NTA NEET MOCK GRAND TEST - 14
## PHYSICS

1. A dip needle, which is free to move in a vertical plane perpendicular to magnetic meridian, will remain
   1) horizontal   2) Vertical
   3) Somewhere in between horizontal and vertical   4) none of these

2. A square coil ACDE with its plane vertical is released from rest in a horizontal uniform magnetic field $\vec{B}$ which extends over a length 2L as shown in the figure. the acceleration of the coil is
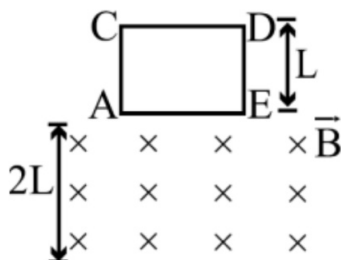
   1) Less than g for all the time till the loop crosses the magnetic field completely
   2) Less than g when it enters the field and greater than g when it comes out of the field
   3) Equal to g all the time
   4) Less than g when it enters and comes out of the field but equal to g when it is within the field

3. The magnetic flux linked with a coil is ϕ and the EMF induced in it is E, then
   1) If $\phi = 0$, E must be 0   2) If $\phi \neq 0$, E cannot be zero
   3) If E is not 0, ϕ may or may not be 0   4) None of the above is correct

4. The impedance of the given circuit will be

   1) zero   2) infinite   3) 110Ω 4) 90Ω
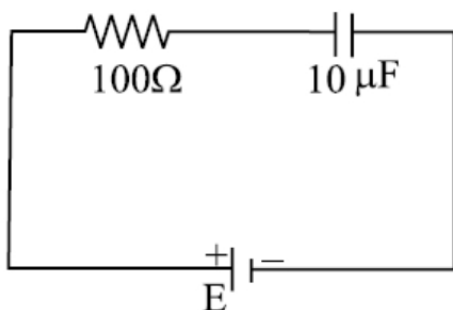
5. A 100 V AC source of frequency 500 Hz is connected to an LCR circuit with L = 8.1 mH, C = 12.5 μF and $R = 10\Omega$ all connected in series as shown figure. What is the quality factor of circuit?


   1) 2.02   2) 2.54   3) 50.54   4) 200.54
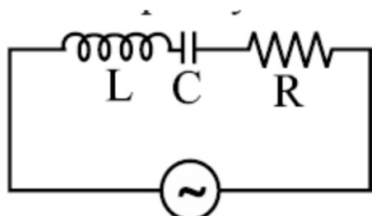
6. The magnifying power of a telescope is 10 and length of telescope is 1.1 m for normal adjustment. The magnification when image is formed at least distance of distinct vision is
   1) 14   2) 6   3) 16   4) 18

7. What happens to the fringe pattern if in the path of one of the slits a glass plate which absorbs 50% energy is introduced?
   1) The bright fringes become brighter and dark fringes become darker
   2) No fringe are observed
   3) The fringe width decreases
   4) None of the above

8. A circular beam of light of diameter d = 2cm falls on a plane surface of glass. The angle of incidence is 60^0 and refractive index of glass is $\mu = \dfrac{3}{2}$. The diameter of the refracted beam is
   1) 4.0 cm   2) 3.0 cm   3) 3.26 cm   4) 2.52 cm

9. The apparent depth of an object O from AB is
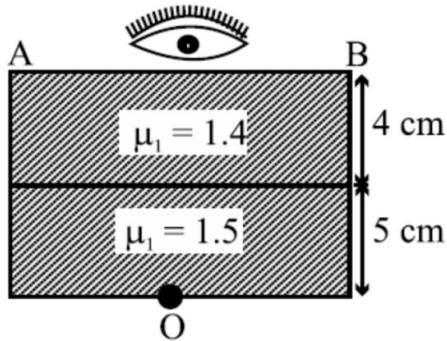
   1) 4.29 cm   2) 5.43 cm   3) 6.19 cm   4) 5.99 cm

10. The deviation produced by a prism is
    1) same for all wavelengths   2) greatest for red and least for violet
    3) greatest for violet and least for red   4) the prism produces no deviation

11. A transistor is used and amplifier in common base mode with a load resistance of $5k\Omega$. If the current gain of amplifier is 0.98 and the input resistance is 70Ω, then voltage gain and power gain respectively are
    1) 70, 68.6   2) 80, 75.6   3) 60, 66.6   4) 90, 96.6

12. A photoelectric experiment is performed at two different light intensities I_1 and I_2 $(I_2 > I_1)$. Choose the correct graph showing the variation of stopping potential versus frequency of light.
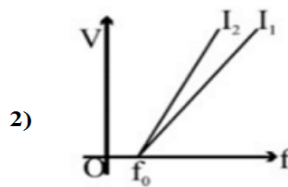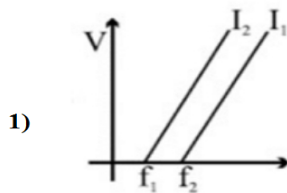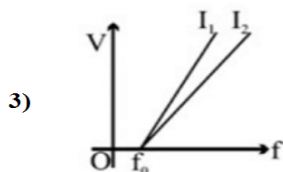
4) None of these

13. In a radioactive series, $^{238}_{92}U$ changes to $^{206}_{82}Pb$ through n_1 α decay process and $n_2 \beta$ decay process, then
    1) $n_1 = 8,\ n_2 = 8$ 2) $n_1 = 6,\ n_2 = 6$
    3) $n_1 = 8,\ n_2 = 6$ 4) $n_1 = 6,\ n_2 = 8$

14. In which of the following systems will the radius of the first orbit be minimum?
    1) Hydrogen atom   2) Deuterium atom
    3) Singly ionized helium   4) Doubly ionized Lithium

15. A cyclist taking a turn, bends inwards while a car passenger taking the same turn in thrown outwards. The reason is
1) car is heavier than cycle
2) car has four wheels while cycle has only two
3) difference in the speed of the two
4) cyclist has to counteract the centrifugal force while in the case of car only the passenger is thrown by force

16. A bird weighs 2kg and is inside a closed cage of 1kg. if it starts flying with constant velocity, then what is weight of the bird and cage assembly
1) 1.5 kg 　　　2) 2.5 kg 　　　3) 3 kg 　　　4) 4 kg

17. A uniform rope of length l lies on a table. If the coefficient of friction is μ, then the maximum length l_1 of the part of this rope which can overhang from the edge of the table without sliding down is
1) $\dfrac{1}{\mu}$ 　　　2) $\dfrac{1}{\mu+1}$ 　　　3) $\dfrac{\mu l}{1+\mu}$ 　　　4) $\dfrac{\mu l}{1-\mu}$

18. A truck travelling due north at 20 m/s turns west and travels at the same speed. The change in its velocity is
1) $40\,ms^{-1}\,N-W$ 　2) $20\sqrt{2}\,ms^{-1}N-W$ 　3) $40\,ms^{-1}S-W$ 　4) $20\sqrt{2}\,ms^{-1}S-W$

19. A stationary object at $4^0 C$ and weighing 3.5 kg falls from a height of 2000m on a snow mountain at $0^0 C$. If the temperature of the object just before hitting the snow is $0^0 C$ and the object comes to rest immediately, then the object will melt (use, $g = 10\,ms^{-2}$ and latent heat of ice $= 3.5\times10^5\,J\,kg^{-1}$)
1) 2kg of ice 　　2) 200 g of ice 　　3) 20 g ice 　　4) 2 g of ice

20. In rainy season, on a clear night the black seat of a bicycle becomes wet because
1) It absorbs water vapour 　　　　2) Black seat is good absorber of heat
3) Black seat is good radiator of heat energy 4) None of the above

21. While measuring the thermal conductivity of a liquid, we keep the upper part hot and lower part cool, so that
1) convection may be stopped 　　　　2) radiation may be stopped
3) heat conduction is easier downwards 　　4) it is easier and more convenient to do so

22. At NTP water boils at $100^0 C$. Deep down a mine, water will boil at a temperature
1) $100^0 C$ 　　2) $>100^0 C$ 　　3) $<100^0 C$ 　　4) will not boil at all

23. A tuning fork of frequency 100Hz when sounded together with another tuning fork of unknown frequency produces 2 beats per second. On loading the tuning fork whose frequency is not known and sounded together with a tuning fork of frequency 100 Hz produces one beat, then the frequency of the other tuning fork is
1) 102 　　　2) 98 　　　3) 99 　　　4) 101

24. The equation of a transverse wave is given by $y = 10\sin\pi(0.01x-2t)$ where x and y are in cm and 't' is in seconds. It frequency is
1) $10\,s^{-1}$ 　　2) $2\,s^{-1}$ 　　3) $1\,s^{-1}$ 　　4) $0.01\,s^{-1}$

25. A particle executing simple harmonic motion along y – axis has its motion described by the equation $y = A\sin(\omega t)+B$. The amplitude of the simple harmonic motion is
1) A 　　　2) B 　　　3) A + B 　　　4) $\sqrt{A+B}$

26. A perfect gas contained in a cylinder is kept in vacuum. If the cylinder suddenly bursts, then the temperature of the gas
1) remains constant 　2) becomes zero 　3) increases 　4) decreases

27. The density of a gas at normal pressure and $27^0 C$ temperature is 24 units. Keeping the pressure constant, the density at $127^0 C$ in same units will be
1) 6 　　　2) 12 　　　3) 18 　　　4) 24

28. A vertical column of a certain liquid, 50 cm long at $50^0 C$ balances another column of the same liquid, 60 cm long at $100^0 C$. The coefficient of absolute expansion of the liquid is
1) $0.005/\,^0C$ 　　2) $0.0005/\,^0C$ 　　3) $0.002/\,^0C$ 　　4) $0.0002/\,^0C$

29. The height of a mercury barometer is 75 cm at sea level and 50 cm at the top of a hill. Ratio of density of mercury to that of air is 10^4. Then the height of the hill is
    1) 250m
    2) 2.5km
    3) 1.25km
    4) 750m

30. A ball is dropped from a height h on the ground. If the coefficient of restitution is e, the height to which the ball goes up after it rebounds for the nth time is
    1) he^{2n}
    2) he^n
    3) $\dfrac{e^{2n}}{h}$
    4) $\dfrac{h}{e^{2n}}$

31. A body moves along an uneven horizontal road with a constant speed at all points. The normal reaction of the road on the body is
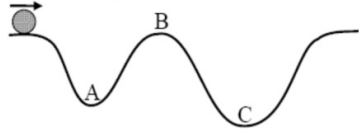
    1) maximum at A
    2) maximum at B
    3) minimum at C
    4) same at A, B and C

32. Two loops P and Q are made from a uniform wire. The radii of P and Q are r_1 and r_2 respectively, and their moments of inertia are I_1 and I_2 respectively. If $I_2 = 4I_1$, then $\dfrac{r_2}{r_1}$ equals
    1) $4^{\frac{2}{3}}$
    2) $4^{\frac{1}{3}}$
    3) $4^{\frac{-2}{3}}$
    4) $4^{\frac{-1}{3}}$

33. A ball of mass m approaches a wall of mass $M\left(>> m\right)$ with speed $4\,ms^{-1}$ along the normal to the all. The speed of wall is $1\,ms^{-1}$ towards the ball. The speed of the ball after an elastic collision with the wall is

    1) $5\,ms^{-1}$ away from the wall
    2) $9\,ms^{-1}$ away from the wall
    3) $3\,ms^{-1}$ away from the wall
    4) $6\,ms^{-1}$ away from the wall

