PHYSICS

1 For Young's double-slit experiment, two statements are given below:

Statement I:	If screen is moved away from the plane of slits, angular separation of the fringes remains constant.
Statement Ii:	If the monochromatic source is replaced by another monochromatic source of larger wavelength, the angular separation of fringes decreases.

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

2 The ratio of frequencies of fundamental harmonic produced by an open pipe to that of closed pipe having the same length is:

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

3 The ratio of the radius of gyration of a solid sphere of mass M and radius R about its own axis to the radius of gyration of the thin hollow sphere of the same mass and radius about its axis is:

1. 5 : 2
2. 3 : 5
3. 5 : 3
4. 2 : 5

4 An AC source is connected to a capacitor C. Due to decrease in its operating frequency:

1.	capacitive reactance remains constant
2.	capacitive reactance decreases.
3.	displacement current increases.
4.	displacement current decreases.

5 In hydrogen spectrum, the shortest wavelength in the Balmer series is λ. The shortest wavelength in the Bracket series is:

1. 16λ
2. 2λ
3. 4λ
4. 9λ

6 A vehicle travels half the distance with speed v and the remaining distance with speed $2v$. Its average speed is:

1. $\frac{3v}{4}$
2. $\frac{v}{3}$
3. $\frac{2v}{3}$
4. $\frac{4v}{3}$

7 The potential energy of a long spring when stretched by 2 cm is U. If the spring is stretched by 8 cm, the potential energy stored in it will be:

1.	$16U$	2.	$2U$
3.	$4U$	4.	$8U$

8 A bullet is fired from a gun at the speed of 280 ms^{-1} in the direction 30° above the horizontal. The maximum height attained by the bullet is: $\left(g = 9.8\ \text{m/s}^2, \sin 30^\circ = 0.5\right)$

1.	3000 m	2.	2800 m
3.	2000 m	4.	1000 m

9 The net magnetic flux through any closed surface is:

1. negative
2. zero
3. positive
4. infinity

10 A metal wire has mass (0.4 ± 0.002) g, radius (0.3 ± 0.001) mm and length (5 ± 0.02) cm. The maximum possible percentage error in the measurement of density will nearly be:

1. 1.4%
2. 1.2%
3. 1.3%
4. 1.6%

11 The angular acceleration of a body, moving along the circumference of a circle, is:

1.	along the axis of rotation
2.	along the radius, away from centre
3.	along the radius towards the centre
4.	along the tangent to its position

12 The magnetic energy stored in an inductor of inductance 4 μH carrying a current of 2 A is:
1. 8 μJ
2. 4 μJ
3. 4 mJ
4. 8 mJ

13 A full wave rectifier circuit consists of two p-n junction diodes, a centre-tapped transformer, capacitor and a load resistance. Which of these components remove the ac ripple from the rectified output?
1. load resistance
2. a centre-tapped transformer
3. p-n junction diodes
4. capacitor

14 A football player is moving southward and suddenly turns eastward with the same speed to avoid an opponent. The force that acts on the player while turning is:
1. along south-west
2. along eastward
3. along northward
4. along north-east

15 The work functions of Caesium (Cs), Potassium (K), and Sodium (Na) are 2.14 eV, 2.30 eV and 2.75 eV respectively. If incident electromagnetic radiation has an incident energy of 2.20 eV. which of these photosensitive surfaces may emit photoelectrons?
1. Na only
2. Cs only
3. both Na and K
4. K only

16 If $\oint_s \vec{E} \cdot d\vec{S} = 0$ over a surface, then:

1.	the electric field inside the surface is necessarily uniform.
2.	the number of flux lines entering the surface must be equal to the number of flux lines leaving it.
3.	the magnitude of electric field on the surface is constant.
4.	all the charges must necessarily be inside the surface.

17 Given below are two statements:

Statement I:	Photovoltaic devices can convert optical radiation into electricity.
Statement II:	The Zener diode is designed to operate under reverse bias in the breakdown.

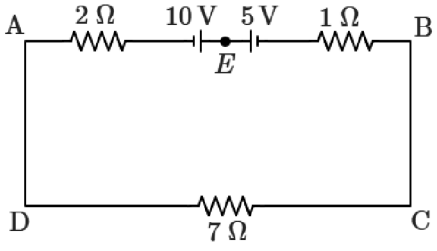
1.	**Statement I** is incorrect but **Statement II** is correct.
2.	Both **Statement I** and **Statement II** are correct.
3.	Both **Statement I** and **Statement II** are incorrect.
4.	**Statement I** is correct but **Statement II** is incorrect.

18 In a plane electromagnetic wave travelling in free space, the electric field component oscillates sinusoidally at a frequency of 2.0×10^{10} Hz and amplitude 48 Vm^{-1}. Then the amplitude of the oscillating magnetic field is: (Speed of light in free space 3×10^8 ms^{-1})
1. 1.6×10^{-6} T
2. 1.6×10^{-9} T
3. 1.6×10^{-8} T
4. 1.6×10^{-7} T

19 The temperature of a gas is -50°C. To what temperature the gas should be heated so that the RMS speed is increased by 3 times?

1.	223 K	2.	669°C
3.	3295°C	4.	3097 K

20 The magnitude and direction of the current in the following circuit is:



1.	1.5 A from B to A through E
2.	0.2 A from B to A through E
3.	0.5 A from A to B through E
4.	$\frac{5}{9}$ A from A to B through E

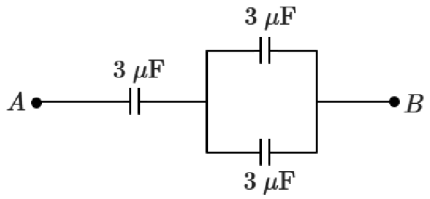
21 An electric dipole is placed at an angle of 30° with an electric field of intensity $2 \times 10^5\ \text{NC}^{-1}$. It experiences a torque equal to 4 N-m. If the dipole length is 2 cm, calculate the magnitude of the charge on the dipole.

1.	2 mC	2.	8 mC
3.	6 mC	4.	4 mC

22 Let a wire be suspended from the ceiling (rigid support) and stretched by a weight W attached at its free end. The longitudinal stress at any point of the cross-sectional area A of the wire is:

1.	zero	2.	$\frac{2W}{A}$
3.	$\frac{W}{A}$	4.	$\frac{W}{2A}$

23 The equivalent capacitance of the system shown in the following circuit is:



1.	9 μF	2.	2 μF
3.	3 μF	4.	6 μF

24 The venturi-meter works on:

1.	The principle of perpendicular axes
2.	Huygen's principle
3.	Bernoulli's principle
4.	The principle of parallel axes

25 In a series LCR circuit, the inductance L is 10 mH, capacitance C is 1 μF and resistance R is 100 Ω. The frequency at which resonance occurs is:

1. 1.59 kHz
2. 15.9 rad/s
3. 15.9 kHz
4. 1.59 rad/s

26 Two bodies of mass m and $9m$ are placed at a distance R. The gravitational potential on the line joining the bodies where the gravitational field equals zero, will be:
(G = gravitational constant)

1. $-\frac{20\ Gm}{R}$
2. $-\frac{8\ Gm}{R}$
3. $-\frac{12\ Gm}{R}$
4. $-\frac{16\ Gm}{R}$

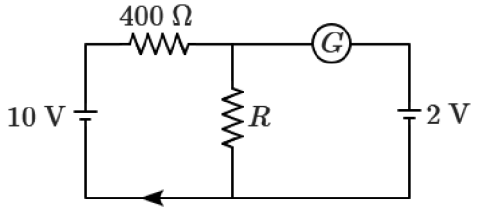
27 Light travels a distance x in time t_1 in air and $10x$ in time t_2 in another denser medium. What is the critical angle for this medium?

