

PHYSICS: SECTION - A

1. A bullet is fired from a gun at the speed of 280ms^{-1} in the direction 30° above the horizontal. The maximum height attained by the bullet is ($g = 9.8\text{ms}^{-2}$, $\sin 30^\circ = 0.5$)
- (1) 2800 m
(2) 2000 m
(3) 1000 m
(4) 3000 m

Ans.(3)

2. 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) 1.2 %
(2) 1.3 %
(3) 1.6 %
(4) 1.4 %

Ans.(3)

3. Given below are two statements :
- Statement I : Photovoltaic devices can convert optical radiation into electricity.
- Statement II : Zener diode is designed to operate under reverse bias in break down region.
- In the light of the above statements, choose the most appropriate answer from the options given below -
- (1) Both Statement I and Statement II are correct
(2) Both Statement I and Statement II are incorrect
(3) Statement I is correct but Statement II is incorrect
(4) Statement I is incorrect but Statement II is correct

Ans.(1)

Photovoltaic cell convert radiation into voltage and zener diode work in reverse bias

4. The magnetic energy stored in an inductor of inductance $4\mu\text{H}$ carrying a current of 2A is -
- (1) $4\mu\text{J}$
(2) 4mJ
(3) 8mJ
(4) $8\mu\text{J}$

Ans.(4)

5. If $\oint_S \vec{E} \cdot d\vec{S} = 0$ over a surface, then -
- (1) The number of flux lines entering the surface must be equal to the number of flux lines leaving it
(2) The magnitude of electric field on the surface is constant
(3) All the charges must necessarily be inside the surface
(4) The electric field inside the surface is necessarily uniform

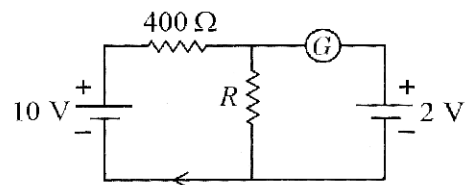
Ans.(1)

6. The net magnetic flux through any closed surface is -
- (1) Zero
(2) Positive
(3) Infinity
(4) Negative

Ans.(1)

Net magnetic flux through any closed surface is always zero

7. If the galvanometer G does not show any deflection in the circuit shown, the value of R is given by-



- (1) 200Ω
(2) 50Ω
(3) 100Ω
(4) 400Ω

Ans.(3)

8. In a series LCR circuit, the inductance L is 10mH , capacitance C is $1\mu\text{F}$ and resistance R is 100Ω . The frequency at which resonance occurs is -
- (1) 15.9rad/s
(2) 15.9kHz
(3) 1.59rad/s
(4) 1.59kHz

Ans.(4)

9. 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) 669°C
- (2) 3295°C
- (3) 3097 K
- (4) 223 K

Ans.(2)

10. 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 cross-sectional area A of the wire is -

- (1) $2W/A$
- (2) W/A
- (3) $W/2A$
- (4) Zero

Ans.(2)

11. A Carnot engine has an efficiency of 50% when its source is at a temperature 327°C . The temperature of the sink is -

- (1) 27°C
- (2) 15°C
- (3) 100°C
- (4) 200°C

Ans.(1)

12. Resistance of a carbon resistor determined from colour codes is $(22000 \pm 5\%) \Omega$. The colour of third band must be -

- (1) Red
- (2) Green
- (3) Orange
- (4) Yellow

Ans.(3)

13. The minimum wavelength of X-rays produced by an electron accelerated through a potential difference of V volts is proportional to -

- (1) \sqrt{V}
- (2) $\frac{1}{V}$

- (3) $\frac{1}{\sqrt{V}}$
- (4) V^2

Ans.(2)

14. 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.

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

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false
- (4) Statement I is false but Statement II is true

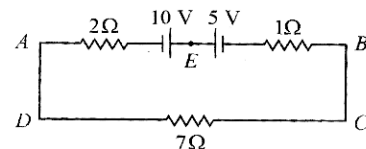
Ans.(3)

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 the photosensitive surfaces may emit photoelectrons -

- (1) Cs only
- (2) Both Na and K
- (3) K only
- (4) Na only

Ans.(1)

16. The magnitude and direction of the current in the following circuit is -



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

Ans.(2)

17. In hydrogen spectrum the shortest wavelength in the Balmer series is λ . The shortest wavelength in the Brackett series is -

- (1) 2λ
- (2) 4λ
- (3) 9λ
- (4) 16λ

Ans.(2)

18. 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. Calculate the magnitude of charge on the dipole, if the dipole length is 2 cm.

- (1) 8 mC
- (2) 6 mC
- (3) 4 mC
- (4) 2 mC

Ans.(4)

19. The half life of a radioactive substance is 20 minutes. In how much time, the activity of substance drops to $\left(\frac{1}{16}\right)^{\text{th}}$ of its initial value -

- (1) 20 minutes
- (2) 40 minutes
- (3) 60 minutes
- (4) 80 minutes

Ans.(4)

20. The venturi-meter works on -

- (1) Huygen's principle
- (2) Bernoulli's principle
- (3) The principle of parallel axes
- (4) The principle of perpendicular axes

Ans.(2)

21. An ac source is connected to a capacitor C. Due to decrease in its operating frequency -

- (1) Capacitive reactance decreases
- (2) Displacement current increases
- (3) Displacement current decreases
- (4) Capacitive reactance remains constant

Ans.(3)

22. 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 eastward
- (2) Along northward
- (3) Along north-east
- (4) Along south-west

Ans.(3)

23. 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) A centre tapped transformer
- (2) p-n junction diodes
- (3) Capacitor
- (4) Load resistance

Ans.(3)

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

- (1) 2U
- (2) 4U
- (3) 8U
- (4) 16U

Ans.(4)

25. 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 48Vm^{-1} . Then the amplitude of oscillating magnetic field is :

(Speed of light in free space = $3 \times 10^8 \text{ms}^{-1}$)

- (1) $1.6 \times 10^{-9} \text{T}$
- (2) $1.6 \times 10^{-8} \text{T}$
- (3) $1.6 \times 10^{-7} \text{T}$
- (4) $1.6 \times 10^{-6} \text{T}$

Ans.(3)

26. 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) $\sin^{-1}\left(\frac{t_2}{t_1}\right)$

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

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

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

Ans.(4)

27. The amount of energy required to form a soap bubble of radius 2 cm from a soap solution is nearly -
(Surface tension of soap solution = 0.03 N m^{-1})

(1) $30.16 \times 10^{-4} \text{ J}$

(2) $5.06 \times 10^{-4} \text{ J}$

(3) $3.01 \times 10^{-4} \text{ J}$

(4) $50.1 \times 10^{-4} \text{ J}$

Ans.(3)

28. A 12 V, 60 W lamp is connected to the secondary of a step down transformer, whose primary is connected to ac mains of 220 V. Assuming the transformer to be ideal, what is current in the primary winding -

(1) 0.27 A

(2) 2.7 A

(3) 3.7 A

(4) 0.37 A

Ans.(1)

29. The angular acceleration of a body, moving along the circumference of a circle is -

(1) along the radius, away from centre

(2) along the radius towards the centre

(3) along the tangent to its position.

