PHYSICS

1. Light with an average flux of 20 W/cm^2 falls on a non-reflecting surface at normal incidence having surface area 20 cm^2. The energy received by the surface during time span of 1 minute is

(a) 10×10^3 J (b) 12×10^3 J

(c) 24×10^3 J (d) 48×10^3 J

2. For transistor action, which of the following statements is correct?

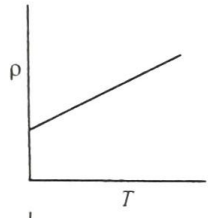
(a) Base, emitter and collector regions should have same doping concentrations.

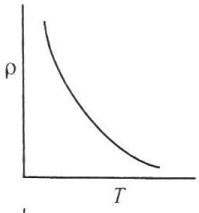
(b) Base, emitter and collector regions should have same size.

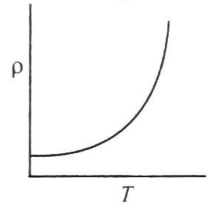
(c) Both emitter junction as well as the collector junction are forward biased.

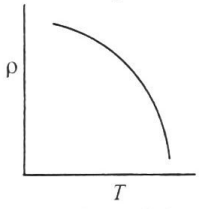
(d) The base region must be very thin and lightly doped.

3. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper?

(a) 

(b) 

(c) 

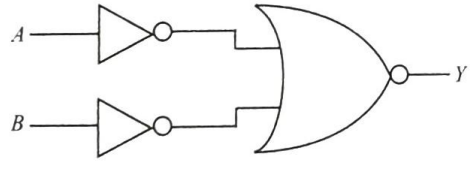
(d) 

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

(a) zero (b) 0.5 N/C

(c) 1 N/C (d) 5 N/C

5. For the logic circuit shown, the truth table is



(a)

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

(b)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(c)

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

(d)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

6. A 40 μF capacitor is connected to a 200 V, 50 Hz ac supply. The r.m.s value of the current in the circuit is, nearly

(a) 1.7 A (b) 2.05 A

(c) 2.5 A (d) 25.1 A

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

(a) 0.5 kg/m^3 (b) 0.2 kg/m^3

(c) 0.1 kg/m^3 (d) 0.02 kg/m^3

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

(a) 9.9801 m (b) 9.98 m

(c) 9.980 m (d) 9.9 m

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

(a) $\frac{1}{\sqrt{2}n\pi d}$ (b) $\frac{1}{\sqrt{2}n\pi d^2}$

(c) $\frac{1}{\sqrt{2}n^2\pi d^2}$ (d) $\frac{1}{\sqrt{2}n^2\pi^2 d^2}$

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

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

(b) 8.0×10^{-5} T m A^{-1}

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

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

11. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is $\left(\frac{1}{4\pi\varepsilon_0} = 9\times10^9 \text{ N m}^2/\text{C}^2\right)$

(a) 50 V (b) 200 V

(c) 400 V (d) zero

12. A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth?
(a) 48 N (b) 32 N
(c) 30 N (d) 24 N

13. The solids which have the negative temperature coefficient of resistance are
(a) metals (b) insulators only
(c) semiconductors only
(d) insulators and semiconductors.

14. Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled?
(a) Doubled (b) Four times
(c) One-fourth (d) Zero

15. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is $\pi/3$. If instead C is removed from the circuit, the phase difference is again $\pi/3$ between current and voltage. The power factor of the circuit is
(a) zero (b) 0.5
(c) 1.0 (d) -1.0

16. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere?
$\left(\frac{1}{4\pi\varepsilon_0} = 9\times10^9 \text{ N m}^2/\text{C}^2\right)$
(a) 1.28×10^4 N/C (b) 1.28×10^5 N/C
(c) 1.28×10^6 N/C (d) 1.28×10^7 N/C

17. Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m.
(a) $6\hat{i}$ N m (b) $6\hat{j}$ N m
(c) $-6\hat{i}$ N m (d) $6\hat{k}$ N m

18. A charged particle having drift velocity of 7.5×10^{-4} m s^{-1} in an electric field of 3×10^{-10} V m^{-1}, has a mobility in m^2 V^{-1} s^{-1} of
(a) 2.25×10^{15} (b) 2.5×10^6
(c) 2.5×10^{-6} (d) 2.25×10^{-15}

19. A ray is incident at an angle of incidence i on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ, then the angle of incidence is nearly equal to
(a) $A/2\mu$ (b) $2A/\mu$
(c) μA (d) $\mu A/2$

20. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5r_2$) through 1 K are in the ratio
(a) $\frac{27}{8}$ (b) $\frac{9}{4}$
(c) $\frac{3}{2}$ (d) $\frac{5}{3}$

21. When a uranium isotope $^{235}_{92}\text{U}$ is bombarded with a neutron, it generates $^{89}_{36}\text{Kr}$, three neutrons and
(a) $^{144}_{56}\text{Ba}$ (b) $^{91}_{40}\text{Zr}$
(c) $^{101}_{36}\text{Kr}$ (d) $^{103}_{36}\text{Kr}$

22. The phase difference between displacement and acceleration of a particle in a simple harmonic motion is
(a) π rad (b) $3\pi/2$ rad
(c) $\pi/2$ rad (d) zero

23. A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is
(a) 1.0×10^{-2} m (b) 1.0×10^{-1} m
(c) 1.5×10^{-1} m (d) 1.5×10^{-2} m

24. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5 g. Another capillary tube of radius $2r$ is immersed in water. The mass of water that will rise in this tube is
(a) 2.5 g (b) 5.0 g
(c) 10.0 g (d) 20.0 g