1.	$\sin^{-1}\left(\frac{10t_1}{t_2}\right)$	2.	$\sin^{-1}\left(\frac{t_2}{t_1}\right)$
3.	$\sin^{-1}\left(\frac{10t_2}{t_1}\right)$	4.	$\sin^{-1}\left(\frac{t_1}{10t_2}\right)$

28 The amount of energy required to form a soap bubble of radius 2 cm from a soap solution is nearly:
(the surface tension of soap solution 0.03 Nm^{-1})

1. 50.1×10^{-4} J
2. 30.16×10^{-4} J
3. 5.06×10^{-4} J
4. 3.01×10^{-4} J

29 If the galvanometer G does not show any deflection in the circuit shown, the value of R is given by;



1.	400 Ω	2.	200 Ω
3.	50 Ω	4.	100 Ω

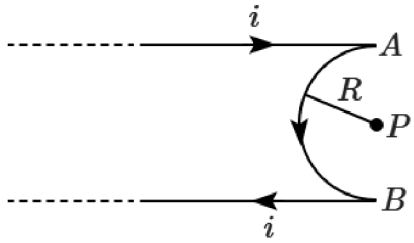
30 The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are:

1.	Random errors	2.	Instrumental errors
3.	Personal errors	4.	Least count errors

31 A wire carrying a current I along the positive x-axis has length L. It is kept in a magnetic field $\vec{B} = (2\hat{i} + 3\hat{j} - 4\hat{k})$ T. The magnitude of the magnetic force acting on the wire is:

1. $\sqrt{3}IL$
2. $3IL$
3. $\sqrt{5}IL$
4. $5IL$

32 A very long conducting wire is bent in a semi-circular shape from A to B as shown in the figure. The magnetic field at the point P for steady current configuration is given by:

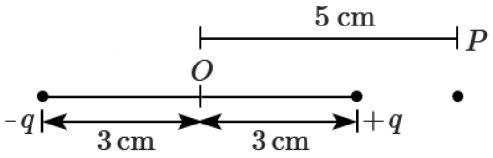


1.	$\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ pointed into the page		
2.	$\frac{\mu_0 i}{4R}$ pointed into the page		
3.	$\frac{\mu_0 i}{4R}$ pointed away from the page		
4.	$\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ pointed away from the page		

33 A bullet from a gun is fired on a rectangular wooden block with velocity u. When bullet travels 24 cm through the block along its length horizontally, velocity of bullet becomes $u/3$. Then it further penetrates into the block in the same direction before coming to rest exactly at the other end of the block. The total length of the block is:

1.	30 cm	2.	27 cm
3.	24 cm	4.	28 cm

34 An electric dipole is placed as shown in the figure.

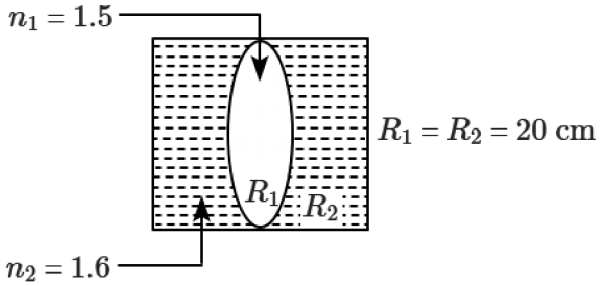


The electric potential (in 10^2 V) at the point P due to the dipole is:

(ε_0 = permittivity of free space and $\frac{1}{4\pi\varepsilon_0} = k$)

1.	$\left(\frac{8}{3}\right)qk$	2.	$\left(\frac{3}{8}\right)qk$
3.	$\left(\frac{5}{8}\right)qk$	4.	$\left(\frac{8}{5}\right)qk$

35 In the figure shown here, what is the equivalent focal length of the combination of lenses?
(Assume that all layers are thin)



1.	-50 cm	2.	40 cm
3.	-40 cm	4.	-100 cm

36 A satellite is orbiting just above the surface of the earth with period T. If d is the density of the earth and G is the universal constant of gravitation, the quantity $\frac{3\pi}{Gd}$ represents:

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

37 10 resistors, each of resistance R are connected in series to a battery of E and negligible internal resistance. Then those are connected in parallel to the same battery, the current is increased n times. The value of n is:

1.	1000	2.	10
3.	100	4.	1

38 A horizontal bridge is built across a river. A student standing on the bridge throws a small ball vertically upwards with a velocity 4 ms^{-1}. The ball strikes the water surface after 4 s. The height of bridge above water surface is: (Take $g = 10\ ms^{-2}$)

1.	68 m	2.	56 m
3.	60 m	4.	64 m

39 Two thin lenses are of the same focal lengths (f), but one is convex and the other one is concave. When they are placed in contact with each other, the equivalent focal length of the combination will be:

1. infinite
2. zero
3. $f/4$
4. $f/2$

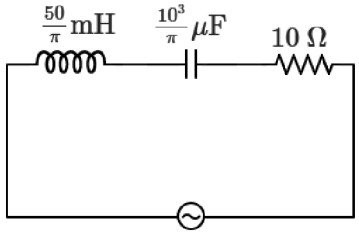
40 The radius of innermost orbit of a hydrogen atom is 5.3×10^{-11} m. What is the radius of the third allowed orbit of a hydrogen atom?

1. 4.77 $\mathring{A}$
2. 0.53 $\mathring{A}$
3. 1.06 $\mathring{A}$
4. 1.59 $\mathring{A}$

41 The resistance of platinum wire at 0°C is 2 Ω and 6.8 Ω at 80°C. The temperature coefficient of resistance of the wire is:

1.	$3 \times 10^{-1}\ ^{\circ}C^{-1}$	2.	$3 \times 10^{-4}\ ^{\circ}C^{-1}$
3.	$3 \times 10^{-3}\ ^{\circ}C^{-1}$	4.	$3 \times 10^{-2}\ ^{\circ}C^{-1}$

42 The net impedance of the circuit (as shown in the figure) will be:

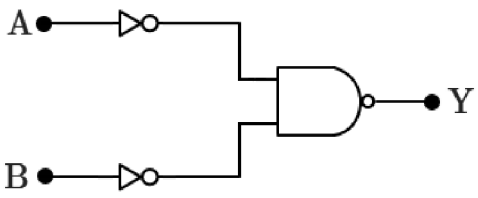


1.	25 Ω	2.	$10\sqrt{2}$ Ω
3.	15 Ω	4.	$5\sqrt{5}$ Ω

43 Calculate the maximum acceleration of a moving car so that a body lying on the floor of the car remains stationary. The coefficient of static friction between the body and the floor is 0.15. (take $g = 10\ ms^{-2}$)

1.	50 ms^{-2}	2.	1.2 ms^{-2}
3.	150 ms^{-2}	4.	1.5 ms^{-2}

44 For the following logic gate, the truth table is:



1.