34. A mass of 1kg is acted upon by a single force $\vec{F} = \left(4\hat{i} + 4\hat{j}\right)N$. Due to force, mass is displaced from $\left(0,0\right)$ to $\left(1m, 1m\right)$. If initially, the speed of the particle was $2\,ms^{-1}$, its final speed should approximately be
    1) $6\,ms^{-1}$
    2) $4.5\,ms^{-1}$
    3) $8\,ms^{-1}$
    4) $7.2\,ms^{-1}$

35. In a cylindrical vessel containing a liquid of density ρ, there are two holes in the side walls at heights of h_1 and h_2 respectively such that the range of efflux at the bottom f the vessel is same. The height of a hole for which the range of efflux would be maximum will be
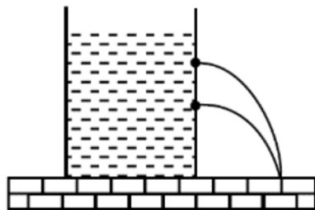
    1) $h_2 - h_1$
    2) $h_2 + h_1$
    3) $\dfrac{h_2 - h_1}{2}$
    4) $\dfrac{h_2 + h_1}{2}$

36. An anisotropic material has a coefficient of linear expansion $\alpha, 2\alpha$ and 3α along the three co-ordinate axis. Coefficient of cubical expansion of material will be equal to
    1) 2α
    2) $\sqrt[3]{6}\alpha$
    3) 6α
    4) none of these

37. Which one of the following would cause the maximum rise in temperature of 20g of water at $30^0 C$?
    1) 20g of water at $40^0 C$ 2) 40g of water at $35^0 C$
    3) 10g of water at $50^0 C$ 4) 4g of water at $80^0 C$

38. Energy is being emitted from the surface of a black body at a temperature of $127^0 C$, at the rate of $1.0 \times 10^6 \, J \sec^{-1} m^{-2}$. The temperature of the black body at which the rate of energy emission is $16.0 \times 10^6 \, J \sec^{-1} m^{-2}$ will be
    1) $254^0 C$ 2) $508^0 C$ 3) $527^0 C$ 4) $727^0 C$

39. Wein's constant is $2892 \times 10^6 \, m \, K$ and the value of λ_m for moon is 14.46 micron. The surface temperature of the moon is
    1) 100K   2) 300K   3) 400K   4) 200K

40. Two particle are projected from a point at the same instant with velocities whose horizontal components and vertical components are $(u_1, v_1) \, and \, (u_2, v_2)$ respectively. The time interval between their passing through the other common point of their path (other than origin) is
    1) $\dfrac{2}{g}\left(\dfrac{v_1 u_1 - v_2 u_2}{u_1 + u_2}\right)$ 2) $\dfrac{2}{g}\left(\dfrac{v_1^2 + v_2^2}{u_1 + u_2}\right)$ 3) $\dfrac{2}{g}\left(\dfrac{u_1^2 + u_2^2}{v_1 + v_2}\right)$ 4) $\dfrac{2}{g}\left(\dfrac{v_1 u_2 - v_2 u_1}{u_1 + u_2}\right)$

41. The capacity of an isolated sphere is increased 'n' times when it enclosed by an earthed concentric sphere. The ratio of their radii is
    1) $\dfrac{n^2}{n-1}$ 2) $\dfrac{n}{n-1}$ 3) $\dfrac{2n}{n+1}$ 4) $\dfrac{2n+1}{n+1}$

42. Capacitor C_1 of capacity $1 \mu F$ and capacitor C_2 of capacity $2 \mu F$ are separately charged fully by a common battery. The two capacitors are then separately battery. The two capacitors are then separately allowed to discharge through equal resistors at t = 0
    1) At $t = 0$ the value of current in the circuit containing $1 \mu F$ is more than current in the circuit containing $2 \mu F$
    2) At $t = 0$ the current in $2 \mu F$ capacitor circuit is more than current in $1 \mu F$ capacitor circuit
    3) $1 \mu F$ capacitor losses 50% charge sooner than $2 \mu F$ capacitor
    4) $2 \mu F$ capacitor losses 50% charge sooner than $1 \mu F$ capacitor

43. A charged soap bubble having surface charge density σ and radius r. If the pressure inside and outside the soap bubble is the same, then the surface tension of the soap solution is
    1) $T = \dfrac{\sigma^2 R}{8\varepsilon_0}$ 2) $T = \dfrac{\sigma^2 R}{4\varepsilon_0}$ 3) $T = \dfrac{\sigma^2 R}{2\varepsilon_0}$ 4) $T = \dfrac{\sigma^2 R}{\varepsilon_0}$

44. Light of wavelength $\lambda = 5000 A^0$ falls normally on a narrow slit. A screen placed at a distance of 1m from the slit and perpendicular to the direction of light. First minima of the diffraction pattern is situated at 5mm from the centre of central maximum. The width of the slit is
    1) 0.1 mm   2) 1.0 mm   3) 0.5 mm   4) 0.2 mm

45. How many minimum numbers of a coplanar vector having different magnitudes can be added to give zero resultant
    1) 2   2) 3   3) 4   4) 5

CHEMISTRY

46. $NH_4 Cl$ crystallizes in a body – centred cubic lattice with edge length of unit cell equal to 387 pm. If the radius of the Cl^- ion is 181 pm, radius for NH_4^+ ion is
    1) 154.1 pm   2) 92.6 pm   3) 366.3 pm   4) none of these

47. Which of the following has the least tendency to dimerise?
    1) NO_2 2) ClO_3 3) ClO_2 4) $Mn(CO)_5$

48. The ionization energy of He^+ is $19.6 \times 10^{-18} \, J \, atom^{-1}$. The energy of the first stationary state of Li^{+2} will be
    1) $21.2 \times 10^{-18} \, J / atom$ 2) $44.10 \times 10^{-18} \, J / atom$
    3) $63.2 \times 10^{-18} \, J / atom$ 4) $84.2 \times 10^{-18} \, J / atom$

49. The IUPAC name of complex $K_3\left[Al\left(C_2O_4\right)_3\right]$ is

    1) potassiumaluminoxalate   2) potassiumtrioxalatoaluminate (III)

    3) potassiumaluminium(III)oxalate   4) potassiumtrioxalatoaluminate (VI)

50. Copper can be reduced from acidic copper sulphate solution by

    1) silver   2) iron   3) carbon   4) lead

51.

    1)

    2)

    3)

    4)
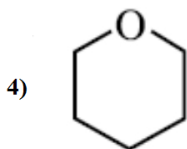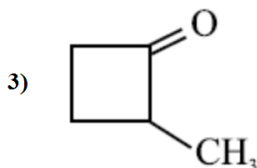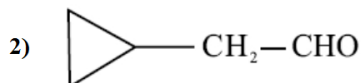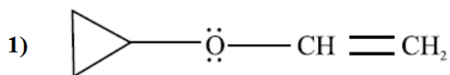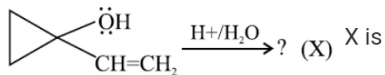
52. If all the electrolytes are removed from the colloid by persistent dialysis then

    1) Colloid becomes extremely stable

    2) Colloids get coagulated

    3) No effect is observed

    4) Colloids convert into true solution

53. For as SN^2 reaction of

$$CH_3 - \overset{\overset{\displaystyle Me}{|}}{C}H - CH_2 - X$$

the most effective nucleophile will be

    1) MeO^- 2)   3) $Me_2CHO^{\ominus}$ 4) $Me_2CH_2O^-$
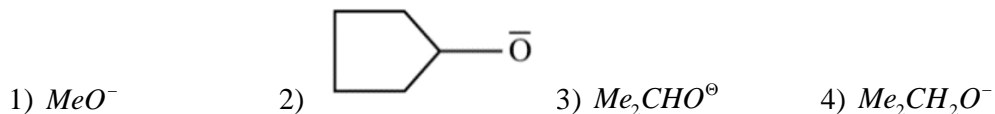
54. Which of the following is correctly matched with the given property?

    1) $MgSO_4 < CaSO_4 < SrSO_4 < BaSO_4$

        (Solubility in water)

    2) $BeCO_3 > MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

        (Thermal stability)

    3) $NaOCl > NaOBr > NaOl$

        (Oxidising nature)

    4) $F_2 > Cl_2 > Br_2 > I_2$
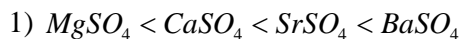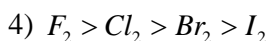
        (Bond energy)

55. Which of the following molecules has highest dipole moment?

    1) BF_3 2) NH_3 3) NF_3 4) CCl_4

56. Which of the following amines form N – nitroso derivative when treated with $NaNO_2$ and HCl ?
1) CH_3NH_2

2) ![benzene ring]—NR_2 3) ![benzene ring with R on N]—$N-H$ 4) ![benzene ring]—NH_2
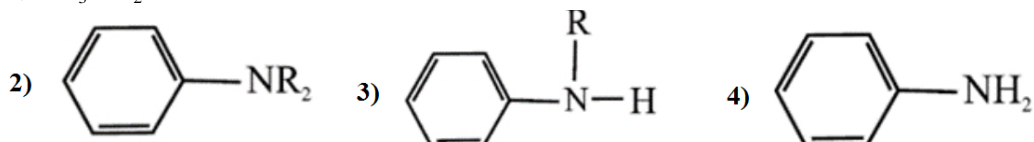
57. The reagent who can't be used to detect the presence of both CO_3^{2-} and HCO_3^- in a mixture is
   1) $CaCl_2$ 2) $SrCl_2$ 3) $AgNO_3$ 4) $MgCl_2$

58. The change in optical rotation with time of freshly prepared solution of glucose is known as
   1) specific rotation   2) inversion   3) rotation   4) mutarotation

59. For a weak electrolyte α_1 and α_2 are in ratio of $1:2$, for a given concentration $k_{a_1} = 2 \times 10^{-4}$. What will be value of k_{a_2}
   1) 8×10^{-4} 2) 2×10^{-4} 3) 4×10^{-4} 4) 1×10^{-4}

60. One mole of an ideal gas $(C_v = 20 JK^{-1} mol^{-1})$ initially at STP is heated at constant volume to twice the initial temperature. For the process, W and q will be
   1) $W = 0; q = 5.46 kJ$ 2) $W = 0; q = 0$
   3) $W = -5.46 kJ; \ q = 5.46 kJ$ 4) $W = 5.46 kJ; \ q = 5.46 kJ$

61. $H_2(g)$ and $O_2(g)$, can be produced by the electrolysis of water. What total volume (inL) of O_2 and H_2 are produced at STP when a current of 30A is passed through a $K_2SO_4(aq)$ solution for 193 min.?
   1) 20.16   2) 40.32   3) 60.48   4) 80.64

62. Sodium carbonate reacts with SO_2 in aqueous solution to give:
   1) $NaHCO_3$ 2) $NaHSO_3$ 3) Na_2SO_3 4) $NaHSO_4$

63. Regarding the structure of cyanamide ion, pick out the wrong statement
   1) It has one carbon with a negative charge
   2) It has two σ bonds
   3) It has two π bonds
   4) It has two negatively charged Nitrogen atoms

64. A freshly prepared $Fe(OH)_3$ precipitate is peptised by adding $FeCl_3$ solution. The charge on the colloidal particles is due to the preferential adsorption of
   1) Cl^- ions   2) Fe^{3+} ions   3) OH^- ions   4) Fe^{+2} ions

65. The correct order of boiling point is :
   1) $NH_3 < HF < H_2O < H_2O_2$ 2) $NH_3 < HF < H_2O_2 < H_2O$
   3) $NH_3 < H_2O < HF < H_2O_2$ 4) $HF < NH_3 < H_2O < H_2O_2$

66. Which of the following statements is wrong
   1) All methyl ketones give a positive iodoform test
   2) Acetaldehyde is the only aldehyde that gives iodoform test
   3) All secondary alcohols give positive iodoform test
   4) Any alcohol that can be oxidized to an acetyl group gives a positive iodoform test