(4) along the axis of rotation

Ans.(4)

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

(1) $\frac{v}{3}$ (2) $\frac{2v}{3}$

(3) $\frac{4v}{3}$

(4) $\frac{3v}{4}$

Ans.(3)

31. The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are -

(1) Instrumental errors

(2) Personal errors

(3) Least count errors

(4) Random errors

Ans.(4)

32. The ratio of 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 same mass and radius about its axis is -

(1) 3 : 5

(2) 5 : 3

(3) 2 : 5

(4) 5 : 2

Ans.(B) (1*)

33. 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) $-\frac{8Gm}{R}$

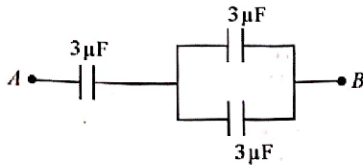
(2) $-\frac{12Gm}{R}$

(3) $-\frac{16Gm}{R}$

(4) $-\frac{20Gm}{R}$

Ans.(3)

34. The equivalent capacitance of the system shown in the following circuit is -



- (1) $2 \mu\text{F}$
- (2) $3 \mu\text{F}$
- (3) $6 \mu\text{F}$
- (4) $9 \mu\text{F}$

Ans.(1)

35. The ratio of frequencies of fundamental harmonic produced by an open pipe to that of closed pipe having the same length is -

- (1) 1 : 2
- (2) 2 : 1
- (3) 1 : 3
- (4) 3 : 1

Ans.(2)

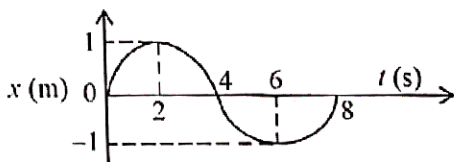
PHYSICS: SECTION - B

36. 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 ($g = 10 \text{ ms}^{-2}$)

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

Ans.(3)

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

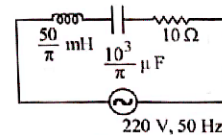


- (1) $\frac{\pi^2}{8} \text{ ms}^{-2}$

- (2) $-\frac{\pi^2}{8} \text{ ms}^{-2}$
- (3) $\frac{\pi^2}{16} \text{ ms}^{-2}$
- (4) $-\frac{\pi^2}{16} \text{ ms}^{-2}$

Ans.(4)

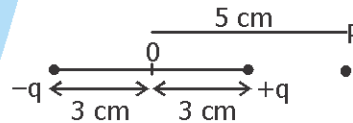
38. The net impedance of circuit (as shown in figure) will be



- (1) $10\sqrt{2} \Omega$
- (2) 15Ω
- (3) $5\sqrt{5} \Omega$
- (4) 25Ω

Ans.(3)

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



The electric potential (in 10^2 V) at point P due to the dipole is ($\epsilon_0 =$ permittivity of free space and $\frac{1}{4\pi\epsilon_0} = K$)

- (1) $\left(\frac{3}{8}\right)qK$
- (2) $\left(\frac{5}{8}\right)qK$
- (3) $\left(\frac{8}{5}\right)qK$
- (4) $\left(\frac{8}{3}\right)qK$

Ans.(1)

40. 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) $3IL$
- (2) $\sqrt{5} IL$
- (3) $5 IL$
- (4) $\sqrt{3} IL$

Ans.(3)

41. 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 $\frac{u}{3}$. 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) 27 cm
- (2) 24 cm
- (3) 28 cm
- (4) 30 cm

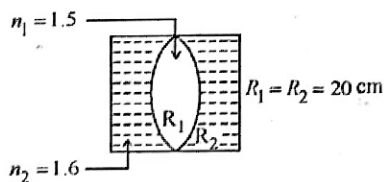
Ans.(1)

42. Two thin lenses are of 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) zero
- (2) $f/4$
- (3) $f/2$
- (4) Infinite

Ans.(4)

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



- (1) 40 cm

- (2) 40 cm
- (3) 100 cm
- (4) 50 cm

Ans.(3)

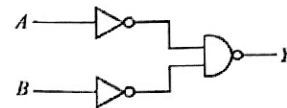
44. A satellite is orbiting just above the surface of the earth with period T . If d is the density of the earth and G is the universal constant of gravitation, the quantity $\left(\frac{3\pi}{Gd}\right)$

represents -

- (1) T
- (2) T^2
- (3) T^3
- (4) \sqrt{T}

Ans.(2)

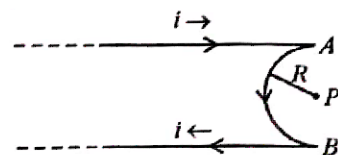
45. For the following logic circuit, the truth table is -



- | | | | | | | | |
|-----|---|---|---|-----|---|---|---|
| (1) | A | B | Y | (2) | A | B | Y |
| | 0 | 0 | 1 | | 0 | 0 | 0 |
| | 0 | 1 | 1 | | 0 | 1 | 1 |
| | 1 | 0 | 1 | | 1 | 0 | 1 |
| | 1 | 1 | 0 | | 1 | 1 | 1 |
| (3) | A | B | Y | (4) | A | B | Y |
| | 0 | 0 | 1 | | 0 | 0 | 0 |
| | 0 | 1 | 0 | | 0 | 1 | 0 |
| | 1 | 0 | 1 | | 1 | 0 | 0 |
| | 1 | 1 | 0 | | 1 | 1 | 1 |

Ans.(2)

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



- (1) $\frac{\mu_0 i}{4R}$ pointed into the page

(2) $\frac{\mu_0 i}{4R}$ pointed away from the page

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

(4) $\frac{\mu_0 i}{4R} \left[1 - \frac{2}{\pi} \right]$ pointed into the page

Ans.(3)

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

(1) $3 \times 10^{-4} \text{ }^\circ\text{C}^{-1}$

(2) $3 \times 10^{-3} \text{ }^\circ\text{C}^{-1}$

(3) $3 \times 10^{-2} \text{ }^\circ\text{C}^{-1}$

(4) $3 \times 10^{-1} \text{ }^\circ\text{C}^{-1}$

Ans.(3)

48. 10 resistors each of resistance R are connected in series to a battery of emf E and negligible internal resistance. The those are connected in parallel to the same battery, the current is increased n times. the value of n is -

(1) 10

(2) 100

(3) 1

(4) 1000

Ans.(2)

49. The radius of inner most orbit of hydrogen atom is $5.3 \times 10^{-11} \text{ m}$. What is the radius of third allowed orbit of hydrogen atom ?