A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

2.

A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

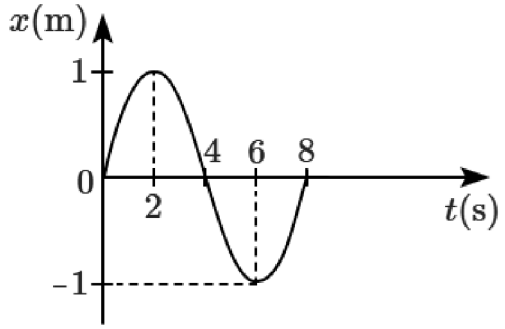
3.

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

4.

A	B	C
0	0	1
0	1	0
1	0	1
1	1	0

45 The displacement-time $(x\text{-}t)$ graph of a particle performing simple harmonic motion is shown in the figure. The acceleration of the particle at $t = 2$ s is:



1. $-\frac{\pi^2}{16}\ \text{ms}^{-2}$
2. $\frac{\pi^2}{8}\ \text{ms}^{-2}$
3. $-\frac{\pi^2}{8}\ \text{ms}^{-2}$
4. $\frac{\pi^2}{16}\ \text{ms}^{-2}$

CHEMISTRY

46 The mass of CO_2 produced by heating 20 g of 20% pure limestone as per the equation given below is:

$$CaCO_3(\text{ s}) \xrightarrow{\text{heat}} CaO(s) + CO_2(\text{ g})$$

1.	1.32 g	2.	1.12 g
3.	1.76 g	4.	2.64 g

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

Assertion (A):	Helium is used to dilute oxygen in the diving apparatus.
Reason (R):	Helium has a high solubility in O_2.

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

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

48 The correct order of energies of molecular orbitals of N_2 molecule is:

1.	$\sigma\,1s < \sigma^*\,1s < \sigma 2s < \sigma^* 2s < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y) < \sigma 2p_z < \sigma^* 2p_z$
2.	$\sigma\,1s < \sigma^*\,1s < \sigma 2s < \sigma^* 2s < (\pi 2p_x = \pi 2p_y) < \sigma 2p_z < (\pi^* 2p_x = \pi^* 2p_y) < \sigma^* 2p_z$
3.	$\sigma\,1s < \sigma^*\,1s < \sigma 2s < \sigma^* 2s < \sigma 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y) < \sigma^* 2p_z$
4.	$\sigma\,1s < \sigma^*\,1s < \sigma 2s < \sigma^* 2s < \sigma 2p_z < \sigma^* 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi^* 2p_x = \pi^* 2p_y)$

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

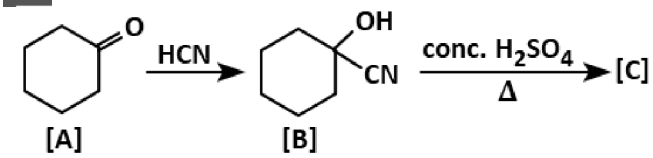
Assertion (A):	A reaction can have zero activation energy.
Reason (R):	The minimum extra amount of energy absorbed by reactant molecules so that their energy becomes equal to threshold value, is called activation energy.

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

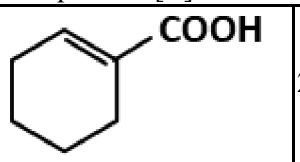
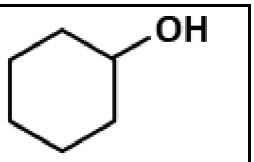
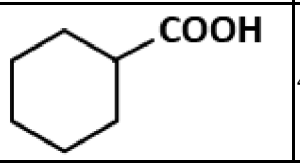
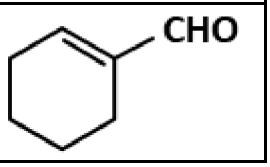
1.	Both **(A)** and **(R)** are True and **(R)** is the correct explanation of **(A)**.
2.	Both **(A)** and **(R)** are True but **(R)** is not the correct explanation of **(A)**.
3.	**(A)** is True but **(R)** is False.
4.	**(A)** is False but **(R)** is True.

50 Weight (g) of two moles of the organic compound, which is obtained by heating sodium ethanoate with sodium hydroxide in the presence of calcium oxide is:
1. 18
2. 16
3. 32
4. 30

51 Given is a reaction for your reference:



The final product [C] is:

1.		2.	
3.		4.	

52 Select the correct statements from the following:

A:	Atoms of all elements are composed of two fundamental particles.
B:	The mass of the electron is 9.10939×10^{-31} kg. .
C:	All the isotopes of a given element show same chemical properties.
D:	Protons and electrons are collectively known as nucleons.
E:	Dalton's atomic theory regarded the atom as an ultimate particle of matter.

Choose the correct answer from the option given below:

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

53 The stability of Cu^{2+} is greater than that of Cu^{+} salts in an aqueous solution due to:
1. Second ionisation enthalpy
2. First ionisation enthalpy
3. Enthalpy of atomization
4. Hydration energy

54 The relation between n_m (n_m = number of permissible values of magnetic quantum number (m_l) for a given value of azimuthal quantum number (l) is:
1. $n_m = l + 2$
2. $l = \dfrac{n_m - 1}{2}$
3. $l = 2n_m + 1$
4. $n_m = 2l^2 + 1$

55 Homoleptic complex from the following complexes is:
1. Triamminetriaquachromium (III)
2. Potassium trioxalatoaluminate (III)
3. Diamminechloridonitrito-N-platinum (II)
4. Pentaamminecarbonatocobalt (III) chloride

56 Among the given reactions, which one does not result in the formation of a primary amine as the product?

1.	$CH_3CONH_2 \xrightarrow[(ii)\ H_3O^+]{(i)\ LiAlH_4}$ Product
2.	$CH_3CONH_2 \xrightarrow{Br_2/KOH}$ Product
3.	$CH_3CN \xrightarrow[(ii)\ H_3O^+]{(i)\ LiAlH_4}$ Product
4.	$CH_3NC \xrightarrow[(ii)\ H_3O^+]{(i)\ LiAlH_4}$ Product

57 On heating, some solid substances change from solid to vapour state without passing through liquid state. The technique used for the purification of such solid substances based on the above principle is known as :
1. Sublimation
2. Distillation
3. Chromatography
4. Crystallization

58 Amongst the given option which of the following molecules/ion acts as a Lewis acid?

1. OH^-
2. NH_3
3. H_2O
4. BF_3

59 Match the allotropes of cabon given in List I with the respective characteristics given in List II.

	List-I		**List-II**
A.	Coke	I.	Carbon atoms are sp^3 hybridised.
B.	Diamond	II.	Used as a dry lubricant
C.	Fullerene	III.	Used as a reducing agent
D.	Graphite	IV.	Cage like molecules

Choose the correct answer from the options given below:

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

60 The element expected to form the largest ion to achieve the nearest noble gas configuration is:

1.	Sodium(Na)	2.	Oxygen(O)
3.	Fluorine(F)	4.	Nitrogen(N)

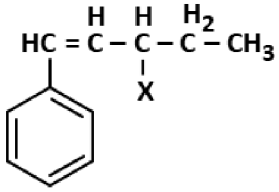
61 Given below are two statements:

Statement I:	A unit formed by the attachment of a base to 1' position of sugar is known as a nucleoside.
Statement II:	When nucleoside is linked to phosphorous acid at 5' position of sugar moiety, we get nucleotide.