67. In reaction $N_2O_4(g) \rightarrow 2NO_2(g)$. The observed molecular weight $80 \ gmol^{-1}$ at 350K. The percentage dissociation of $N_2O_4(g)$ at 350K is
   1) 10%   2) 15%   3) 20%   4) 18%

68. In the following compounds
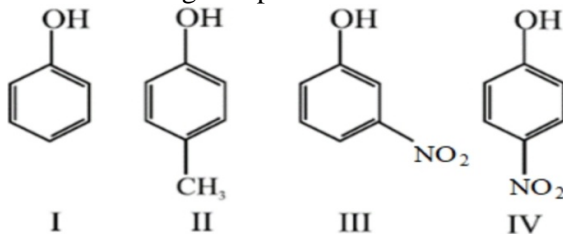
The order of acidity is
1) III>IV>I>II
2) I>IV>III>II
3) II>I>III>IV
4) IV>III>I>II

69. Two liquids A and B have P_A^0 and P_B^0 in the ratio of 1:3. If the ratio of number of moles A and B are 1:3, the mole fraction of 'A' in vapour phase in equilibrium with the solution is equal to
1) 0.1
2) 0.2
3) 0.5
4) 1.0

70. In the Born-Haber cycle for the formation of solid common salt $(NaCl)$, the largest contribution comes from
1) The low ionization energy of Na
2) The high electron affinity of Cl
3) The low ΔH_{vap} of Na (s)
4) The lattice energy

71. Among the following substituted silanes the one which will give rise to cross linked silicone polymer on hydrolysis is
1) $R_3 SiCl$
2) $R_4 Si$
3) $RSiCl_3$
4) $R_2 SiCl_2$

72. Malonic acid on dehydration with P_4O_{10} gives an oxide, which is
1) linear
2) bent V – shaped
3) planer
4) tetrahedral

73. 40ml $\dfrac{N}{10}$ HCl solution is mixed with 60 ml of $\dfrac{N}{20}$ KOH solution. The resulting mixture will be
1) acidic
2) basic
3) neutral
4) cannot be predicted

74.
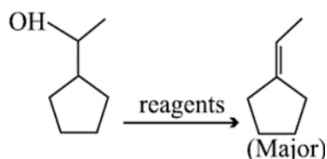
The most appropriate regent for the given reaction can be
1) Conc. $(H_2SO_4)/\Delta$
2) $(Al_2O_3)/\Delta$
3) $(ThO_2)/\Delta$
4) All of them

75. Increasing basic properties of TiO_2, ZrO_2 and HfO_2 are in order:
1) $TiO_2 < ZrO_2 < HfO_2$
2) $HfO_2 < ZrO_2 < TiO_2$
3) $HfO_2 < TiO_2 < ZrO_2$
4) $ZrO_2 < TiO_2 < HfO_2$

76. In a solid AB having $NaCl$ structure, 'A' atoms occupy the corners & face centre of the cubic unit cell. If all the face centered atoms along one of the axes are removed, then the resultant stoichiometry of the solid is
1) AB_2
2) A_2B
3) A_4B_3
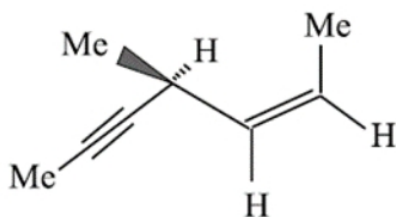4) A_3B_4

77.

Compound A is -

1)
2)
3)
4)
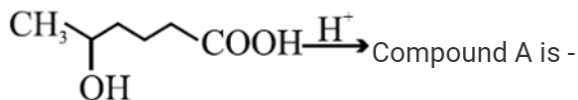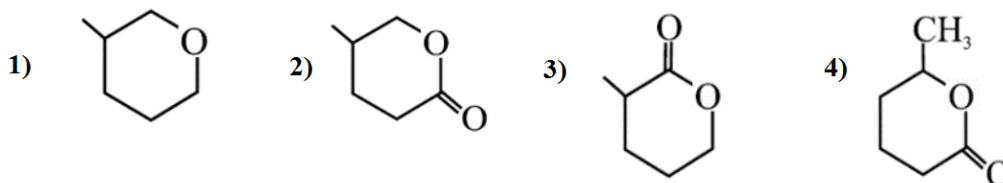
78. A compound was found to contain nitrogen 28g and oxygen 80g. The formula of the compound is (N=14, O=16)

1) NO   2) N_2O_3 3) N_2O_5 4) N_2O_4

79. In an isothermal process at 300K, 1 mole of an ideal gas expands from a pressure 100 atm against an external pressure of 50 atm. Then total entropy change $\left(Cal\,K^{-1}\right)$ in the process is

1) +0.39   2) -0.39   3) +1.59   4) -1.59

80.

Hydrogenation of the above compound in the presence of sodium in liquid ammonia gives :
An optically active compound
An optically inactive compound
A racemic mixture
A diastereomeric mixture

81.
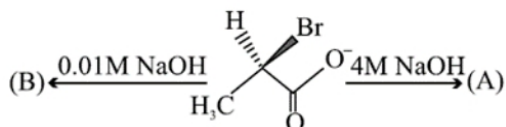
Which of the following is correct regarding compounds [A] and [B]?
[A] and [B] are super imposable mirror images
The configuration of [A] is 'R' and [B] is 'S'
[A] and [B] are diastereomers
[A] is formed with inversion of configuration & [B] with retention of configuration

82. Equivalent mass of the reaction $C_6H_5NO_2 \rightarrow C_6H_5NH_2$.

1) $\dfrac{M}{6}$ 2) $\dfrac{M}{3}$ 3) $\dfrac{M}{4}$ 4) $\dfrac{M}{2}$

83. Which of the following statements regarding copper salts is not true:
1) Copper (I) disproportionate into Cu and Cu(II) in aqueous solution
2) Copper (I) can be stabilized by the formation of insoluble complex compounds such as $CuCl_2^-$ and $Cu(CN)_2^-$
3) Copper (II) oxide is red powder
4) Hydrated $CuSO_4$ is $\left[Cu(H_2O)_4\right]SO_4.H_2O$

84. Antiseptic chloroxylenol is
1) 4 – chloro – 3, 5 – dimethylphenol
2) 3 – chloro – 4, 5 – dimethylphenol
3) 4 – chloro – 2, 5 – dimethylphenol
4) 5 – chloro – 3, 4 – dimethylphenol

85. Choose the incorrect statement in the following?
    1) Friedel – Crafts reaction between benzene and acetic anhydride in the presence of anhydrous $AlCl_3$ yields acetophenone and not poly substituted products.
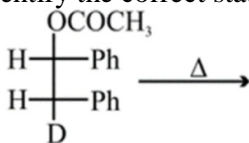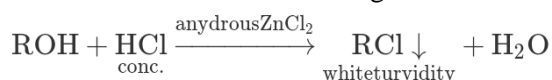   2) Acetophenone formed poisons the catalyst preventing further the Freidel – Crafts reaction.
    3) During fridel crafts alkylation reaction rearrangement of carbocation takes place.
    4) Carbocation is poor electrophile than acylium ion.

86. Identify the correct statement about the reaction

$$\begin{array}{c} OCOCH_3 \\ H-\!\!\!-\!\!\!-Ph \\ H-\!\!\!-\!\!\!-Ph \\ D \end{array} \xrightarrow{\Delta}$$

It is a syn – elimination reaction and gives cis alkene
It is an anti – elimination reaction and gives trans alkene
It is a syn – elimination reaction and gives Trans alkene
The product does not contain deuterium

87. Lucas test is used to make distinguation between $1^0, 2^0$ and 3^0 alcohols.

$$ROH + HCl \xrightarrow[\text{conc.}]{\text{anydrousZnCl}_2} RCl\downarrow_{\text{whiteturvidity}} + H_2O$$

This shown that
ROH behaves as a base
Greater the value of pK_a (alcohols), greater the reactivity with conc. HCl and thus sooner the formation of white tarbidity
Both of the above are correct
None of the above is correct

88. A colourless fuming liquid (A) can be prepared by passing SO_2 over phosphorous pentachloride. The liquid can readily be hydrolysed to give sulphurous acid. The compound (A) is
    1) $SOCl_2$ 2) SO_2Cl_2 3) SCl_2 4) SCl_4

89. In Lassaigne's test, a blue colour is obtained if the organic compound contains nitrogen. The blue colour is due to
    1) $K_4\left[Fe(CN)_6\right]$ 2) $Fe_4\left[Fe(CN)_6\right]_3$ 3) $Na_3\left[Fe(CN)_6\right]$ 4) $Cu_2\left[Fe(CN)_6\right]$
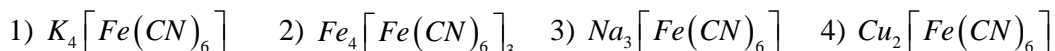
90. The dipole moment of LiH is 1.964×10^{-29} Coulomb meter and the interatomic distance between Li and H is $1.596 A^0$. The percentage ionic character of LiH is
    1) 82.5%   2) 63.2%   3) 76.8%   4) 90.5%

BIOLOGY

91. In maize, pollination is
    1) Anemophiloous (wind)   2) Ornithophilous (birds)
    3) Malacophilous (snail)   4) Entomophilous (ants)

92. Which of the following contraceptive method is used can also help in preventing STD?
    1) Coitus withdrawl   2) Diaphragms
    3) Condoms   4) Oral contraceptives

93. During transcription the template strand is the one with polarity
    1) Always 3' to 5' as the template strand
    2) Always 5' to 3' as the template strand
    3) Any of the strands can become template strand
    4) Alternatively both strand work as template strand

94. Which one of the following is wrongly matched?
    1) Fungi – Chitin
    2) Plasma membrane – Phospholipid
    3) Bacteria – Lipopolysaccharide
   4) Endodermis – Suberin

95. A protoplast is a cell:
    1) Without nucleus
    2) Undergoing division
    3) Without cell wall
    4) Without Golgi body
96. Which of the following statement is correct about competitive inhibitors?
    1) The inhibitor does not resembles the substrate
    2) The inhibitor competes with the substrate for the allosteric sites
    3) Inhibitoin of succinic hydrogenase by malonate which closely resembles the substrate succinate in structure is an example of it.
    4) This mechanism is used in the control of bacterial pathogens
97. The deficiencies of micronutrients, not only affect the growth of plants but also vital functions such as photosynthetic and mitochondrial electron flow. Among the list given below, which group of three elements shall affect most, both photosynthetic and mitochondrial electron transport?
    1) Co, Ni, Mo
    2) Ca, K, Na
    3) Mn, Co, Ca
    4) Cu, Mn, Fe
98. A thin, muscular wall (oval depression) in the heart is seen
    1) Inter – artial septum
    2) Inter – ventricular septum
    3) Right auriculo – ventricular septum
    4) Left auriculo – ventricular septum
99. Coralloid roots of Cycas are useful in
    1) N_2-fixation
    2) Absorption
    3) Transpiration
    4) Fixation
100. To be evolution of successful, a mutation must occur in
    1) Germpalsm DNA
    2) Somatoplasm DNA
    3) RNA
    4) Cytoplasm
101. Select the incorrectly matched pair from the following

i)	Serciculature	Silkmoth
ii)	Aquaculture	Fish
iii)	Apiculture	Honey bee
iv)	Pisciculture	Bombyx mori