25. The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is (c = speed of electromagnetic waves)
(a) $c : 1$ (b) $1 : 1$
(c) $1 : c$ (d) $1 : c^2$

26. In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes
(a) double (b) half
(c) four times (d) one-fourth

27. A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is ($\mu_0 = 4\pi \times 10^{-7}$ T m A^{-1})
(a) 6.28×10^{-4} T (b) 3.14×10^{-4} T
(c) 6.28×10^{-5} T (d) 3.14×10^{-5} T

28. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is (g = 10 m/s^2)
(a) 360 m (b) 340 m
(c) 320 m (d) 300 m

29. For which one of the following, Bohr model is not valid?
(a) Hydrogen atom
(b) Singly ionised helium atom (He^+)
(c) Deuteron atom
(d) Singly ionised neon atom (Ne^+)

30. The average thermal energy for a mono-atomic gas is (k_B is Boltzmann constant and T, absolute temperature)
(a) $\frac{1}{2}k_BT$ (b) $\frac{3}{2}k_BT$
(c) $\frac{5}{2}k_BT$ (d) $\frac{7}{2}k_BT$

31. Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass. The centre of mass of the system from the 5 kg particle is nearly at a distance of
(a) 33 cm (b) 50 cm
(c) 67 cm (d) 80 cm

32. In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be
(a) 523 Hz (b) 524 Hz
(c) 536 Hz (d) 537 Hz

33. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is
(a) isothermal (b) adiabatic
(c) isochoric (d) isobaric

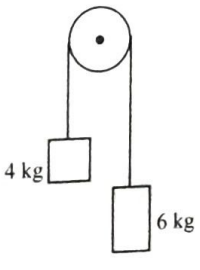
34. The capacitance of a parallel plate capacitor with air as medium is 6 μF. With the introduction of a dielectric medium, the capacitance becomes 30 μF. The permittivity of the medium is ($\varepsilon_0 = 8.85 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$)
(a) $0.44 \times 10^{-13}\ C^2\ N^{-1}\ m^{-2}$
(b) $1.77 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$
(c) $0.44 \times 10^{-10}\ C^2\ N^{-1}\ m^{-2}$
(d) $5.00\ C^2\ N^{-1}\ m^{-2}$

35. An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of the electron is 1.227×10^{-2} nm, the potential difference is
(a) 10 V (b) 10^2 V
(c) 10^3 V (d) 10^4 V

36. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to L_1 when mass M is suspended from its free end. The expression for Young's modulus is
(a) $\frac{MgL_1}{AL}$ (b) $\frac{Mg(L_1 - L)}{AL}$
(c) $\frac{MgL}{AL_1}$ (d) $\frac{MgL}{A(L_1 - L)}$

37. The Brewsters angle i_b for an interface should be
(a) $0° < i_b < 30°$ (b) $30° < i_b < 45°$
(c) $45° < i_b < 90°$ (d) $i_b = 90°$

38. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is
(a) g (b) $g/2$
(c) $g/5$ (d) $g/10$



39. Dimensions of stress are
(a) $[MLT^{-2}]$ (b) $[ML^2T^{-2}]$
(c) $[ML^0T^{-2}]$ (d) $[ML^{-1}T^{-2}]$

40. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale. The pitch of the screw gauge is
(a) 0.01 mm (b) 0.25 mm
(c) 0.5 mm (d) 1.0 mm

41. The energy required to break one bond in DNA is 10^{-20} J. This value in eV is nearly
(a) 6 (b) 0.6
(c) 0.06 (d) 0.006

42. The color code of a resistance is given below.

Yellow Violet Brown Gold

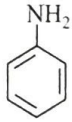
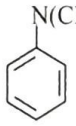
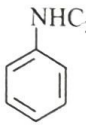
The values of resistance and tolerance, respectively, are
(a) 470 kΩ, 5% (b) 47 kΩ, 10%
(c) 4.7 kΩ, 5% (d) 470 Ω, 5%

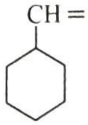
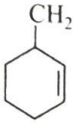
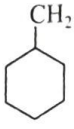
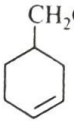
43. Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is
(a) 3.66×10^{-7} rad (b) 1.83×10^{-7} rad
(c) 7.32×10^{-7} rad (d) 6.00×10^{-7} rad

44. The increase in the width of the depletion region in a p-n junction diode is due to
(a) forward bias only (b) reverse bias only
(c) both forward bias and reverse bias
(d) increase in forward current

45. The energy equivalent of 0.5 g of a substance is
(a) 4.5×10^{16} J (b) 4.5×10^{13} J
(c) 1.5×10^{13} J (d) 0.5×10^{13} J

CHEMISTRY

46. Which of the following amines will give the carbylamine test?
(a)  (b) 
(c)  (d) 

47. An alkene on ozonolysis gives methanal as one of the product. Its structure is
(a)  (b) 
(c)  (d) 

47. Match the following and identify the correct option

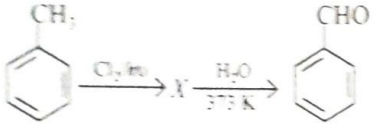
(A) $CO_{(g)} + H_{2(g)}$	(i)	$Mg(HCO_3)_2 + Ca(HCO_3)_2$	
(B) Temporary hardness of water	(ii)	An electron deficient hydride	
(C) B_2H_6	(iii)	Synthesis gas	
(D) H_2O_2	(iv)	Non-planar structure	

	(A)	(B)	(C)	(D)
(a)	(iii)	(i)	(ii)	(iv)
(b)	(iii)	(ii)	(i)	(iv)
(c)	(iii)	(iv)	(ii)	(i)
(d)	(i)	(iii)	(ii)	(iv)

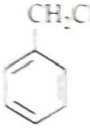
48. The freezing point depression constant (K_f) of benzene is 5.12 K kg mol^{-1}. The freezing point depression for the solution of molality 0.078 m containing a non-electrolyte solute in benzene is (rounded off upto two decimal places)
(a) 0.20 K (b) 0.80 K
(c) 0.40 K (d) 0.60 K

49. On electrolysis of dil. sulphuric acid using platinum (Pt) electrode, the product obtained at anode will be
(a) hydrogen gas (b) oxygen gas
(c) H_2S gas (d) SO_2 gas.