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

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

62 The following compound would be classified as:



1.	Vinylic halide	2.	Benzylic halide
3.	Aryl halide	4.	Allylic halide

63 In Lassaigne's extract of an organic compound, both nitrogen and sulphur are present, which gives blood red colour with Fe^{3+} due to the formation of:

1. $[Fe(SCN)]^{2+}$
2. $Fe_4[Fe(CN)_6]_3 \cdot xH_2O$
3. NaSCN
4. $[Fe(CN)_5NOS]^{4-}$

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

Assertion (A):	In equation $\Delta_rG = -nFE_{cell}$, value Δ_rG depends on n.
Reason (R):	E_{cell} is an intensive property and Δ_rG is an extensive property.

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

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

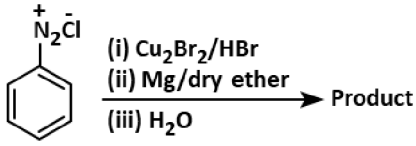
65 Given the following five species:

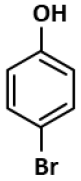
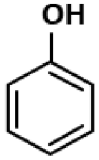
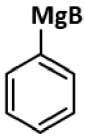
$NH_3, AlCl_3, BeCl_2, CCl_4, PCl_5$

The total number of these species that do not have eight electrons around the central atom in its/their outermost shell, is/are:

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

66 Identify the product in the following reaction:



1.		2.	
3.		4.	

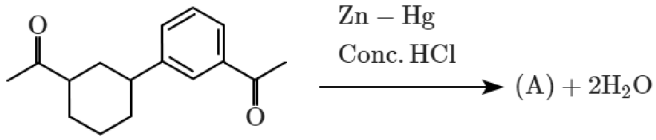
67 The conductivity of centimolar solution of KCl at 25°C is 0.0210 ohm^{-1} cm^{-1} and the resistance of the cell containing the solution at 25°C is 60 ohm. The value of the cell constant is:

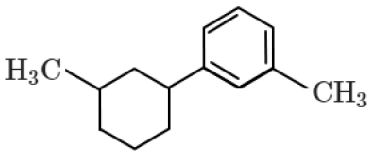
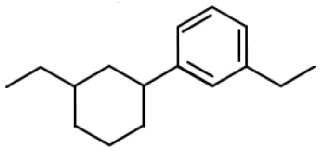
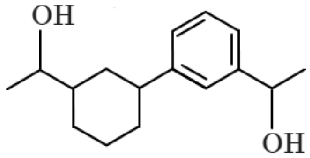
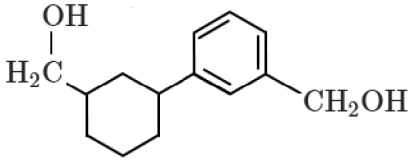
1.	3.34 cm^{-1}	2.	1.34 cm^{-1}
3.	3.28 cm^{-1}	4.	1.26 cm^{-1}

68 The number of σ bonds, π bonds and lone pair of electrons in pyridine respectively are:
1. 12, 2, 1
2. 11, 2, 0
3. 12, 3, 0
4. 11, 3, 1

69 Identify the correct relationship of stability from the options provided.
1. $TlI > TlI_3$
2. $TlCl_3 > TlCl$
3. $InI_3 > InI$
4. $AlCl > AlCl_3$

70 Identify the product (A) in the following reaction:



1.	
2.	
3.	
4.	

71 Match List I with List II.

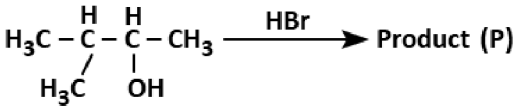
	List I (Compound)		**List II (Shape/geometry)**
A.	NH_3	I.	Trigonal Pyramidal
B.	BrF_5	II.	Square planar
C.	XeF_4	III.	Octahedral
D.	SF_6	IV.	Square Pyramidal

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

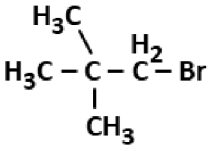
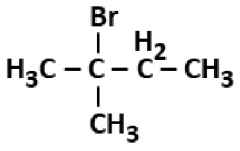
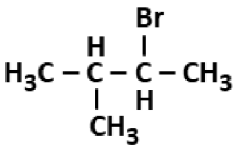
72 For a certain reaction, the rate = $k[A]^2[B]$, when the initial concentration of A is tripled keeping the concentration of B constant, the initial rate would be:

1.	Increase by a factor of three
2.	Decrease by a factor of nine
3.	Increase by a factor of six
4.	Increase by a factor of nine

73 Consider the following reaction and identify the product (P).



3-Methylbutan-2-ol

1.		2.	
3.	$H_3CHC = CHCH_3$	4.	

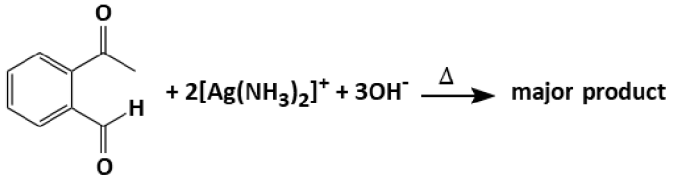
74 What is the correct relationship between changes in enthalpy and internal energy within the following options?

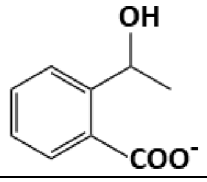
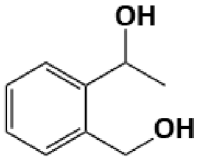
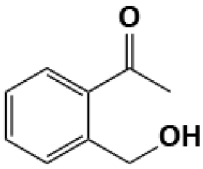
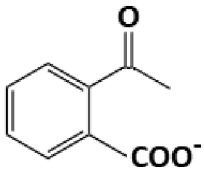
1. $\Delta H + \Delta U = \Delta nR$
2. $\Delta H = \Delta U - \Delta n_g RT$
3. $\Delta H = \Delta U + \Delta n_g RT$
4. $\Delta H - \Delta U = -\Delta n_g RT$

75 The equilibrium concentration of the species in the reaction $A + B \rightleftharpoons C + D$ are 2, 3, 10 and 6 mol L^{-1}, respectively at 300 K. ΔG^o for the reaction is: (R = 2 cal/mol K)

1.	–13.73 cal	2.	1372.60 cal
3.	–137.26 cal	4.	–1381.80 cal

76 Identify the major product obtained in the following reaction:



1.		2.	
3.		4.	