    1) (i)
    2) (ii)
    3) (iii)
    4) (iv)
102. Yellowing of tea leaf is due to the deficiency of
    1) Chlorine
    2) Hydrogen
    3) Oxygen
    4) Sulphur
103. In meiosis, division is
    1) I reductional and II equational
    2) I equational and II reductional
    3) Both reductional
    4) Both equational
104. During the transmission of nerve impulse through a nerve fibre, the inner membrane charge of the neurilemma will be
    1) First positive, then negative and continue to be positive
    2) First negative, then positive and continue to be positive
    3) First positive, then negative nad again back to positive
    4) First negative, then positive and again back to negative

105. The product formed by the catalyst malic dehydrogenase is
    1) Malic acid
    2) Fumaric acid
    3) Oxaloacetic acid
    4) Succinic acid
106. In India, forests constitute about
    1) 19.4% of the land area
    2) 33.7% of the land area
    3) 22% fo the land area
    4) 67% of the and area
107. Binomial nomenclature means
    1) One name given by two scientists
    2) One scientific name consisting of a generic and specific epithet
    3) Two names, one latinised, other of a person
    4) Two names of same plant
108. Plants growing in shady region are called
    1) Sciophytes
    2) Xerophytes
    3) Epiphytes
    4) Heliophytes
109. Lippes loop is an example of
    1) Vaults
    2) Cu releasing IUDs
    3) Non – medicated IUDs
    4) Hormonal IUDs

110. Most of the unicellular organisms are kept under
    1) Kingdom Monera and kingdom Protista
    2) Kingdom Monera and kingdom Plantae
    3) Kingdom Protista and kingdom Plantae
    4) Kingdom Protista and kingdom Fungi

111. Sella turcica is a
    1) Covering of kidney   2) Covering of testis
    3) Depression in brain   4) Depression in skull which lodges the pituitary body

112. A large persistent cotyledon in the embryo of the wheat grain is called
    1) Coleorhiza   2) Scutellum   3) Coleoptile   4) Epiblast

113. Which one of the following is heterosporous?
    1) Dryopteris   2) Salvinia   3) Adiantum   4) Equisetum

114. Preserving germplasm in frozen state in
    1) Cryopreservation   2) Cold storage   3) in situ preservation 4) Vernalisation

115. First diacarboxylic acid formed during TCA cycle is
    1) Citric acid   2) Succinyl CoA   3) $\propto$ - ketoglutaric acid   4) Oxaloacetic acid

116. Widal test is used for the susceptibility of :
    1) Malaria   2) Cholera   3) Yellow fever   4) Typhoid

117. Floral features are chiefly used in Angiosperms identification because
    1) Flowers are of same colours
    2) Flowers can be safely pressed
    3) Reproductive parts are more stable and conservative than vegetative parts
    4) Flowers are freely available

118. Which of the following compound is used in visualization of DNA fragments in gel electrophorests?
    1) hexachlorobenzene   2) Silver bromide
    3) Ethyl chloride   4) Ethidiumbromide

119. The type of cell junctions that helps in preventing leakage of substances is called
    1) Adhering junctions   2) Gap junctions
    3) Tight junctions   4) Plasmodesmata

120. Bacillus thuringiensis (Bt) strains have been used for designing a novel
    1) Bio – metallurgical technique   2) Bio – mineralization processes
    3) Bio – insecticidal plants   4) Bio – fertilizers

121. Which of the following is absent in polluted water?
    1) Hydrilla   2) Water hyacinth   3) Larva of stone fly   4) Blue green algae

122. Observe the following figures and identify the structures or parts labelled as P, Q, R and S.
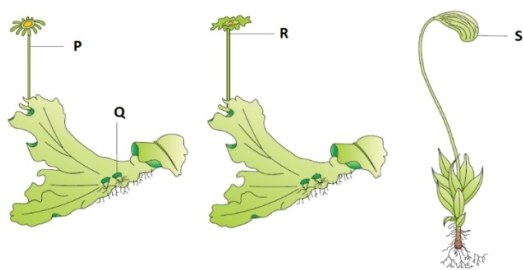
1)

P	Q	R	S
Archegoniophore	Gemma cup	Antheridiophore	Seta

2)

P	Q	R	S
Antheridiophores	Rhizoids	Archegoniophore	Capsule

3)

P	Q	R	S
Antheridiophore	Seta	Archegoniophore	Leaves

4)

| P	Q	R	S
Archegoniophore	Gemma cup	Antheridiophore	Capsule

123. In dicot stem, the xylem is
    1) exarch   2) mesarch   3) centarch   4) endarch

124. According to the Central Pollution Control Board (CPCB), the size of particulate matter (in micrometres) that can cause harm to humans is
    1) 1.5 or less   2) 1.0 or less   3) 5.2-2.5   4) 2.5 or less

125. The microbial source for citric acid is
    1) Aspergillus niger   2) Acetobacter aceti   3) Clostridium butylicum 4) lactobacillus acidophilus

126. Which disease is characterized by inflammation of joints due to the accumulation of uric acid crystals?
    1) Arthritis   2) Gout   3) Tetany   4) Muscular dystrophy

127. The portion of the embryonal axis above the level of cotyledons is the
    1) hypocotyls   2) Root cap   3) Root tip   4) Epicotyl

128. Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (mostly in the nucleus)?
    1) Insulin, glucagon   2) Thyroxin, insulin   3) Somatostain, oxytocin   4) Cortisol, testosterone

129. Fibroblasts, macrophages and mast cells are present in
    1) Cartilage tissue   2) Adipose tissue   3) Areolar tissue   4) Glnadular epithelium

130. Complete the equation Nucleic acids $\xrightarrow{Nucleases}$ Nucleotides $\rightarrow$ ....
    1) Monoglycerides   2) Diglycerides   3) Disaccharides   4) Nucleosides

131. Choose the correct statement
    1) The C_4-plants do not have RubisCO.
    2) Carboxylation of RuBP leads to the formation of PGA and phosphoglycolate.
    3) Carboxylation of phosphoenolpyruvate results in the formation of oxalic acid in C_4-plants
    4) Decarboxylation of C_4- acids occur in the mesophyll cells.

132. Which one of the following pairs of structures are correctly matched with their description?
    1) Tibia and fibila – Both form parts of acetabulum cavity
    2) Cartilage and cornea – Oxygen is required for respiratory need and is supplied by the blood vessels
    3) Shoulder joint and elbow joint – Synovial type of joints
    4) Premolars and molars – 20 in all and 3 rooted

133. Fertilization is depicted by the condition
    1) Haploid to diploid   2) Diploid to triploid
    3) Diploid to haploid   4) Diploid to hexaploid

134. In the given figure of the heart, which of the marked structures (1,2,3,4 and 5) carry oxygeneated blood?
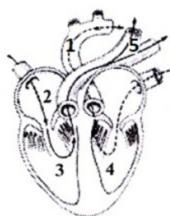
    1) 1,2,3 and 4   2) 1 and 5   3) 1 and 4   4) 3 and 5

135. The vector must also have one unique recognition site to enable foreign DNA to be inserted into the vector during the generation of an rDNA molecule. Most of the commonly used vectors contain unique recoginition sites for several restriction enzymes in a small region of DNA which is referred to as a polylinker or multiple cloning site (MCS). An MCS provides:
    1) Ability to separate DNA fragments
    2) Flexibility in the choice of restriction
    3) Flexibility in selectable marker
    4) Ability of DNA to mutate itself

136. Find out the wrong pair with respect to the number of chromosomes in moiocytes
    1) Fruit fly - 8   2) Apple – 36   3) Rice – 24   4) Housefly – 12
137. The permissible use of the technique amniocentesis is for
    1) Detecting sex of the unborn foetus
    2) Artificial insemination
    3) Transfer of embryo into the uterus of a surrogate mother
    4) Detecting any genetic abnormality
138. A taxon is
    1) A group of related families
    2) A group of related species
    3) A type of living organisms
    4) A taxonomic group of any ranking
139. If a wavelength of above 680 nm is available for excitement, the product of the reaction will be
    1) O_2 2) ATP and $NADPH_2$ 3) ATP 4) $NADPH_2$
140. Oral contraceptives are prescribed in females to check:
    1) Ovulation   2) Fertilization   3) Implantation   4) Entry of sperms in vagina
141. The cloaca in frog is common chamber for the urinary tract, reproductive tract and
    1) Alimentary canal   2) Portal system
    3) hepatic portal vessels   4) Notochord
142. At what concentration of CO_2, C_3 plants shows saturation
    1) $450 \mu IL^{-1}$ 2) $360 \mu IL^{-1}$ 3) $540 \mu IL^{-1}$ 4) $630 \mu IL^{-1}$
143. The rejection of organ transplanting in human is prevented by using
    1) Aspirin   2) Cyclosporin   3) Calcitonin   4) Thrombin
144. Consider the following

    i. For a solution at atmospheric pressure $\Psi_\omega = \Psi_s$
    ii. Ψ_ω (water potential) of a cell is affected by solute potential only
    iii. Ψ_p (pressure potential) is usually positive in xylem during the day
    which of the statements given above is/are correct?
    1) ii & iii   2) i only   3) ii only   4) i, ii & iii
145. How many different types of gametes can be formed by the F_1 progeny, resulting from the following cross? $AABBCC \times aabbcc$
    1) 3   2) 8   3) 27   4) 64
146. Which one of the following pairs is not correctly matched?
    1) Plasmid – Small piece of extrachromosomal DNA in bacteria
    2) Interferon – An enzyme that interferes with DNA replication
    3) Cosmid – A vector for carrying large DNA fragments into host cells
    4) myeloma antibodies – producing tumor cells
147. Identify the given diagram
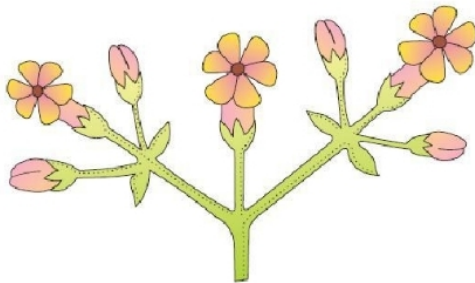
    1) Racemose inflorescence
    2) Cymose inflorescence
    3) Verticilastar inflorescence
    4) Hypenthodium

148. Blastula lacks
    1) blastomeres　　　2) Blastoderm　　　3) Blastocoel　　　4) Blastopore
149. The cranial capacity of Homo erectus was
    1) 900 c.c　　　2) 1350 c.c　　　3) 1075 c.c　　　4) 1450 c.c.
150. The ageing of leaves is called
    1) Necrosis　　　2) Senescence　　　3) Photoperiodism　　　4) Vernalization
151. Which of the following hormone represent the mechanism of hormone action shown in the given diagram?
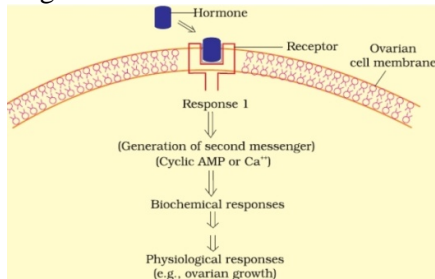
    1) Estrogen　　　2) Progesterone　　　3) FSH　　　4) Cortisol
152. Which of the following statement is correct about mycorrhiza?
    1) It is a symbiotic association between fungi and the root of higher plants.
    2) Pinus seeds cannot germinate in their absence
    3) Plants having such associations show resistance to salinity
    4) More than one option is correct
153. The peripheral nervous system is divided into two divisions called A and B. A relasy impulses from the CNS to skeletal muscles while the B transmits impulses from the CNS to the involuntary organs and smooth muscles of the body. B is further classified into C and D neural system.
    1)

A	B	C	D
Autonomic neural system	Somatic neural system	Sympathetic	Parasympathetic

    2)

A	B	C	D
Sympathetic	Parasympathetic	Autonomic neural system	Somatic neural system

    3)

A	B	C	D
Somatic neural system	Autonomic neural system	Sympathetic	Parasympathetic

    4)

