PHYSICS

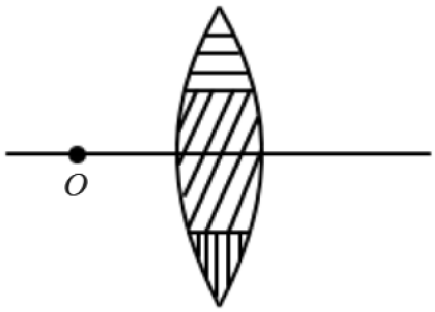
1 A bullet of mass m hits a stationary block of mass M elastically. The transfer of energy is the maximum, when:
1. $M = m$
2. $M = 2m$
3. $M \ll m$
4. $M \gg m$

2 The ground state energy of a hydrogen atom is -13.6 eV. The energy needed to ionize the hydrogen atom from its second excited state will be:
1. 13.6 eV
2. 6.8 eV
3. 1.51 eV
4. 3.4 eV

3 The escape velocity of a body on the earth's surface is 11.2 km/s. If the same body is projected upward with a velocity 22.4 km/s, the velocity of this body at an infinite distance from the centre of the earth will be:

1.	$11.2\sqrt{2}$ km/s	2.	zero
3.	11.2 km/s	4.	$11.2\sqrt{3}$ km/s

4 A lens is made up of 3 different transparent media as shown in the figure. A point object O is placed on its axis beyond $2f$. How many real images will be obtained on the other side?



1. 2
2. 1
3. No image will be formed
4. 3

5 The diameter of a spherical bob, when measured with vernier callipers yielded the values: 3.33 cm, 3.32 cm, 3.34 cm, 3.33 cm and 3.32 cm. The mean diameter to appropriate significant figures is:
1. 3.328 cm
2. 3.3 cm
3. 3.33 cm
4. 3.32 cm

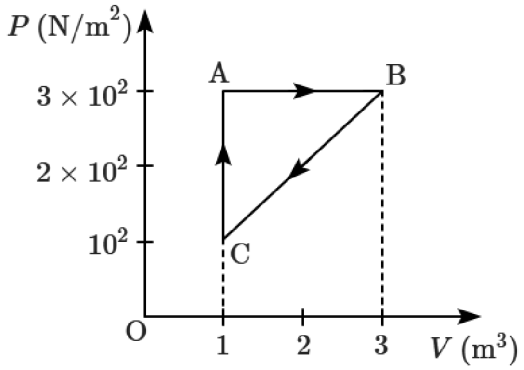
6 On the basis of electrical conductivity, which one of the following material has the smallest resistivity?
1. Germanium
2. Silver
3. Glass
4. Silicon

7 The mechanical quantity, which has dimensions of reciprocal of mass (M^{-1}), is:

1.	angular momentum
2.	coefficient of thermal conductivity
3.	torque
4.	gravitational constant

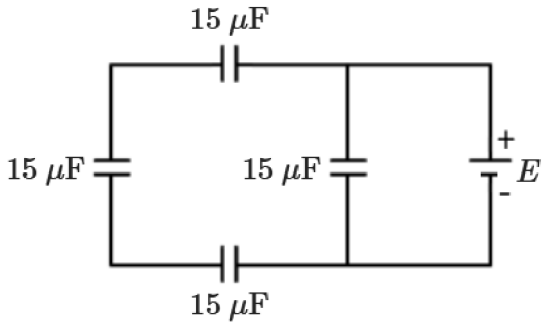
8 The position of a particle is given by; $\vec{r}(t) = 4t\hat{i} + 2t^2\hat{j} + 5\hat{k}$, where t is in seconds and r in metres. Find the magnitude and direction of the velocity $v(t)$, at $t = 1$ s, with respect to the x-axis.
1. $4\sqrt{2}\ \text{ms}^{-1}, 45^\circ$
2. $4\sqrt{2}\ \text{ms}^{-1}, 60^\circ$
3. $3\sqrt{2}\ \text{ms}^{-1}, 30^\circ$
4. $3\sqrt{2}\ \text{ms}^{-1}, 45^\circ$

9 For the given cycle, the work done during the isobaric process is:



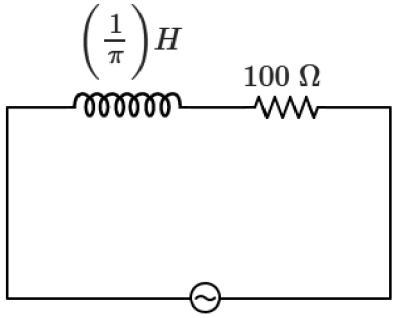
1. 200 J
2. zero
3. 400 J
4. 600 J

10 The equivalent capacitance of the arrangement shown in the figure is:



1. 30 μF
2. 15 μF
3. 25 μF
4. 20 μF

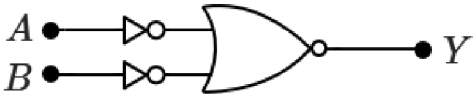
11 An AC source is connected to the given circuit. The value of ϕ will be:

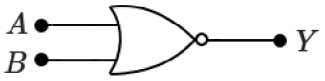
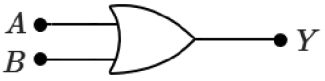


$V = 220 \sin(100\,\pi t + \phi)$ volt

1.	60°	2.	90°
3.	30°	4.	45°

12 The given circuit is equivalent to:



1.	
2.	
3.	
4.	

13 A particle moves with a velocity $(5\hat{i} - 3\hat{j} + 6\hat{k})$ ms^{-1} horizontally under the action of a constant force $(10\hat{i} + 10\hat{j} + 20\hat{k})$ N. The instantaneous power supplied to the particle is:

1.	200 W	2.	zero
3.	100 W	4.	140 W

14 A certain wire A has resistance 81 Ω. The resistance of another wire B of the same material and equal length but of diameter thrice the diameter of A will be:

1.	81 Ω	2.	9 Ω
3.	729 Ω	4.	243 Ω

15 ε_0 and μ_0 are the electric permittivity and magnetic permeability of free space respectively. If the corresponding quantities of a medium are $2\varepsilon_0$ and $1.5\mu_0$ respectively, the refractive index of the medium will nearly be:

1. $\sqrt{2}$
2. $\sqrt{3}$
3. 3
4. 2

16 The amount of elastic potential energy per unit volume (in SI unit) of a steel wire of length 100 cm to stretch it by 1 mm is:
(given: Young's modulus of the wire = $Y = 2.0 \times 10^{11}$ N/m^2)
1. 10^{11} J/m^3
2. 10^{17} J/m^3
3. 10^{7} J/m^3
4. 10^{5} J/m^3

17 The 4^{th} overtone of a closed organ pipe is the same as that of the 3^{rd} overtone of an open pipe. The ratio of the length of the closed pipe to the length of the open pipe is:

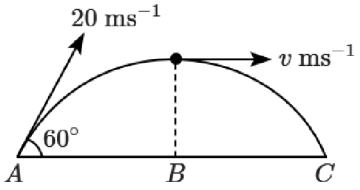
1.	8 : 9	2.	9 : 7
3.	9 : 8	4.	7 : 9

18 A long straight wire of length 2 m and mass 250 g is suspended horizontally in a uniform horizontal magnetic field of 0.7 T. The amount of current flowing through the wire will be:
($g = 9.8$ ms^{-2})
1. 2.45 A
2. 2.25 A
3. 2.75 A
4. 1.75 A

19 According to Gauss's law in electrostatics, the electric flux through a closed surface depends on:

1.	the area of the surface
2.	the quantity of charges enclosed by the surface
3.	the shape of the surface
4.	the volume enclosed by the surface

20 A ball is projected from point A with velocity 20 ms^{-1} at an angle 60° to the horizontal direction. At the highest point B of the path (as shown in figure), the velocity v (in ms^{-1}) of the ball will be:



1.	20	2.	$10\sqrt{3}$
3.	zero	4.	10

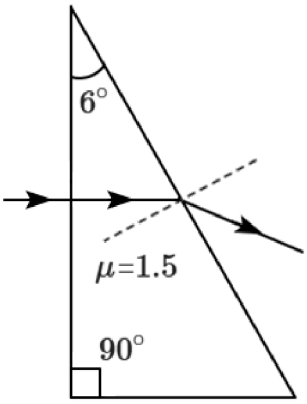
21 Which of the following statements is not true?