77 A compound X contains 32% of A, 20% of B and remaining percentage of C. Then, the empirical formula of X is :
(Given atomic mass of A = 64; B = 40; C = 32u)

1. ABC_3
2. AB_2C_2
3. ABC_4
4. A_2BC_2

78 For the given redox reaction,

$aCr_2O_7^{2-} + bSO_3^{2-}(aq) + cH^+(aq) \rightarrow 2aCr^{3+}(aq) + bSO_4^{2-}(aq) + \frac{c}{2}H_2O(\ell)$

the coefficients a, b and c of a balanced equation are found to be, respectively:

1. 8, 1, 3
2. 1, 3, 8
3. 3, 8, 1
4. 1, 8, 3

79 Match List-I with List-II:

	(List-I) Solid salt treated with dil. H_2SO_4		**(List-II)** Anion detected
A.	Effervescence of colourless gas	I.	NO_2^-
B.	Gas with smell of rotten egg	II.	CO_3^{2-}
C.	Gas with pungent smell	III.	S^{2-}
D.	Brown fumes	IV.	SO_3^{2-}

Choose the correct answer from the options given below:

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

80 Consider the following reaction in a sealed vessel at equilibrium with concentrations of

$N_2 = 3.0 \times 10^{-3}M, O_2 = 4.2 \times 10^{-3}M$ and

$NO = 2.8 \times 10^{-3}$

$2NO_{(g)} \rightleftharpoons N_{2(g)} + O_{2(g)}$

If 0.1 mol L^{-1} of $NO_{(g)}$ is taken in a closed vessel, what will be the degree of dissociation (α) of $NO_{(g)}$ at equilibrium?

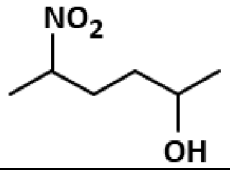
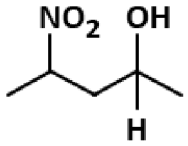
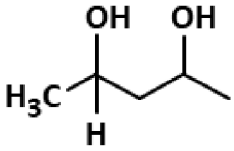
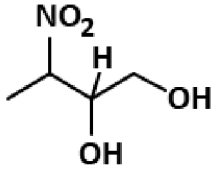
1. 0.0889
2. 0.8889
3. 0.717
4. 0.00889

81 The ratio of solubility of AgCl in 0.1 M KCl solution to the solubility of AgCl in water is:

(Given : Solubility product of AgCl $= 10^{-10}$)

1. 10^{-4}
2. 10^{-6}
3. 10^{-9}
4. 10^{-5}

82 Which amongst the following will be most readily dehydrated under acidic conditions?

1.	
2.	
3.	
4.	

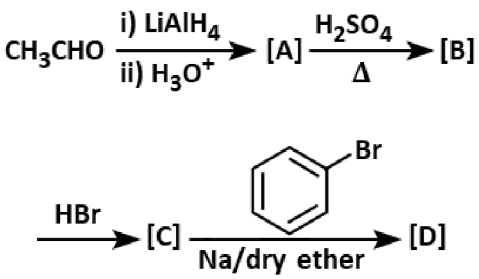
83 Match the Oxoacids of Sulphur given in List I with the number of bonds given in List II and mark the correct option.

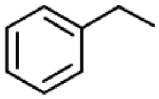
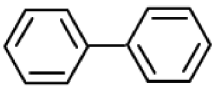
	List-I (Oxoacids of Sulphur)		**List-II (Bonds)**
A.	Peroxodisulphuric acid	I.	Two S-OH, Four S=O, One S-O-S
B.	Sulphuric acid	II.	Two S-OH, One S=O
C.	Pyrosulphuric acid	III.	Two S-OH, Four S=O, One S-O-O-S
D.	Sulphurous acid	IV.	Two S-OH, Two S=O

Choose the correct answer from the options given below:

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

84 Identify the final product [D] obtained in the following sequence of reactions:

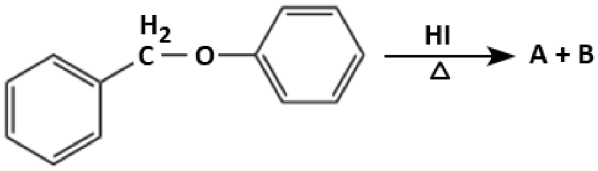


1.	$HC \equiv C^- Na^+$	2.	
3.		4.	C_4H_{10}

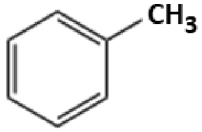
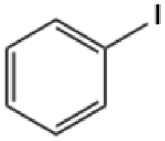
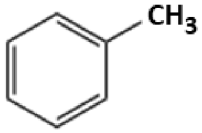
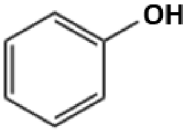
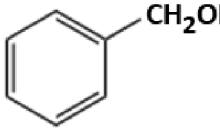
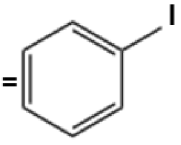
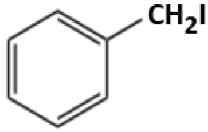
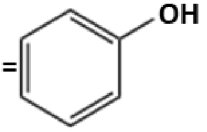
85 The most stable compound, among the following, is:

1. $[Co(NH_3)_6]_2(SO_4)_3$
2. $[Co(NH_3)_4(H_2O)Br](NO_3)_2$
3. $[Co(NH_3)_3(NO_3)_3]$
4. $[CoCl_2(en)_2]NO_3$

86 Consider the following reaction:



Identify products A and B.

1.	A = 	and B = 
2.	A = 	and B = 
3.	A = 	and B = 
4.	A = 	and B = 

87 Given below are two statements :

Statement I:	$[Co(NH_3)_6]^{3+}$ is a homoleptic complex, whereas $[Co(NH_3)_4Cl_2]^+$ is a heteroleptic complex.
Statement II:	Complex $[Co(NH_3)_6]^{3+}$ has only one kind of ligand but $[Co(NH_3)_4Cl_2]^+$ has more than one kind of ligands.

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

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

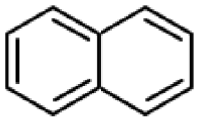
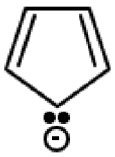
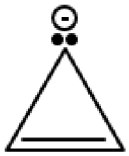
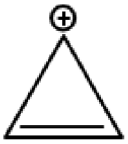
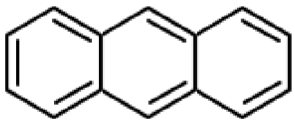
88 Which of the following statements is incorrect?

A.	All the transition metals except scandium form MO oxides which are ionic.
B.	The highest oxidation number corresponds to the group number in transition metal oxides is attained in Sc_2O_3 to Mn_2O_7.
C.	Basic character increases from V_2O_3 to V_2O_4 to V_2O_5.
D.	V_2O_4 dissolves in acids to give VO_4^{3-}.
E.	CrO is basic, but Cr_2O_3 is amphoteric.

