PHYSICS

1 When a uranium isotope $^{235}_{92}\mathrm{U}$ is bombarded with a neutron, it generates $^{89}_{36}\mathrm{Kr}$, three neutrons and:

1.	$^{91}_{40}\mathrm{Zr}$	2.	$^{101}_{36}\mathrm{Kr}$
3.	$^{103}_{36}\mathrm{Kr}$	4.	$^{144}_{56}\mathrm{Ba}$

2 A wire of length $'l'$ and resistance $100\ \Omega$ is divided into 10 equal parts. The first 5 parts are connected in series while the next 5 parts are connected in parallel. The two combinations are again connected in series. The resistance of this final combination is:

1.	$52\ \Omega$	2.	$55\ \Omega$
3.	$60\ \Omega$	4.	$26\ \Omega$

3 An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of an electron is 1.227×10^{-2} nm. What will be its potential difference?

1. 10^2 V
2. 10^3 V
3. 10^4 V
4. 10^5 V

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

1. 12×10^3 J
2. 24×10^3 J
3. 48×10^3 J
4. 10×10^3 J

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

1.	0.25 mm	2.	0.5 mm
3.	1.0 mm	4.	0.01 mm

6 The phase difference between displacement and acceleration of a particle in a simple harmonic motion is:

1.	$\frac{3\pi}{2}$ rad	2.	$\frac{\pi}{2}$ rad
3.	zero	4.	π rad

7 The Brewster's angle for an interface should be:

1. $30^\circ < i_b < 45^\circ$
2. $45^\circ < i_b < 90^\circ$
3. $i_b = 90^\circ$
4. $0^\circ < i_b < 30^\circ$

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

1. 50 cm
2. 67 cm
3. 80 cm
4. 33 cm

9 If an unpolarised light is incident on a plane surface of refractive index $\sqrt{3}$ at Brewster's angle, then the angle of refraction is:

1. 0°
2. 30°
3. 60°
4. 90°

10 A charged particle having drift velocity of 7.5×10^{-4} ms^{-1} in an electric field of 3×10^{-10} Vm^{-1}, has mobility of:

1. 2.5×10^6 m^{2}V^{-1}s^{-1}
2. 2.5×10^{-6} m^{2}V^{-1}s^{-1}
3. 2.25×10^{-15} m^{2}V^{-1}s^{-1}
4. 2.25×10^{15} m^{2}V^{-1}s^{-1}

11 The increase in the width of the depletion region in a p-n junction diode is due to:

1. reverse bias only
2. both forward bias and reverse bias
3. increase in forwarding current
4. forward bias only

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?

1.	32 N	2.	30 N
3.	24 N	4.	48 N

13 The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is: (c = speed of electromagnetic waves)

1.	1 : 1	2.	1 : c
3.	1 : c^2	4.	c : 1

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

1.	$\frac{9}{4}$	2.	$\frac{3}{2}$
3.	$\frac{5}{3}$	4.	$\frac{27}{8}$

15 For which one of the following Bohr models is not valid?

1.	Singly ionised helium atom $\left(He^{+}\right)$.
2.	Deuteron atom.
3.	Singly ionised neon atom $\left(Ne^{+}\right)$.
4.	Hydrogen atom.

16 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 the electric field in this region is:
1. 0.5 N/C
2. 1 N/C
3. 5 N/C
4. zero

17 A 40 μF capacitor is connected to a 200 V, 50 Hz AC supply. The RMS value of the current in the circuit is, nearly:
1. 2.05 A
2. 2.5 A
3. 25.1 A
4. 1.7 A

18 What would be the torque about the origin when a force $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m?

1.	$6\hat{j}$ N-m	2.	$-6\hat{i}$ N-m
3.	$6\hat{k}$ N-m	4.	$6\hat{i}$ N-m

19 The average thermal energy for a mono-atomic gas is:
(k_B is Boltzmann constant and T absolute temperature)

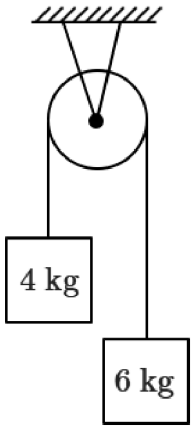
1.	$\frac{3}{2}k_BT$	2.	$\frac{5}{2}k_BT$
3.	$\frac{7}{2}k_BT$	4.	$\frac{1}{2}k_BT$

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

1.	340 m	2.	320 m
3.	300 m	4.	360 m

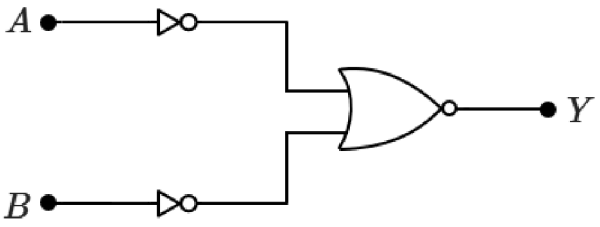
21 Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is:
1. adiabatic
2. isochoric
3. isobaric
4. isothermal

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



1.	$\frac{g}{2}$	2.	$\frac{g}{5}$
3.	$\frac{g}{10}$	4.	g

23 For the logic circuit shown, the truth table is:



1.

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

2.

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

3.

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

4.