1.	The coefficient of viscosity is a scalar quantity.
2.	Surface tension is a scalar quantity.
3.	Pressure is a vector quantity.
4.	Relative density is a scalar quantity.

22 A uniform electric field and a uniform magnetic field are acting along the same direction in a certain region. If an electron is projected in the region such that its velocity is pointed along the direction of fields, then the electron:

1.	will turn towards right of direction of motion
2.	will turn towards left of direction of motion
3.	speed will decrease
4.	speed will increase

23 A horizontal ray of light is incident on the right-angled prism with prism angle 6°. If the refractive index of the material of the prism is 1.5, then the angle of emergence will be:



1. 9°
2. 10°
3. 4°
4. 6°

24 A p-type extrinsic semiconductor is obtained when Germanium is doped with:

1.	antimony	2.	phosphorous
3.	arsenic	4.	boron

25 If Z_1 and Z_2 are the impedances of the given circuits (a) and (b) as shown in the figures, then choose the correct option:

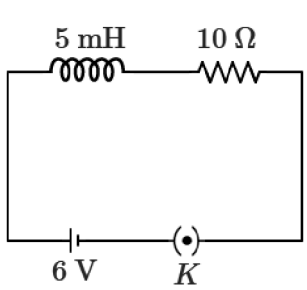


figure (a)

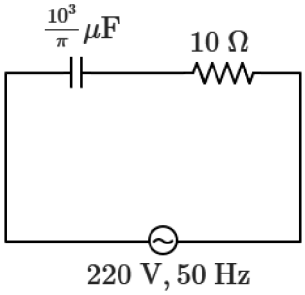


figure (b)

1.	$Z_1 < Z_2$	2.	$Z_1 + Z_2 = 20\ \Omega$
3.	$Z_1 = Z_2$	4.	$Z_1 > Z_2$

26 The wavelength of the Lyman series of hydrogen atom appears in:

1.	visible region
2.	far infrared region
3.	ultraviolet region
4.	infrared region

27 The de-Broglie wavelength associated with an electron, accelerated by a potential difference of 81 V is given by:

1. 13.6 nm
2. 136 nm
3. 1.36 nm
4. 0.136 nm

28 The maximum kinetic energy of the emitted photoelectrons in the photoelectric effect is independent of the:

1.	work function of material
2.	intensity of incident radiation
3.	frequency of incident radiation
4.	wavelength of incident radiation

29 Two particles A and B initially at rest, move toward each other under the mutual force of attraction. At an instance when the speed of A is v and speed of B is $3v$, the speed of the centre-of-mass will be:

1. $2v$
2. zero
3. v
4. $4v$

30 A charge $Q\ \mu$C is placed at the centre of a cube. The flux coming out from any one of its faces will be (in SI units):

1.	$\frac{Q}{\varepsilon_0} \times 10^{-6}$	2.	$\frac{2Q}{3\varepsilon_0} \times 10^{-3}$
3.	$\frac{Q}{6\varepsilon_0} \times 10^{-3}$	4.	$\frac{Q}{6\varepsilon_0} \times 10^{-6}$

31 The viscous drag acting on a metal sphere of diameter 1 mm, falling through a fluid of viscosity 0.8 Pa-s with a velocity of 2 m s^{-1} is nearly equal to:

1. 15×10^{-3} N
2. 30×10^{-3} N
3. 1.5×10^{-3} N
4. 20×10^{-3} N

32 If R is the radius of the earth and g is the acceleration due to gravity on the earth surface. Then the mean density of the earth will be:

1.	$\frac{\pi RG}{12g}$	2.	$\frac{3\pi R}{4gG}$
3.	$\frac{3g}{4\pi RG}$	4.	$\frac{4\pi G}{3gR}$

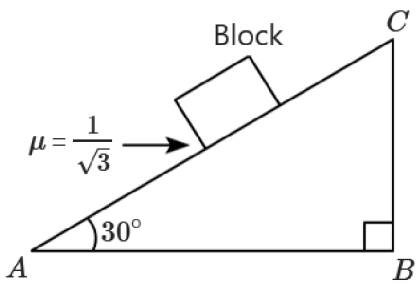
33 An object is mounted on a wall. Its image of equal size is to be obtained on a parallel wall with the help of a convex lens placed between these walls. The lens is kept at distance x in front of the second wall. The required focal length of the lens will be:

1.	less than $\frac{x}{4}$
2.	more than $\frac{x}{4}$ but less than $\frac{x}{2}$
3.	$\frac{x}{2}$
4.	$\frac{x}{4}$

34 If a conducting sphere of radius R is charged. Then the electric field at a distance $r(r > R)$ from the centre of the sphere would be, (V = potential on the surface of the sphere):

1.	$\frac{rV}{R^2}$	2.	$\frac{R^2V}{r^3}$
3.	$\frac{RV}{r^2}$	4.	$\frac{V}{r}$

35 A block of mass 2 kg is placed on inclined rough surface AC (as shown in the figure) of coefficient of friction μ. If $g = 10$ ms^{-1}, the net force (in N) on the block will be:



1. $10\sqrt{3}$
2. zero
3. 10
4. 20

36 A container of volume 200 cm^3 contains 0.2 mole of hydrogen gas and 0.3 mole of argon gas. The pressure of the system at temperature 200 K ($R = 8.3$ JK^{-1} mol^{-1}) will be:

1. 6.15×10^5 Pa
2. 6.15×10^4 Pa
3. 4.15×10^5 Pa
4. 4.15×10^6 Pa

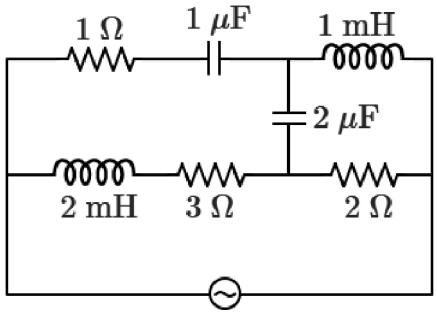
37 To produce an instantaneous displacement current of 2 mA in the space between the parallel plates of a capacitor of capacitance 4 μF, the rate of change of applied variable potential difference $\left(\frac{dV}{dt}\right)$ must be:

1. 800 V/s
2. 500 V/s
3. 200 V/s
4. 400 V/s

38 An emf is generated by an ac generator having 100 turn coil, of loop area 1 m^2. The coil rotates at a speed of one revolution per second and placed in a uniform magnetic field of 0.05 T perpendicular to the axis of rotation of the coil. The maximum value of emf is:

1. 3.14 V
2. 31.4 V
3. 62.8 V
4. 6.28 V

39 For very high frequencies, the effective impedance of the circuit (shown in the figure) will be:



1.	4 Ω	2.	6 Ω
3.	1 Ω	4.	3 Ω

40 A constant torque of 100 N-m turns a wheel of moment of inertia 300 kg-m^2 about an axis passing through its centre. Starting from rest, its angular velocity after 3 s is:

1. 1 rad/s
2. 5 rad/s
3. 10 rad/s
4. 15 rad/s

41 The emf of a cell having internal resistance 1 Ω is balanced against a length of 330 cm on a potentiometer wire. When an external resistance of 2 Ω is connected across the cell, the balancing length will be:

1.	220 cm	2.	330 cm
3.	115 cm	4.	332 cm

42 A 1 kg object strikes a wall with velocity 1 ms^{-1} at an angle of 60° with the wall and reflects at the same angle. If it remains in contact with the wall for 0.1 s, then the force exerted on the wall is:

1. $30\sqrt{3}$ N
2. zero
3. $10\sqrt{3}$ N
4. $20\sqrt{3}$ N

43 The angular momentum of an electron moving in an orbit of a hydrogen atom is $1.5\left(\frac{h}{\pi}\right)$. The energy in the same orbit is nearly:

1.	-1.5 eV	2.	-1.6 eV
3.	-1.3 eV	4.	-1.4 eV

44 A particle is executing uniform circular motion with velocity $\vec{v}$ and acceleration $\vec{a}$. Which of the following is true?