Choose the correct answer from the options given below:

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

89 Consider the following compounds/species:

i.		ii.	
iii.		iv.	
v		vi	
vii			

The number of compounds/species which obey Huckel's rule is:

1.	5	2.	4
3.	6	4.	2

90 Methyl group attached to a positively charged carbon atom stabilizes the carbocation due to:
1. -I inductive effect
2. Electromeric effect
3. Hyperconjugation
4. Mesomeric effect

BIOLOGY

91 Unequivocal proof that DNA is the genetic material was first proposed by:
1. Wilkins and Franklin
2. Frederick Griffith
3. Alfred Hershey and Martha Chase
4. Avery, Macleod and McCarthy

92 Give below are two statements :

Statement I:	Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.
Statement II:	Exarch condition is the most common feature of the root system.

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

93 Cellulose does not form blue colour with iodine because

1.	It breaks down when iodine reacts with it.
2.	It is a disaccharide.
3.	It is a helical molecule.
4.	It does not contain complex helices and hence cannot hold iodine molecules.

94 Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.

1.	Epiphyllous and Dithecous anthers
2.	Diadelphous and Dithecous anthers
3.	Polyadelphous and epipetalous stamens
4.	Monoadelphous and Monothecous anthers

95 The reaction centre in PS II has an absorption maxima at:

1.	780 nm	2.	680 nm
3.	700 nm	4.	660 nm

96 Upon exposure to UV radiation, DNA stained with ethidium bromide will show:
1. Bright orange colour
2. Bright red colour
3. Bright Blue colour
4. Bright yellow colour

97 The phenomenon of pleiotropism refers to:

1.	more than two genes affecting a single character.
2.	presence of several alleles of a single gene controlling a single crossover.
3.	presence of two alleles, each of the two genes controlling a single trait.
4.	a single gene affecting multiple phenotypic expressions.

98 The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year :

1.	2002	2.	1985
3.	1992	4.	1986

99 During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out:

1.	Polysaccharides	2.	RNA
3.	DNA	4.	Histones

100 Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by:

1.	Henking	2.	Thomas Hunt Morgan
3.	Sutton and Boveri	4.	Alfred Sturtevant

101 Give below are two statements : One is labelled as Assertion (A) and the other is labelled Reason (R) :

Assertion (A):	The first stage of gametophyte in the life cycle of moss is protonema stage.
Reason (R):	Protonema develops directly from spores produced in capsule.

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

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

102 Among eukaryotes, replication of DNA takes place in:
1. G_2 Phase
2. M phase
3. S phase
4. G_1 phase

103 What is the function of tassels in the corn cob?

1.	To protect seeds	2.	To attract insects
3.	To trap pollen grains	4.	To disperse pollen grains

104 In the equation

$$\mathbf{GPP - R = NPP}$$

GPP is Gross Primary Productivity. NPP is net Primary Productivity. R here is _____
1. Reproductive allocation
2. Photosynthetically active radiation
3. Respiratory quotient
4. Respiratory loss

105 Which hormone promotes internode / petiole elongation in deep water rice?

1.	2, 4-D	2.	GA_3
3.	Kinetin	4.	Ethylene

106 Axile placentation is observed in:

1. China rose, Petunia and Lemon
2. Mustard, Cucumber and Primrose
3. China rose, Beans and Lupin
4. Tomato, Dianthus and Pea

107 The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?

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

108 Which of the following stages of meiosis involves division of centromere?

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

109 Identify the correct statements:

A:	Detrivores perform fragmentation.
B:	The humus is further degraded by some microbes during mineralization.
C:	Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D:	The detritus food chain begins with living organisms.
E:	Earthworms break down detritus into smaller particles by a process called catabolism.

Choose the correct answer from the options given below:

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

110 In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :

1.	Synergids, antipodals and Polar nuclei
2.	Synergids, Primary endosperm nucleus and zygote
3.	Antipodals, synergids, and primary endosperm nucleus
4.	Synergids, Zygote and Primary endosperm nucleus

111 Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species?

1. Co-extinctions
2. Habitat loss and fragmentation
3. Over exploitation for economic gain
4. Alien species invasions

112 In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as

1.	Senescence	2.	Differentiation
3.	Dedifferentiation	4.	Development

113 In gene gun method used to introduce alien DNA into host cells, microparticles of _____ metal are used.

1.	Silver	2.	Copper
3.	Zinc	4.	Tungsten or gold

114 Large, colorful, fragrant flowers with nectar are seen in:

1.	wind pollinated plants	2.	insect pollinated plants
3.	bird pollinated plants	4.	bat pollinated plants

115 Expressed Sequence Tags (ESTs) refers to:

1. Certain important expressed genes.
2. All genes that are expressed as RNA.
3. All genes that are expressed as proteins.
4. All genes whether expressed or unexpressed

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

Assertion (A):	ATP is used at two steps in glycolysis .
Reason (R):	First ATP is used in converting glucose into glocose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1-6-diphosphate.

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

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

117 Spraying of which of the following phytohormone on juvenile conifers helps in hastening the maturity period, that leads to early seed production?
1. Abscisic Acid
2. Indole-3-butyric Acid
3. Gibberellic Acid
4. Zeatin

118 Identify the pair of heterosporous pteridophytes among the following :
1. *Equisetum* and *Salvinia*
2. *Lycopodium* and *Selaginella*
3. *Selaginella* and *Salvinia*
4. *Psilotum* and *Salvinia*

119 In a dicot stem, the term 'starch sheath' is often used to indicate:
1. The hypodermis
2. The endodermis
3. The pericycle
4. The medullary rays

120 What is the role of RNA polymerase III in the process of transcription in Eukaryotes?
1. Transcription of only snRNAs
2. Transcription of rRNAs (28S, 18S and 5.8S)
3. Transcription of tRNA, 5 srRNA and snRNA
4. Transcription of precursor of mRNA

121 How many ATP and $NADPH_2$ are required for the synthesis of one molecule of glucose during Calvin cycle?
1. 18 ATP and 16 $NADPH_2$
2. 12 ATP and 12 $NADPH_2$
3. 18 ATP and 12 $NADPH_2$
4. 12 ATP and 16 $NADPH_2$

122 How many different proteins does the ribosome consist of?

1.	20	2.	80
3.	60	4.	40

123 Match List I with List II

	List I		**List II**
A.	Oxidative decarboxylation	I.	Citrate synthase
B.	Glycolysis	II.	Pyruvate dehydrogenase
C.	Oxidative phosphorylation	III.	Electron transport system
D.	Tricarboxylic acid cycle	IV.	EMP pathway

Choose the correct answer from the options given below:

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

124 Match List I with List II

	List I (Interaction)		**List II** (Species A and B)
A.	Mutualism	I.	+(A), O(B)
B.	Commensalism	II.	–(A), O(B)
C.	Amensalism	III.	+(A), –(B)
D.	Parasitism	IV	+(A), +(B)

Choose the correct answer from the options given below:

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

125 Given below are two statements:

Statement I:	Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.
Statement II:	In general, carnivores are more adversely affected by competition than herbivores.

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

126 Identify the correct statements:

A:	Lenticels are the lens-shaped openings permitting the exchange of gases.
B:	Bark formed early in the season is called hard bark.
C:	Bark is a technical term that refers to all tissues exterior to vascular cambium.
D:	Bark refers to periderm and secondary phloem.
E:	Phellogen is single- layered in thickness.