A	B	C	D
Somatic neural system	Sympathetic	Autonomic neural system	Parasympathetic

154. The trigger for activation of toxin produced by Bacillus thuringiensis requires
    1) Acidic pH of gut　　　　　2) Alkaline pH of gut
    3) High temperature　　　　　4) mechanical action in the insect gut
155. The pollen grains lose their viability in 30 minutes in
    1) Triticum aestivum　　　　　2) Allium cepa
    3) Atropa belladonna　　　　　4) Solanum nigrum

156. Which one of the following statements is correct about Phycomycetes?
    1) The mycelium is aseptate and coenocytic.
    2) A zygospore is formed by fusion of two gametes
    3) Rhizopus and Albugo are examples
    4) All of these
157. The nuclear membrane disappears in
    1) metaphase　　　2) Early prophase　　　3) Late prophase　　　4) Anaphase
158. Which one is important constituent of the renniangiotensinogen – aldosteron system?
    1) Juxtaglomerular apparatus
    2) Bowman's capsule
    3) Loop of Henle
    4) Glomerulus

159. The mechanism universally accepted to describe the translocation of sugars from source to sink is called
    1) Translocation of food due to TP gradient and imbibitions force
    2) Translocation of food due turgor pressure (TP) gradient
    3) Translocation of food due to ibibition force
    4) None of the above

160. The class of enzyme that catalyzes the reaction is $S - G + S' \rightarrow S + S' - G$
    1) Lyases   2) Transfeases   3) Isomerases   4) Oxidoreductases

161. Hypersensitivity towards any foreign material is due to antibody
    1) IgA   2) IgG   3) IgM   4) IgE

162. Match the respiratory volumes in column – I with volume of air in column – II and choose the correct option

	Column I		Column II
A	Tridal volume	i)	2500 to 3000 ml
B	IRV	ii)	1000 to 1100 ml
C	ERV	iii)	500 ml
D	RV	iv)	3400 to 4800 ml
E	VC	v)	1100 to 1200 ml

    1) A-III, B-IV, C-II, D-I, E-V
    2) A-III, B-I, C-II, D-V, E-IV
    3) A-III, B-I, C-IV, D-V, E-IV
    4) A-IV, B-III, C-II, D-I, E-V

163. Select the correct statements with regard to sexual reproduction.
    I. Sexual reproduction does not always require two individuals
    II. Sexual reproduction generally involves gametic fusion
    III. meiosis never occurs during sexual reproduction
    IV. External fertilization is a rule during sexual reproduction
    1) I and III   2) I and II   3) II and III   4) I and IV

164. The central part of the proximal region of the centriole is proteinaceous and called the__A__, which is connected with tubules of the peripheral triplets by __B__made of protein.
    1) A – Axoneme; B – Linear spokes
    2) A – Axoneme; B – Linear hub
    3) A – Hub; B – Radial spokes
    4) A – Hub; B – Radial axoneme

165. Gibbarillin was first extracted from
    1) Gibberella fujikuroi
    2) Gracilaria verrucosa
    3) Gardnerella vaginilis
    4) Geotrichum penicillatum

166. In the renal tubules, the permeability of the distal convoluted tubule and collecting duct to water is controlled by
    1) Vasopressin (ADH)   2) Aldosterone
    3) Growth hormone   4) Renin

167. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produce (in the host cells)
    1) Sense RNA   2) Anti – sense RNA
    3) A toxic protein   4) Both sense and anti – sense RNA

168. Attractive force of cell walls of xylem for water molecule is termed as
    1) Adhesion   2) Cohesion
    3) Osmosis   4) Plasmolysis

169. ABO blood group system is due to
    1) multifactor inheritance   2) Incomplete dominance
    3) Multiple allelism   4) Epistasis

170. The meristem that occurs in the mature regions of roots and shoots of many plants, particularly those that produce woody axis
    1) primary meristem   2) secondary meristem
    3) intercalary meristem   4) both 2 and 3

171. If a certain group of cells utilize the amino acid glycine exclusively for protein synthesis, and if a growing culture of these cells is fed radioactive glycine, radioactivity will be found first in the
    1) Ribosomes   2) tRNA   3) mRNA   4) Mitochondria

172. Ecological succession is
    1) Directional but unpredictable   2) Directional and predictable.
    3) Gradual and predictable   4) Directionless and unpredictable

173. Gemmae are vegetative reproductive structures found in
    1) Angiosperma   2) bryophytes   3) Algae   4) Gymnosperms

174. Read the following statements. Which one of the following is incorrect?
    1) GAATTC is the recognition site of EcoRI.
    2) Agrobacterium tumefaciens is used for cloning genes in plants.
    3) In the restriction enzyme EcoRI, "co" stands for coenzyme.
    4) For trnaformation, micro – particles coated with DNA to be bombareded with gene gun are made up of gold or tungsten.

175. Which animal and phylum is represented in the given figure?

    1) Ascidia – hemichordate
    2) Ascidia – Chordata
    3) Ascidia – Tunicata
    4) Ascidia – urochordata

176. Which of the following variety is resistant against hill bunt?
    1) Himgiri   2) Prabhani kranti   3) Pusa Komal   4) Pusa Gaurav

177. At puberty, only _____primary follicles remain are left in each ovary.
    1) 200 – 300 million   2) 60000-80000   3) 1 million   4) 6000-8000

178. Water potential of actively absorbing cells is
    1) Always +ve   2) Always –ve   3) Always 0   4) Always >1

179. Energy storage at consumer level is called
    1) Gross primary productivity   2) Secondary productivity
    3) Net primary productivity   4) Net productivity

180. Select the incorrectly matched pair
    1) Fig and fig wasp – Mutualism
    2) Cuscuta and hedge plant – Commensalism
    3) Cuckoo and crow – Brood parasitism
    4) Goats and Abingdon tortoise on Galapagos islands – Competition

NTA ABHYAS NEET MOCK TEST - 14

Answers and Solutions

PHYSICS

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

CHEMSITRY

46) 1	47) 3	48) 2	49) 2	50) 2	51) 3	52) 2	53) 1	54) 3	55) 2
56) 3	57) 4	58) 4	59) 1	60) 1	61) 3	62) 3	63) 1	64) 2	65) 1
66) 3	67) 2	68) 4	69) 1	70) 4	71) 3	72) 1	73) 1	74) 2	75) 1
76) 4	77) 4	78) 3	79) 1	80) 1	81) 4	82) 1	83) 3	84) 1	85) 2
86) 3	87) 3	88) 1	89) 2	90) 3					

BIOLOGY

91) 1	92) 3	93) 1	94) 3	95) 3	96) 4	97) 4	98) 1	99) 1	100) 1
101) 4	102) 4	103) 1	104) 4	105) 3	106) 3	107) 2	108) 1	109) 3	110) 1
111) 4	112) 2	113) 2	114) 1	115) 3	116) 4	117) 3	118) 4	119) 3	120) 3
121) 1	122) 4	123) 4	124) 4	125) 1	126) 2	127) 4	128) 4	129) 3	130) 4
131) 3	132) 3	133) 1	134) 3	135) 2	136) 2	137) 4	138) 4	139) 3	140) 1
141) 1	142) 1	143) 2	144) 2	145) 2	146) 2	147) 2	148) 4	149) 1	150) 2
151) 3	152) 4	153) 3	154) 2	155) 1	156) 4	157) 3	158) 1	159) 2	160) 2
161) 4	162) 2	163) 2	164) 3	165) 1	166) 1	167) 4	168) 1	169) 3	170) 2
171) 2	172) 3	173) 2	174) 3	175) 2	176) 1	177) 2	178) 2	179) 2	180) 2

PHYSICS

1) In the plane perpendicular to magnetic meridian, horizontal component of field is zero.

$B'_H = B_H \cos 90° = 0$

$B'_V = B_V$

∴ Only vertical component remains, so the dip needle will remain vertical.

2) There will be three situations,

(i) When the coil is entering into the field, flux increases and from Lenz's law the induced emf or current opposes the change. Therefore $a < g$.

(ii) When the coil is completely within the field, flux remains constant and hence no emf is induced. Therefore $a = g$.

(iii) When the coil is coming out from the field, flux decreases and from Lenz's law the induced emf or current opposes the change. Therefore $a < g$.

3) Induced emf,

$E = -\dfrac{d\phi}{dt}$

Therefore, $E = 0$ when $\dfrac{d\phi}{dt} = 0$ and vice versa.

Even if $\phi = 0$, $\dfrac{d\phi}{dt}$ may be non-zero.

Similarly, if $\phi \neq 0$, $\dfrac{d\phi}{dt}$ may be zero.

For example, if $\phi = \phi_0 \sin(\omega t)$

Then, $E = -\dfrac{d\phi}{dt} = -\phi_0 \cos(\omega t)$

4) As this is a DC circuit, so capacitor will behave as open circuit and impedance will be infinite.

5) Quality factor of series LCR is given by

$Q = \dfrac{1}{R}\sqrt{\dfrac{L}{C}}$

$Q = \dfrac{1}{10}\sqrt{\dfrac{8.1\times10^{-3}}{12.5\times10^{-6}}}$

$Q = \dfrac{1}{10}\sqrt{\dfrac{81\times10^2}{12.5}}$

$Q = \dfrac{9}{\sqrt{12.5}} = 2.54$

6) Magnifying power of a telescope is

$\dfrac{f_0}{f_e} = 10$

Length of telescope is $f_0 + f_e = 1.1$ m

∴ $f_0 = 1$ m & $f_e = 0.1$ m

When final image is at D; then magnification is

$m = f_0\left(\dfrac{1}{D} + \dfrac{1}{f_e}\right) = 100\left(\dfrac{1}{25} + \dfrac{1}{10}\right)$

$m = 14$

7) Intensity of dark and bright fringes is given by

$I_{Dark} = \left(\sqrt{I_1} - \sqrt{I_2}\right)^2$

$I_{Bright} = \left(\sqrt{I_1} + \sqrt{I_2}\right)^2$

When there is no glass plate

$I_1 = I_2 = I_0$

∴ $I_{Dark} = 0$ and $I_{Bright} = 4I_0$

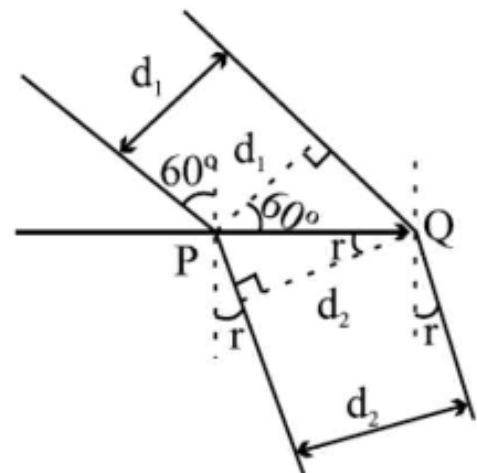But when glass plate is introduced in the path of one of the slits,

$I_2 = \dfrac{I_0}{2}$

∴ $I_{Dark} \neq 0$ increases and I_{Bright} decreases.

Fringe width remains same.