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

24 An iron rod of susceptibility 599 is subjected to a magnetizing field of 1200 A m^{-1}. The permeability of the material of the rod is:
$(\mu_0 = 4\pi \times 10^{-7}$ T $mA^{-1})$
1. 8.0×10^{-5} T mA^{-1}
2. $2.4\pi \times 10^{-5}$ T mA^{-1}
3. $2.4\pi \times 10^{-7}$ T mA^{-1}
4. $2.4\pi \times 10^{-4}$ T mA^{-1}

25 The energy equivalent of 0.5 g of a substance is:
1. 4.5×10^{13} J
2. 1.5×10^{13} J
3. 0.5×10^{13} J
4. 4.5×10^{16} J

26 The capacitance of a parallel plate capacitor with air as a medium is 6 μF. With the introduction of a dielectric medium, the capacitance becomes 30 μF. The permittivity of the medium is:
$\left(\varepsilon_0 = 8.85 \times 10^{-12}\ C^2N^{-1}m^{-2}\right)$
1. $1.77 \times 10^{-12}\ C^2N^{-1}m^{-2}$
2. $0.44 \times 10^{-10}\ C^2N^{-1}m^{-2}$
3. $5.00\ C^2N^{-1}m^{-2}$
4. $0.44 \times 10^{-13}\ C^2N^{-1}m^{-2}$

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

1.	half	2.	four times
3.	one-fourth	4.	double

28 An AC voltage source is connected to a series LCR circuit. When L is removed from the circuit, the phase difference between current and voltage is $\frac{\pi}{3}$. If C is instead removed from the circuit, the phase difference is again $\frac{\pi}{3}$ between current and voltage. The power factor of the circuit is:
1. 0.5
2. 1.0
3. -1.0
4. zero

29 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:

1.	5.0 g	2.	10.0 g
3.	20.0 g	4.	2.5 g

30 A ray is incident at an angle of incidence i on one surface of a small angle prism (with the angle of the 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:

1.	$\frac{2A}{\mu}$	2.	μA
3.	$\frac{\mu A}{2}$	4.	$\frac{A}{2\mu}$

31 In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be:

1.	524 Hz	2.	536 Hz
3.	537 Hz	4.	523 Hz

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

1. $\frac{1}{\sqrt{2}n\pi d^2}$
2. $\frac{1}{\sqrt{2}n^2\pi d^2}$
3. $\frac{1}{\sqrt{2}n^2\pi^2 d^2}$
4. $\frac{1}{\sqrt{2}n\pi d}$

33 A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of the electric field at a point 15 cm from the centre of the sphere?

$\left(\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{ N-m}^2/\text{C}^2\right)$

1. 1.28×10^5 N/C
2. 1.28×10^6 N/C
3. 1.28×10^7 N/C
4. 1.28×10^4 N/C

34 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:

$\left(\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{ N-m}^2/\text{C}^2\right)$

1. 200 V
2. 400 V
3. zero
4. 50 V

35 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:

$\left(\mu_0 = 4\pi \times 10^{-7} \text{ TmA}^{-1}\right)$

1. 3.4×10^{-4} T
2. 6.28×10^{-5} T
3. 3.14×10^{-5} T
4. 6.28×10^{-4} T

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

1. 0.6
2. 0.06
3. 0.006
4. 6

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

1.	$\frac{Mg(L_1 - L)}{AL}$	2.	$\frac{MgL}{AL_1}$
3.	$\frac{MgL}{A(L_1 - L)}$	4.	$\frac{MgL_1}{AL}$

38 Dimensions of stress are:

1.	$\left[ML^2T^{-2}\right]$	2.	$\left[ML^0T^{-2}\right]$
3.	$\left[ML^{-1}T^{-2}\right]$	4.	$\left[MLT^{-2}\right]$

39 Taking into account the significant figures, what is the value of (9.99 m − 0.0099 m)?

1. 9.98 m
2. 9.980 m
3. 9.9 m
4. 9.9801 m

40 Light of a frequency of 1.5 times the threshold frequency is incident on a photosensitive material. What happens to the photoelectric current when the frequency is cut in half and the intensity is doubled?

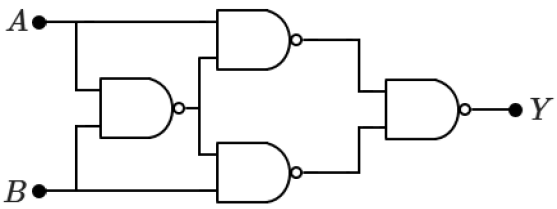
1.	four times	2.	one-fourth
3.	zero	4.	doubled

41 A cylinder contains hydrogen gas at a pressure of 249 kPa and temperature 27°C. Its density is:
($R = 8.3$ J mol^{-1}K^{-1})
1. 0.2 kg/m^3
2. 0.1 kg/m^3
3. 0.02 kg/m^3
4. 0.5 kg/m^3

42 The solids which have the negative temperature coefficient of resistance are:

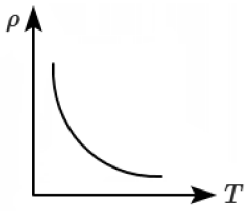
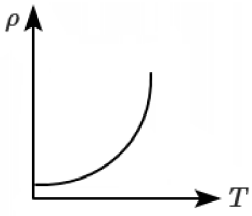
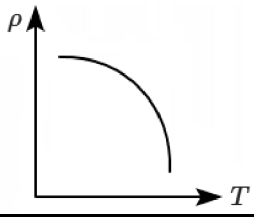
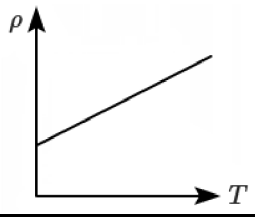
1.	insulators only
2.	semiconductors only
3.	insulators and semiconductors
4.	metals