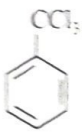
50. Identify compound X in the following sequence of reactions :



(a) 

(b) 

(c) 

(d) 

51. Which one of the followings has maximum number of atoms?
(a) 1 g of $Ag_{(s)}$ [Atomic mass of Ag = 108]
(b) 1 g of $Mg_{(s)}$ [Atomic mass of Mg = 24]
(c) 1 g of $O_{2(g)}$ [Atomic mass of O = 16]
(d) 1 g of $Li_{(s)}$ [Atomic mass of Li = 7]

52. Identify the correct statement from the following :
(a) Wrought iron is impure iron with 4% carbon.
(b) Blister copper has blistered appearance due to evolution of CO_2.
(c) Vapour phase refining is carried out for Nickel by van Arkel method.
(d) Pig iron can be moulded into a variety of shapes.

53. A tertiary butyl carbocation is more stable than a secondary butyl carbocation because of which of the following?
(a) $-I$ effect of $-CH_3$ groups
(b) $+R$ effect of $-CH_3$ groups
(c) $-R$ effect of $-CH_3$ groups
(d) Hyperconjugation

54. Urea reacts with water to form A which will decompose to form B. B when passed through $Cu^{2+}_{(aq)}$, deep blue colour solution C is formed. What is the formula of C from the following?
(a) $CuSO_4$ (b) $[Cu(NH_3)_4]^{2+}$
(c) $Cu(OH)_2$ (d) $CuCO_3 \cdot Cu(OH)_2$

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

57. An element has a body centered cubic (*bcc*) structure with a cell edge of 288 pm. The atomic radius is
(a) $\frac{\sqrt{3}}{4} \times 288$ pm (b) $\frac{\sqrt{2}}{4} \times 288$ pm
(c) $\frac{4}{\sqrt{3}} \times 288$ pm (d) $\frac{4}{\sqrt{2}} \times 288$ pm

58. The rate constant for a first order reaction is 4.606×10^{-3} s^{-1}. The time required to reduce 2.0 g of the reactant to 0.2 g is
(a) 100 s (b) 200 s
(c) 500 s (d) 1000 s

59. Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give
(a) *iso*-propyl alcohol (b) *sec*-butyl alcohol
(c) *tert*-butyl alcohol (d) *iso*-butyl alcohol.

60. Which of the following set of molecules will have zero dipole moment?
(a) Ammonia, beryllium difluoride, water, 1, 4-dichlorobenzene
(b) Boron trifluoride, hydrogen fluoride, carbon dioxide, 1, 3-dichlorobenzene
(c) Nitrogen trifluoride, beryllium difluoride, water, 1, 3-dichlorobenzene
(d) Boron trifluoride, beryllium difluoride, carbon dioxide, 1, 4-dichlorobenzene

61. What is the change in oxidation number of carbon in the following reaction?
$CH_{4(g)} + 4Cl_{2(g)} \rightarrow CCl_{4(l)} + 4HCl_{(g)}$
(a) -4 to $+4$ (b) 0 to $+4$
(c) -4 to $+4$ (d) 0 to -4

62. Match the following :

Oxide	Nature
(A) CO	(i) Basic
(B) BaO	(ii) Neutral
(C) Al_2O_3	(iii) Acidic
(D) Cl_2O-	(iv) Amphoteric

Which of the following is correct option?

	(A)	(B)	(C)	(D)
(a)	(i)	(ii)	(iii)	(iv)
(b)	(ii)	(i)	(iv)	(iii)
(c)	(iii)	(iv)	(i)	(ii)
(d)	(iv)	(iii)	(ii)	(i)

63. Which of the following is not correct about carbon monoxide?
(a) It forms carboxyhaemoglobin.
(b) It reduces oxygen carrying ability of blood.
(c) The carboxyhaemoglobin (haemoglobin bound to CO) is less stable than oxyhaemoglobin.
(d) It is produced due to incomplete combustion.

64. Measuring zeta potential is useful in determining which property of colloidal solution?
(a) Viscosity

(b) Solubility
(c) Stability of the colloidal particles
(d) Size of the colloidal particles

65. Which of the following is the correct order of increasing field strength of ligands to form coordination compounds?
(a) $SCN^- < F^- < C_2O_4^{2-} < CN^-$
(b) $SCN^- < F^- < CN^- < C_2O_4^{2-}$
(c) $F^- < SCN^- < C_2O_4^{2-} < CN^-$
(d) $CN^- < C_2O_4^{2-} < SCN^- < F^-$

66. Elimination reaction of 2-bromopentane to form pent-2-ene is
(A) β-Elimination reaction
(B) Follows Zaitsev rule
(C) Dehydrohalogenation reaction
(D) Dehydration reaction
(a) (A), (B), (C) (b) (A), (C), (D)
(c) (B), (C), (D) (d) (A), (B), (D)

67. The correct option for free expansion of an ideal gas under adiabatic condition is
(a) $q = 0, \Delta T = 0$ and $w = 0$
(b) $q = 0, \Delta T < 0$ and $w > 0$
(c) $q < 0, \Delta T = 0$ and $w = 0$
(d) $q > 0, \Delta T > 0$ and $w > 0$

68. Identify the incorrect statement.
(a) Cr^{2+} (d^4) is a stronger reducing agent than Fe^{2+} (d^6) in water.
(b) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.
(c) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.
(d) The oxidation states of chromium in CrO_4^{2-} and $Cr_2O_7^{2-}$ are not the same.