(1) 0.53 \AA

(2) 1.06 \AA

(3) 1.59 \AA

(4) 4.77 \AA

Ans.(4)

50. 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 4s. The height of bridge above water surface is (Take $g = 10 \text{ ms}^{-2}$)

(1) 56 m

(2) 60 m

(3) 64 m

(4) 68 m

Ans.(3)

CHEMISTRY : SECTION - A

51. The relation between n_m , (n_m = the number of permissible values of magnetic quantum number (m)) for a given value of azimuthal quantum number (l), is -

(1) $l = \frac{n_m - 1}{2}$

(2) $l = 2n_m + 1$

(3) $n_m = 2l^2 + 1$

(4) $n_m = l + 2$

Ans.(1)

52. The element expected to form largest ion to achieve the nearest noble gas configuration is -

(1) O

(2) F

(3) N

(4) Na

Ans.(3)

53. Which amongst the following molecules on polymerization produces neoprene?

(1) $\text{H}_2\text{C} = \text{CH} - \text{CH} = \text{CH}_2$

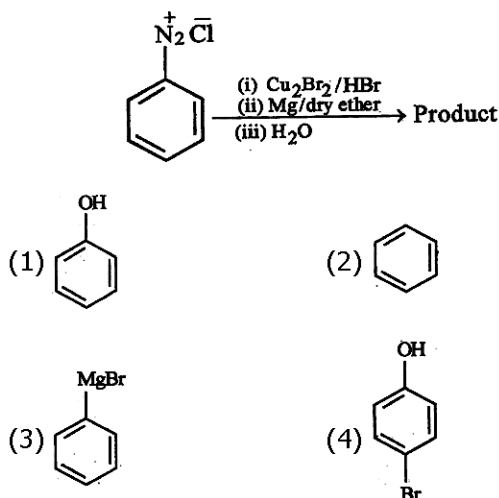
(2) $\begin{array}{c} \text{Cl} \\ | \\ \text{H}_2\text{C} = \text{C} - \text{CH} = \text{CH}_2 \end{array}$

(3) $\text{H}_2\text{C} = \text{CH} - \text{C} \equiv \text{CH}$

(4) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_2\text{C} = \text{C} - \text{CH} = \text{CH}_2 \end{array}$

Ans.(2)

54. Identify the product in the following reaction :



Ans.(2)

Initial product is PhBr, then PhMgBr which on reaction with water gives benzene

55. 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 cell constant is -

- (1) 1.34 cm⁻¹
 (2) 3.28 cm⁻¹
 (3) 1.26 cm⁻¹
 (4) 3.34 cm⁻¹

Ans.(3)

56. Match List-I with List-II :

List-I

- A. Coke
 B. Diamond
 C. Fullerene
 D. Graphite

List-II

- I. Carbon atoms are sp³ hybridised.
 II. Used as a dry lubricant
 III. Used as a reducing agent
 IV. Cage like molecules

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

Ans.(3)

57. 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 and R is not the correct explanation of A.
 (3) A is true but R is false.
 (4) A is false but R is true.

Ans.(4)

58. Homoleptic complex from the following complexes is -

- (1) Potassium trioxalatoaluminate (III)
 (2) Diamminechloridonitrito - N - platinum (II)
 (3) Pentaamminecarbonatocobalt (III) chloride
 (4) Triammetriaquachromium (III) chloride

Ans.(1)

59. A compound is formed by two elements A and B. The element B forms cubic close packed structure and atoms of A occupy 1/3 of tetrahedral voids. If the formula of the compound is A_xB_y, then the value of x + y is in option -

- (1) 5 (2) 4
 (3) 3 (4) 2

Ans.(1)

60. The right option for the mass of CO₂ produced by heating 20 g of 20% pure limestone is (Atomic mass of Ca = 40).



- (1) 1.12 g
 (2) 1.76 g
 (3) 2.64 g
 (4) 1.32 g

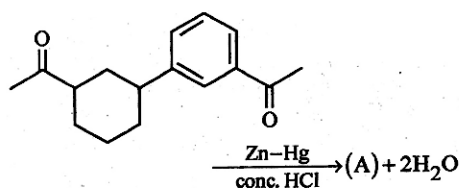
Ans.(2)

61. Taking stability as the factor, which one of the following represents correct relationship?

- (1) $TiCl_3 > TiCl$
- (2) $InI_3 > InI$
- (3) $AlCl > AlCl_3$
- (4) $TiI > TiI_3$

Ans.(4)

62. Identify product (A) in the following reaction :



- (1)
- (2)
- (3)
- (4)

Ans.(1)

63. 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 options given below -

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

Ans.(4)

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

- (1) decrease by a factor of nine.
- (2) increase by a factor of six.
- (3) increase by a factor of nine.
- (4) increase by a factor of three.

Ans.(3)

65. Given below are two statements :

Statements I : A unit formed by the attachment of a base to 1' position of sugar is known as nucleoside.

Statements 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) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false
- (4) Statement I is false but Statement II is true

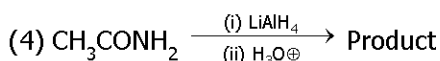
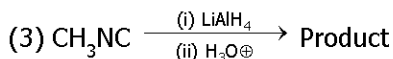
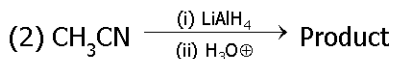
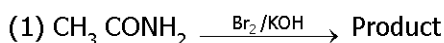
Ans.(3)

66. Amongst the given options which of the following molecules / ion acts as a Lewis acid?

- (1) NH_3
- (2) H_2O
- (3) BF_3
- (4) OH^-

Ans.(3)

67. Which of the following reactions will not give primary amine as the product?



Ans.(3)

68. Amongst the following, the total number of species not having eight electrons around central atom in its outer most shell, is -



(1) 3

(2) 2

(3) 4

(4) 1

Ans.(1)

69. Which of the following statements are not correct?

A. Hydrogen is used to reduce heavy metal oxides to metals.

B. Heavy water is used to study reaction mechanism.

C. Hydrogen is used to make saturated fats from oils.

D. The H-H bond dissociation enthalpy is lowest as compared to a single bond between two atoms of any element.

E. Hydrogen reduces oxides of metals that are more active than iron.

Choose the **most appropriate** answer from the options given below :

(1) B, C, D, E only

(2) B, D only

(3) D, E only

(4) A, B, C only

Ans.(3)

70. Weight (g) of two moles of the organic compound, which

is obtained by heating sodium ethanoate with sodium hydroxide in presence of calcium oxide is :

(1) 16

(2) 32

(3) 30

(4) 18

Ans.(2)

This reaction is sodalime decarboxylation, which will give two moles of CH_4 (Molecular weight = 16)

71. The number of σ bond, π bonds and lone pair of electrons in pyridine, respectively are :

(1) 11, 2, 0

(2) 12, 3, 0

(3) 11, 3, 1

(4) 12, 2, 1

Ans.(3)

72. Which one of the following statement is correct?

(1) The daily requirement of Mg and Ca in the human body is estimated to be 0.2 - 0.3 g.

