times I$ or ionisation constant

118 **(a)**
Genes that direct the steps in nodulation of a legume by a specific rhizobial strain are called *nod* genes. Many *nod* genes from different rhizobia are highly conserved and are contained on large plasmids, which given then host specificity.
In symplasmid of *Rhizobium leguminosarum* var. *viciae*, *nod* genes for nitrogen fixation, the *nif* genes.
Number of *nod* genes are present in different species leading to *nod* factors, which induce root hair curling cell division, nodule formation.

119 **(b)**
It is the microbes, which competes with plants in the soil for the limited nitrogen

120 **(c)**
In stroma, the fixing of CO_2 takes place by expanding $NADPH_2$ and ATP formed by light reaction. So, scientist should have supplied $NADPH_2$ and ATP to intact stroma for CO_2 fixation

121 **(b)**
Carbon dioxide is usually a limiting factor in photosynthesis under normal conditions particularly, clear summer days under adequate water supply

122 **(c)**
The activity of succinate dehydrogenase is inhibited by Malonate.

123 **(a)**
Oxaloacetic acid – 4C. Phosphoglyceric acid – 3C Ribulose bisphosphite – 3C. Phosphoenl pyruvate – 3C

124 **(c)**
Gibberellin promotes internodal elongation in a wide range of species. This internodal elongation phenomenon is known as blotting. Giberellin is a plant growth hormone, which was first obtained from a fungus
Gibberellafujikuroi (*Fusariummoniliformi*).

125 **(a)**
Auxin (derived from Greek work *auxin*, which means to grow) was first isolated from human urine. Kogl and Heagen Smith (1931) isolated three chemicals from human urine and named them as auxin

126 **(c)**
Gibberellins were named after the fungus *Gibberella fujikuroi* which causes disease in rice plants. A Japanese plant pathologist, Elichi Kurosawa investigated it as the bakane (foolish seedling) disease

127 **(a)**
Vitamins-CE and provitamin-A (β-carotene) are known as antioxidant vitamins because their inactive oxygen free radicals are highly reactive particles

128 **(d)**

Column I	**Column II**
Goblet cells	Mucus
Lysozyme	Antibacterial agent
Saliva	Sublingual gland
Oxyntic cells	Hydrochloric acid

129 **(d)**
Aerobic Respiration Cells utilise O_2 from atmospheric air or from water to oxidise the nutrients. *It involves*
(i) **External Respiration** Gaseous exchange of $O_2$and CO_2 between the blood and air (or water)
(ii) **Transport** of gases to tissues
(iii) **Internal Respiration** Gaseous exchange between the blood and tissues
(iv) **Cellular Respiration** Oxidation of nutrients in the cells and liberation of energy

130 **(b)**
Alveoli are the primary site of exchange of gases. Exchange of gases also occur between the blood and tissue. O_2 and CO_2 are exchanged in these sites by simple diffusion, mainly based on pressure concentration gradient

131 **(c)**
This is the same case of giving birth to Rh^+ child whose father is Rh^+ and mother is Rh^-

132 **(c)**
The waves of contraction originating from SA-node, when reaches the AV-node (pace-setter), the latter is simulated and excitatory impulses are rapidly transmitted from it to all parts of the ventricle *via* bundle of His and Purkinje fibres.

133 **(b)**
Because these are ATP dependant substances whose movement occurs against concentration gradient. In active transport, ATP provided by mitochondria, provides energy needed to move these ions and molecules across the cell membrane

134 **(b)**
The formation of urea form NH_3 and CO_2occurs in liver through ornithine cycle or Krebs Henseleit cycle.

135 **(a)**
DCT (Distal Convoluted Tubule) Conditional reabsorption of Na^+ and water takes place in this segment. DCT also capable of reabsorption of HCO_3^- and selective secretion of hydrogen and potassium ions and NH_3 to maintain the pH and sodium-potassium balance in blood

136 **(a)**
First seven pairs of ribs are known as true ribs because these are attached to sternum by mears of hyaline cartilage.

137 **(b)**
Each actin (thin) filament is made up of two 'F' (filamentous) actins which are helically wound to each other. Each F-actin is a polymer of monomeric G (globular) actins. Two filaments of another protein, tropomyosin also run close to the 'F' actins throughout its length.
A, complex protein troponin is distributed at regular intervals on the tropomyosin. In the resting state, a sub-unit of troponin masks the active binding sites for myosin on the actin filaments

138 **(b)**
Gout is generally a old age disorder in which inflammation of joints accurs due to the line accumulation of uric acid crystals

139 **(d)**
Two types of system in the body is responsible for inter-cellular communication nervous and hormonal.
1.Nervous system is responsible for short time and quick effect.