69. Identify the incorrect match.

Name	IUPAC Official Name
(A) Unnilunium	(i) Mendelevium
(B) Unniltrium	(ii) Lawrencium
(C) Unnilhexium	(iii) Seaborgium
(D) Ununnnium	(iv) Darmstadtium

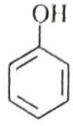
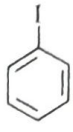
(a) (A), (i) (b) (B), (ii)
(c) (C), (iii) (d) (D), (iv)

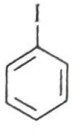
70. Reaction between benzaldehyde and acetophenone in presence of dilute NaOH is known as
(a) Aldol condensation
(b) Cannizzaro's reaction
(c) Cross Cannizzaro's reaction
(d) Cross Aldol condensation.

71. Which of the following oxoacid of sulphur has — O — O — linkage
(a) H_2SO_3, sulphurous acid
(b) H_2SO_4, sulphuric acid
(c) $H_2S_2O_8$, peroxodisulphuric acid
(d) $H_2S_2O_7$, pyrosulphuric acid

72. HCl was passed through a solution of $CaCl_2$, $MgCl_2$ and NaCl. Which of the following compound(s) crystallise(s)?
(a) Both $MgCl_2$ and $CaCl_2$
(b) Only NaCl
(c) Only $MgCl_2$
(d) NaCl, $MgCl_2$ and $CaCl_2$

73. Anisole on cleavage with HI gives

(a)  + CH_3I (b)  + CH_3OH

(c)  + C_2H_5I (d)  + C_2H_5OH

74. Identify the correct statements from the following :
(A) $CO_{2(g)}$ is used as refrigerant for ice-cream and frozen food.
(B) The structure of C_{60} contains twelve six carbon rings and twenty five carbon rings.
(C) ZSM-5, a type of zeolite, is used to convert alcohols into gasoline.
(D) CO is colourless and odourless gas.
(a) (A), (B) and (C) only
(b) (A) and (C) only
(c) (B) and (C) only
(d) (C) and (D) only

75. For the reaction, $2Cl_{(g)} \rightarrow Cl_{2(g)}$, the correct option is
(a) $\Delta_r H > 0$ and $\Delta_r S > 0$ (b) $\Delta_r H > 0$ and $\Delta_r S < 0$
(c) $\Delta_r H < 0$ and $\Delta_r S > 0$ (d) $\Delta_r H < 0$ and $\Delta_r S < 0$

76. Paper chromatography is an example of
(a) adsorption chromatography
(b) partition chromatography
(c) thin layer chromatography
(d) column chromatography.

77. Which of the following alkane cannot be made in good yield by Wurtz reaction?
(a) *n*-Hexane (b) 2, 3-Dimethylbutane
(c) *n*-Heptane (d) *n*-Butane

78. An increase in the concentration of the reactants of a reaction leads to change in
(a) activation energy (b) heat of reaction
(c) threshold energy (d) collision frequency.

79. The number of Faradays (F) required to produce 20 g of calcium from molten $CaCl_2$ (Atomic mass of Ca = 40 g mol^{-1}) is
(a) 1 (b) 2
(c) 3 (d) 4

80. The mixture which shows positive deviation from Raoult's law is
(a) ethanol + acetone
(b) benzene + toluene
(c) acetone + chloroform
(d) chloroethane + bromoethane.

81. Hydrolysis of sucrose is given by the following reaction :
Sucrose + $H_2O \rightleftharpoons$ Glucose + Fructose
If the equilibrium constant (K_C) is 2×10^{13} at 300 K, the value of $\Delta_r G^\circ$ at the same temperature will be
(a) $-8.314\ J\ mol^{-1}K^{-1} \times 300\ K \times \ln(2 \times 10^{13})$

(b) $8.314\ J\ mol^{-1}K^{-1} \times 300\ K \times \ln(2 \times 10^{13})$

(c) $8.314\ J\ mol^{-1}K^{-1} \times 300\ K \times \ln(3 \times 10^{13})$

(d) $-8.314\ J\ mol^{-1}K^{-1} \times 300\ K \times \ln(4 \times 10^{13})$

82. Sucrose on hydrolysis gives
(a) β-*D*-glucose + α-*D*-fructose
(b) α-*D*-glucose + β-*D*-glucose
(c) α-*D*-glucose + β-*D*-fructose
(d) α-*D*-fructose + β-*D*-fructose.