(2) All enzymes that utilise ATP in phosphate transfer require Ca as the cofactor.

(3) The bone in human body is an inert and unchanging substance.

(4) Mg plays roles in neuromuscular function and interneuronal transmission.

Ans.(1)

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

Assertion A : Metallic sodium dissolves in liquid ammonia giving a deep blue solution, which is paramagnetic.

Reason R : The deep blue solution is due to the formation of amide.

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.

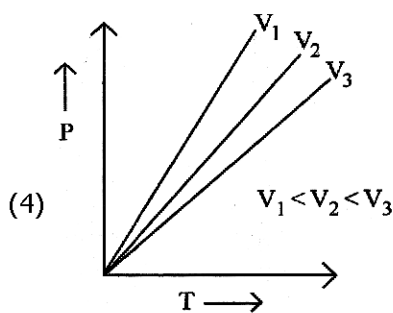
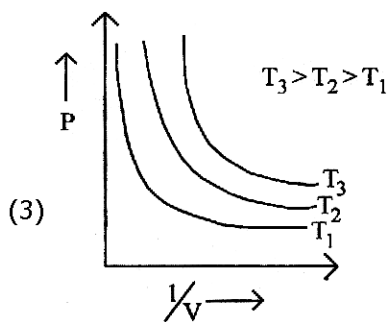
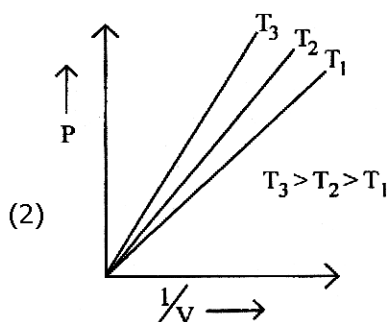
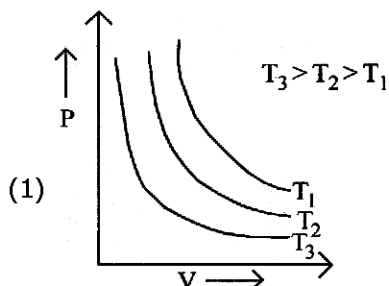
(2) Both A and R are true and R is not the correct explanation of A.

(3) A is true but R is false.

(4) A is false but R is true.

Ans.(3)

74. Which amongst the following options is correct graphical representation of Boyle's Law?



Ans.(2)

75. The correct order of energies of molecular orbitals of N_2 molecule, is -

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

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

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

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

Ans.(1)

76. Some tranquilizers are listed below. Which one from the following belongs to barbiturates -

(1) Chlordiazepoxide

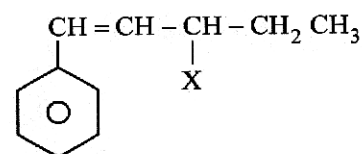
(2) Meprobamate

(3) Valium

(4) Veronal

Ans.(4)

77. The given compound



is an example of -

(1) benzylic halide

(2) aryl halide

(3) allylic halide

(4) vinylic halide

Ans.(3)

78. Intermolecular forces are forces of attraction and repulsion between interacting particles that will include-

A. dipole - dipole forces.

B. dipole - induced dipole forces.

C. hydrogen bonding.

D. covalent bonding

E. dispersion forces.

Choose the most appropriate answer from the options given below.

- (1) B, C, D, E are correct
 (2) A, B, C, D are correct
 (3) A, B, C, E are correct
 (4) A, C, D, E are correct

Ans.(3)

79. Which one is an example of heterogenous catalysis -

- (1) Oxidation of sulphur dioxide into sulphur trioxide in the presence of oxides of nitrogen.
 (2) Hydrolysis of sugar catalysed by H^+ ions.
 (3) Decomposition of ozone in presence of nitrogen monoxide
 (4) Combination between dinitrogen and dihydrogen to form ammonia in the presence of finely divided iron

Ans.(4)

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

Assertion A : Helium is used to dilute oxygen in diving apparatus.

Reasons R : Helium has high solubility in O_2 . 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 and R is NOT the correct explanation of A.
 (3) A is true but R is false
 (4) A is false but R is true

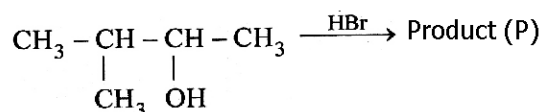
Ans.(2)

81. The stability of Cu^{2+} is more than Cu^+ salts in aqueous solution due to -

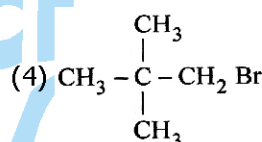
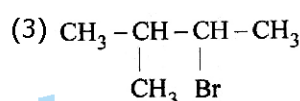
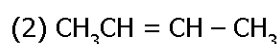
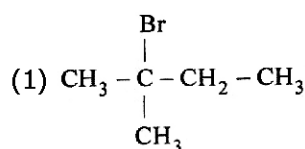
- (1) first ionisation enthalpy
 (2) enthalpy of atomization
 (3) hydration energy
 (4) second ionisation enthalpy

Ans.(3)

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

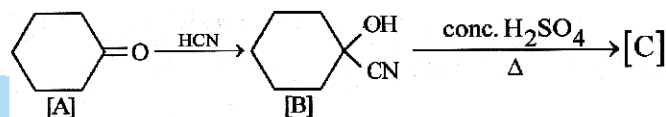


3 - Methylbutan - 2 - ol

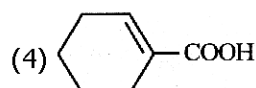
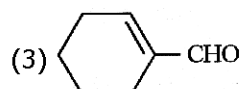
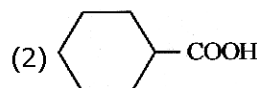
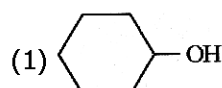


Ans.(1)

83. Complete the following reaction.



[C] is -



Ans.(4)

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

Assertion A : In equation $\Delta_r G = -nFE_{\text{cell}}$, value of $\Delta_r G$ is depends on n.

Reasons R : E_{cell} is an intensive property and $\Delta_r G$ is an extensive property.