Choose the correct answer from the options given below:

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

127 Main steps in the formation of Recombinant DNA are given below. Arrange these steps in a correct sequence.

A.	Insertion of recombinant DNA into the host cell.
B.	Cutting of DNA at specific location by restriction enzyme.
C.	Isolation of desired DNA fragment.
D.	Amplification of gene of interest using PCR.

Choose the correct answer from the options given below:

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

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

Assertion (A):	In gymnosperms, the pollen grains are released from the microsporangium and carried by air currents.
Reason (R):	Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

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

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

129 Which of the following statements are correct about Klinefelter's Syndrome?

A.	This disorder was first described by Langdon Down (1866).
B.	Such an individual has overall masculine development. However, the feminine development is also expressed.
C.	The affected individual is short statured.
D.	Physical, psychomotor and mental development is retarded.
E.	Such individuals are sterile.

Choose the correct answer from the options given below:

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

130 Given below are two statements. One is labelled as Assertion (A) and the other is labelled as Reason (R):

Assertion (A):	A flower is defined as a modified shoot wherein the shoot apical meristem changes to floral meristem.
Reason (R):	Internode of the shoot gets condensed to produce different floral appendages laterally at successive nodes instead of leaves.

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

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

131 Match List I with List II:

	List I		**List II**
A.	M Phase	I.	Proteins are synthesized
B.	G_2 Phase	II.	Inactive phase
C.	Quiescent stage	III.	Interval between mitosis and initiation of DNA replication
D.	G_1 Phase	IV.	Equational division

Choose the correct answer from the options given below:

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

132 Malonate inhibits the growth of pathogenic bacteria by inhibiting the activity of:
1. Dinitrogenase
2. Succinic dehydrogenase
3. Amylase
4. Lipase

133 Which of the following combinations is required for chemiosmosis?

1.	Proton pump, electron gradient, NADP synthase.
2.	Membrane, proton pump, proton gradient, ATP synthase.
3.	Membrane, proton pump, proton gradient, NADP synthase
4.	Proton pump, electron gradient, ATP synthase

134 Broad palm with single palm crease is visible in a person suffering from-

1.	Thalassemia	2.	Down's syndrome
3.	Turner's syndrome	4.	Klinefelter's syndrome

135 Given below are two statements:

Statement I:	Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat.
Statement II:	When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor.

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

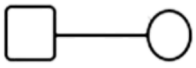
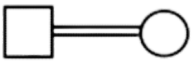
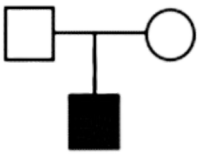
136 Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?
1. HIV Infection
2. Genital herpes
3. Gonorrhoea
4. Hepatitis-B

137 Given below are two statements:

Statement I:	Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.
Statement II:	The cavity of the cervix is called cervical canal which along with vagina forms birth canal.

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

138 Which one of the following symbols represents mating between relatives in human pedigree analysis?

1.		2.	
3.		4.	

139 Match List I with List II.

	List I		**List II**
A.	*Taenia*	I.	Nephridia
B.	*Paramoecium*	II.	Contractile vacuole
C.	*Periplaneta*	III.	Flame cells
D.	*Pheretima*	IV.	Urecose gland

Choose the correct answer from the options given below:

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

140 Given below are two statements:

Statement I:	In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.
Statement II:	In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

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

141 Which of the following functions is carried out by the cytoskeleton in a cell?

1.	Transportation	2.	Nuclear division
3.	Protein synthesis	4.	Motility

142 Given below are two statements:

Statement I:	Ligaments are dense irregular tissue.
Statement II:	Cartilage is dense regular tissue.

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

143 Which of the following are not considered as part of endomembrane system?
A. Mitochondria
B. Endoplasmic Reticulum
C. Chloroplasts
D. Golgi complex
E. Peroxisomes
Choose the most appropriate answer from the options given below:

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

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

Assertion (A):	Amniocentesis for sex determination is one of the strategies of Reproductive and Child Health Care Programme.
Reason (R):	Ban on amniocentesis checks increasing menace of female foeticide.

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

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

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

Assertion (A):	Nephrons are of two types: Cortical & Juxta medullary, based on their relative position in cortex and medulla.
Reason (R):	Juxta medullary nephrons have short-loop of Henle whereas, cortical nephrons have longer loop of Henle.

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

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

146 Match List I with List II

	List I (Type of Joint)		**List II (Found between)**
A.	Cartilaginous Joint	I.	Between flat skull bones
B.	Ball and Socket Joint	II.	Between adjacent vertebrae in vertebral column
C.	Fibrous Joint	III.	Between carpal and metacarpal of thumb
D.	Saddle Joint	IV.	Between Humerus and Pectoral girdle

Choose the correct answer from the options given below:

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

147 Vital capacity of lung is

1. IRV + ERV + TV
2. IRV + ERV
3. IRV + ERV + TV + RV
4. IRV + ERV + TV - RV

148 Match List I with List II

	List I		**List II**
A.	Ringworm	I.	*Haemophilus influenza*
B.	Filariasis	II.	*Trichophyton*
C.	Malaria	III.	*Wuchereria bancrofti*
D.	Pneumonia	IV.	*Plasmodium vivax*

Choose the correct answer from the options given below:

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

149 In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?
1. Eosinophils
2. T_H cells
3. B-lymphocytes
4. Basophils

150 Match List I with List II

	List I		**List II**
A.	Gene 'a'	I.	β-galactosidase
B.	Gene 'y'	II.	Transacetylase
C.	Gene 'i'	III.	Permease
D.	Gene 'z'	IV.	Repressor protein

Choose the correct answer from the options given below:

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

151 In the nervous system of lower invertebrates such as Hydra, neural organization is primarily structured as a:
1. Centralized nervous system with brain and ganglia
2. Network of neurons without central processing
3. Reflex arc mechanism only
4. Diffused arrangement of sensory and motor neurons

152 Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.
1. Lemur, Anteater, Wolf
2. Tasmanian wolf, Bobcat, Marsupial mole
3. Numbat, Spotted cuscus, Flying phalanger
4. Mole, Flying squirrel, Tasmanian tiger cat

153 Which of the following statements are correct regarding female reproductive cycle?

A.	In non-primate mammals, cyclical changes during reproduction are called oestrus cycle.
B.	First menstrual cycle begins at puberty and is called menopause.
C.	Lack of menstruation may be indicative of pregnancy.
D.	Cyclic menstruation extends between menarche and menopause.

Choose the most appropriate answer from the options given below:

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

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

Assertion (A):	Endometrium is necessary for implantation of blastocyst.
Reason (R):	In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

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

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

155 Match List I with List II

	List I		**List II**
A.	Heroin	I.	Effect on cardiovascular system
B.	Marijuana	II.	Slows down body function
C.	Cocaine	III.	Painkiller
D.	Morphine	IV.	Interferes with transport of dopamine

Choose the correct answer from the options given below:

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

156 Which of the following is not a cloning vector?

1.	Probe	2.	BAC
3.	YAC	4.	$_{p}$BR322

157 Consider the given two statements:

Statement I:	Electron transport chain is located in the outer mitochondrial membrane.
Statement II:	NADH and $FADH_2$ donate electrons to the electron transport chain.