1.	$\vec{v}$ is a constant; $\vec{a}$ is not a constant.
2.	$\vec{v}$ is not a constant; $\vec{a}$ is not a constant.
3.	$\vec{v}$ is a constant; $\vec{a}$ is a constant.
4.	$\vec{v}$ is not a constant; $\vec{a}$ is a constant.

45 A simple pendulum oscillating in air has a period of $\sqrt{3}$ s. If it is completely immersed in non-viscous liquid, having density $\left(\frac{1}{4}\right)^{th}$ of the material of the bob, the new period will be:

1.	$2\sqrt{3}$ s	2.	$\frac{2}{\sqrt{3}}$ s
3.	2 s	4.	$\frac{\sqrt{3}}{2}$ s

CHEMISTRY

46 Incorrect set of quantum numbers from the following is :

1. n=4,l=3, m_l =-3, -2, -1, 0, +1, +2, +3, m_s=-1/2
2. n=5, l=2, m_l =-2, -1, +1, +2, m_s=+1/2
3. n=4, l=2, m_l = -2, -1, 0, +1, +2, m_s=-1/2
4. n=5,l=3, m_l =-3, -2, -1, 0, +1, +2, +3, m_s=+1/2

47

Assertion (A):	Ionization enthalpy increases along each series of transition elements from left to right. However, small variations occur.
Reason (R):	There is a corresponding increase in nuclear charge which accompanies the filling of electrons in the inner d-orbitals.

1.	**(A)** is correct but **(R)** is not correct
2.	**(A)** is not correct but **(R)** is correct
3.	Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**
4.	Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**

48 Given below are two statements:

Statement I :	Propene on treatment with diborane gives an addition product with the formula $(CH_3)_2 - CH)_3 - B$
Statement II :	Oxidation of $(CH_3)_2 - CH)_3 - B$ with hydrogen peroxide in presence of $NaOH$ gives propan-2-ol.

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

49 Which one of the following molecules is paramagnetic?
1. H_2
2. Li_2
3. C_2
4. O_2

50 For a weak acid HA, the percentage of dissociation is nearly 1% at equilibrium. If the concentration of acid is 0.1 mol L^{-1}, then the correct option for its K_a at the same temperature will be:

1.	1×10^{-4}
2.	1×10^{-6}
3.	1×10^{-5}
4.	1×10^{-3}

51 A 1 M solution of a compound 'X' has a density of 1.25 g/mL. If the molar mass of compound X is 85 g, what is the molality (m) of the solution?

1.	0.705 m	2.	1.208 m
3.	1.165 m	4.	0.858 m

52 Consider the given reaction:

$CH_3COCH_3 \xrightarrow{\text{dil. } Ba(OH)_2}$ " X "

The functional groups present in the compound "X" are:
1. Ketone and double bond
2. Double bond and aldehyde
3. Alcohol and aldehyde
4. Alcohol and ketone

53 The $E^{\ominus}$ values for

$Al^{+}/Al = +0.55$ V and $Tl^{+}/Tl = -0.34$ V

$Al^{3+}/Al = -1.66$ V and $Tl^{3+}/Tl = +1.26$ V

The incorrect statement among the following is:
1. Al is more electropositive than TI.
2. Tl^{3+} is a good reducing agent than Tl^{1+}.
3. Al^{+} is unstable in solution.
4. Tl can be easily oxidized to Tl^{+} as compared to Tl^{3+}.

54 The correct order of dipole moments for molecules NH_3, H_2S, CH_4 and HF is :

1.	$CH_4 > H_2S > NH_3 > HF$
2.	$H_2S > NH_3 > HF > CH_4$
3.	$NH_3 > HF > CH_4 > H_2\ S$
4.	$HF > NH_3 > H_2S > CH_4$

55 Molar mass of a compound (X) whose 2.6 mol weighs 312 g is:
1. 312 g mol^{-1}
2. 120 g mol^{-1}
3. 60 g mol^{-1}
4. 811.2 g mol^{-1}

56 The molar conductance of an electrolyte increases with dilution according to the equation:

$\Lambda_m = \Lambda_m^{\circ} - A\sqrt{c}$

Consider the following four statements:

A:	This equation applies to both strong and weak electrolytes.
B:	The value of the constant A depends upon the nature of the solvent.
C:	The value of constant A is the same for both $BaCl_2$ and $MgSO_4$
D:	The value of constant A is the same for both $BaCl_2$ and $Mg(OH)_2$

Which of the above statements are correct?

1.	**(A)** and **(B)** only	2.	**(A)**, **(B)**, and **(C)** only
3.	**(B)** and **(C)** only	4.	**(B)** and **(D)** only

57 Cheilosis occurs due to the deficiency of:

1.	Thiamine	2.	Nicotinamide
3.	Pyridoxamine	4.	Riboflavin

58 The correct value of cell potential in volts for the reaction that occurs when the following two half cells are connected, is:

$Fe^{2+}_{(aq)} + 2e^- \rightarrow Fe(s), E^\circ = -0.44\ V$

$Cr_2O^{2-}_{7\ (aq)} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O,$

$E^\circ = +1.33\ V$

1. +1.77 V
2. +2.65 V
3. +0.01 V
4. +0.89 V

59 Consider the following reactions:

$$R - COOH \xrightarrow[(ii)\ H_2O/HCl]{(i)\ X} R - CH_2OH$$

$$R - CH = CH_2 \xrightarrow[(ii)\ H_2O,NaOH,H_2O_2]{(i)\ X} R - CH_2 - CH_2 - OH$$

Identify 'X' in above reactions:

1.	B_2H_6	2.	$LiAlH_4$
3.	$NaBH_4$	4.	H_2/Pd

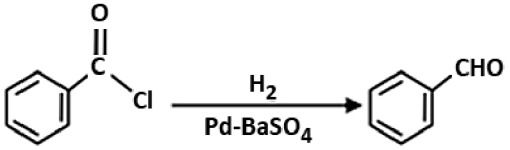
60 For a reaction $3A \rightarrow 2B$

The average rate of appearance of B is given by $\frac{\Delta[B]}{\Delta t}$.

The correct relation between the average rate of appearance of B with the average rate of disappearance of A is:

1.	$\frac{-\Delta[A]}{\Delta t}$	2.	$\frac{-3\Delta[A]}{2\Delta t}$
3.	$\frac{-2\Delta[A]}{3\Delta t}$	4.	$\frac{\Delta[A]}{\Delta t}$

61 Mark the name of the reaction associated with the following conversion



1. Stephen reaction
2. Gattermann-Koch reaction
3. Etard reaction
4. Rosenmund reaction

62 Which one of the following represents all isoelectronic species?

1. Na^+, Cl^-, O^-, NO^+
2. N_2O, N_2O_4, NO^+, NO
3. Na^+, Mg^{2+}, O^-, F^-
4. Ca^{2+}, Ar, K^+, Cl^-

63 Match List-I with List-II

	List-I (Element)		**List-II (Most Common oxidation state/s)**
A.	Fe	I.	+2, +7
B.	V	II.	+3, +2
C.	Mn	III.	+4
D.	Ti	IV.	+5

Choose the correct answer from the options given below:

1.	A-II, B-IV, C-I, D-III	2.	A-IV, B-II, C-I, D-III
3.	A-II, B-I, C-IV, D-III	4.	A-I, B-IV, C-II, D-III

64 Given below are two statements:

Statement I:	The value of wave function, Ψ depends upon the coordinates of the electron in the atom.
Statement II:	The probability of finding an electron at a point within an atom is proportional to the orbital wave function.

In light of the above statements, choose the correct answer from the options given below:

1.	**Statement I** is True but **Statement II** is False.
2.	**Statement I** is False but **Statement II** is True.
3.	Both **Statement I** and **Statement II** are True.
4.	Both **Statement I** and **Statement II** are False.