43 Which input (A, B)−output (Y) combination correctly represents the given logic circuit?



1.	$A = 1, B = 1, Y = 1$
2.	$A = 0, B = 1, Y = 1$
3.	$A = 1, B = 0, Y = 0$
4.	$A = 0, B = 0, Y = 1$

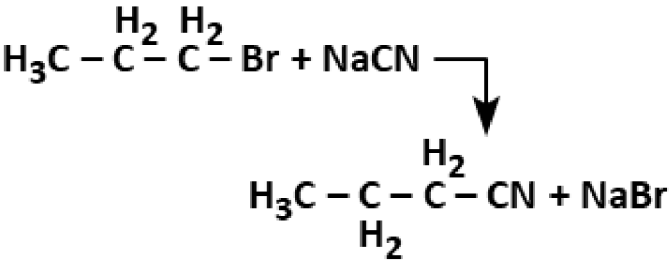
44 Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper?

1.		2.	
3.		4.	

45 A resistance wire connected in the left gap of a meter bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. lf the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire will be:
1. 1.0×10^{-1} m
2. 1.5×10^{-1} m
3. 1.5×10^{-2} m
4. 1.0×10^{-2} m

CHEMISTRY

46 Consider the reaction,



This reaction will be the fastest in:
1. Ethanol
2. Methanol
3. N, N'-dimethylformamide (DMF)
4. Water

47 Identify the incorrect statement.

1.	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.
2.	Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.
3.	The oxidation states of chromium in CrO_4^{2-} and $Cr_2O_7^{2-}$ are not the same.
4.	$Cr^{2+}(d^4)$ is a stronger reducing agent than $Fe^{2+}(d^6)$ in water.

48 Identify the correct statements from the following:

(a)	$CO_2(g)$ is used as a refrigerant ice cream and frozen food.
(b)	The structure of C_{60} customs12 six carbon rings and 25 five carbon rings
(c)	ZSM-5, a type of zeolite, is used to convert alcohol into gasoline.
(d)	CO is a colorless and odorless gas.

1.	**(a)** and **(c)** only	2.	**(b)** and **(c)** only
3.	**(c)** and **(d)** only	4.	**(a)**, **(c)** and **(d)** only

49 The end product (C) in the below-mentioned reaction is:

$$H_3C-Br \xrightarrow{\mathbf{KCN}} A \xrightarrow{\mathbf{H_3O^+}} B \xrightarrow[\mathbf{Ether}]{LiAlH_4} C$$

1. Acetone
2. Methane
3. Acetaldehyde
4. Ethyl alcohol

50 The reaction between benzaldehyde and acetophenone in the presence of dilute NaOH is known as:
1. Cannizzaro's reaction
2. Cross Cannizzaro's reaction
3. Cross aldol condensation
4. Aldol condensation

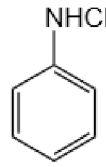
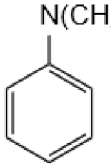
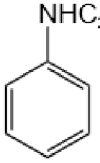
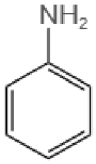
51 Match the following:

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

Which of the following is the correct option?

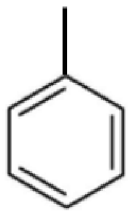
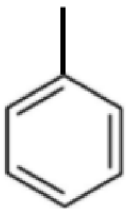
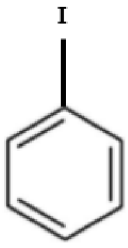
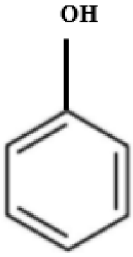
	a	**b**	**c**	**d**
1.	(ii)	(i)	(iv)	(iii)
2.	(iii)	(iv)	(i)	(ii)
3.	(iv)	(iii)	(ii)	(i)
4.	(i)	(ii)	(iii)	(iv)

52 Which amine gives the carbylamine test?

1.		2.	
3.		4.	

53 Identify the incorrect statement regarding the halogens.
1. All form monobasic oxyacids.
2. All are oxidizing agents.
3. All but fluorine show positive oxidation states.
4. Chlorine has the highest electron-gain enthalpy.

54 Anisole on reaction with HI gives:

1.	 + CH_3COOH	2.	 + C_2H_5I
3.	 + C_2H_5OH	4.	 + CH_3I

55 The number of protons, neutrons and electrons in $^{175}_{71}Lu$ respectively, are:
1. 104, 71 and 71
2. 71, 71 and 104
3. 175, 104 and 71
4. 71, 104 and 71

56 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 $\Delta_r G^{\ominus}$ at the same temperature will be:

1. 8.314 J mol^{-1} $K^{-1}\times300$ K$\times\ln(2\times10^{13})$
2. 8.314 J mol^{-1} $K^{-1}\times300$ K$\times\ln(3\times10^{13})$
3. –8.314 J mol^{-1} $K^{-1}\times300$ K$\times\ln(4\times10^{13})$
4. –8.314 J mol^{-1} $K^{-1}\times300$ K$\times\ln(2\times10^{13})$