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 and R is NOT the correct explanation of A.
 (3) A is true but R is false
 (4) A is false but R is true

Ans.(1)

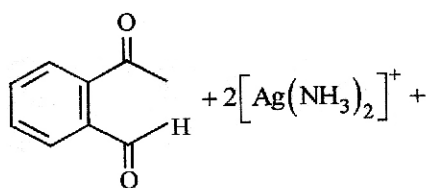
85. In Lassaigne's extract of an organic compound, both nitrogen and sulphur are present, which gives blood red colour, with Fe^{3+} due to the formation of -

- (1) $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3 \cdot x\text{H}_2\text{O}$
 (2) NaSCN
 (3) $[\text{Fe}(\text{CN})_5\text{NOS}]^{4-}$
 (4) $[\text{Fe}(\text{SCN})]^{2+}$

Ans.(4)

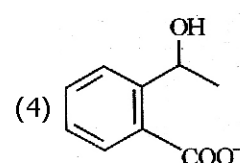
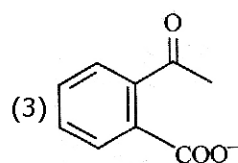
CHEMISTRY : SECTION - B

86. Identify the major product obtained in the following reaction-



$3^{\circ}\text{OH} \xrightarrow{\Delta}$ major product

- (1) (2)



Ans.(3)

87. Match List-I with List-II :

List-I

(Oxoacids of Sulphur)

- (A) Peroxodisulphuric acid
 (B) Sulphuric acid
 (C) Pyrosulphuric acid
 (D) Sulphurous acid

List-II

(Bonds)

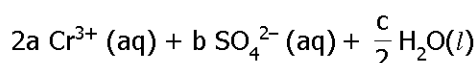
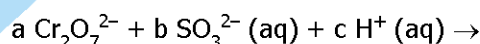
- (I) Two S-OH, Four S=O, One S-O-S
 (II) Two S-OH, One S=O
 (III) Two S-OH, Four S=O, One S-O-O-S
 (IV) Two S-OH, Two S=O

Choose the correct answer from the options given below-

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

Ans.(2)

88. On balancing the given redox reaction,



the coefficients a, b and c are found to be, respectively-

- (1) 1, 3, 8
 (2) 3, 8, 1
 (3) 1, 8, 3
 (4) 8, 1, 3

Ans.(1)

89. Pumice stone is an example of -

- (1) sol
 (2) gel
 (3) solid sol
 (4) foam

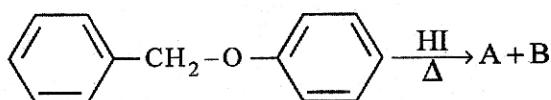
Ans.(3)

90. Which complex compound is most stable -

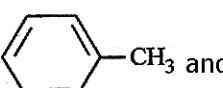
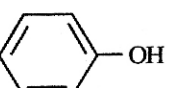
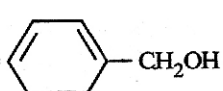
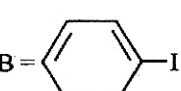
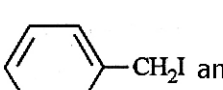
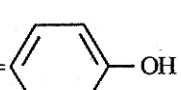
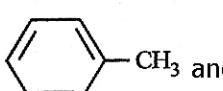
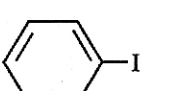
- (1) $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Br}](\text{NO}_3)_2$
- (2) $[\text{Co}(\text{NH}_3)_3(\text{NO}_3)_3]$
- (3) $[\text{CoCl}_2(\text{en})_2]\text{NO}_3$
- (4) $[\text{Co}(\text{NH}_3)_6]_2(\text{SO}_4)_3$

Ans.(3)

91. Consider the following reaction :

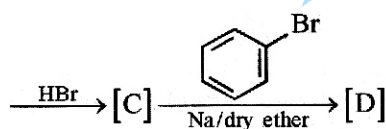
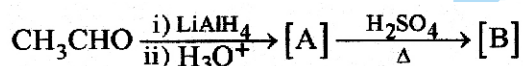


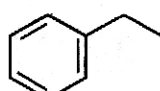
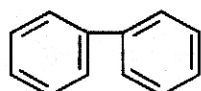
Identify products A and B

- (1) A =  and B = 
- (2) A =  and B = 
- (3) A =  and B = 
- (4) A =  and B = 

Ans.(3)

92. Identify the final product [D] obtained in the following sequence of reactions.



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

Ans.(1)

93. Given below are two statements :

Statement I : The nutrient deficient water bodies lead to eutrophication.

Statement II : Eutrophication leads to decrease in the

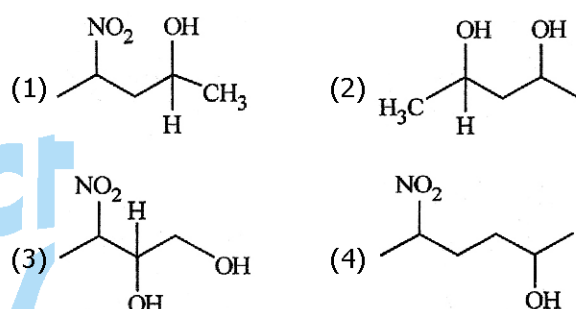
level of oxygen in the water bodies.

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

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is correct but Statement II is false
- (4) Statement I is incorrect but Statement II is true

Ans.(4)

94. Which amongst the following will be most readily dehydrated under acidic conditions -



Ans.(4)

95. What fraction of one edge centred octahedral void lies in one unit cell of fcc -

- (1) $\frac{1}{2}$
- (2) $\frac{1}{3}$
- (3) $\frac{1}{4}$
- (4) $\frac{1}{12}$

Ans.(3)

96. The reaction that does NOT take place in a blast furnace between 900 K to 1500 K temperature range during extraction of iron is -

- (1) $\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow 2\text{FeO} + \text{CO}_2$
- (2) $\text{FeO} + \text{CO} \rightarrow \text{Fe} + \text{CO}_2$
- (3) $\text{C} + \text{CO}_2 \rightarrow 2\text{CO}$
- (4) $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$

Ans.(1)

97. Which amongst the following options is the correct relation between change in enthalpy and change in internal energy-

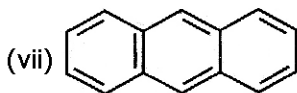
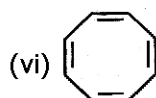
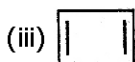
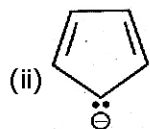
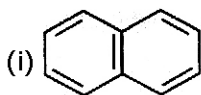
- (1) $\Delta H = \Delta U - \Delta n_g RT$
- (2) $\Delta H = \Delta U + \Delta n_g RT$

(3) $\Delta H - \Delta U = -\Delta nRT$

(4) $\Delta H + \Delta U = \Delta nR$

Ans.(2)

98. Consider the following compounds/species -



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

- (1) 4
- (2) 6
- (3) 2
- (4) 5

Ans.(1)

99. The equilibrium concentrations 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^0 for the reaction is -

(R = 2 cal / mol K)

- (1) 1372.60 cal
- (2) -137.26 cal
- (3) -1381.80 cal
- (4) -13.73 cal

Ans.(3)

100. Which of the following statements are incorrect -

- (A) All the transition metals except scandium form MO oxides which are ionic.
- (B) The highest oxidation number corresponding to the group number in transition metal oxides is attained in Sc₂O₃ to Mn₂O₇.
- (C) Basic character increases from V₂O₃ to V₂O₄ to V₂O₅.
- (D) V₂O₄ dissolves in acids to give VO₄³⁻ salts.