1.	**Statement I** is correct; **Statement II** is correct
2.	**Statement I** is correct; **Statement II** is incorrect
3.	**Statement I** is incorrect; **Statement II** is correct
4.	**Statement I** is incorrect; **Statement II** is incorrect

158 Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

1.	Enzyme Linked Immuno-Sorbent Assay (ELISA) technique
2.	Recombinant DNA Technology
3.	Serum and Urine analysis
4.	Polymerase Chain Reaction (PCR) technique

159 Given below are two statements:

Statement I:	RNA mutates at a faster rate.
Statement II:	Viruses having RNA genome and shorter life span mutate and evolve faster.

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

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

160 Match List I with List II

	List-I		**List-II**
A.	CCK	I.	Kidney
B.	GIP	II.	Heart
C.	ANF	III.	Gastric gland
D	ADH	IV.	Pancreas

Choose the correct answer from the options given below:

Options:	**(a)**	**(b)**	**(c)**	**(d)**
1.	IV	II	III	I
2.	IV	III	II	I
3.	III	II	IV	I
4.	II	IV	I	III

161 Given below are two statements:

Statement I:	A protein is imagined as a line, the left end represented by first amino acid (C-terminal) and the right end represented by last amino acid (N-terminal).
Statement II:	Adult human haemoglobin, consists of 4 subunits (two subunits of α type and two subunits of ß type.)

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

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

162 Match List I with List II

	List I (Interacting species)		**List II (Name of Interaction)**
A.	A Leopard and a Lion in a Forest/grassland	I.	Competition
B.	A Cuckoo laying an egg in a Crow's nest	II.	Brood parasitism
C.	Fungi and root of a higher plant mycorrhizae	I.	Mutualism
D.	A cattle egret and a Cattle in a field	IV.	Commensalism

Choose the correct answer from the options given below:

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

163 Match List I with List II

	List I		**List II**
A.	P-wave	I.	Beginning of systole
B.	Q-wave	II.	Repolarisation of ventricles
C.	QRS complex	III.	Depolarisation of atria
D.	T-wave	IV.	Depolarisation of ventricles

Choose the correct answer from the options given below:

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

164 Radial symmetry is not found in adults of phylum_____

1.	Echinodermata D	2.	Ctenophora
3.	Hemichordata	4.	Coelenterata

165 Match List I with List II

	List I		**List II**
A.	Vasectomy	I.	Oral method
B.	Coitus interruptus	II.	Barrier method
C.	Cervical caps	III.	Surgical method
D.	Saheli	IV.	Natural method

Choose the correct answer from the options given below:

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

166 Which of the following statements are correct?

A:	Basophils are most abundant cells of the total WBCs.
B:	Basophils secrete histamine, serotonin and heparin.
C:	Basophils are involved in inflammatory response.
D:	Basophils have kidney shaped nucleus.
E:	Basophils are agranulocytes.

Choose the correct answer from the options given below:

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

167 Select the correct statements.

A.	Tetrad formation is seen during Leptotene.
B.	During Anaphase, the centromeres split and chromatids separate.
C.	Terminalization takes place during Pachytene.
D.	Nucleolus, Golgi complex and ER are reformed during Telophase.
E.	Crossing over takes place between sister chromatids of homologous chromosome.

Choose the correct answer from the options given below:

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

168 Select the correct statements with reference to chordates.

A:	Presence of a mid-dorsal, solid and double nerve cord.
B:	Presence of closed circulatory system.
C:	Presence of paired pharyngeal gill slits
D:	Presence of dorsal heart.
E:	Triploblastic pseudocoelomate animals.

Choose the correct answer from the options given below:

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

169 Which of the following statements are correct regarding skeletal muscle?

A:	Muscle bundles are held together by collagenous connective tissue layer called fascicle.
B:	Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.
C:	Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.
D:	M line is considered as functional unit of contraction called sarcomere.

Choose the most appropriate answer from the options given below:

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

170 Given below are two-statements:

Statement I:	During G_0 phase of cell cycle, the cell is metabolically inactive.
Statement II:	The centrosome undergoes duplication during S phase of interphase.

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

1.	**Statement I** is incorrect but **Statement II** is correct.
2.	Both **Statement I** and **Statement II** are correct.
3.	Both **Statement I** and **Statement II** are incorrect.
4.	**Statement I** is correct but **Statement II** is incorrect.

171 Different species of a genus

1.	Are very different from each other in their basic properties
2.	Have morphological similarities
3.	Can be placed in different families
4.	Cannot be differentiated on the basis of their morphological features

172 Which of the following statements are correct?

A:	An excessive loss of body fluid from the body switches off osmoreceptors.
B:	ADH facilitates water reabsorption to prevent diuresis.
C:	ANF causes vasodilation.
D:	ADH causes increase in blood pressure.
E:	ADH is responsible for decrease in GFR.

Choose the correct answer from the options given below:

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

173 Which of the following are not under the control of thyroid hormone?

A.	Maintenance of water and electrolyte balance.
B.	Regulation of basal metabolic rate.
C.	Normal rhythm of sleep-wake cycle.
D.	Development of immune system.
E.	Support the process of formation of RBCs.

Choose the correct answer from the options given below:

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

174 The parts of the human brain that help in the regulation of sexual behavior, expression of excitement, pleasure, rage, fear, etc. are:
1. Corpus callosum and thalamus
2. Limbic system & hypothalamus
3. Corpora quadrigemina & hippocampus
4. Brain stem & epithalamus

175 Match List I with List II.

	List I		**List II**
A.	Logistic growth	I.	Unlimited resource availability condition
B.	Exponential growth	II.	Limited resource availability condition
C.	Expanding age pyramid	III.	The percent individuals of pre-reproductive age is largest followed by reproductive and post reproductive age groups
D.	Stable age pyramid	IV.	The percent individuals of pre-reproductives and reproductive age group are same

Choose the correct answer from the options given below:

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

176 Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows
5'AUCGAUCGAUCGAUCGAUCGAUCG 3'?
1. 3' ATCGATCGATCGATCGATCGATCG 5'
2. 5' UAGCUAGCUAGCUAGCUAGCUAGC 3'
3. 3' UAGCUAGCUAGCUAGCUAGCUAGC 5'
4. 5' ATCGATCGATCGATCGATCGATCG 3'

177 Which of the following is the characteristic feature of cockroach regarding sexual dimorphism?
1. Presence of anal cerci
2. Dark brown body colour and anal cerci
3. Presence of anal styles
4. Presence of sclerites

178 Match List I with List II.

	List-I		**List-II**
A.	Mast cells	I.	Ciliated epithelium
B.	Inner surface of bronchiole	II.	Areolar connective tissue
C.	Blood	III.	Cuboidal epithelium
D.	Tubular parts of nephron	IV.	specialised connective tissue

Choose the correct answer from the options given below:

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

179 The unique mammalian characteristics are:

1. pinna, monocondylic skull and mammary glands
2. hairs, tympanic membrane and mammary glands
3. hairs, pinna and mammary glands
4. hairs, pinna and indirect development

180 In cockroach, excretion is brought about by:

A.	Phallic gland
B.	Urecose gland
C.	Nephrocytes
D.	Fat body
E.	Collaterial glands

Choose the correct answer from the options given below:

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