8)

From the diagram, diameter of incident beam is $d_1 = PQ \cos 60°$ and diameter of refracted beam is $d_2 = PQ \cos r$.

$$\therefore \frac{d_1}{d_2} = \frac{1}{2\cos r}$$
$$\Rightarrow d_2 = 2d_1 \cos r$$

From Snell's law:
$$1 \times \sin i = \mu \sin r$$
$$\sin r = \frac{\sin 60°}{\mu} = \frac{1}{\sqrt{3}}$$
$$\Rightarrow \cos r = \sqrt{\frac{2}{3}}$$
$$\therefore d_2 = 2 \times 2 \times \sqrt{\frac{2}{3}} = 3.26 \text{ cm}$$

9) Apparent depth d is given by
$$\Rightarrow d = \frac{t_1}{\mu_1} + \frac{t_2}{\mu_2}$$
$$\Rightarrow d = \frac{4}{1.4} + \frac{5}{1.5} = 2.857 + 3.333$$
$$\Rightarrow d = 6.190 \text{ cm}$$

10) Deviation is given by, $\delta = A(\mu - 1)$
Also, refractive index $\mu \propto \frac{1}{\lambda}$
As $\lambda_R > \lambda_\nu$
$$\therefore \mu_R < \mu_\nu$$
$$\therefore \delta_R < \delta_\nu$$

11) Current gain in common base mode
$$\alpha = \frac{I_C}{I_E} = 0.98$$

Voltage gain
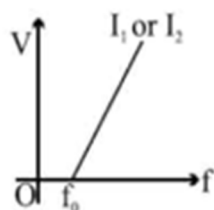$$A_V = \alpha \frac{R_L}{R_{in}} = 0.98 \times \frac{5 \times 10^3}{70}$$
$$\Rightarrow A_V = 70$$
Power gain
$$A_P = \alpha^2 \frac{R_L}{R_{in}} = (0.98)^2 \times \frac{5 \times 10^3}{70}$$
$$\Rightarrow A_P = 68.6$$

12) The value of stopping potential depends on the maximum kinetic energy of the photo-electron and thus it is independent of the intensity of light. Therefore, none of the graph shown is correct. The correct graph is shown in the figure.

13)
$$^{238}_{92}U \rightarrow ^{206}_{82}Pb + n_1\alpha + n_2\beta$$
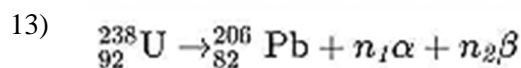
From conservation of mass number:
$$238 = 206 + 4n_1$$
$$32 = 4n_1$$
$$\Rightarrow n_1 = 8$$

From conservation of charge:
$$92 = 82 + 2n_1 - n_2$$
$$92 = 82 + 2(8) - n_2$$
$$\Rightarrow n_2 = 6$$

14) If r_0 is radius of first orbit in Hydrogen atom then radius of first orbit in Hydrogen like atoms is given by $r = \frac{r_0}{Z}$.
For Hydrogen, $Z = 1$
For Deuterium, $Z = 1$
For singly ionized Helium He^+, $Z = 2$
For doubly ionized Lithium Li^{2+}, $Z = 3$

$\therefore$ Radius of the first orbit, r is minimum for doubly ionized Lithium.

15) Cyclist has to counteract the centrifugal force while in the case of car only the passenger is thrown by this force

16) When the bird flies, it pushes air down to balance its weight. So the weight of the bird and closed cage assembly remains unchanged.

17)
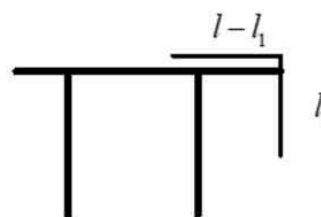
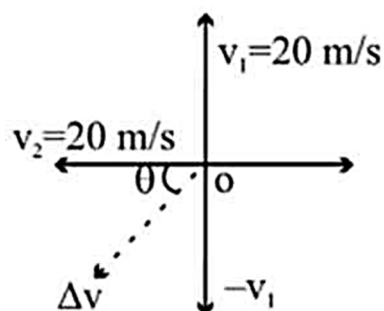Weight of hanging part is balanced by friction

$$\left(m\frac{l_1}{l}\right)g = \mu N$$

$$\left(m\frac{l_1}{l}\right)g = \mu \left(m\frac{l-l_1}{l}\right)g$$

$$l_1 = \mu(l - l_1)$$

$$l_1 = \frac{\mu l}{\mu + 1}$$

18) The representative figure for the problem is given below:-

From the diagram

$$\vec{v}_1 = 20\,\hat{i} \text{ and } \vec{v_2} = -20\,\hat{i}$$

Therefore change in velocity is

$$\Delta \vec{v} = \vec{v_2} - \vec{v_1} = -20\left(\hat{i} + \hat{j}\right)$$

Magnitude of change in velocity

$$\left|\Delta \vec{v}\right| = 20\sqrt{2} \text{ and direction is}$$
$$\theta = \tan^{-1}(1) = 45° \text{ i.e. S-W}$$

19) Suppose m kg of ice melts then by using

$$\underset{\text{(Joules)}}{W} = \underset{\text{(Joules)}}{H}$$

$$Mgh = mL$$

$$3.5 \times 10 \times 2000 = m \times 3.5 \times 10^5$$

$$m = 0.2 \text{ kg} = 200 \text{ g}$$

20) Black seat is good radiator of heat energy therefore on a clear night the black seat of a bicycle becomes wet.

21) Natural convection in liquid occurs because of difference in density and is always in vertical direction. Therefore if we keep the upper part hot (lower density) and lower part cool (higher density) then heat transfer is because of conduction only.

22) Pressure inside the mines is greater than that of normal pressure or atmospheric pressure. Also we know that boiling point increases with increase in pressure. Therefore water will boil at a temperature greater than 100 °C.

23) Suppose n_A is known frequency, then $n_A = 100$ Hz, and let n_B be the frequency of the other tuning fork

$x = 2$ =Beat frequency, which is decreasing after loading (i.e. $x \downarrow$)

Unknown tuning fork is loaded so n_B decreases and also given that beat frequency is 1, so beat frequency also decreases

Hence, $n_B > n_A$ and $n_B - n_A = x$

$$\Rightarrow n_B = n_A + x = 100 + 2 = 102 \text{ Hz}$$

24) Comparing with the standard equation, $y = A\sin(kx - \omega t)$, we have $\omega = 2\pi \text{ rad/s}$

Frequency $n = \frac{\omega}{2\pi} = \frac{2\pi}{2\pi} = 1 \text{ s}^{-1}$
$$\Rightarrow n = 1 \text{ s}^{-1}$$

25) $y = A\sin(\omega t) + B$
The amplitude of the simple harmonic motion is A

26) During free expansion of a perfect gas no work is done and also no heat is supplied from outside. Therefore from first law of thermodynamics, there is no change in the internal energy. Hence, temperature remains constant.

27) Pressure is $P = \frac{\rho RT}{M}$

Hence at constant pressure, $\rho T =$ constant

$$\Rightarrow \frac{\rho_1}{\rho_2} = \frac{T_1}{T_2}$$

$$\Rightarrow \frac{24}{\rho_2} = \frac{(273+127)}{(273+27)} = \frac{400}{300}$$

$$\Rightarrow p_2 = 18 \text{ units}$$

28)

$$h_1 g \rho_1 = h_2 g \rho_2$$

$$\frac{h_1}{h_2} = \frac{\rho_2}{\rho_1} = \frac{(1 + \gamma\,\theta_1)}{(1 + \gamma\,\theta_2)}$$

$$\left[\because \quad \rho = \frac{\rho_0}{(1 + \gamma\,\theta)} \right]$$

$$\Rightarrow \frac{50}{60} = \frac{1 + \gamma \times 50}{1 + \gamma \times 100}$$

$$\Rightarrow \gamma = 0.005 \,/^{\circ}C$$

29) Difference of pressure between sea level and the top of hill

$$\Delta P = (h_1 - h_2) \times \rho_{Hg} \times g \qquad \text{.....(i)}$$

$$= (75 - 50) \times 10^{-2} \times \rho_{Hg} \times g$$

and pressure difference due to h meter of air

$$\Delta P = h \times \rho_{air} \times g \text{ .....(ii)}$$

By equating (i) and (ii) we get

$$h \times \rho_{air} \times g = (75 - 50) \times 10^{-2} \times \rho_{Hg} \times g$$

$$\therefore h = 25 \times 10^{-2} \left(\frac{\rho_{Hg}}{\rho_{air}} \right) = 25 \times 10^{-2}$$

$$\times 10^4 = 2500 \text{ m}$$

$\therefore$ Height of the hill = 2.5 km

30) After each collision speed becomes e times

$\therefore$ Speed after 1st collision is $\nu_1 = e\nu_0$

$\therefore$ Maximum height after 1st collision is,

$$h_1 = \frac{\nu_1^2}{2g} = e^2 \left(\frac{\nu_0^2}{2g} \right) = e^2 h$$

Similarly maximum height after 2nd collision is,
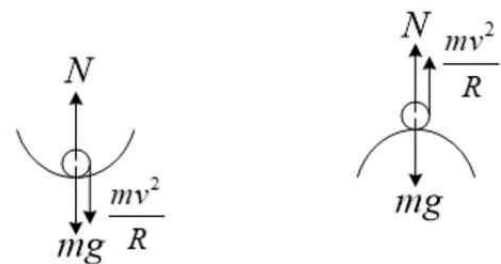
$$h_2 = e^2 h_1 = e^4 h$$

maximum height after 3rd collision is,

$$h_3 = e^2 h_2 = e^6 h$$

$\therefore$ The height to which the ball goes up after it rebounds for the nth time is $h_n = e^{2n} h$

31)

$$\therefore N_A = mg + \frac{m\nu^2}{R_A}$$

$$N_B = mg - \frac{m\nu^2}{R_B}$$

$$N_C = mg + \frac{m\nu^2}{R_C}$$

From the curve,

$$R_A < R_C$$

$$\therefore N_A > N_C$$

N_A is maximum.

32) Moment of inertia of a loop is,

$$I = Mr^2 = (2\pi r A \rho)r^2$$

Therefore $I \propto r^3$
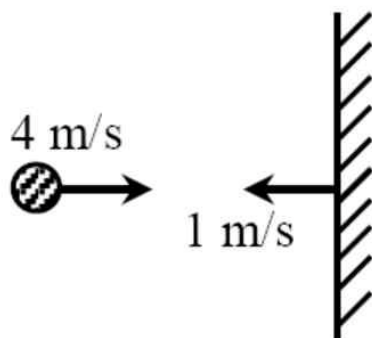
or $r \propto I^{\frac{1}{3}}$

For the two loops

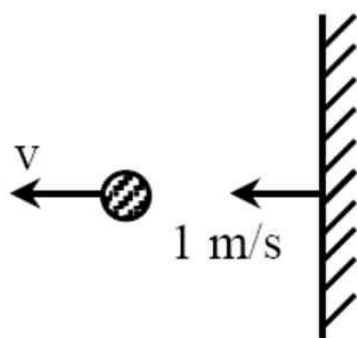$$\frac{r_2}{r_1} = \left(\frac{I_2}{I_1}\right)^{\frac{1}{3}}$$

As $I_2 = 4I_1$

$$\frac{r_2}{r_1} = \left(\frac{4}{1}\right)^{\frac{1}{3}}$$

33)

4 m/s

1 m/s

Before collision

V

1 m/s

After collision

Let v be the velocity of the ball after the collision.