2.Endocrine system secretes hormone. Hormone effect is long lasting and slow.

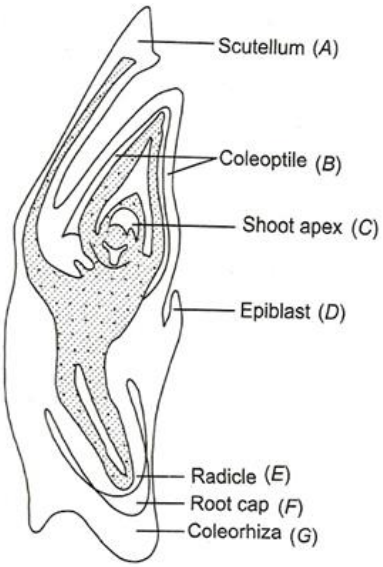
140 **(a)**
Reflexes are classified as the spinal reflexes and the cranial reflexes. The former are so called because their basic neural path leads through spinal nerves and spinal cord. Reflexes at the spinal level have the purpose of removing the animal from harmful stimuli.

141 **(a)**
Parathormone is secreted from parathyroid gland. This hormone helps to regulate the metabolism of calcium and certain other minerals like phosphate. Combined effect of parathormone and calcitonin normally maintain the blood calcium level.

142 **(c)**
Prolactin or luteotrophic hormone (LTH) or lactogenic hormone initiates and maintains milk secretion by mammary glands, a process called lactation.

145 **(a)**
Clone is an individual obtaining from single parent through apomixis, vegetative reproduction and tissue culture. The process of fusion of two male gametes in a single embryo sac is called **double fertilization.** It is found in sexual reproduction of angiosperms only and discovered by **Nawaschin** (1898).

146 **(b)**



LS of an embryo of grass

Embryos of monocotyledons possess only one cotyledon. In the grass family the cotyledon is called scutellum that is situated toward the one side (lateral) of the embryonal axis. At its lower end, the embryonal axis has the radical and root cap enclosed in an undifferentiated sheath called coleorhiza.

The portion of the embryonal axis above the level of attachment of scutellum is epicotyl. Epicotyl has a shoot apex and few leaf primordia enclosed in hallow structure the coleoptile

147 **(c)**

When pollen grains of one flower are transferred to the stigma of another flower belonging to either the same plant or genetically similar plant, it is referred to as **geitonogamy**.

148 **(a)**

All bones are derived from the mesoderm but only facial bones which are derived from the ectoderm

149 **(a)**

Testosterone.

Region outside the seminiferous tubules is called interdigital space, which is lined by interstitial cells also called Leydig cells. Leydig cells secretes testosterone and also called endocrine part of the testis

150 **(a)**

The male humans, if testes fail to descend into the scrotal sac, it is called **cryptorchidism.**

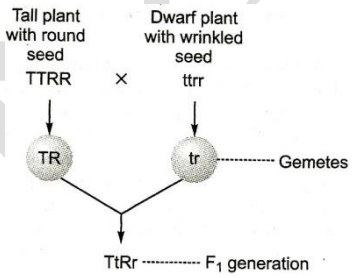
151 **(c)**

A-vas deferens; B-urinary bladder

152 **(c)**

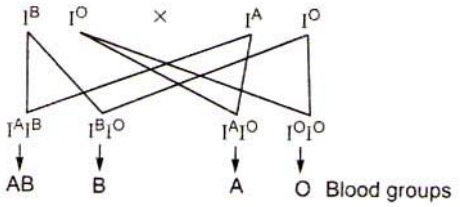
Spermicidal creams contains chemicals, which kills the sperms. If they are used along with the barrier contraceptive methods than it increases their effectibility

154 **(c)**



Thus, there is no dwarf plant with wrinkled seeds in F_1-generation.

155 **(d)**



Thus, the genotype of parents will be BO × AO.

156 **(d)**

The basic chromosome number of wheat is 7(x=7) and its hexaploid species contain 42(6× 7) chromosomes. Thus, it's monosomic (one chromosomes missing) contains **41**(42-1) chromosomes. Haploid contains **21** (half to the 42) chromosomes. Nullisomic (one chromosome pair missing) contains **40**(42-2) chromosomes and trisomic contain (one chromosome extra) **43**(42+1) chromosomes.

157 **(a)**

The non-coding strand of the DNA molecule has the following base sequence:

CAT GTT TAT CGC

Hence, the coding strand or the *m*RNA will have the base sequence complementary to it but in *m*RNA.