83. The calculated spin only magnetic moment of Cr^{2+} ion is
(a) 3.87 BM (b) 4.90 BM
(c) 5.92 BM (d) 2.84 BM

84. Which of the following is a natural polymer?
(a) *cis*-1, 4-polyisoprene
(b) poly (Butadiene-styrene)
(c) polybutadiene
(d) poly (Butadiene-acrylonitrile)

85. Which of the following is a basic amino acid?
(a) Serine (b) Alanine
(c) Tyrosine (d) Lysine

86. Which of the following is a cationic detergent?
(a) Sodium lauryl sulphate
(b) Sodium stearate
(c) Cetyltrimethyl ammonium bromide
(d) Sodium dodecylbenzene sulphonate

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

88. Identify a molecule which does not exist.
(a) He_2 (b) Li_2
(c) C_2 (d) O_2

89. The following metal ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals.
(a) Iron (b) Copper
(c) Calcium (d) Potassium

90. The number of protons, neutrons and electrons in $^{175}_{71}Lu$, respectively, are
(a) 71, 104 and 71 (b) 104, 71 and 71
(c) 71, 71 and 104 (d) 175, 104 and 71

BIOLOGY

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

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

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

	(A)	(B)	(C)	(D)
(a)	(ii)	(iii)	(i)	(iv)
(b)	(iii)	(i)	(iv)	(ii)
(c)	(iv)	(ii)	(i)	(iii)
(d)	(i)	(ii)	(iv)	(iii)

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

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

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

96. The infectious stage of *Plasmodium* that enters the human body is
(a) trophozoites
(b) sporozoites
(c) female gametocytes
(d) male gametocytes.

97. Which of the following statements about inclusion bodies is incorrect?
(a) They are not bound by any membrane.
(b) These are involved in ingestion of food particles.
(c) They lie free in the cytoplasm.
(d) These represent reserve material in cytoplasm.

98. Dissolution of the synaptonemal complex occurs during
(a) pachytene (b) zygotene
(c) diplotene (d) leptotene.

99. Ray florets have
(a) inferior ovary (b) superior ovary
(c) hypogynous ovary (d) half inferior ovary.

100. In gel electrophoresis, separated DNA fragments can be visualized with the help of
(a) acetocarmine in bright blue light
(b) ethidium bromide in UV radiation
(c) acetocarmine in UV radiation
(d) ethidium bromide in infrared radiation.

101. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive?
(a) ZIFT and IUT (b) GIFT and ZIFT
(c) ICSI and ZIFT (d) GIFT and ICSI

102. Select the option including all sexually transmitted diseases.
(a) Gonorrhoea, Syphilis, Genital herpes
(b) Gonorrhoea, Malaria, Genital herpes
(c) AIDS, Malaria, Filaria
(d) Cancer, AIDS, Syphilis

103. Identify the wrong statement with reference to transport of oxygen.
(a) Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2.
(b) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.
(c) Higher H^+ conc. in alveoli favours the formation of oxyhaemoglobin.
(d) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin.

104. Identify the incorrect statement.
(a) Heartwood does not conduct water but gives mechanical support.
(b) Sapwood is involved in conduction of water and minerals from root to leaf.
(c) Sapwood is the innermost secondary xylem and is lighter in colour.
(d) Due to deposition of tannins, resins, oils, etc., heartwood is dark in colour.

105. Identify the wrong statement with regard to restriction enzymes.
(a) Each restriction enzyme functions by inspecting the length of a DNA sequence.
(b) They cut the strand of DNA at palindromic sites.
(c) They are useful in genetic engineering.
(d) Sticky ends can be joined by using DNA ligases.

106. Floridean starch has structure similar to
(a) starch and cellulose
(b) amylopectin and glycogen
(c) mannitol and algin
(d) laminarin and cellulose.

107. Choose the correct pair from the following.
(a) Ligases - Join the two DNA molecules
(b) Polymerases - Break the DNA into fragments
(c) Nucleases - Separate the two strands of DNA
(d) Exonucleases - Make cuts at specific positions with in DNA

108. Embryological support for evolution was disapproved by
(a) Karl Ernst von Baer
(b) Alfred Wallace
(c) Charles Darwin
(d) Oparin.

109. The first phase of translation is
(a) binding of *m*RNA to ribosome
(b) recognition of DNA molecule
(c) aminoacylation of *t*RNA
(d) recognition of an anti-codon.

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

111. The number of substrate level phosphorylations in one turn of citric acid cycle is
(a) zero (b) one
(c) two (d) three.

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

	Column-I		Column-II
(A)	Floating ribs	(i)	Located between second and seventh ribs
(B)	Acromion	(ii)	Head of the humerus
(C)	Scapula	(iii)	Clavicle
(D)	Glenoid cavity	(iv)	Do not connect with the sternum

	(A)	(B)	(C)	(D)
(a)	(ii)	(iv)	(i)	(iii)
(b)	(i)	(iii)	(ii)	(iv)
(c)	(iii)	(ii)	(iv)	(i)
(d)	(iv)	(iii)	(i)	(ii)

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

	Column-I		Column-II
(A)	Typhoid	(i)	*Wuchereria*
(B)	Pneumonia	(ii)	*Plasmodium*
(C)	Filariasis	(iii)	*Salmonella*
(D)	Malaria	(iv)	*Haemophilus*

	(A)	(B)	(C)	(D)
(a)	(i)	(iii)	(ii)	(iv)
(b)	(iii)	(iv)	(i)	(ii)
(c)	(ii)	(i)	(iii)	(iv)
(d)	(iv)	(i)	(ii)	(iii)

114. Montreal Protocol was signed in 1987 for control of
(a) transport of genetically modified organisms from one country to another
(b) emission of ozone depleting substances
(c) release of greenhouse gases
(d) disposal of e-wastes.

115. The QRS complex in a standard ECG represents
(a) repolarisation of auricles
(b) depolarisation of auricles
(c) depolarisation of ventricles
(d) repolarisation of ventricles.

116. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.
(a) Cytokinin (b) Gibberellin
(c) Ethylene (d) Abscisic acid

117. How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits?
(a) 4 (b) 2
(c) 14 (d) 8

118. Bilaterally symmetrical and acoelomate animals are exemplified by
(a) ctenophora (b) platyhelminthes
(c) aschelminthes (d) annelida.

119. Cuboidal epithelium with brush border of microvilli is found in
(a) lining of intestine
(b) ducts of salivary glands
(c) proximal convoluted tubule of nephron
(d) Eustachian tube.

120. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?
(a) Endoplasmic reticulum
(b) Peroxisomes
(c) Golgi bodies
(d) Polysomes

121. In light reaction, plastoquinone facilitates the transfer of electrons from
(a) PS-II to Cytb_6f complex
(b) Cytb_6f complex to PS-I
(c) PS-I to $NADP^+$
(d) PS-I to ATP synthase.

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

Column-I		Column-II	
(A)	Iron	(i)	Photolysis of water
(B)	Zinc	(ii)	Pollen germination
(C)	Boron	(iii)	Required for chlorophyll biosynthesis
(D)	Manganese	(iv)	IAA biosynthesis

Select the correct option.

	(A)	(B)	(C)	(D)
(a)	(ii)	(i)	(iv)	(iii)
(b)	(iv)	(iii)	(ii)	(i)
(c)	(iii)	(iv)	(ii)	(i)
(d)	(iv)	(i)	(ii)	(iii)

123. The roots that originate from the base of the stem are
(a) fibrous roots (b) primary roots
(c) prop roots (d) lateral roots.

124. From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask.
(a) CH_4, H_2, NH_3 and water vapor at 800°C
(b) CH_3, H_2, NH_4 and water vapor at 800°C
(c) CH_4, H_2, NH_3 and water vapor at 600°C
(d) CH_3, H_2, NH_3 and water vapor at 600°C

125. Identify the basic amino acid from the following.
(a) Tyrosine (b) Glutamic Acid
(c) Lysine (d) Valine

126. The process of growth is maximum during
(a) log phase (b) lag phase
(c) senescence (d) dormancy.

127. Presence of which of the following conditions in urine are indicative of diabetes mellitus?
(a) Uremia and Ketonuria
(b) Uremia and Renal calculi
(c) Ketonuria and Glycosuria
(d) Renal calculi and Hyperglycaemia

128. Select the correct match.
(a) Haemophilia – Y linked
(b) Phenylketonuria – Autosomal dominant trait
(c) Sickle cell anaemia – Autosomal recessive trait, chromosome -11
(d) Thalassemia – X linked

129. Strobili cones are found in
(a) *Salvinia* (b) *Pteris*
(c) *Marchantia* (d) *Equisetum.*

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

131. Identify the correct statement with reference to human digestive system.
(a) Ileum opens into small intestine.
(b) Serosa is the innermost layer of the alimentary canal.
(c) Ileum is a highly coiled part.
(d) Vermiform appendix arises from duodenum.

132. Which of the following would help in prevention of diuresis?
(a) More water reabsorption due to under-secretion of ADH.
(b) Reabsorption of Na^+ and water from renal tubules due to aldosterone.
(c) Atrial natriuretic factor causes vasoconstriction.
(d) Decrease in secretion of renin by JG cells.

133. Match the following with respect to meiosis.
(A) Zygotene (i) Terminalization
(B) Pachytene (ii) Chiasmata

(C) Diplotene (iii) Crossing over
(D) Diakinesis (iv) Synapsis
Select the correct option from the following

	(A)	(B)	(C)	(D)
(a)	(iii)	(iv)	(i)	(ii)
(b)	(iv)	(iii)	(ii)	(i)
(c)	(i)	(ii)	(iv)	(iii)
(d)	(ii)	(iv)	(iii)	(i)

134. Which of the following is not an inhibitory substance governing seed dormancy?
(a) Gibberellic acid (b) Abscisic acid
(c) Phenolic acid (d) Para-ascorbic acid

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

	Column-I		Column-II
(A)	Bt cotton	(i)	Gene therapy
(B)	Adenosine deaminase deficiency	(ii)	Cellular defence
(C)	RNAi	(iii)	Detection of HIV infection
(D)	PCR	(iv)	*Bacillus thuringiensis*

	(A)	(B)	(C)	(D)
(a)	(iv)	(i)	(ii)	(iii)
(b)	(iii)	(ii)	(i)	(iv)
(c)	(ii)	(iii)	(iv)	(i)
(d)	(i)	(ii)	(iii)	(iv)

136. Match the following.
(A) Inhibitor of catalytic activity (i) Ricin
(B) Possess peptide bonds (ii) Malonate
(C) Cell wall material in fungi (iii) Chitin
(D) Secondary metabolite (iv) Collagen
Choose the correct option from the following:

	(A)	(B)	(C)	(D)
(a)	(ii)	(iv)	(iii)	(i)
(b)	(iii)	(i)	(iv)	(ii)
(c)	(iii)	(iv)	(i)	(ii)
(d)	(ii)	(iii)	(i)	(iv)

137. The sequence that controls the copy number of the linked DNA in the vector, is termed
(a) selectable marker
(b) Ori site
(c) palindromic sequence
(d) recognition site.

138. Snow-blindness in Antarctic region is due to
(a) freezing of fluids in the eye by low temperature
(b) inflammation of cornea due to high dose of UV-B radiation
(c) high reflection of light from snow
(d) damage to retina caused by infra-red rays.

139. According to Robert May, the global species diversity is about
(a) 1.5 million (b) 20 million
(c) 50 million (d) 7 million.