As collision is elastic

$\therefore e = 1$ or

The relative velocity of separation = relative velocity of approach

$\therefore v - 1 = 4 + 1$

or $v = 6$ m s^{-1} (away from the wall)

34) Mass is displaced from (0, 0) to (1, 1). Therefore displacement is,

$$\vec{S} = (1 - 0)\hat{i} + (1 - 0)\hat{j}$$

$$\vec{S} = \left(\hat{i} + \hat{j}\right) m$$

Given force

$$\vec{F} = \left(4\hat{i} + 4\hat{j}\right) N$$

$\therefore$ Work done by a constant force,

$$W = \vec{F} . \vec{S}$$

$$W = \left(4\hat{i} + 4\hat{j}\right) . \left(\hat{i} + \hat{j}\right)$$

$$W = 4 + 4 = 8 \, J$$

From work-energy theorem

$$\Delta K = W$$

$$\tfrac{1}{2}m \left(v_2^2 - v_1^2\right) = W$$

$$\tfrac{1}{2} (1) \left(v_2^2 - 2^2\right) = 8$$

$$v_2^2 = 20$$

$$v_2 = 4.5 \, m \, s^{-1}$$

35)
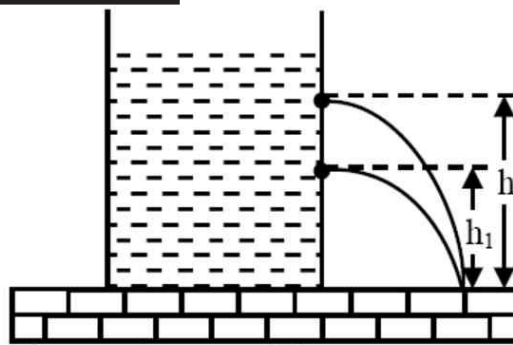
If H is the height of the liquid surface then for same range

$$h_2 = H - h_1$$

and for maximum range

$$h = \frac{H}{2} = \frac{h_1 + h_2}{2}$$

36)

For anisotropic material

Coefficient of cubical expansion

$$\gamma = \alpha + 2\alpha + 3\alpha = 6\alpha$$

37)

$$T = \frac{m_1 s_1 T_1 + m_2 s_2 T_2}{m_1 s_1 + m_2 s_2}$$

But $s_1 = s_2$, therefore,

$$T = \frac{m_1 T_1 + m_2 T_2}{m_1 + m_2}$$

for 10 g of water at 50°

$$T = \frac{20 \times 30 + 10 \times 50}{20 + 10} = \frac{1100}{30}$$

T is maximum, if we take 4 g of water at 80 °C.

38)

$$T_1 = 127°$$

$$T_1 = 400 \text{ K}$$

From Stefan's Law

$$\frac{\frac{dQ_1}{dt}}{\frac{dQ_2}{dt}} = \frac{T_1^4}{T_2^4}$$

$$\left(\frac{1}{16}\right)^{\frac{1}{4}} = \frac{T_1}{T_2}$$

$$\left(\frac{1}{2}\right) = \frac{400}{T_2}$$

$$T_2 = 800K$$
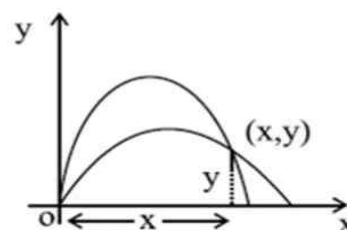
$$T_2 = 800 - 273 = 527\,^{\circ}C$$

39) According to Wein's displacement law

$$\lambda_m T = b$$

$$T = \frac{b}{\lambda_m} = \frac{2892 \times 10^{-6}}{14.46 \times 10^{-6}}$$

$$T = 200 \text{ K}$$

40)

The time for particle 1 to pass through common point of their path

$$t_1 = \frac{x}{u_1}$$

The time for particle 2 to pass through common point of their path

$$t_2 = \frac{x}{u_2}$$

Difference of time $t = t_1 - t_2$

Time $t = \frac{x}{u_1} - \frac{x}{u_2} = x\left(\frac{1}{u_1} - \frac{1}{u_2}\right)$
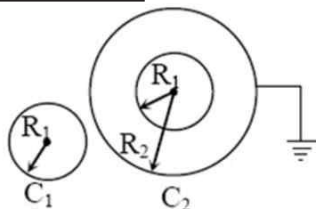
$$y = x\tan\theta - \frac{gx^2}{2u_x^2}$$

$$y = x\frac{v_1}{u_1} - \frac{gx^2}{2u_1^2} = x\frac{v_2}{u_2} - \frac{gx^2}{2u_2^2}$$

$$\frac{v_1}{u_1} - \frac{v_2}{u_2} = x\frac{g}{2}\left(\frac{1}{u_1^2} - \frac{1}{u_2^2}\right)$$

$$\frac{v_1}{u_1} - \frac{v_2}{u_2} = x\frac{g}{2}\left(\frac{1}{u_1} + \frac{1}{u_2}\right)\left(\frac{1}{u_1} - \frac{1}{u_2}\right)$$

$$t = x\left(\frac{1}{u_1} - \frac{1}{u_2}\right) = \frac{2}{g}\left(\frac{v_1 u_1 - v_2 u_2}{u_1 + u_2}\right)$$

41)

Capacity of an isolated sphere
$C_1 = 4\pi\varepsilon_0 R_1$

and Capacity of a sphere when enclosed by an earthed concentric sphere

$C_2 = 4\pi\varepsilon_0 \left(\frac{R_1 R_2}{R_1 + R_2} \right)$

Given that $C_2 = nC_1$

or $\frac{R_2 R_1}{R_2 - R_1} = nR_1$

or $\frac{\frac{R_2}{R_1}}{\frac{R_2}{R_1} - 1} = n$

or $\frac{R_2}{R_1} = \frac{n}{n-1}$

42) Total potential difference E_0 is given to both of the capacitor.
The two capacitors are then separately allowed to discharge through same resistors.
Since both capacitors are charged to same potential difference hence current at $t = 0$, $I_0 = \frac{E_0}{R}$ will be same in both circuits.

Time taken in 50 % discharging
$= RC\ln(2)$

As 1st capacitance is 50% less than that of 2nd capacitance,

hence 1 μF will take less time compared to 2 μF

43) Excess of Pressure inside liquid bubble
$P_1 = \frac{4T}{R}$

electrostatic pressure due to charge
$P_2 = \frac{\sigma^2}{2\varepsilon_0}$

Comparing them $\frac{4T}{R} = \frac{\sigma^2}{2\varepsilon_0}$

Therefore $T = \frac{\sigma^2 R}{8\varepsilon_0}$
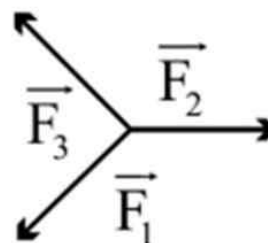
44) Position of nth minima

$x_n = \frac{n\lambda D}{d}$

$5 \times 10^{-3} = \frac{1 \times 5000 \times 10^{-10} \times 1}{d}$

$d = 10^{-4}$ m $= 0.1$ mm .

45) Let $\vec{F}_1$ and $\vec{F}_2$ are two vectors having resultant $\vec{F}_3$ i.e. $\vec{F}_3 = \vec{F}_1 + \vec{F}_2$.

This means all the three forces $\vec{F}_1$, $\vec{F}_2$ and $\vec{F}_3$ lie in the same plane. Therefore, if there be a vector acting exactly opposite of $\vec{F}_3$ with two other vectors $\vec{F}_1$ and $\vec{F}_2$, the net force is zero but they must be coplanar

BIOLOGY

91) Pollination by wind is known as anemophilous and is the more common amongst abiotic pollinations

92) Condoms have additional benefit of protecting the user from contracting STI and AIDS.

93) Thanscription occurs in only one direction, thus the strand that was the polarity $3' \rightarrow 5'$ acts as the
template strand, the other strand which has the polarity $5' \rightarrow 3'$ acts as the coding strand.

94) Most prokaryotic cells, particularly the bacterial cells, have a chemically complex cell envelope. The cell envelope consists of a tightly bound three-layered structure i.e., the outermost glycocalyx followed by the cell wall and then the plasma membrane.

95) Plant cell - cell wall = Protoplast
Protoplast is a biological term proposed by Hanstein in 1880 to refer to the entire cell, excluding the cell wall, but currently has several definitions: a plant, bacterial or fungal cell that had its cell wall completely or partially removed using either mechanical or enzymatic means.

96) When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity
of the enzyme

97) Cu → it is constituent of plastocyanin
Mn → participates in photolysis of water
Fe → it is a part of catalases, peroxidases, cytochrome

98) An oval depression called fossa ovalis is present in the inter auricular septum within the right auricle. Through this foramen, the blood from the right auricle is communicated towards the left auricle in the embryo. Over the course of several months, the foramen ovale closes, leaving a shallow depression known as the fossa ovalis in the adult heart.

99) Anabaena, Nostoc and other cyananobacteria are found in coralloid roots to help in $_2N$ fixation

100) The mutation which occur in germplasm DNA can lead evolution because germplasm (gametes) are
fused and form zygote, which will develop into next progeny

101) Sericulture is the production of raw silk by rearing of silkworms. Aquaculture is the farming of fish, crustaceans, molluscs, aquatic plants, etc. Apiculture is the maintenance of hives of honeybees for the production of honey. Pisciculture is the controlled rearing and breeding of fish.

102) Chlorosis is the loos of chlorophyll leading to yellowing in leaves, this symptoms is caused by the deficiency of N,K,Mg,S,Fe,Mn,Zn

103) Meiotic division occurs in two stages, meiosis I and meiosis II, dividing the cells once at each stage. Meiosis I separates homologous chromosomes, producing two haploid cells (**N chromosomes**, 23 in humans), and thus meiosis I is referred to as a **reductional division**. In meiosis II, an **equational division** similar to mitosis will occur whereby the sister chromatids are finally split, creating a total of 4 haploid cells (**23 chromosomes**, N) - two from each daughter cell from the first division.

104) The electrical potential difference across the plasma membrane is called the action potential or as a nerve impulse. At the resting stage, the outer membrane is positively charged and the inner membrane is negatively charged. Upon stimulus, the membrane becomes freely permeable to Na+. This leads to a rapid influx of Na+ followed by the reversal of the polarity at that site, i.e., the outer surface of the membrane becomes negatively charged and the inner side becomes positively charged. Later repolarization happens to get back the inner membrane to negatively charged.

105) Malate dehydrogenase enzyme help to produced Oxaloacetate

106) As per the India state of forest report 2009 is 690899 59 km which constitutes 21.02% of the geographical area of the country.

107) Binomial Nomenclature means the scientific name of any organism consist of a generic epithet and a specific epithet. Generic name starts with capital letter and specific name with small letter. Both the names are written in Italics or underlined in manuscripts.

108) Those plant which grow best in shade (or) diffused light are called sciophytes (or) heliophobous (or) photophoboas (or) shade loving plants

109) Intra-Uterine devices are presently available as the non-medicated IUDs (e.g., Lippes loop), copper releasing IUDs (CuT, Cu7, Multiload 375) and the hormone-releasing IUDs (Progestasert, LNG-20).

110) According to five kingdom classification, single cellular eukaryotes come under Protista and single cellular prokaryotes come under Monera. Thus all single unicellular organisms belong to these two groups.

111) Sella turcica is a depression in the skull bone called sphenoid bone which lodges pituitary gland.

112) The scutellum is the large persistent cotyledon in the embryo of wheat grain.

—Scutellum
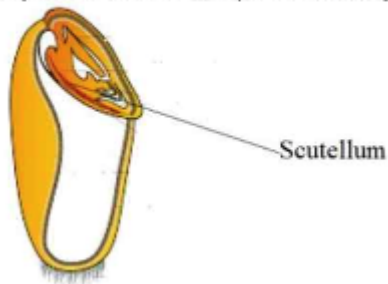
113) The sporophyte of pteridophytes produced mesopores inside the sporangia. Eg: Selaginalla and Salvinia are heterospores.

114) Germplasm at $196_0 C$ in liquid nitrogen (Ex – situ conservation)

115) During the TCA cycle, the first step where a carbon group is lost as carbon dioxide in a decarboxylation reaction the compound having 5 carbon formed is called alpha-ketoglutaric acid.

116) The WIDAL test is one of the presumptive diagnostic methods of enteric fever/typhoid fever. WIDAL test detects the presence of agglutinins to O and H antigens of Salmonella typhi and Salmonella paratyphi in the serum of patients with suspected Salmonella infection.