57 An increase in the concentration of the reactants of a reaction leads to a change in:

1.	Heat of reaction	2.	Threshold energy
3.	Collision frequency	4.	Activation energy

58 Anisole is produced by which of the following set of reactants:

1. CH_3CHO ; RMgX
2. C_6H_5OH ; NaOH ; CH_3I
3. C_6H_5OH ; neutral $FeCl_3$
4. C_6H_5 - CH_3 ; CH_3COCl ; $AlCl_3$

59 Given that the ionic product of $Ni(OH)_2$ is 2×10^{-15}. The solubility of $Ni(OH)_2$ in 0.1 M NaOH is ;

1. 2×10^{-8} M
2. 1×10^{-13} M
3. 1×10^{8} M
4. 2×10^{-13} M

60 Which of the following statement(s) is/are correct about the elimination reaction of 2-Bromopentane to form pent-2-ene:

(a) β-Elimination reaction
(b) Follows Zaitsev rule
(c) Dehydrohalogenation reaction
(d) Dehydration reaction

1.	(a), (c), (d)	2.	(b), (c), (d)
3.	(a), (b), (d)	4.	(a), (b), (c)

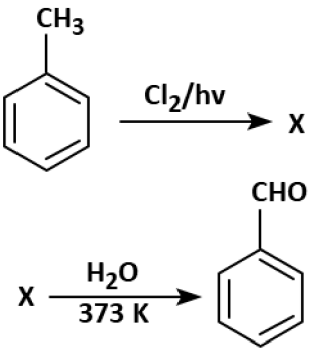
61 The number of Faradays (F) required to produce 20 g of calcium from molten $CaCl_2$ (Atomic mass of Ca = 40 g mol^{-1}) is:

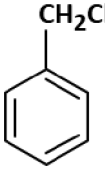
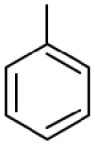
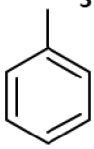
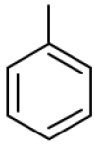
1. 2
2. 3
3. 4
4. 1

62 Which of the following is a basic amino acid?

1. Alanine
2. Tyrosine
3. Lysine
4. Serine

63 The product 'X' in the below mentioned reaction is:



1.		2.	
3.		4.	

64 The correct order of bond order in the following species is:

1.	$O_2^{2+} > O_2^{+} > O_2^{-}$	2.	$O_2^{2+} < O_2^{-} < O_2^{+}$
3.	$O_2^{+} > O_2^{-} < O_2^{2+}$	4.	$O_2^{-} < O_2^{+} > O_2^{2+}$

65 In the following reaction:

$$HC\equiv CH \xrightarrow[Hg^{2+}]{H_2SO_4} P$$

Product 'P' will not give

1. Tollen's reagent test
2. Fehling's solution
3. Victor Meyer test
4. Iodoform test

66 What is the alteration in the oxidation state of carbon in the given reaction?

$CH_{4(g)} + 4Cl_{2(g)} \rightarrow CCl_{4(l)} + 4HCl_{(g)}$

1.	0 to +4	2.	–4 to +4
3.	0 to –4	4.	+4 to +4

67 The rate constant for a first order reaction is $4.606 \times 10^{-3}\ s^{-1}$. The time required to reduce 2.0 g of the reactant to 0.2 g is:

1.	200 s	2.	500 s
3.	1000 s	4.	100 s

68 For the reaction, $2Cl(g) \rightarrow Cl_2(g)$, the correct option is:

1. $\Delta_r H > 0$ and $\Delta_r S < 0$
2. $\Delta_r H < 0$ and $\Delta_r S > 0$
3. $\Delta_r H < 0$ and $\Delta_r S < 0$
4. $\Delta_r H > 0$ and $\Delta_r S > 0$

69 Which of the following set of molecules will have zero dipole moment?

1.	Boron trifluoride, hydrogen fluoride, carbon dioxide, 1 3-dichlorobenzene
2.	Nitrogen trifluoride, beryllium difluoride, water, 1 3 -dichlorobenzene
3.	Boron trifluoride, beryllium difluoride, carbon dioxide, 1 4-dichlorobenzene
4.	Ammonia, beryllium difluoride, water, 1, 4-dichlorobenzene

70 The maximum number of atoms is present in which of the following -

1.	1 g of $Mg_{(s)}$	2.	1 g of $O_{2\ (g)}$
3.	1 g of $Li_{(s)}$	4.	1 g of $Ag_{(s)}$

71 The correct order of increasing field strength of ligands is:

1. $SCN^- < F^- < CN^- < C_2O_4^{2-}$
2. $F^- < SCN^- < C_2O_4^{2-} < CN^-$
3. $CN^- < C_2O_4^{2-} < SCN^- < F^-$
4. $SCN^- < F^- < C_2O_4^{2-} < CN^-$

72 Compound of sulphur that has $-O-O-$ linkage among the following is:

1. H_2SO_4, sulphuric acid
2. $H_2S_2O_8$, peroxodisulphuric acid
3. $H_2S_2O_7$, pyrosulphuric acid
4. H_2SO_3, sulphurous acid

73 On electrolysis of dilute sulphuric acid using Platinum (Pt) electrode, the product obtained at the anode will be:

1. Oxygen gas
2. H_2S gas
3. SO_2 gas
4. Hydrogen gas

74 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?