(E) CrO is basic but Cr₂O₃ is amphoteric.

Choose the correct answer from the options given below.

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

Ans.(3)

BOTANY: SECTION - A

101. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

- (1) Osmosis
- (2) Facilitated Diffusion
- (3) Passive Transport
- (4) Active Transport

Ans.(4)

102. How many ATP and NADPH₂ are required for the synthesis of one molecule of Glucose during Calvin cycle -

- (1) 12 ATP and 12 NADPH₂
- (2) 18 ATP and 12 NADPH₂
- (3) 12 ATP and 16 NADPH₂
- (4) 18 ATP and 16 NADPH₂

Ans.(2)

103. Which micronutrient is required for splitting of water molecule during photosynthesis -

- (1) manganese
- (2) molybdenum
- (3) magnesium
- (4) copper

Ans.(1)

104. Given 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) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is correct but Statement II is false
- (4) Statement I is incorrect but Statement II is true

Ans.(4)

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

Assertion A : Late wood has fewer xylary elements with narrow vessels.

Reason R : Cambium is less active in winters.

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

- (1) Both A and R are true and R is the correct explanation of A
 (2) Both A and R are true and R is NOT the correct explanation of A
 (3) A is true but R is false
 (4) A is false but R is true

Ans.(1)

106. During the purification process for recombinant DNA technology addition of chilled ethanol precipitates out -

- (1) RNA (2) DNA
 (3) Histones (4) Polysaccharides

Ans.(2)

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

- (1) Copper (2) Zinc
 (3) Tungsten or gold (4) Silver

Ans.(3)

108. The historic convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year -

- (1) 1985 (2) 1992 (3) 1986 (4) 2002

Ans.(2)

109. In angiosperm the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are -

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

Ans.(3)

110. Upon exposure to UV radiation, DNA stained with ethidium bromide will show -

- (1) Bright red colour (2) Bright blue colour
 (3) Bright yellow colour (4) Bright orange colour

Ans.(4)

111. 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) Diadelphous and Dithecous anthers
 (2) Polyadelphous and epipetalous anthers
 (3) Monoadelphous and Monothealous anthers
 (4) Epiphyllous and Dithecous anthers

Ans.(1)

112. Which hormone promotes internode/petiole elongation in deep water rice -

- (1) GA₃ (2) Kinetin
 (3) Ethylene (4) 2, 4-D

Ans.(3)

113. 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) Thomas Hunt Morgan
 (2) Sutton and Boveri
 (3) Alfred Sturtevant
 (4) Henking

Ans.(3)

114. Identify the pair or heterosporous pteridophytes among the following -

- (1) Lycopodium and Selaginella
 (2) Selaginella and Salvinia
 (3) Psilotum and Salvinia
 (4) Equisetum and Salvinia

Ans.(2)

115. What is the role of RNA polymerase III in the process of transcription in Eukaryotes -

- (1) Transcription of rRNAs (28S, 18S and 5.8S)
 (2) Transcription of tRNA 5 srRNA and snRNA
 (3) Transcription of precursor mRNA
 (4) Transcription of only snRNAs

Ans.(2)

116. Expressed Sequence Tags (ESTs) refers to -

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

Ans.(1)

117. Cellulose does not form blue colour with Iodine because-

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

Ans.(3)

118. Given below are two statements : One is labelled as Assertion A and the other is labelled Reason R
Assertion A : ATP is used at two steps in glycolysis

Reason R : First ATP is used in converting glucose into glucose-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 give below

- (1) Both A and R are true and R is the correct explanation of A
- (2) Both A and R are true and R is NOT the correct explanation of A
- (3) A is true but R is false
- (4) A is false but R is true

Ans.(1)

119. The phenomenon of pleiotropism refers to -

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

Ans.(3)

120. 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 soild 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) A, B, C only
- (2) B, C, D only
- (3) C, D, E only
- (4) D, E, A only

Ans.(1)

121. The thickness of ozone in a coloumn of air in the atmosphere is measured in terms of -

- (1) Dobson units
- (2) Decibels
- (3) Decameter
- (4) Kilobase

Ans.(1)

122. Given below are two statements :

Statement I : The forces generated by transpiration can lift a xylem-sized column of water over 130 meters height.
Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees, by evaporative cooling.

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

- (1) Both Statement I and Statement II are correct
- (2) Both Statement I and Statement II are incorrect
- (3) Statement I is correct but Statement II is incorrect
- (4) Statement I is incorrect but Statement II is correct

Ans.(1)

123. What is the function of tassels in the corn cob -

- (1) To attract insects
- (2) To trap pollen grains
- (3) to disperse pollen grains
- (4) To protect seeds

Ans.(2)

124. The reaction centre in PS II has an absorption maxima at

- (1) 680 nm
- (2) 700 nm
- (3) 660 nm
- (4) 780 nm

Ans.(1)

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

- (1) Differntitation
- (2) Dedifferentiation
- (3) Development
- (4) Senescence

Ans.(2)

126. Given 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 give below

- (1) Both A and R are true and R is the correct explanation of A
- (2) Both A and R are true and R is NOT the correct explanation of A
- (3) A is true but R is false
- (4) A is false but R is true

Ans.(1)

127. Among eukaryotes, replication of DNA takes place in -

- (1) M phase (2) S phase (3) G₁ phase (4) G₂ phase

Ans.(2)

128. Axile placentation is observed in -

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

Ans.(4)

129. In the equation -

$$GPP - R = NPP$$

GPP is Gross Primary Productivity

NPP is Net Primary Productivity

R here is _____.