117) In flowers, there are four different types of whorls like calyx, corolla, stamens, and pistil. The reproductive parts (floral features) are more stable and conservative than vegetative parts, which exhibit changes due to the environmental factors quite readily. So floral features are more reliable.

118) The separated DNA fragments can be visualised only after staining the DNA with a compound known as ethidium bromide followed by exposure to UV radiation.

119) Three types of cell junctions are found in the epithelium and other tissues. These are called tight, adhering, and gap junctions. Tight junctions help to stop substances from leaking across a tissue. Adhering junctions perform cementing to keep neighbouring cells together. Gap junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for rapid transfer of ions, small molecules and sometimes big molecules.

120) Bt strains have been used to design bio-insecticidal plants, through genetic engineering. Bacillus thuringiensis is commonly used as a biopesticide and synthesizes the proteins known as endotoxins or cry proteins. These proteins have insecticidal action. The gene for these proteins is introduced in many transgenic products that provide resistance to pests.

121) Hydrilla is a freshwater plant.
Hydrilla is a genus of aquatic plant, usually treated as containing just one species, Hydrilla verticillata, though some botanists divide it into several species. It is native to the cool and warm waters of the Old World in Asia, Africa and Australia, with a sparse, scattered distribution; in Australia from Northern Territory, Queensland, and New South Wales. They show pollination via water.

122) P = Archegoniophore(the stalk or other outgrowth of a prothallium upon which archegonia are borne),
Q = Gemma cup (The gemma cups are cup-like structures containing gemmae),
R = Antheridiophore (In bryophytes, the antheridium is borne on an antheridiophore, a stalk-like structure that carries the antheridium at its apex),
S = Capsule (a capsule is a type of simple, dry fruit produced by many species of flowering plants).
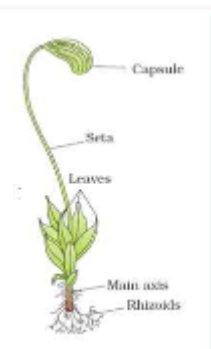
123) Endarch – Protoxylem is toward the inside and mataxylum is toward the outside. Eg : dicot stem

124) According to CPCB the size of particulate matter 2.5 micrometer or less than cause harm because they will be suspended in air for longer time.

125) Aspergillus niger (fungus) produced citric acid

126) Gout disease is due to accumulation of uric acid crystals in the joints

127) The proton of the embryonal axis above the level of cotyledons is the epicotyls

128) Cartisole, testosterone are made up of cholesterol hence they can easily pass through cell membrane of target cells.

129) Fibroblast, macrophage & mast cells are present in areolar tissue.

130) Nucleases in the pancreatic juice act on nucleic acids to form nucleotides and further nucleosides.

131) C plants have both Rubisco – enzyme and PEP carboxylase

132) Tibia & Fibula are bones of Shank. They don't form acetabulum.

Cartilage & Cornea – Avascular, Take oxygen from the other tissue/environment directly.
Premolars have 1 or 2 roots in Upper jaw & 1 in lower jaw.
Molars in 3 roots in upper jaw & 2 roots in lower jaw.

133) On fertilization, the egg (n) becomes diploid (2n).
Human fertilization is the union of a human egg and sperm, usually occurring in the ampulla of the fallopian tube. The result of this union is the production of a zygote cell, or fertilized egg, initiating prenatal development.

134) In the diagram 1 represent aorta and 4 represents left ventricle. They have oxygenated blood.

135) Mutliple cloning site (mcs) also called a polylinker, mcs allows considerable flexibility in the choice of restriction enzymes for cloning

136) A **melocyte** is a type of cell that differentiates into a gamete through the process of meiosis. Through meiosis, the diploid meiocyte divides into four genetically different haploid gametes.

The number of chromosomes in apple is 17 when it is haploid, 34 when it is diploid, and 51 when it is triploid.

137) The permissible use of amniocentesis is to detect any genetic abnormality

138) Taxon – Taxonomic group of any rank. It was first used by Adolf meyer

139) Cyclic photophosphorylation occurs when only light of wavelengths beyond 680 nm are available for excitation. The product of cyclic photophosphorylation is ATP.

140) OCP's are prescribed in females to check ovulation

141) The Cloaca in frog is common chamber for the urinary tract, reproductive tract and alimentary canal openings.

142) C_4 plants show saturation at about 360 μIL^{-1} while C_3 responds to increased CO_2 concentration and saturation is seen only beyond 450 μIL^{-1}.

143) Cyclosporine is used as an immunosuppressant, this drug is derived from a fungus called *Trichoderma polysporum* and inhibit the activity of helper-T cells, thus help to prevent rejection of organ transplant.

144) Water potential of a solution is the sum total of four components: gravitational potential, osmotic(solute) potential, matric potential and pressure potential. But, since matric potential and gravitational potential are negligible, water potential is generally more affected by solute and pressure potential. Pressure potential of water during the standard stage is 0 MPa. The positive value of water potential within the cell is referred to as turgor pressure. During the day when transpiration is high, pressure potential of the xylem mostly is negative since water is evaporated and its turgor pressure is less.

145) Types of gametes = 2^n

n = number of heterozygotes considered i.e., monohybrid cross (n = 1), dihybrid cross (n = 2), trihybrid cross (n = 3) and so on.

AABBCC × aabbcc is a trihybrid cross, therefore, different types of gametes are:

$$= 2^n$$

$$n = 3 = (2)^3$$

$$= 2 \times 2 \times 2 = 8.$$

146) Interferons are small glycoproteins produced by virus infected cell to provide anti viral state in neighbouring

147) The cymose inflorescence is a type of flowering shoot in which the first-formed flower develops from the growing region at the top of the flower stalk. E.g. - Red campion.

148) Blastula is a closed cavity, it lacks blastopore

149) Fossils discovered in Java in 1891 revealed the next stage, i.e., *Homo erectus* about 1.5 mya. *Homo erectus* had a large brain around 900cc and probably ate meat.

150) The ageing of leaves is called senescence. It is the process of growing old, which occurs in all species and is typified by a gradual slowing down of metabolism and breakdown of tissues, often accompanied by endocrinal changes.

151) Peptide hormones that interact with membrane-bound receptors normally do not enter the target cell but generate second messengers (e.g., cyclic AMP, IP_3, Ca^{+2}, etc.) which in turn regulate cellular metabolism. Examples of peptide hormones is insulin, glucagon, pituitary hormones, hypothalamic hormones, etc.

152) Fungi are also known to form symbiotic associations with plants (mycorrhiza). Many members of the genus *Glomus* form mycorrhiza. The fungal symbiont in these associations absorbs phosphorus from soil and passes it to the plant. Plants having such associations show other benefits also, such as resistance to root-borne pathogens, tolerance to salinity and drought, and an overall increase in plant growth and development. *Pinus* seeds cannot germinate and establish without the presence of mycorrhiza.

153) Perispheral nervous system is divided into 2 divisions called somatic & Autonomic neural system.
Somatic neural system relay impulses from CNS to skeletal muscle while Autonomous neural system transmits impulses from CNS to the involuntary organs and smooth muscles of the body.
Autonomous neural system is further classified into sympathetic and parasympathetic neural system.

154) The trigger for activation of toxin produced by Baillus thuringiensis occurs in alkaline pH of insect gut.

155) Some cereals such as rice and wheat pollen grains lase viability within 30 minutes of their release.
But in ceguminosase and solanaceae, rosaceae viability for months

156) In the members of Phycomycetes, the mycelium is aseptate and coenocytic. Asexual reproduction takes place by zoospores (motile) or by aplanospores (non-motile). These spores are endogenously produced in the sporangium. A zygospore is formed by the fusion of two gametes. These gametes are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous). Some common examples are *Mucor, Rhizopus* (the bread mould mentioned earlier), and *Albugo* (the parasitic fungi on mustard).

157) During early prophase, the chromatin network condenses and resolves into a definite number of chromosomes. In late prophase, the nuclear membrane and nucleolus begin to disappear. The daughter centrioles (in animal cells) start moving away from each other, till they occupy a polar position.

158) In RAAS system, Juxtaglomerular apparatus is important, because it secretes renin when there is fall of GFR/B.P.

159) Munch hypothesis based on translocation of food due to turgor pressure (TP) gradient

160) Enzyme catalysing a transfer a group other than H, O or electron are called transferase

161) Hypersensitive towards an antigen/foreign material is due to IgE antibody

162) A) T.V = 500 ml;
B) IRV = 2500 - 3000 ml
C) ERV = 1000 – 1100 ml
D) RV = 1100 - 1200 ml;
E) VC = 3400 - 4800 ml

163) Sexual reproduction does not always require two individuals sexual reproduction generally involves
gametic fusion

164) The central part of the proximal region of the centriole is proteinaceous and called the hub, which is connected with tubules of the peripheral triplets by radial spokes made of protein. The centrioles form the basal body of cilia or flagella, and spindle fibres that give rise to the spindle apparatus during cell division in animal cells.

165) Gibberillins was extracted from rice seedling suffering from bakanae disease which is caused by
Gibberella

166) In the renal tubules, the permeability of DCT & CD to water is due to vasopressin (ADH)

167) In Tobacco plant resistance to nematode have been developed by introducing DNA that produce both sense and anti – sense RNA strands

168) Walls of tracheids and vessels of xylem are made up of lignin and cellulose and have a strong affinity for water (Adhesion)

169) A gene may have more than two alternative forms occupying the same locus on a chromosome such alleles are known as multiple alleles and the phenomenon is turned as multiple allelism. ABO blood group has 3 alleles I^O, I^A, and I^B.

170) The meristem that occurs in the mature regions of roots and shoots of many plants, particularly those that produce woody axis and appear later than primary meristem is called the secondary or lateral meristem. They are cylindrical meristems. Fascicular vascular cambium, interfascicular cambium, and cork-cambium are examples of lateral meristems. These are responsible for producing the secondary tissues.

171) All amino acids are firstly attached with tRNA

172) The gradual and fairly predictable changes that occur in a species till a climax stage develops which does not change further because it is in perfect harmony with the environment is called ecological succession.

173) Mostly bryophytes the vegetative reproductive structure are gemmae. Gemmae are green, multicellular asexual buds.

174) Restriction enzymes are named after the organism from which it has been isolated. First letter of genus and first two letters of species plus the order of endonuclease in which it was discovered from the bacterial strain.

Eco - *Escherichia coli*, R - Strain RY13, I - First endonuclease isolated from this strain.

175) Phylum Chordata is divided into three subphyla: Urochordata or Tunicata, Cephalochordata, and Vertebrata. In Urochordata, the notochord is present only in the larval tail.
Examples: *Ascidia, Salpa, Doliolum*, etc.

176) Himgiri is the variety of wheat which is developed by conventional breeding and is resistant against leaf and stripe rust and hill bunt.

177) A large number of primary follicles degenerate during the phase from birth to puberty. Therefore, at puberty, only 60,000-80,000 primary follicles are left in each ovary. The primary follicles get surrounded by more layers of granulosa cells and a new theca and are called secondary follicles.

178) Water potential is regarded as the tendency of water to leave a system, pure water has the highest possible water potential which is zero, All solutions have water potential lower than that of pure water

179) The rate at which the consumers convert the chemical energy of their food into their own biomass is called secondary productivity

180) The relationship exhibited by *Cuscuta* and hedge plant is parasitism. In this interaction, *Cuscuta* obtains nutrients directly from the hedge plant by producing haustoria and inserting them into the vascular system of the host. *Cuscuta* is a holoparasite, thus it is completely dependent on the host for all the requirements.

Commensalism: Interaction in which one species benefits and other is neither harmed nor benefited. The species which is benefitted is termed commensal and the other species is called the host. Such a population interaction is represented as (+,0).