1.	$[Cu(NH_3)_4]^{2+}$	2.	$Cu(OH)_2$
3.	$CuCO_3.Cu(OH)_2$	4.	$CuSO_4$

75 Paper chromatography is an example of:

1. Partition chromatography
2. Thin layer chromatography
3. Column chromatography
4. Adsorption chromatography

76 Which of the following metal ions activates many enzymes participating in the oxidation of glucose to produce ATP and with Na it is also responsible for the transmission of nerve signals:

1. Copper
2. Calcium
3. Potassium
4. Iron

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

1. $q = 0, \Delta T < 0$ and $w > 0$
2. $q < 0, \Delta T = 0$ and $w = 0$
3. $q > 0, \Delta T > 0$ and $w > 0$
4. $q = 0, \Delta T = 0$ and $w = 0$

78 A tertiary butyl carbocation is more stable than a secondary butyl carbocation because-

1. + R effect of CH_3 groups
2. $-$R effect of $-\ CH_3$ groups
3. Hyperconjugation
4. $-$I effect of $-CH_3$ groups

79 A molecule that cannot exist is:

1.	Li_2	2.	C_2
3.	O_2	4.	He_2

80 The calculated spin only magnetic moment of Cr^{2+} ion is:

1. 4.90 BM
2. 5.92 BM
3. 2.84 BM
4. 3.87 BM

81 A reaction between acetone and methylmagnesium chloride followed by hydrolysis will give:

1.	sec-Butyl alcohol	2.	tert-Butyl alcohol
3.	iso-Butyl alcohol	4.	iso-Propyl alcohol

82 Identify the INCORRECT match.

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

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

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

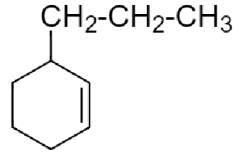
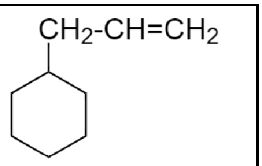
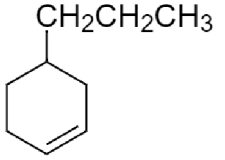
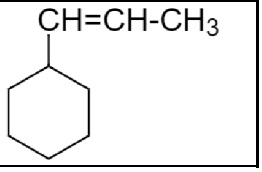
84 Standard reduction potentials of the half-reactions are given below:
$F_{2(g)} + 2e^- \rightarrow 2F^-_{(aq)}$; $E^\circ = +2.85\ V$
$Cl_{2(g)} + 2e^- \rightarrow 2Cl^-_{(aq)}$; $E^\circ = +1.36\ V$
$Br_{2(g)} + 2e^- \rightarrow 2Br^-_{(aq)}$; $E^\circ = +1.06\ V$
$I_{2(g)} + e^- \rightarrow 2I^-_{(aq)}$; $E^\circ = +0.53\ V$
The strongest oxidizing and reducing agents, respectively, are:
1. Br_2 and Cl^-
2. Cl_2 and Br^-
3. Cl_2 and I_2
4. F_2 and l^-

85 Sucrose on hydrolysis gives:
1. α-D-Glucose + β-D-Glucose
2. α-D-Glucose + β-D-Fructose
3. α-D-Fructose + β-D-Fructose
4. β-D-Glucose + α-D-Fructose

86 The freezing point of 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 up to two decimal places)
1. 0.80 K
2. 0.40 K
3. 0.60 K
4. 0.20 K

87 The species Ar, K^+ and Ca^{2+} contain the same number of electrons. In which order do their radii increase?
1. $Ar < K^+ < Ca^{2+}$
2. $Ca^{2+} < Ar < K^+$
3. $Ca^{2+} < K^+ < Ar$
4. $K^+ < Ar < Ca^{2+}$

88 An alkene on ozonolysis gives methanal as one of the products. Its structure is:

1.		2.	
3.		4.	

89 At room temperature, MY and NY_3, two nearly insoluble salts, have the same K_{sp} values of 6.2×10^{-13}. The true statement regarding MY and NY_3 is:

1.	The molar solubility of MY in water is less than that of NY_3.
2.	The salts MY and NY_3 are more soluble in 0.5 M KY than in pure water.
3.	The addition of the salt of KY to a solution of MY and NY_3 will have no effect on their solubilities.
4.	The molar solubilities of MY and NY_3 in water are identical.

90 Which of the following alkane cannot be made in good yield by Wurtz reaction?

1.	2,3-Dimethylbutane	2.	n-Heptane
3.	n-Butane	4.	n-Hexane

BIOLOGY

91 Casparian strips occur in?
1. Epidermis
2. Pericycle
3. Cortex
4. Endodermis

92 Which of the following characteristics represent the 'Inheritance of blood groups' in humans?
a. Dominance
b. Co-dominance
c. Multiple allelism
d. Incomplete dominance
e. Polygenic inheritance

1.	b, c, and e	2.	a, b and c
3.	b, d, and e	4.	a, c, and e

93 Dissolution of the synaptonemal complex occurs during :

1.	Zygote	2.	Diplotene
3.	Leptotene	4.	Pachytene

94 Experimental verification of the chromosomal theory of inheritance was done by:

1.	Sutton	2.	Boveri
3.	Morgan	4.	Mendel

95 In light reaction, plastoquinone facilitates the transfer of electrons from:

1.	$Cytb_6f$ complex to PS I	2.	PS I to $NADP^+$
3.	PS I to ATP synthase	4.	PS II to $Cytb_6f$ complex

96 Select the correct match:

1.	Phenylketonuria	Autosomal dominant trait
2.	Sickle cell anemia	Autosomal recessive trait chromosome - 11
3.	Thalassemia	X linked
4.	Haemophilia	Y linked

97 Match the following with respect to meiosis:

Column I		Column II	
(a)	Zygotene	(i)	Terminalization
(b)	Pachytene	(ii)	Chiasmata
(c)	Diplotene	(iii)	Crossing over
(d)	Diakinesis	(iv)	Synapsis

Select the correct option from the following:

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

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

99 Which of the following is put into anaerobic sludge digester for further sewage treatment?
1. Floating debris
2. Effluents of primary treatment
3. Activated sludge
4. Primary sludge

100 In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct?

1.	Gross primary productivity is always more than Net primary productivity.
2.	Gross primary productivity and Net primary productivity are one and the same.
3.	There is no relationship between Gross primary productivity and Net primary productivity.
4.	Gross primary productivity is always less than net primary productivity.