- (1) Photosynthetically active radiation
- (2) Respiratory quotient
- (3) Respiratory loss
- (4) Reproductive allocation

Ans.(3)

130. Which of the following stages of meiosis involves division of centromere -

- (1) Metaphase I (2) Metaphase II
- (3) Anaphase II (4) Telophase

Ans.(3)

131. Spraying of which of the following phytohormone in juvenile conifers helps in hastening the maturity period, that leads to early seed production -

- (1) Indole-3-butyric Acid (2) Gibberellic Acid
- (3) Zeatin (4) Abscisic Acid

Ans.(2)

132. Unequivocal proof that DNA is the genetic material was first proposed by -

- (1) Frederic Griffith (2) Alfred Hershey and Martha Chase

- (3) Avery, Macleoid and McCarthy (4) Wilkins and Franklin

Ans.(2)

133. Large, colourful, fragrant flowers with nectar are seen in

- (1) insect pollinated plants (2) bird pollinated plants
- (3) bat pollinated plants (4) wind pollinated plants

Ans.(1)

134. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis -

- (1) Zygotene (2) Pachytene (3) Diplotene (4) Diakinesis

Ans.(2)

135. Among 'The Evil Quartet' which one is considered the most important cause driving extinction of species -

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

Ans.(1)

136. 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 technical terms 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, C and E only (2) A and D only
- (3) A, B and D only (4) B and C only

Ans.(2)

137. Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

- (1) Succinic dehydrogenase
- (2) Amylase
- (3) Lipase
- (4) Dinitrogenase

Ans.(1)

138. Match List I with List II -

- | | |
|--------------------|------------------------------------|
| List - I | List - II |
| A. Cohesion | I. More attraction in liquid phase |
| B. Adhesion | II. Mutual attraction among water |
| C. Surface tension | III. Water loss in liquid phase |

D. Guttation IV. Attraction towards polar surfaces

Choose the correct answer from the options given below-

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

Ans.(1)

139. Match List I with List II

List - I	List - II
A. Iron	I. Synthesis of auxin
B. Zinc	II. Component of nitrate reductase
C. Boron	III. Activator of catalase
D. Molybdenum	IV. Cell elongation and differentiation

Choose the correct answer from the options given below-

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

Ans.(3)

140. 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 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 B only
- (2) C and D only
- (3) B and E only
- (4) A and E only

Ans.(3)

141. Which of the following combinations is required for chemiosmosis -

- (1) membrane proton pump, proton gradient ATP synthase
- (2) membrane, proton pump, proton gradient NADP synthase
- (3) proton pump, electron gradient, ATP synthase
- (4) proton pump, electron gradient, NADP synthase

Ans.(1)

142. How many different proteins does the ribosome consist of -

- (1) 80
- (2) 60
- (3) 40
- (4) 20

Ans.(1)

143. 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 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) Both A and R are true and R is the correct explanation of A
- (2) Both A and R are true and R is NOT the correct explanation of A
- (3) A is true but R is false
- (4) A is false but R is true

Ans.(1)

144. 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) 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

Ans.(3)

145. Match List-I with List-II :

List-I	List-II
(Interaction)	(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

- (1) A-IV, B-II, C-I, D-III
- (2) A-IV, B-I, C-II, D-III

(3) A-IV, B-III, C-I, D-II (4) A-III, B-I, C-IV, D-II

Ans.(2)

146. 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, C, D, A (2) C, A, B, D
- (3) C, B, D, A (4) B, D, A, C

Ans.(1)

147. Given below are two statements :

Statement I : Gause's Competitive Exclusion Principle states that two closely related species competing for the same resources cannot coexist 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) Both statement I and Statement II are true
- (2) Both statement I and Statement II are false
- (3) Statement I is correct but statement II is false
- (4) Statement I is incorrect but statement II is true

Ans.(3)

148. 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 :

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

Ans.(4)

149. Which one of the following statement is NOT correct -

- (1) The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume

a lot of oxygen causing the death of aquatic organisms
(2) Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries

(3) Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body

(4) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels

Ans.(2)

150. 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
D. G ₁ phase	IV. Equational division

Choose the correct answer from the options given below :

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

Ans.(3)

151. In which blood corpuscles, the HIV undergoes replication and produces progeny viruses -

- (1) T_H cells (2) B-lymphocytes
- (3) Basophils (4) Eosinophils

Ans.(1)

152. Which of the following is not a cloning vector -

- (1) BAC (2) YAC (3) pBR322 (4) Probe

Ans.(4)

153. Once the undigested and unabsorbed substance enter the caecum, their backflow is prevented by -

- (1) Sphincter of Oddi (2) Ileo - caecal valve
- (3) Gastro - oesophageal sphincter (4) Pyloric sphincter

Ans.(2)

154. 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

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

Ans.(1)

155. Given below are two statements one is labelled as Assertion A and the other is labelled as 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) 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

Ans.(4)

156. 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 :

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

Ans.(2)

157. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment -

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

Ans.(2)

158. Given below are two statements :

Statement I : Electrostatic precipitator is most widely used in thermal power plant.

Statement II : Electroprecipitator in thermal power plant

removes ionising radiations.

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

- (1) Both statement I and Statement II are correct
(2) Both statement I and Statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

Ans.(3)

159. 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) 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

Ans.(2)

160. Match List-I with List-II

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

Choose the correct answer from the options given below:

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

Ans.(1)

161. 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) Both statement I and Statement II are true

- (2) Both statement I and Statement II are false
 (3) Statement I is true but statement II is false
 (4) Statement I is false but statement II is true

Ans.(2)

162. Match List-I with List-II

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

Choose the correct answer from the options given below :

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

Ans.(1)

163. 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 :

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

Ans.(2)

164. Which of the following function is carried out by cytoskeleton in a cell -

- (1) Nuclear division
 (2) Protein synthesis
 (3) Motility
 (4) Transportation

Ans.(3)

165. Select the correct group/set of Australian Marsupials exhibiting adaptive radiation -

- (1) Tasmanian wolf, Bobcat, Marsupial mole
 (2) Numbat Spotted cuscus, Flying phalanger
 (3) Mole, Flying squirrel, Tasmanian tiger cat
 (4) Lemur, Anteater, Wolf

Ans.(2)

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

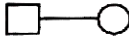

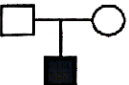

Ans.(4)

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

- (1) Down's syndrome
 (2) Turner's syndrome
 (3) Klinefelter's syndrome
 (4) Thalassemia

Ans.(1)

168. Which one of the following symbols represents mating between relative in human pedigree analysis -

- (1)  (2) 
 (3)  (4) 

Ans.(2)

169. Which one of the following common sexually transmitted disease is completely curable when detected early and treated properly -

- (1) Genital herpes (2) Gonorrhoea
 (3) Hepatitis-B (4) HIV Infection

Ans.(2)

170. 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 statement, choose the correct answer from the options given below :

- (1) Both statement I and Statement II are true

- (2) Both statement I and Statement II are false
 (3) Statement I is true but statement II is false
 (4) Statement I is false but statement II is true

Ans.(4)

171. 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) Both statement I and Statement II are true
 (2) Both statement I and Statement II are false
 (3) Statement I is correct but statement II is false
 (4) Statement I is incorrect but statement II is true

Ans.(1)

172. Radial symmetry is NOT found in adults of phylum -

- (1) Ctenophora (2) Hemichordata
 (3) Coelenterata (4) Echinodermata

Ans.(2)

173. Which of the following are NOT considered as the 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) B and D only (2) A, C and E only
 (3) A and D only (4) A, D and E only

Ans.(2)

174. Match List-I with List-II

- | List-I | List-II |
|----------------------------|--|
| (Type of Joint) | (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 |
| (1) A-III, B-I, C-II, D-IV | (2) A-II, B-IV, C-I, D-III |
| (3) A-I, B-IV, C-III, D-II | (4) A-II, B-IV, C-III, D-I |

Ans.(2)

175. 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. Pancrease |

Choose the correct answer from the options given below :

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

Ans.(1)

176. 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 statement, choose the correct answer from the options given below:

- (1) Both Statement I and Statement II are true.
 (2) Both Statement I and Statement II are false.
 (3) Statement I is true but Statement II are false.
 (4) Statement I is false but Statement II are true.