140. By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams?
(a) Out crossing (b) Mutational breeding
(c) Cross breeding (d) Inbreeding

141. Which of the following regions of the globe exhibits highest species diversity?
(a) Western Ghats of India
(b) Madagascar (c) Himalayas
(d) Amazon forests

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

	Column-I		Column-II
(A)	6-15 pairs of gill slits	(i)	*Trygon*
(B)	Heterocercal caudal fin	(ii)	Cyclostomes
(C)	Air bladder	(iii)	Chondrichthyes
(D)	Poison sting	(iv)	Osteichthyes

	(A)	(B)	(C)	(D)
(a)	(ii)	(iii)	(iv)	(i)
(b)	(iii)	(iv)	(i)	(ii)
(c)	(iv)	(ii)	(iii)	(i)
(d)	(i)	(iv)	(iii)	(ii)

143. Which of the following statements is not correct?
(a) In man insulin is synthesised as a proinsulin.
(b) The proinsulin has an extra peptide called C-peptide.
(c) The functional insulin has A and B chains linked together by hydrogen bonds.
(d) Genetically engineered insulin is produced in *E.coli*.

144. Match the organism with its use in biotechnology.
(A) *Bacillus thuringiensis* (i) Cloning vector
(B) *Thermus aquaticus* (ii) Construction of first *r*DNA molecule
(C) *Agrobacterium tumefaciens* (iii) DNA polymerase
(D) *Salmonella typhimurium* (iv) Cry proteins
Select the correct option from the following:

	(A)	(B)	(C)	(D)
(a)	(ii)	(iv)	(iii)	(i)
(b)	(iv)	(iii)	(i)	(ii)
(c)	(iii)	(ii)	(iv)	(i)
(d)	(iii)	(iv)	(i)	(ii)

145. Which of the following pairs is of unicellular algae?
(a) *Laminaria* and *Sargassum*
(b) *Gelidium* and *Gracilaria*
(c) *Anabaena* and *Volvox*
(d) *Chlorella* and *Spirulina*

146. Meiotic division of the secondary oocyte is completed
(a) prior to ovulation
(b) at the time of copulation
(c) after zygote formation
(d) at the time of fusion of a sperm with an ovum.

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

(a) nutritive value (b) growth response
(c) defence action (d) effect on reproduction.

148. Which of the following statements are true for the Phylum Chordata?
(A) In Urochordata, notochord extends from head to tail and it is present throughout their life.
(B) In Vertebrata, notochord is present during the embryonic period only.
(C) Central nervous system is dorsal and hollow.
(D) Chordata is divided into 3 subphyla : Hemichordata, Tunicata and Cephalochordata.
(a) (D) and (C) (b) (C) and (A)
(c) (A) and (B) (d) (B) and (C)

149. Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to
(a) insect pests (b) fungal diseases
(c) plant nematodes (d) insect predators.

150. The product(s) of reaction catalysed by nitrogenase in root nodules of leguminous plants is/are
(a) ammonia alone
(b) nitrate alone
(c) ammonia and oxygen
(d) ammonia and hydrogen.

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

	Column-I		Column-II
(A)	Pituitary gland	(i)	Grave's disease
(B)	Thyroid gland	(ii)	Diabetes mellitus
(C)	Adrenal gland	(iii)	Diabetes insipidus
(D)	Pancreas	(iv)	Addison's disease

	(A)	(B)	(C)	(D)
(a)	(iv)	(iii)	(i)	(ii)
(b)	(iii)	(ii)	(i)	(iv)
(c)	(iii)	(i)	(iv)	(ii)
(d)	(ii)	(i)	(iv)	(iii)

152. Which one of the following is the most abundant protein in the animals?
(a) Haemoglobin (b) Collagen
(c) Lectin (d) Insulin

153. Identify the correct statement with regard to G_1 phase (Gap 1) of interphase.
(a) DNA synthesis or replication takes place.
(b) Reorganisation of all cell components takes place.
(c) Cell is metabolically active, grows but does not replicate its DNA.
(d) Nuclear division takes place.

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

(A) Fourth trophic level	(i) Crow
(B) Second trophic level	(ii) Vulture
(C) First trophic level	(iii) Rabbit
(D) Third trophic level	(iv) Grass

Select the correct option.

	(A)	(B)	(C)	(D)
(a)	(ii)	(iii)	(iv)	(i)
(b)	(iii)	(ii)	(i)	(iv)
(c)	(iv)	(iii)	(ii)	(i)
(d)	(i)	(ii)	(iii)	(iv)

155. The ovary is half inferior in
(a) brinjal (b) mustard
(c) sunflower (d) plum.

156. The body of the ovule is fused within the funicle at
(a) hilum (b) micropyle
(c) nucellus (d) chalaza.

157. The specific palindromic sequence which is recognised by *Eco*RI is
(a) 5′ - GAATTC - 3′
3′ - CTTAAG - 5′
(b) 5′ - GGAACC - 3′
3′ - CCTTGG - 5′
(c) 5′ - CTTAAG - 3′
3′ - GAATTC - 5′
(d) 5′ - GGATCC - 3′
3′ - CCTAGG - 5′.

158. Which of the following is correct about viroids?
(a) They have RNA with protein coat.
(b) They have free RNA without protein coat.
(c) They have DNA with protein coat.
(d) They have free DNA without protein coat.

159. In water hyacinth and water lily, pollination takes place by
(a) insects or wind (b) water currents only
(c) wind and water (d) insects and water.