101 The ovary is half inferior in:
1. Mustard
2. Sunflower
3. Plum
4. Brinjal

102 Given below are two statements :

Statement I:	When the fitness of one species is significantly lower in the presence of another species, the process is defined as competition.
Statement II:	When fungi remain in association with living plants or animals, they are called saprophytes.

In light of the above statements, choose the correct answer from the options given below :
1. Both **Statement I** and **Statement II** are True
2. Both **Statement I** and **Statement II** are False
3. **Statement I** is True but **Statement II** is False
4. **Statement I** is False but **Statement II** is True

103 Which of the following is not an attribute of a population?
1. Natality
2. Mortality
3. Species interaction
4. Sex ratio

104 The roots that originate from the base of the stem are:

1.	Primary roots	2.	Prop roots
3.	Lateral roots	4.	Fibrous roots

105 Which of the following is correct about viroids?

1. They have free RNA without protein coat.
2. They have DNA with protein coat.
3. They have free DNA without protein coat.
4. They have RNA with protein coat.

106 Which of the following pairs is of unicellular algae?

1. *Gelidium* and *Gracilaria*
2. *Anabaena* and *Volvox*
3. *Chlorella* and *Spirulina*
4. *Laminaria* and *Sargassum*

107 Which statement is wrong for Krebs' cycle?

1.	There is one point in the cycle where FAD^+ is reduced to $FADH_2$.
2.	During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesized.
3.	The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid.
4.	There are three points in the cycle where NAD^+ is reduced to $NADH + H^+$.

108 The first phase of translation is:

1. Recognition of DNA molecule
2. Aminoacylation of tRNA
3. Recognition of an anti-codon
4. Binding of mRNA to ribosome

109 In water hyacinth and water lily, pollination takes place by:

1. Water currents only
2. Wind and water
3. Insects and water
4. Insects or wind

110 Some dividing cells exit the cell cycle and enter the vegetative inactive stage. This is called the quiescent stage (G_0). This process occurs at the end of:

1. G_1 *phase*
2. S phase
3. G_2 *phase*
4. M phase

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

1.	2	2.	14
3.	6	4.	4

112 According to Robert May, global species diversity is about:

1. 20 Million
2. 50 Million
3. 7 Million
4. 1.5 Million

113 The true nucleus is absent in:

1. *Anabaena*
2. *Mucor*
3. Vaucheria
4. *Volvox*

114 The number of substrate level of phosphorylations in one turn of citric acid cycle is:

1.	One	2.	Two
3.	Three	4.	Four

115 The body of the ovule is fused within the funicle at :

1.	Micropyle	2.	Nucellus
3.	Chalaza	4.	Hilum

116 If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately:

1.	2.5 meters	2.	2.2 meters
3.	2.7 meters	4.	2.0 meters

117 Floridian starch has structure similar to :

1. Amylopectin and glycogen
2. Mannitol and algin
3. Laminarin and cellulose
4. Starch and cellulose

118 Match the following microorganism with product

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

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

119 Strobili or cones are found in:

1.	*Pteris*	2.	*Marchantia*
3.	*Equisetum*	4.	*Salvinia*

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

121 Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups.

1.	A person will have only two of the 3 alleles.
2.	When I^A and I^B are present together, they express same type of sugar.
3.	Allele 'i' does not produce any sugar.
4.	The gene (I) has three alleles.

122 The plant parts which consist of two generations, one within the other, are:

(a)	Pollen grains inside the anther
(b)	Germinated pollen grain with two male gametes
(c)	Seed inside the fruit
(d)	Embryo sac inside the ovule

1. **(a), (b)** and **(c)**
2. **(c)** and **(d)**
3. **(a)** and **(d)**
4. **(a)** only

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

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

125 Identify the correct statement with regard to G_1 phase (Gap 1) of interphase:

1.	The reorganisation of all cell components takes place.
2.	The cell is metabolically active and grows but does not replicate its DNA
3.	Nuclear division takes place
4.	DNA synthesis or replication takes place.

126 Which of the following regions of the globe exhibits the highest species diversity?

1.	Madagascar	2.	Himalayas
3.	Amazon forests	4.	Western Ghats of India

127 Which one of the following is not an inclusion body found in prokaryotes?

1.	Phosphate granule	2.	Cyanophycean granule
3.	Glycogen granule	4.	Polysome

128 Match **List-I** with **List-II**:

	List-I		List-II
A.	Abscisic acid	I.	Promotes female flowers in cucumber
B.	Ethylene	II.	Helps seeds to withstand desiccation
C.	Gibberellin	III.	Helps in nutrient mobilisation
D.	Cytokinin	IV.	Promotes bolting in beet cabbage etc

Choose the correct answer from the options given below:
1. A-II, B-III, C- IV, D- I
2. A-III, B-II, C- I, D- IV
3. A-II, B-I, C- IV, D- III
4. A-II, B-I, C- III, D- IV

129 The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of:

1.	1 molecule of the 3-C compound
2.	1 molecule of the 6-C compound
3.	1 molecule of a 4-C compound and 1 molecule of the 2-C compound
4.	2 molecules of the 3-C compound

130 The transverse section of a plant shows following anatomical features:

a.	Large number of scattered vascular bundles surrounded by bundle sheath.
b.	Large conspicuous parenchymatous ground tissue.
c.	Vascular bundles conjoint and closed.
d.	Phloem parenchyma absent.