Ans.(1)

177. 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 β type.)

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

- (1) Both Statement I and Statement II are true.
 (2) Both Statement I and Statement II are false.
 (3) Statement I is true but Statement II are false.

(4) Statement I is false but Statement II are true.

Ans.(4)

178. Given below are two 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 statement, 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.

Ans.(3)

179. Match List I with List II

List I

- A. Taenia
- B. Paramoecium
- C. Periplaneta
- D. Pheretima

List II

- I. Nephridia
- II. Contractile vacuole
- III. Flame cells
- IV. Urecose gland

Choose the correct answer from the options give below:

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

Ans.(3)

180. Match List I with List II

List I

- A. Heroin
- B. Marijuana
- C. Cocaine
- D. Morphine

List II

- I. Effect on cardiovascular system
- II. Slow down body function
- III. Painkiller
- IV. Interfere with transport of dopamine

Choose the correct answer from the options give below:

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

Ans.(1)

181. Which of the following statements is correct?

- (1) Eutrophication refers to increase in domestic sewage and waste water in lakes.
- (2) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.
- (3) Presence of large amount of nutrients in water restricts 'Algal Bloom'
- (4) Algal Bloom decreases fish mortality

Ans.(2)

182. Match List I with List II

List I

(Cells)

- A. Peptic cells
- B. Goblet cells
- C. Oxyntic cells
- D. Hepatic cells

List II

(Secretion)

- I. Mucus
- II. Bile juice
- III. Proenzyme pepsinogen
- IV. HCl and intrinsic factor for absorption of vitamin B₁₂

Choose the correct answer from the options give below:

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

Ans.(3)

183. 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 the light of the above statement, choose the correct answer from the options given below:

- (1) Both Statement I and Statement II are true.
- (2) Both Statement I and Statement II are false.
- (3) Statement I is correct but Statement II are false.
- (4) Statement I is incorrect but Statement II are true.

Ans.(1)

184. Vital capacity of lung is _____.

- (1) IRV + ERV
- (2) IRV + ERV + TV + RV
- (3) IRV + ERV + TV – RV
- (4) IRV + ERV + TV

Ans.(4)

185. Match List I with List II with respect to human eye.

List I	List II
A. Fovea	I. Visible coloured portion of eye that regulates diameter of pupil.
B. Iris	II. External layer of eye formed of dense connective tissue.
C. Blind spot	III. Point of greatest visual acuity or resolution.
D. Sclera	IV. Point where optic nerve leaves the eyeball and photoreceptor cells are absent.

Choose the correct answer from the options give below:

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

Ans.(1)

186. In cockroach excretion is brought about by -

- A. Phallic gland
- B. Urecoase gland
- C. Nephrocytes
- D. Fat body
- E. Collateral glands

Chhose the correct answer from the options given below:

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

Ans.(3)

187. Which one of the following is the sequence on corresponding coding strand if the sequence on mRNA formed is as follows

- 5' AUCGAUCGAUCGAUCGAUCG AUCG AUCG 3'?
- (1) 5' UAGCUAGCUAGCUAGCUA GCUAGC UAGC 3'
 - (2) 3' UAGCUAGCUAGCUAGCUA GCUAGCUAGC 5'
 - (3) 5' ATCGATCGATCGATCGATCGATCGATCG 3'
 - (4) 3' ATCGATCGATCGATCGATCGATCGATCG 5'

Ans.(3)

188. Match List I with List II

List I	List II
A. Logistic growth	I. Unlimited resource availability condition
B. Exponential	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 give below:

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

Ans.(1)

189. Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

- (1) Dark brown body colour and anal cerci
- (2) Presence of anal styles
- (3) Presence of sclerites
- (4) Presence of anal cerci

Ans.(2)

190. The unique mammalian characteristics are :

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

Ans.(2)

191. Select the correct statements.

- A. Tetrad formation is seen during Leptotene.
- B. During Anaphase, the centromeres split and chromatids separte
- 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) A and C only
- (2) B and D only
- (3) A, C and E only
- (4) B and E only

Ans.(2)

192. 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) D and E only
- (2) C and E only
- (3) B and C only
- (4) A and B only

Ans.(3)

193. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure rage, fear etc. are :

- (1) Limbic system & hypothalamus
- (2) Corpora quadrigemina & hippocampus
- (3) Brain stem & epithalamus
- (4) Corpus callosum and thalamus

Ans.(1)

194. 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) A and B only
- (2) B, C and D only
- (3) A, B and E only
- (4) C, D and E only

Ans.(2)

195. 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) A, B and C only
- (2) B and C only
- (3) A, C and D only
- (4) C and D only

Ans.(2)

196. Which one of the following is NOT an advantage of inbreeding?

- (1) It decreases homozygosity.
- (2) It exposes harmful recessive genes that are eliminated by selection
- (3) Elimination of less desirable genes and accumulation of superior genes takes place due to it.
- (4) It decreases the productivity of inbred population, after continuous inbreeding.

Ans.(4)

197. Match List I with List II

List I

- A. Mast cells
- B. Inner surface of bronchiole
- C. Blood
- D. Tubular parts of nephron

List II

- I. Ciliated epithelium
- II. Areolar connective tissue
- III. Cuboidal epithelium
- IV. Specialised connective tissue

Choose the correct answer from the options give below:

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

Ans.(3)

198. 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 statement, choose the correct most appropriate answer the from the options given below:

- (1) Both Statement I and Statement II are correct.
- (2) Both Statement I and Statement II are incorrect.
- (3) Statement I is correct but Statement II is incorrect.
- (4) Statement I is incorrect but Statement II is correct.

Ans.(4)

199. 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 R.B.Cs formation

Choose the correct answer from the options given below:

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

Ans.(3)

200. 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 gillslits.
- D. Presence of dorsal heart
- E. Triploblastic pseudocoelomate animals.

Choose the correct answer from the options given below:

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

Ans.(2)