65 Match the reagents in **List-I** with the corresponding reactions in **List-II**:

	List-I (Reagent)		**List-II (Name of the reaction)**
A.	$H_2, Pd - BaSO_4$	I.	Gattermann-Koch reaction
B.	(i) CrO_2Cl_2, CS_2 (ii)H_2C	II.	Reimer-Tiemann reaction
C.	CO, HCl, Anhyd. $AlCl_3/CuCl$	III.	Etard reaction
D.	$CHCl_3, NaOH$	IV.	Rosenmund reduction

Choose the correct answer from the options given below:

1. A-II, B-III, C-I, D-IV
2. A-IV, B-III, C-I, D-II
3. A-I, B-III, C-IV, D-II
4. A-II, B-I, C-III, D-IV

66 Which of the following pair is correctly matched?

1. Basic oxides - In_2O_3, K_2O, SnO_2
2. Neutral oxides - CO, NO_2, N_2O
3. Acidic oxides - Mn_2O_7, SO_2, TeO_3
4. Amphoteric oxides -BeO, Ga_2O_3, GeO

67 Match List -I with List-II

	List-I (Mixtures/Sample)		**List-II (Technique used for purification)**
A	Glycerol from spent lye	(I)	Steam distillation
B	Chloroform + Aniline	(II)	Fractional distillation
C	Fractions of crude oil	(III)	Distillation under reduced pressure
D	Aniline+water	(IV)	Distillation

Choose the correct answer from the options given below

Options:	**(A)**	**(B)**	**(C)**	**(D)**
1.	III	IV	II	I
2.	IV	II	I	III
3.	I	II	III	IV
4.	I	III	II	IV

68 A reaction among the following can generate isonitriles as a major product.

A. $R - X + HCN \rightarrow$

B. $R - X + AgCN \rightarrow$

C. $R - X + KCN \rightarrow$

D. $R - X + NaCN \xrightarrow[C_2H_5OH]{H_2O}$

Choose the most appropriate answer from the options given below:

1.	(D) only	2.	(C) and (D) only
3.	(B) only	4.	(A) and (B) only

69 Which one of the following statements is incorrect related to Molecular Orbital Theory?

1.	The π^* antibonding molecular orbital has a node between the nuclei.
2.	In the formation of a bonding molecular orbital, the two electron waves of the bonding atoms reinforce each other.
3.	Molecular orbitals obtained from $2P_x$ and $2P_y$ orbitals are symmetrical around the bond axis.
4.	A $\pi-$bonding molecular orbital has larger electron density above and below the internuclear axis.

70 Which combination of the following substances will result in the formation of an acidic buffer when mixed?

1.	Weak acid and it's salt with a strong base.
2.	Equal volumes of equimolar solutions of weak acid and weak base.
3.	Strong acid and its salt with a strong base.
4.	Strong acid and its salt with a weak base. (The pK_a of acid = pK_b of the base)

71 Match List-I with List-II:

	List-I (Process/Property)		**List-II (Characteristic)**
A.	Adiabatic process	I.	Independent of amount of substance
B.	Reversible process	II.	Both way process reactant to product and vice-versa
C.	Intensive property	III.	No transfer of heat between system and surrounding
D.	Extensive property	IV.	Dependent on amount of substance

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

72 Reagents that can be used to convert alcohols to carboxylic acids are:
(A) CrO_3 - H_2SO_4
(B) $K_2Cr_2O_7 + H_2SO_4$
(C) $KMnO_4 + KOH/H_3O^+$
(D) Cu, 573 K
(E) CrO_{3+} $(CH_3CO)_2O$
Choose the most appropriate answer from the options given below:
1. (B), (C) and (D) only
2. (B), (D) and (E) only
3. (A), (B) and (C) only
4. (A), (B) and (E) only

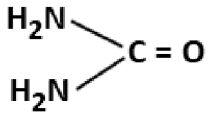
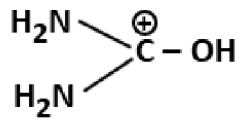
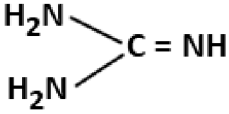
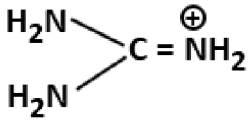
73 Select the element (M) whose trihalides cannot be hydrolysed to form $[M(H_2O)_6]^{3+}$.

1.	Ga	2.	In
3.	Al	4.	B

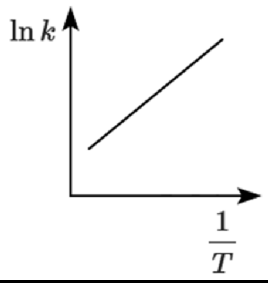
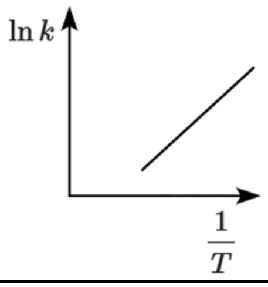
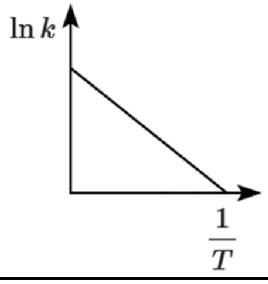
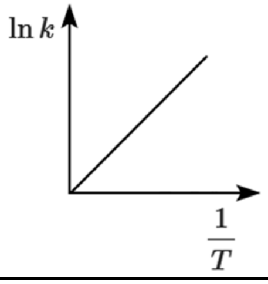
74 The correct options for the rate law that corresponds to overall first order reaction is:

1.	$Rate = k[A]^0[B]^2$	2.	$Rate = k[A][B]$
3.	$Rate = k[A]^{1/2}[B]^2$	4.	$Rate = k[A]^{-1/2}[B]^{3/2}$

75 The least basic compounds/species among the following is:

1.		2.	
3.		4.	

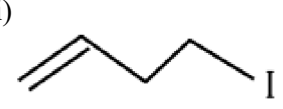
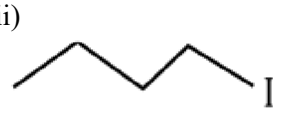
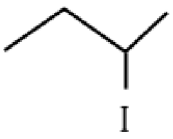
76 Which of the following plot represents the variation of $ln\ k$ versus $\frac{1}{T}$ in according with the Arrhenius equation?

1.		2.	
3.		4.	

77 Which of the following sets represents a complex and a double salt, respectively?
1. $CuSO_4.5H_2O$ and $CuCl_2,4NH_3$
2. $PtCl_2.2NH_3$ and $PtCl_4.2HCl$
3. $K_2PtCl_2.2NH_3$ and $KAl(SO_4)_2.12H_2O$
4. $NiCl_2.6H_2O$ and $NiCl_2(H_2O)_4$

78 Which amongst the following compounds will show geometrical isomerism?
1. Pent-1-ene
2. 2,3-Dimethylbut-2-ene
3. 2-Methylprop-1-ene
4. 3,4-Dimethylhex-3-ene

79 The correct order for the rate of α , β-dehydrohalogenation for the following compounds is:

(i) 	(ii) 
(iii) 	

1.	(i) < (ii) < (iii)	2.	(ii) < (i) < (iii)
3.	(iii) < (ii) < (i)	4.	(ii) < (iii) < (i)

80 Type of isomerism exhibited by compounds $[Cr(H_2O)_6Cl_3]$, $[Cr(H_2O)_5Cl]Cl_2.H_2O$, $[Cr(H_2O)_4Cl_2]Cl.2H_2O$ and the value of coordination number (CN) of central metal ion in all these compounds, respectively is:

1. Geometrical isomerism, CN = 2
2. Optical isomerism, CN = 4
3. Ionisation isomerism, CN = 4
4. Solvate isomerism, CN = 6

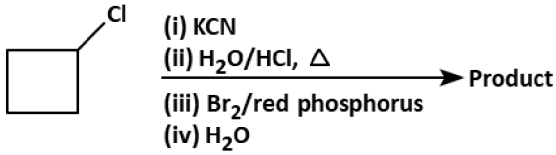
81 The correct sequence given below contains neutral, acidic, basic, and amphoteric oxide each, respectively is:

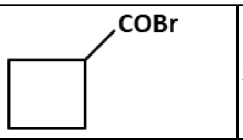
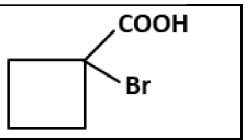
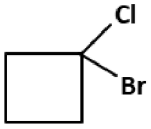
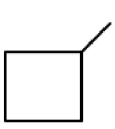
1.	NO, ZnO, CO_2, CaO	2.	ZnO, NO, CaO, CO_2
3.	NO, CO_2, ZnO, CaO	4.	NO, CO_2, CaO, ZnO

82 Choose the correct sequence of reagents in the conversion of 4-nitrotoluene to 2-bromotoluene.

1. $NaNO_2$/HCl; Sn/HCl; Br_2; H_2O/H_3PO_2
2. Sn/HCl ; $NaNO_2$/HCl; Br_2;H_2O/H_3PO_2
3. Br_2;Sn/HCl;$NaNO_2$/HCl;H_2O/H_3PO_2
4. Sn/HCl;Br_2;$NaNO_2$/HCl;H_2O/H_3PO_2

83 Identify the product in the following reaction:



1. 		2. 	
3. 		4. 	