Identify the category of plant and its part :
1. Monocotyledonous root
2. Dicotyledonous stem
3. Dicotyledonous root
4. Monocotyledonous stem

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

132 Choose the correct pair from the following :

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

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

134 Ray florets have:

1.	Superior ovary	2.	Hypogynous ovary
3.	Half-inferior ovary	4.	Inferior ovary

135 Match the trophic levels with their correct species examples in the green land ecosystem

Column I		Column II	
(a)	Fourth trophic level	(i)	Cow
(b)	Second trophic level	(ii)	Vulture
(c)	First trophic level	(iii)	Rabbit
(d)	Third trophic level	(iv)	Grass

Select the correct option:

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

136 Which of the following statements is not correct?

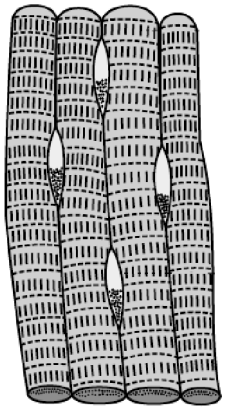
1.	The proinsulin has an extra peptide called C-peptide
2.	Functional insulin has A and B chains linked together by hydrogen bonds.
3.	Genetically engineered insulin is produced in *E. Coli.*
4.	In man, insulin is synthesized as proinsulin.

137 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 defense
c.	RNAi	(iii)	Detection of HIV infection
d.	PCR	(iv)	*Bacillus thuringiensis*

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

138 Identify the tissue shown in the diagram and match with its characteristics and its location:



1.	Smooth muscles, show branching, found in the walls of the heart
2.	Cardiac muscles, unbranched muscles, found in the walls of the heart
3.	Striated muscles, tapering at both ends attached to the bones of the ribs
4.	Skeletal muscle, shows striations and is closely attached to the bones of the limbs

139 Flippers of Penguins and Dolphins are examples of:

1.	Convergent evolution	2.	Industrial melanism
3.	Natural selection	4.	Adaptive radiation

140 Identify the wrong statement with regards to restriction enzyme:

1.	They cut the strength at palindromic sites.
2.	They are useful in genetic engineering.
3.	Sticky ends can be joined by using DNA ligases.
4.	Each restriction enzyme functions by inspecting the length of a DNA sequence.

141 Identify the wrong statement with reference to transport of oxygen:

1.	Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.
2.	Higher H^+ concentration in alveoli favours the formation of oxyhaemoglobin.
3.	Low pCO_2 in alveoli favours the formation of oxyhaemoglobin.
4.	Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2.

142 Which one of the following is the most abundant protein in animals?
1. Collagen
2. Lectin
3. Insulin
4. Hemoglobin

143 Select the correct route for the passage of sperms in male frogs:

1.	Testes → Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca
2.	Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca
3.	Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca
4.	Testes → Bidder's canal→ Kidney→ Vasa efferentia → Urinogenital duct→ Cloaca

144 Which of the following shows coiled RNA strand and capsomeres?

1.	Poliovirus	2.	Tobacco mosaic virus
3.	Measles virus	4.	Retrovirus

145 Match the organism with its use in biotechnology.

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

Select the correct option from the following:

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

146 In-gel electrophoresis, separated DNA fragments can be visualized with the help of:
1. Ethidium bromide in UV radiation
2. Acetocarmine in UV radiation
3. Ethidium bromide in infrared radiation
4. Acetocarmine in bright blue light

147 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

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

148 Identify the wrong statement with a reference to immunity.

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

149 Out of ‘X’ pairs of ribs in humans only 'Y' pairs are true ribs. Select the option that correctly represents values of X and Y and provides their explanation:

1.	X=12, Y=5 True ribs are attached to vertebral column and sternum on the two ends.
2.	X=24, Y=7 True ribs are dorsally attached to vertebral column but are free on ventral side.
3.	X=24, Y=12 True ribs are dorsally attached to vertebral column but are free on ventral side.
4.	X=12, Y=7 True ribs are attached dorsally to vertebral column and ventrally to the sternum.

150 Identify the substances having a glycosidic bond and peptide bond, respectively in their structure:
1. Glycerol, trypsin
2. Cellulose, lecithin
3. Inulin, insulin
4. Chitin, cholesterol

151 In Which of the following techniques, the embryos are transferred to assist those females who cannot conceive?

1.	GIFT and ZIFT	2.	ICSI and ZIFT
3.	GIFT and ICSI	4.	ZIFT and IUT

152 Which of the following would help in prevention of diuresis?

1.	Reabsorption of Na^+ and water from renal tubules due to aldosterone
2.	Atrial natriuretic factor causes vasoconstriction
3.	Decrease in the secretion of renin by JG cells
4.	More water reabsorption due to under secretion of ADH

153 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

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

154 Select the option including all sexually transmitted diseases:
1. Gonorrhoea, Malaria, Genital herpes
2. AIDS, Malaria, Filaria
3. Cancer, AIDS, Syphilis
4. Gonorrhoea, Syphilis, Genital herpes

155 Goblet cells of alimentary canal are modified from:

1.	Columnar epithelial cells	2.	Chondrocytes
3.	Compound epithelial cells	4.	Squamous epithelial cells

156 Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (BT) is resistant to:
1. Fungal diseases
2. Plant nematodes
3. Insect predators
4. Insect pests