158 **(b)**

Splicing takes place in eukaryotes because intron are found only in case of eukaryotes. Before processing, exons needs to be removed out. This process is called splicing

159 **(d)**

Abiogenesis (Gr. *abios*=without life; *genesis*=origin) is the process of spontaneous generation of living organisms from non-living substances. Fossils of certain prokaryotic cells have been found from the rock about **3.6 billion** years old. It is, therefore, believed that life must have appeared at least about 3.7 billion years ago.

160 **(d)**

According to **Allen's rule**, the animals of colder areas have shorter extremities (*i.e.*, tail, ears, head) as compared to animals of warmer areas. According to **Gloger's law**, the birds and mammals of warm humid regions tend to be darker in colour than inhabiting the cold or dry region of their geographical range.

161 **(b)**
Both sickle cell anaemia and Huntington's chorea are congenital genetic disorders. Sickle cell anaemia was first reported by James Herrick (1904). In this disease, the patient's haemoglobin level reduced to half of the normal and the RBCs becomessickle shaped. A single mutation in a gene can cause sickle cell anaemia. Huntington's chorea is caused by autosomal mutation, which is dominant. The gene is present on 4-chromosome numbers.

162 **(b)**
Human immunodeficiency Virus (HIV) is causal organism of AIDS (Acquired Immuno Deficiency Syndrome). It is a retrovirus belonging to the family-Retroviridae. The core of HIV contains two molecules of single standard RNA(as genetic material) and reverse transcriptase.

163 **(a)**
Hallucinogens include LSD, marijuana, mescaline, psilocybin, bhang, ganja, hashish, charas, etc, while narcotic drugs include opium and its derivatives such as morphine, codeine, herion, etc.

165 **(a)**
Genetic variability is the root any breeding program pre-existing genetic variability is collected from wild varieties, species and relatives of the cultivated crop species

166 **(c)**
In order to protect the major rivers of India from sewage pollution, the ministry of environment and forests, has initiated development of sewage treatment plants under the National River Conservation Authority, *e*. *g*.,Ganga Action Plan (GAP), Yamuna Action Plan, Sutlej Action Plan, Gomti Action Plan

167 **(c)**
Labeo bata is minor carp, its size is smaller and growth rate is slower.

170 **(a)**
In callus culture, shoot and root regenerations are controlled, generally, by auxin-cytokinin balance. Usually, the excess of auxin (such as naphthalene acetic acid or NAA), promotes root regeneration, whereas that of cytokinin (like BAP) promotes shoot regeneration.

171 **(d)**
Bt cotton is not resistant to all pesticides

172 **(d)**
In the initial stages of protoplast culture, sorbitol/mannitol is added as an osmotic stabilizer.

173 **(b)**
Sammophytesare grown on sandy soils. Lithophytes are grown on bare soils. Hydrophytes are grown on aquatic habitat.
Xerophytes are grown on dry habitat.

174 **(d)**
Sexual parasite is type of parasitism in which a parasite live on the particular sex of the organism An angler fish (*Photocorynus*) male lives as a small parasite over the head of the female. In *Bonellia* the male is an internal parasite while in *Schistosoma* male lives in gynecophoral canal of the female

175 **(b)**
Food web
Producers

176 **(a)**
There is some sort of relationship between the numbers, biomass and energy contents of the producers and consumers of different orders in any ecosystem. These relationships, when represented in diagrammatic ways, are called ecological pyramids
Ecological pyramids are of the types
(i) Pyramid of number
(ii) Pyramid of biomass
(iii) Pyramid of energy
The concept of pyramid was proposed by Charles Elton (1927) so, they are also called as Eltonian pyramids

177 **(c)**
Conservation of biodiversity is the protection, uplift and scientific management of biodiversity so as to maintain it at its optimum level and derive sustainable benefits for the present as well as future generations. Sustainable use is the ability to use natural resources in a way that helps people and protects the ecosystem

178 **(c)**
Exsituconservation is the preservation of components of biological diversity outside their natural habitat. It includes cryopreservation, off site collections, gene banks and tissue culture.

Insituconservation is the preservation of biological diversity in their natural wild conditions, usually in the form of biosphere

reserves, national parks and wild life sanctuaries.

179 **(c)**

Ozone protects us from the harmful UV-radiations from the sun. Major pollutants responsible for the depletion of ozone layer are chlorofluorocarbons, nitrogen oxides and hydrocarbons. CFCs are widely used as coolants in air conditioners and refrigerators, cleaning solvents, aerosol propellants and in foam insulation. The threat to $O_3$is mainly from CFCs, which are known to deplete O_3 by 14% at the current emission rate.

180 **(c)**

Population explosion is the major cause of urbanization, deforestation and increasing pollution.