84 Given below are two statements:

Statement I:	In an organic compound, when inductive and electromeric effects operate in opposite directions, the inductive effect predominates.
Statement II:	Hyperconjugation is observed in o-xylene.

In the light of the above statements, choose the correct answer from the options given below:

1. **Statement I** is true but **Statement II** is false.
2. **Statement I** is false but **Statement II** is true
3. Both **Statement I** and **Statement II** are true.
4. Both **Statement I** and **Statement II** are false.

85 The molar conductance of a solution, given its conductivity (0.248 S m^{-1}) and concentration (0.2 mol m^{-3}) is:

1. 0.124 S cm^2 mol^{-1}
2. 1.24 S m^2 mol^{-1}
3. 124 S cm^2 mol^{-1}
4. 124 S m^2 mol^{-1}

86 Given below are two statements:

Assertion (A):	Ionisation enthalpies of early actinoids are lower than for early lanthanoids.
Reason (R):	Electrons are entering 5f orbitals in actinoids which experience greater shielding from nuclear charge.

1.	Both **(A)** and **(R)** are True and **(R)** is the correct explanation of **(A)**.
2.	Both **(A)** and **(R)** are True but **(R)** is not the correct explanation of **(A)**.
3.	**(A)** is True but **(R)** is False.
4.	**(A)** is False but **(R)** is True.

87 Consider the following reaction:

$2H_2(g) + O_2(g) \rightarrow 2H_2O(g) \Delta_r H^\circ = -483.64 kJ.$

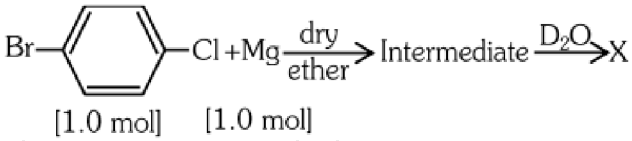
What is the enthalpy change for the decomposition of one mole of water?

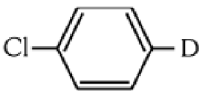
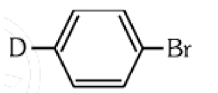
1.	120.9 kJ	2.	241.82 kJ
3.	18 kJ	4.	100 kJ

88 Which of the following aqueous solutions of electrolytes will exhibit the least elevation in boiling point?

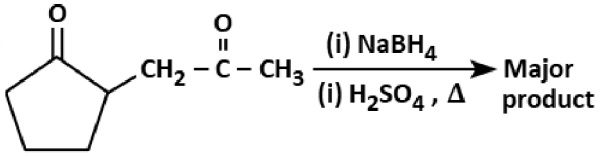
1.	0.05 M NaCl	2.	0.1 M KCl
3.	0.1 M $MgSO_4$	4.	1 M NaCl

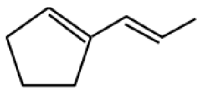
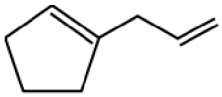
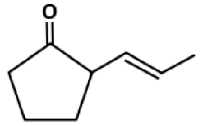
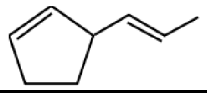
89 Identify 'X' in the following reaction.



1.		2.	
3.		4.	

90 The major product formed in the following conversion is:



1.	
2.	
3.	
4.	

BIOLOGY

91 Match List - I with List - II

	List-I		**List-II**
(A)	Protein	(I)	C=C double bonds
(B)	Unsaturated fatty acid	(II)	Phosphodiester bond
(C)	Nucleic acid	(III)	Glycosidic bonds
(D)	Polysaccharide	(IV)	Peptide bonds

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	II	I	IV	III
2.	IV	III	I	II
3.	IV	I	II	III
4.	I	IV	III	II

92 Why do ecosystems require a constant supply of energy?

1.	To support the cycling of matter through biotic and abiotic components.
2.	To counteract the tendency toward increasing disorder, in line with the Second Law of Thermodynamics.
3.	To ensure continuous reproduction of species within the ecosystem.
4.	To stabilize the populations of consumers at each trophic level.

93 In *Calotropis*, aestivation is:

1.	Valvate	2.	Vexillary
3.	Imbricate	4.	Twisted

94 Match List - I with List - II

	List - I		**List - II**
(A)	Chlorophyll a	(I)	Yellow to yellow orange
(B)	Chlorophyll b	(II)	Yellow green
(C)	Xanthophyll	(III)	Blue green
(D)	Carotenoids	(IV)	Yellow

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	III	II	IV	I
2.	III	I	IV	II
3.	II	III	I	IV
4.	IV	III	II	I

95 Match List - I with List - II

	List - I		**List - II**
	(Type of cross)		(Phenotypic ratio)
(A)	Monohybrid cross	(I)	1:1
(B)	Dihybrid cross	(II)	1:2:1
(C)	Incomplete dominance	(III)	3:1
(D)	Test cross	(IV)	9:3:3:1

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	III	IV	II	I
2.	II	IV	III	I
3.	II	III	IV	I
4.	IV	III	I	II

96 How many times decarboxylation occurs during each TCA cycle?

1.	Thrice	2.	Many
3.	Once	4.	Twice

97 The dissolution of synaptonemal complex occurs during:

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

98 Doubling of the number of chromosomes can be achieved by disrupting mitotic cell division soon after:

1.	Anaphase	2.	Telophase
3.	Prophase	4.	Metaphase

99 Given below are two statements :

Statement I:	RuBisCO is the most abundant enzyme in the world.
Statement II:	Photorespiration does not occur in C_4 plants.

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

100 In 'rivet popper hypothesis', Paul Ehrlich compared the rivets in an airplane to

1.	species within a genus	2.	genetic diversity
3.	ecosystem	4.	genera within a family

101 In a pea flower, five petals are arranged in a specialized manner with one posterior, two lateral and two anterior. These are named as_____, _____ and _____ respectively.
1. Keel, Wings and standard
2. Vexillum, Keel and standard
3. Keel, Standard and Carina
4. Standard, Wings and Keel

102 In which of the following sets of families, the pollen grain are viable for months?
1. Solanaceae, Poaceae and Liliaceae
2. Brassicaceae, Liliaceae and Poaceae
3. Rosaceae, Liliaceae and Poaceae
4. Leguminosae, Solanaceae and Rosaceae

103 Transfer of pollen grains from anther to stigma of another flower of same plant is known as:

1.	Geitonogamy	2.	Xenogamy
3.	Autogamy	4.	Cleistogamy

104 The phenomenon which is influenced by auxin and also played a major role in its discovery is:

1.	Phototropism	2.	Root initiation
3.	Gravitropism	4.	Apical Dominance

105 The transverse section of plant part showed polyarch, radial and exarch xylem, with endodermis and pericycle. The plant part is identified as:

1.	Monocot root	2.	Dicot root
3.	Dicot stem	4.	Monocot stem

106 The last chromosome sequenced in Human Genome project was:

1.	Chromosome 6	2.	Chromosome 1
3.	Chromosome 22	4.	Chromosome 14

107 The rate of decomposition is faster in detritus that is rich in:
1. Lignin and chitin
2. Cellulose and starch
3. Phosphates and proteins
4. Sugars and nitrogen

108 Plants offer rewards to animals in the form of pollen and nectar and the animals facilitate the pollination process. This is an example of:

1.	Amensalism	2.	Competition
3.	Commensalism	4.	Mutualism

109 The species of plants that plays a vital role in controlling the relative abundance of other species in a community is called _____.
1. alien species
2. endemic species
3. exotic species
4. keystone species

110 Match List - I with List - II

	List-I		**List-II**
(A)	Pteropsida	(I)	*Psilotum*
(B)	Lycopsida	(II)	*Equisetum*
(C)	Psilopsida	(III)	*Adiantum*
(D)	Sphenopsida	(IV)	*Selaginella*

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	II	III	I	IV
2.	III	I	IV	II
3.	II	III	IV	I
4.	III	IV	I	II

111 Inulin is a polymer of:

1.	Fructose	2.	Galactose
3.	Amino Acids	4.	Glucose

112 Thermostable DNA polymerase used in PCR was isolated from:
1. *Thermus aquaticus*
2. *Escherichia coli*
3. *Agrobacterium tumefaciens*
4. *Bacillus thuringiensis*

113 Name the component that binds to the operator region of an operon and prevents RNA polymerase from transcribing the operon.