160. The transverse section of a plant shows following anatomical features :
(i) Large number of scattered vascular bundles surrounded by bundle sheath
(ii) Large conspicuous parenchymatous ground tissue
(iii) Vascular bundles conjoint and closed
(iv) Phloem parenchyma absent
Identify the category of plant and its part.
(a) Monocotyledonous stem
(b) Monocotyledonous root
(c) Dicotyledonous stem
(d) Dicotyledonous root

161. Which of the following statements is correct?
(a) Adenine pairs with thymine through two H-bonds.
(b) Adenine pairs with thymine through one H-bond.
(c) Adenine pairs with thymine through three H-bonds.
(d) Adenine does not pair with thymine.

162. Select the correct statement.
(a) Glucocorticoids stimulate gluconeogenesis.
(b) Glucagon is associated with hypoglycemia.
(c) Insulin acts on pancreatic cells and adipocytes.
(d) Insulin is associated with hyperglycemia.

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

	Column-I		Column-II
(A)	Gregarious, polyphagous pest	(i)	*Asterias*
(B)	Adult with radial symmetry and larva with bilateral symmetry	(ii)	Scorpion
(C)	Book lungs	(iii)	*Ctenoplana*
(D)	Bioluminescence	(iv)	*Locusta*

	(A)	(B)	(C)	(D)
(a)	(i)	(iii)	(ii)	(iv)
(b)	(iv)	(i)	(ii)	(iii)
(c)	(iii)	(ii)	(i)	(iv)
(d)	(ii)	(i)	(iii)	(iv)

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

	Column-I		Column - II
(A)	Eosinophils	(i)	Immune response
(B)	Basophils	(ii)	Phagocytosis
(C)	Neutrophils	(iii)	Release histaminase, destructive enzymes
(D)	Lymphocytes	(iv)	Release granules containing histamine

	(A)	(B)	(C)	(D)
(a)	(iii)	(iv)	(ii)	(i)
(b)	(iv)	(i)	(ii)	(iii)
(c)	(i)	(ii)	(iv)	(iii)
(d)	(ii)	(i)	(iii)	(iv)

165. If the head of cockroach is removed, it may live for few days because
(a) the supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen
(b) the cockroach does not have nervous system
(c) the head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body
(d) the head holds a $1/3^{rd}$ of a nervous system while the rest is situated along the dorsal part of its body.

166. Name the enzyme that facilitates opening of DNA helix during transcription.
(a) DNA ligase (b) DNA helicase
(c) DNA polymerase (d) RNA polymerase

167. Flippers of penguins and Dolphins are examples of
(a) adaptive radiation (b) convergent evolution
(c) industrial melanism (d) natural selection.

168. Which of the following hormone levels will cause release of ovum (ovulation) from the Graffian follicle?
(a) High concentration of estrogen
(b) High concentration of progesterone
(c) Low concentration of LH
(d) Low concentration of FSH

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

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

	Column-I		Column-II
(A)	Placenta	(i)	Androgens
(B)	Zona pellucida	(ii)	Human Chorionic Gonadotropin (hCG)
(C)	Bulbo-urethral glands	(iii)	Layer of the ovum
(D)	Leydig cells	(iv)	Lubrication of the penis

	(A)	(B)	(C)	(D)
(a)	(iv)	(iii)	(i)	(ii)
(b)	(i)	(iv)	(ii)	(iii)
(c)	(iii)	(ii)	(iv)	(i)
(d)	(ii)	(iii)	(iv)	(i)

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

	Column-I		Column-II
(A)	*Clostridium butylicum*	(i)	Cyclosporin-A
(B)	*Trichoderma polysporum*	(ii)	Butyric acid
(C)	*Monascus purpureus*	(iii)	Citric acid
(D)	*Aspergillus niger*	(iv)	Blood cholesterol lowering agent

	(A)	(B)	(C)	(D)
(a)	(iii)	(iv)	(ii)	(i)
(b)	(ii)	(i)	(iv)	(iii)
(c)	(i)	(ii)	(iv)	(iii)
(d)	(iv)	(iii)	(ii)	(i)

172. Goblet cells of alimentary canal are modified from
(a) squamous epithelial cells
(b) columnar epithelial cells
(c) chondrocytes
(d) compound epithelial cells.

173. Experimental verification of the chromosomal theory of inheritance was done by
(a) Mendel (b) Sutton
(c) Boveri (d) Morgan.

174. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is
(a) transpiration (b) root pressure
(c) imbibition (d) plasmolysis.

175. Identify the substances having glycosidic bond and peptide bond, respectively in their structure.
(a) Chitin, cholesterol (b) Glycerol, trypsin
(c) Cellulose, lecithin (d) Inulin, insulin

176. Which of the following is not an attribute of a population?
(a) Sex ratio (b) Natality
(c) Mortality (d) Species interaction

177. The enzyme enterokinase helps in conversion of
(a) protein into polypeptides
(b) trypsinogen into trypsin
(c) caseinogen into casein
(d) pepsinogen into pepsin.

178. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of
(a) M phase (b) G_1 phase
(c) S phase (d) G_2 phase.

179. In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct?
(a) Gross primary productivity is always less than Net primary productivity.
(b) Gross primary productivity is always more than Net primary productivity.
(c) Gross primary productivity and Net primary productivity are one and same.
(d) There is no relationship between Gross primary productivity and Net primary productivity.

180. Which of the following is put into anaerobic sludge digester for further sewage treatment?
(a) Primary sludge
(b) Floating debris
(c) Effluents of primary treatment
(d) Activated sludge

answer key

PHYSICS

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

CHEMISTRY

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

BIOLOGY

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