157 Match the following columns and select the correct option:

	Column-I		**Column-I**
(a)	Eosinophils	(i)	Immune response
(b)	Basophils	(ii)	Phagocytosis
(c)	Neutrophils	(iii)	Release histaminase, destructive enzymes
(d)	Lymphocytes	(iv)	Release granules containing histamine

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

158 Meiotic division of the secondary oocyte is completed:

1. At the time of copulation
2. After zygote formation
3. At the time of fusion of a sperm with an ovum
4. Prior to ovulation

159 Identify the basic amino acid from the following.

1.	Glutamic Acid	2.	Lysine
3.	Valine	4.	Tyrosine

160 Match the following:

(a)	Inhibitor of catalytic activity of succinate dehydrogenase	(i)	Ricin
(b)	Possess peptide bonds	(ii)	Malonate
(c)	Cell wall material in fungi	(iii)	Chitin
(d)	Secondary metabolite	(iv)	Collagen

Choose the correct option from the following:

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

161 Which of the following statements are true for the phylum-Chordata?

(a)	In Urochordata, notochord extends from head to tail and 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 sub-phyla : Hemichordata, Tunicata and Cephalochordata

1. **(c)** and **(a)**
2. **(a)** and **(b)**
3. **(b)** and **(c)**
4. **(d)** and **(c)**

162 Match the following columns and select the correct option.

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

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

163 Which of the following hormone levels will cause release of ovum (ovulation) from the Graafian follicle?

1. High concentration of Progesterone
2. Low concentration of LH
3. Low concentration of FSH
4. High concentration of estrogen

164 Which statement is wrong for viruses?

1.	All are parasites
2.	All of them have helical symmetry
3.	They have the ability to synthesize nucleic acids and proteins
4.	Antibiotics have no effect on them

165 From his experiments, S.L. Miller produced amino acids by mixing which of the following in a closed flask:

1. CH_3, H_2, NH_4 and water vapour at 800°C
2. CH_4, H_2, NH_3 and water vapour at 600°C
3. CH_3, H_2, NH_3 and water vapour at 600°C
4. CH_4, H_2, NH_3 and water vapour at 800°C

166 The specific palindromic sequence which is recognized by *EcoRI* is:

1.	5' -GGAACC-3' 3'-CCTTGG-5'	2.	5'-CTTAAG-3' 3'-GAATTC-5'
3.	5'-GGATCC-3' 3'-CCTAGG-5'	4.	5'-GAATTC-3' 3'-CTTAAG-5'

167 Presence of which of the following conditions in urine is indicative of Diabetes mellitus:
1. Uremia and Renal Calculi
2. Ketonuria and Glycosuria
3. Renal Calculi and Hyperglycaemia
4. Uremia and Ketonuria

168 The QRS complex in a standard ECG represents:
1. Depolarisation of auricles
2. Depolarisation of ventricles
3. Repolarisation of ventricles
4. Repolarisation of auricles

169 The sequence that controls the copy number of the linked DNA in the vector is termed as :
1. Ori site
2. Palindromic sequence
3. Recognition site
4. Selectable marker

170 The infectious stage of plasmodium that enters the human body is:
1. Sporozoites
2. Female gametocytes
3. Male gametocytes
4. Trophozoites

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

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

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

172 Ernst Haeckel's embryological support for evolution was disapproved by:

1.	Alfred Wallace	2.	Charles Darwin
3.	Oparin	4.	Karl Ernst von Baer

173 Match the following diseases with the causative organism and select the correct option:

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

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

174 Bilaterally symmetrical and acoelomate animals are exemplified by:
1. Platyhelminthes
2. Aschelminthes
3. Annelida
4. Ctenophora

175 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)
1.	(i)	(iii)	(ii)	(iv)
2.	(iii)	(ii)	(iv)	(i)
3.	(iv)	(iii)	(i)	(ii)
4.	(iv)	(ii)	(i)	(iii)

176 If the head of the cockroach is removed, it may live for a few days because:

1.	The cockroach does not have a nervous system
2.	The head holds a small proportion of the nervous system while the rest is situated along the ventral part of its body
3.	The head holds 1/3rd of the nervous system while the rest is situated along the dorsal part of its body
4.	The supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen

177 Which of the following refers to correct example(s) of organisms that have evolved due to changes in environment brought about by anthropogenic action?

(a)	Darwin's Finches of Galapagos islands
(b)	Herbicide-resistant weeds
(c)	Drug-resistant eukaryotes
(d)	Man-created breeds of domesticated animals like dogs

1. **(a)** and **(c)**
2. **(b), (c)** and **(d)**
3. only **(d)**
4. only **(a)**

178 Select the correct statement.

1. Glucagon is associated with hypoglycemia.
2. Insulin acts on pancreatic cells and adipocytes.
3. Insulin is associated with hyperglycemia.
4. Glucocorticoids stimulate gluconeogenesis.

179 Select the correct events that occur during inspiration.

(a) Contraction of diaphragm
(b) Contraction of external inter-costal muscles
(c) Pulmonary volume decreases
(d) Intra pulmonary pressure increases

1.	(c) and (d)	2.	(a), (b) and (d)
3.	only (d)	4.	(a) and (b)

180 Cuboidal epithelium with brush border of microvilli is found in :

1. Ducts of salivary glands
2. Proximal convoluted tubule of nephron
3. Eustachian tube
4. Lining of intestine