1.	Promotor	2.	Regulator protein
3.	Repressor protein	4.	Inducer

114 A heterozygous pea plant with violet flowers was crossed with a homozygous pea plant with white flowers. Violet is dominant over white. Which one of the following represents the expected combinations among 40 progenies formed?
1. 30 produced violet and 10 produced white flowers
2. 20 produced violet and 20 produced white flowers.
3. All 40 produced violet flowers
4. All 40 produced white flowers

115 Fatty acids are connected with the respiratory pathway through:
1. Acetyl CoA
2. α - Ketoglutaric acid
3. Dihydroxy acetone phosphate
4. Pyruvic acid

116 Ligation of foreign DNA at which of the following site will result in loss of tetracycline resistance of pBR322?

1.	PsT I	2.	Pvu I
3.	*EcoR I*	4.	*BamH I*

117 Match List - I with List - II

	List - I		**List - II**
(A)	Auxin	(I)	Promotes female flower formation in cucumber
(B)	Gibberellin	(II)	Overcoming apical dominance
(C)	Cytokinin	(III)	Increase in the length of grape stalks
(D)	Ethylene	(IV)	Promotes flowering in pineapple

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	II	I	IV	III
2.	IV	III	II	I
3.	I	III	IV	II
4.	III	II	I	IV

118 Which classes of algae possess pigment fucoxanthin and pigment phycoerythrin, respectively?
1. Phaeophyceae and Chlorophyceae
2. Phaeophyceae and Rhodophyceae
3. Chlorophyceae and Rhodophyceae
4. Rhodophyceae and Phaeophyceae

119 In which disorder, change of single base pair in the gene for beta globin chain results in change of glutamic acid to valine?

1.	Thalassemia	2.	Sickle cell anemia
3.	Haemophilia	4.	Phenylketonuria

120 For chemical defense against herbivores, *Calotropis* has

1.	Cardiac glycosides	2.	strychnine
3.	toxic ricin	4.	distasteful quinine

121 Consider the following tissues in the stellar region of a stem showing secondary growth.
(A) Primary xylem
(B) Secondary xylem
(C) Primary phloem
(D) Secondary phloem
Arrange these in the correct sequence of their position from pith towards cortex.

1.	(A), (B), (D), (C)	2.	(B), (A), (C), (D)
3.	(A), (B), (C), (D)	4.	(B), (A), (D), (C)

122 Which out of the following statements is incorrect?

1.	Grana lamellae have both PS I and PS II
2.	Cyclic photophosphorylation involved both PS I and PS II
3.	Both ATP and NADPH + H^+ are synthesised during non-cyclic photophosphorylation
4.	Stroma lamellae lack PS II and NAP reductase

123 In angiosperms, the correct sequence of events leading to the formation of female gametophyte in the ovule is:

A.	3 successive free nuclear divisions in functional megaspore.
B.	Degeneration of 3 megaspores
C.	Meiotic division in megaspore mother cell
D.	Migration of 3 nuclei towards each pole.
E.	Formation of a wall resulting in seven celled embryosac.

Choose the correct answer from the options given below:

1.	(A), (B), (C), (D), (E)	2.	(C), (E), (A), (D), (B)
3.	(B), (C), (A), (D), (E)	4.	(C), (B), (A), (D), (E)

124 Consider the two statements:

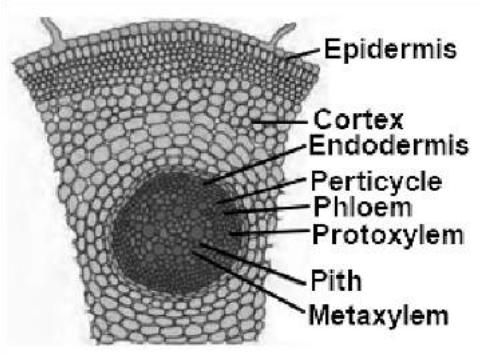
I:	All pteridophytes are heterosporous
II:	All gymnosperms are homosporous

1. Only **I**
2. Only **II**
3. Both **I** and **II** are correct
4. Both **I** and **II** are incorrect

125 Which of the following statement is incorrect above *Agrobacterium tumefaciens* ?

1.	It is used to deliver gene of interest in both prokaryotic as well as eukaryotic host cells.
2.	'Ti' plasmid from *Agrobacterium tumefaciens* used for gene transfer is not pathogenic to plant cells.
3.	It transforms normal plant cells into tumor cells
4.	It delivers 'T-DNA' into plant cell

126 The given figure shows the transverse section of:



1. Dicot root
2. Monocot root
3. Dicot stem
4. Monocot stem

127 Match **List-I** with **List-II**

	List-I		**List-II**
(A)	Kanamycin	(I)	Delivers genes into animal cells
(B)	ClaI	(II)	Selectable marker
(C)	Disarmed retroviruses	(III)	Restriction site
(D)	Kanamycin ^{R}gene	(IV)	Antibiotic resistance

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	(II)	(III)	(I)	(IV)
2.	(III)	(I)	(IV)	(II)
3.	(IV)	(III)	(I)	(II)
4.	(II)	(IV)	(I)	(III)

128 Given below are two statements:

I:	The process of copying genetic information from one strand of the DNA into RNA is termed as transcription
II:	A transcription unit in DNA is defined primarily by the three regions in the DNA i.e. a promoter, the structural gene and a terminator.

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

129 Which scientist conducted an experiment with ^{32}p and ^{35}s labelled phages for demonstrating that DNA is the genetic material?
1. James D. Watson and F.H.C Crick
2. A.D. Hershey and M.J. Chase
3. F. Griffith
4. O.T. Avery, C.M. MacLeod and M. McCarty

130 A certain plant homozygous for yellow seeds and red flowers was crossed with a plant homozygous for green seeds and white flowers. The F_1 plants had yellow seeds and pink flowers. The F_1 plants were selfed to get F_2 progeny. Assuming independent assortment of the two characters, how many phenotypic categories are expected for these characters in the F_2 generation?

1.	9	2.	16
3.	4	4.	6

131 During which stages of mitosis and meiosis, respectively, does the centromere of each chromosome split?

1.	Metaphase, Metaphase II	2.	Prophase, Telophase I
3.	Telophase, Anaphase I	4.	Anaphase, Anaphase II

132 Which of the following statements is not correct?

1.	Phase of cell elongation of plant cells is characterized by increased vacuolation.
2.	Cells in the meristematic phase of growth exhibit abundant plasmodesmatal connections
3.	Plant growth is generally determinate
4.	Plant growth is measurable

133 Match List - I with List - II

	Type of flower		**Example**
(A)	Zygomorphic	(I)	Mustard
(B)	Hypogynous	(II)	Plum
(C)	Perigynous	(III)	*Cassia*
(D)	Epigynous	(IV)	Cucumber

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	I	II	IV	III
2.	I	II	III	IV
3.	IV	I	III	II
4.	III	I	II	IV

134 Which of the following sexually transmitted infections are completely curable?
1. HIV infection and Trichomoniasis
2. Syphilis and Trichomoniasis
3. Hepatitis-B and Genital herpes
4. Genital Herpes and Genital warts

135 Match List - I with List - II

	List-I		**List-II**
(A)	Typhoid	(I)	Protozoan
(B)	Elephantiasis	(II)	*Salmonella*
(C)	Ringworm	(III)	Aschelminthes
(D)	Malaria	(IV)	*Microsporum*

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	(I)	(IV)	(III)	(II)
2.	(I)	(III)	(IV)	(II)
3.	(II)	(III)	(IV)	(I)
4.	(II)	(IV)	(III)	(I)

136 Which of the following is not a secondary metabolite?

1.	Curcumin	2.	Morphine
3.	Anthocyanin	4.	Lecithin

137 Arrange the sequence of different hormones for their role during gametogenesis:

A.	Gonadotropin LH stimulates synthesis and secretion of Androgen
B.	Gonadotropin releasing hormone from hypothalamus
C.	Androgen stimulates spermatogenesis
D.	Gonadotropin FSH helps in the process of spermiogenesis
E.	Gonadotropins from anterior pituitary gland

Choose the correct answer from the options given below:

1.	(E), (A), (D), (B), (C)	2.	(C), (A), (D), (E), (B)
3.	(B), (E), (A), (C), (D)	4.	(D), (B), (A), (C), (E)

138 House fly belongs to _____ family.

1.	Cyprinidae	2.	Hominidae
3.	Calliphoridae	4.	Muscidae

139 Select incorrect statement, regarding chemical structure of insulin:

1.	Mature insulin molecule consists of three polypeptide chains - A, B and C.
2.	Insulin is synthesized as prohormone which contains extra stretch of C-peptide.
3.	C-peptide is not present in mature insulin molecule.
4.	Polypeptide chains A and B are linked to disulphide bridges.

140 Which one of the following is the quiescent stage of cell cycle?

1.	M	2.	G_2
3.	G_1	4.	G_0

141 Given below are two statements:

Statement I:	RNA being unstable, it mutates at a faster rate
Statement II:	RNA can directly code for synthesis of proteins hence can easily express the characters.

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

142 Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R)

Assertion (A):	Ascending limb of the loop of Henle is impermeable to water and allows transport of electrolytes actively or passively.
Reason (R):	Dilution of filtrate takes place due to efflux of electrolytes in the medullary fluid

In light of the above statements, choose the correct answer from the options given below:

1.	**(A)** is True, **(R)** is False
2.	**(A)** is False, **(R)** is True
3.	Both **(A)** and **(R)** are True and **(R)** is the correct explanation of **(A)**
4.	Both **(A)** and **(R)** are True but **(R)** is not the correct explanation of **(A)**

143 The Cockroach is:

1. Ammonotelic only
2. Uricotelic only
3. Ureotelic only
4. Ureotelic and Uricotelic

144 Which of the following statements are correct with respect to the hormone and its function?

A:	Thyrocalcitonin (TCT) regulates the blood calcium level
B:	In males, FSH and androgens regulate spermatogenesis
C:	Hyperthyroidism can lead to goitre
D:	Glucocorticoids are secreted in Adrenal Medulla
E:	Parathyroid hormone is regulated by circulated levels of sodium ions

Choose the most appropriate answer from the options given below:

1.	**(C)** and **(E)** only	2.	**(A)** and **(B)** only
3.	**(B)** and **(C)** only	4.	**(A)** and **(D)** only

145 Select the sequence of steps in respiration.

(A)	Diffusion of gases (O_2 and CO_2) across alveolar membrane.
(B)	Diffusion of O_2 and CO_2 between blood and tissues
(C)	Transport of gases by the blood
(D)	Pulmonary ventilation by which atmospheric air is drawn in and CO_2 rich alveolar air is released out.
(E)	Utilisation of O_2 by the cells for catabolic reactions and resultant release of CO_2

Choose the correct answer from the options given below:

1.	(D), (A), (C), (B), (E)	2.	(C), (B), (A), (E), (D)
3.	(B), (C), (E), (D), (A)	4.	(A), (C), (B), (E), (D)

146 Which of the following is/are cause(s) of biodiversity losses?

1. Over-exploitation, habitat loss and fragmentation
2. Climate change only
3. Over-exploitation only
4. Habitat loss and fragmentation only

147 Match List - I with List - II

	List-I		**List-II**
(A)	Contractile vacuole	(I)	*Asterias*
(B)	Water vascular system	(II)	*Amoeba*
(C)	Canal system	(III)	*Spongilla*
(D)	Flame cells	(IV)	*Taenia*

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	(IV)	(II)	(I)	(III)
2.	(I)	(III)	(II)	(IV)
3.	(III)	(II)	(I)	(IV)
4.	(II)	(I)	(III)	(IV)

148 Match List - I with List - II

	List-I		**List-II**
(A)	Palm bones	(I)	Phalanges
(B)	Wrist bones	(II)	Metacarpals
(C)	Ankle bones	(III)	Carpals
(D)	Digit bones	(IV)	Tarsals

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	II	III	I	IV
2.	IV	I	II	III
3.	III	IV	I	II
4.	II	III	IV	I

149 Match List - I with List - II

	List-I		**List-II**
(A)	Non-medicated IUDs	(I)	Multiload 375
(B)	Copper releasing IUDs	(II)	Rubber barrier
(C)	Hormone releasing IUDs	(III)	Lippes loop
(D)	Vaults	(IV)	LNG-20

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	(IV)	(III)	(I)	(II)
2.	(II)	(IV)	(III)	(I)
3.	(III)	(I)	(IV)	(II)
4.	(III)	(IV)	(II)	(I)

150 Which of the following can act as molecular scissors?
1. Restriction enzymes
2. DNA ligase
3. RNA polymerase
4. DNA polymerase

151 Select the correct statements about sickle cell anemia:

A:	There is a change in the gene for beta-globin
B:	In beta-globin, there is a valine in place of Lysine
C:	It is an example of point mutation
D:	In the normal gene, U is replaced by A

Choose the correct answer from the options given below:

1.	**(B)**, **(C)** and **(D)** only	2.	**(B)** and **(D)** only
3.	**(A)**, **(B)** and **(D)** only	4.	**(A)** and **(C)** only

152 Given below are two statements:

I:	Intra Cytoplasmic sperm injection (ICSI) is another specialized procedure of *in-vivo* fertilization.
II:	Infertility cases due to the inability of the male partner to inseminate the female can be corrected by artificial insemination (AI)

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

153 Match List - I with List - II

	List-I (ECG)		**List-II (Electrical activity of heart)**
(A)	P-wave	(I)	Depolarisation of ventricles
(B)	QRS complex	(II)	End of systole
(C)	T wave	(III)	Depolarisation of atria
(D)	End of T wave	(IV)	Repolarisation of ventricles

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	IV	I	III	II
2.	I	IV	III	II
3.	IV	III	I	II
4.	III	I	IV	II

154 Match List - I with List - II

	List-I		**List-II**
(A)	Eosinophils	(I)	6-8%
(B)	Lymphocytes	(II)	2-3%
(C)	Neutrophils	(III)	20-25%
(D)	Monocytes	(IV)	60-65%

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	IV	I	II	III
2.	IV	I	III	II
3.	II	III	IV	I
4.	II	III	I	IV

155 Given below are two statements:

I:	Goblet cells are unicellular glands
II:	Earwax is the secretion of exocrine gland

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

156 Given below are two statements regarding oogenesis.

I:	The primary follicles get surrounded by more layers of granulosa cells, a theca and shows fluid filled cavity antrum. Now it is called secondary follicle.
II:	Graafian follicle ruptures to release the secondary oocyte from the ovary by the process called ovulation.

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

157 There are 250 snails in a pond and within a year their number increases to 2500 by reproduction. What should be their birth rate (in per snail per year)?
1. 10
2. 9
3. 25
4. 15

158 The part of the neuron that typically conducts nerve impulses away from the cell body towards other neurons, muscles, or glands is the:

1.	Dendrite	2.	Soma
3.	Axon	4.	Synapse

159 Which one of the following acts as an inducer for lac operon?

1.	Sucrose	2.	Lactose
3.	Glucose	4.	Galactose

160 Diacetyl morphine is also called as:

1.	Amphetamine	2.	Barbiturate
3.	Crack	4.	Smack

161 'X' and 'Y' are the components of Binomial nomenclature. This naming system was proposed by 'Z':

1.	X - Generic name, Y - Specific epithet, Z - Carolus Linnaeus
2.	X - Specific epithet, Y - Generic name, Z - R.H. Whittaker
3.	X - Specific epithet, Y - Generic name, Z - Carolus Linnaeus
4.	X - Generic name, Y - Specific epithet, Z - R.H. Whittaker

162 Which of the following statements are correct?

A:	Reproductive health refers to total well-being in all aspects of reproduction
B:	Amniocentesis is legally banned for sex determination in India
C:	"Saheli" - an oral contraceptive for females was developed in collaboration with ICMR (New Delhi).
D:	Amniocentesis is used to determine genetic disorders and survivability of foetus.

Choose the most appropriate answer from the options given below:

1.	**(B)** and **(C)** only	2.	**(D)** and **(C)** only
3.	**(A)**, **(B)** and **(D)** only	4.	**(A)** and **(C)** only

163 Match List - I with List - II

	List-I		**List-II**
(A)	Terpenoids	(I)	Codeine
(B)	Unsaturated fatty acid	(II)	Diterpenes
(C)	Nucleic acid	(III)	Ricin
(D)	Polysaccharide	(IV)	Concanavalin A

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	II	IV	III	I
2.	II	I	IV	III
3.	II	III	I	IV
4.	II	IV	I	III

164 Given below are two statements:

I:	In bacteria, the mesosomes are formed by the extensions of the plasma membrane.
II:	The mesosomes, in bacteria, help in DNA replication and cell wall formation.

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

165 Select the correct sequence of substages of Prophase - I of Meiotic division
(A) Zygotene
(B) Pachytene
(C) Diakinesis
(D) Leptotene
(E) Diplotene
Choose the correct answer from the options given below:

1.	(D), (B), (A), (E), (C)	2.	(A), (B), (D), (E), (C)
3.	(D), (A), (B), (E), (C)	4.	(A), (D), (B), (C), (E)

166 Brain stem of the human brain consists of:
1. Mid-brain, Pons and Medulla Oblongata
2. Forebrain, Cerebellum and Pons
3. Thalamus, Hypothalamus and Corpora quadrigemina
4. Amygdala, Hippocampus and Corpus Callosum

167 Identify the fossil of a man who showed the following characteristics:
(A) Brain capacity of 1400 cc
(B) Used hides to protect their body
(C) Buried their dead bodies
In the light of above statements, choose the correct answer from the options given below:

1.	*Homo erectus*	2.	Neanderthal man
3.	*Homo habilis*	4.	*Australopithecus*

168 With reference to Hershey and Chase experiments, select the correct statements:

A:	Viruses grown in the presence of radioactive phosphorus contained radioactive DNA.
B:	Viruses grown on radioactive sulphur contained radioactive proteins.
C:	Viruses grown on radioactive phosphorus contained radioactive protein
D:	Viruses grown on radioactive sulphur contained radioactive DNA
E:	Viruses grown on radioactive protein contained radioactive DNA

Choose the most appropriate answer from the options given below:

1.	**(D)** and **(E)** only	2.	**(A)** and **(B)** only
3.	**(A)** and **(C)** only	4.	**(B)** and **(D)** only

169 Consider the given two statements:

Assertion (A):	A population experiencing high natality rates will always exhibit exponential growth.
Reason (R):	Exponential growth occurs only when resources are unlimited.

1.	Both **(A)** and **(R)** are True and **(R)** correctly explains **(A)**.
2.	Both **(A)** and **(R)** are True but **(R)** does not explain **(A)**.
3.	**(A)** is True but **(R)** is False.
4.	**(A)** is False but **(R)** is True.

170 The salient features of genetic code are:
(A) The code is palindromic
(B) UGA act as initiator codon
(C) The code is unambiguous and specific
(D) The code is nearly universal
Choose the most appropriate answer from the options given below:

1.	(A) and (D) only	2.	(B) and (C) only
3.	(A) and (B) only	4.	(C) and (D) only

171 Arrange the events of Renin-Angiotensin mechanism in correct sequence

(A)	Activation of JG cells and release of renin
(B)	Angiotensin II activated release of aldosterone
(C)	Fall in glomerular blood pressure
(D)	Reabsorption of Na^+ and water from distal convoluted tubule
(E)	Angiotensinogen is converted to Angiotensin I and then to Angiotensin II

Choose the correct answer from the options given below:

1.	(C), (A), (E), (B), (D)	2.	(A), (D), (E), (C), (B)
3.	(A), (D), (C), (B), (E)	4.	(B), (A), (E), (D), (C)

172 Given below are two statements:

Statement I:	Parathyroid hormone acts on bones and stimulates the process of bone resorption
Statement II:	Parathyroid hormone along with Thyrocalcitonin plays a significant role in carbohydrate metabolism.

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

173 Select the correct statements:

A:	Platyhelminthes are triploblastic, pseudocoelomate and bilaterally symmetrical organisms.
B:	Ctenophores reproduce only sexually and fertilization is external.
C:	In tapeworm, fertilization is internal but sexes are not separate.
D:	Ctenophores are exclusively marine, diploblastic and bioluminescent organisms.
E:	In sponges, fertilization is external and development is direct.

Choose the correct answer from the options given below:

1.	**(A)**, **(C)** and **(D)** only	2.	**(B)**, **(C)** and **(D)** only
3.	**(A)** and **(E)** only	4.	**(B)** and **(D)** only

174 Match List - I with List - II

	List-I		**List-II**
(A)	Gene therapy	(I)	Separation of DNA fragments
(B)	RNA interference	(II)	Diagnostic test for AIDS
(C)	ELISA	(III)	Cellular defense
(D)	Gel Electrophoresis	(IV)	Allows correction of a gene defect

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	IV	I	II	III
2.	IV	II	III	I
3.	IV	III	II	I
4.	IV	III	I	II

175 Which of the following statements are correct in the context of Golgi apparatus?

A:	It is the important site for the formation of glycoprotein and glycolipids
B:	It produces cellular energy in the form of ATP
C:	It modifies the protein synthesized by ribosomes on ER
D:	It facilitates the transport of ions
E:	It provides mechanical support

Choose the most appropriate answer from the options given below:

1.	**(B)** and **(C)** only	2.	**(A)** and **(C)** only
3.	**(A)** and **(D)** only	4.	**(D)** and **(E)** only

176 Consider the following statements about bacteria:

Statement I:	Bacteria are classified into four categories based on their shape: cocci, bacilli, vibrios, and spirilla.
Statement II:	The majority of bacteria are autotrophs, synthesizing their own food from inorganic substrates.
Statement III:	Archaebacteria are a unique group of bacteria that can survive in extreme environments due to their distinct cell wall structure.

Which of the above statements is/are correct?
1. Only **Statement II** is correct
2. Both **Statement I** and **Statement III** are correct
3. Both **Statement II** and **Statement III** are correct
4. All Statements are correct

177 Given below are two statements:

I:	In cockroaches, the forewings are transparent and prothoracic in origin.
II:	In cockroaches, the hind wings are opaque, leathery and mesothoracic in origin.

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

178 Match List - I with List - II

	List-I		**List-II**
(A)	Columnar epithelium	(I)	Ducts of glands
(B)	Ciliated epithelium	(II)	Inner lining of stomach and intestine
(C)	Squamous epithelium	(III)	Inner lining of bronchioles
(D)	Cuboidal epithelium	(IV)	Endothelium

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	III	II	I	IV
2.	III	II	IV	I
3.	II	III	I	IV
4.	II	III	IV	I

179 Match List - I with List - II

	List-I		**List-II**
(A)	Cytokine barriers	(I)	Mucus coating of respiratory tract
(B)	Cellular barriers	(II)	Interferons
(C)	Physiological barriers	(III)	Neutrophils and Macrophages
(D)	Physical barriers	(IV)	Tears and Saliva

Choose the correct answer from the options given below:

Options:	(A)	(B)	(C)	(D)
1.	(II)	(III)	(IV)	(I)
2.	(III)	(I)	(IV)	(II)
3.	(III)	(I)	(II)	(IV)
4.	(II)	(III)	(I)	(IV)

180 Select the correct statement/s with respect to mechanism of sex determination in Grasshopper.

A:	It is an example of female heterogamety
B:	Male produces two different types of gametes either with or without X chromosomes.
C:	Total number of chromosomes (autosomes and sex chromosomes) is same in both males and females.
D:	All eggs bear an additional X chromosome besides the autosomes.

Choose the correct answer from the options given below:

1.	**(B)** and **(D)** only	2.	**(A)**, **(C)** and **(D)** only
3.	**(A)** only	4.	**(A)** and **(C)** only