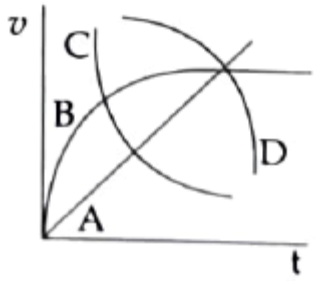
**1.** A spherical ball is dropped in a long column of a highly viscous liquid. The curve in the graph shown, which represents the speed of the ball (v) as a function of time (t) is:




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

**2.** The distance travelled by a particle starting from rest and moving with an acceleration $\frac{4}{3}$ ms$^{-2}$, in the third-second is

(1) 6 m (2) 4 m
(3) $\frac{10}{3}$ m (4) $\frac{19}{3}$ m

**3.** A 10 N force is applied on a body produces an acceleration of 1 m/s$^2$. The mass of the body is

(1) 5 kg (2) 10 kg
(3) 15 kg (4) 20 kg

**4.** An AC voltage is applied to a resistance R and an inductor L in series. If R and the inductive reactance are both equal to 3 Ω, the plate difference between the applied voltage and the current in the circle is –

(1) π / 4 (2) π / 2
(3) Zero (4) π / 6

**5.** A body initially at rest, breaks up into two pieces of masses 2 M and 3 M respectively, together having a total kinetic energy E. the piece of mass 2 M, after breaking up, has a kinetic energy –

(1) $\frac{2E}{5}$ (2) $\frac{E}{2}$
(3) $\frac{E}{5}$ (4) $\frac{3E}{5}$

**6.** A bomb of mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 ms$^{-1}$. The kinetic energy of the other mass is

(1) 256 J (2) 486 J
(3) 524 J (4) 324 J

**7.** The dimensions of $(\mu_0\varepsilon_0)^{-1/2}$ are –

(1) [L$^{-1}$ T]
(2) [LT$^{-1}$]
(3) [L$^{-1/2}$ T$^{1/2}$]
(4) [L$^{1/2}$ T$^{-1/2}$]

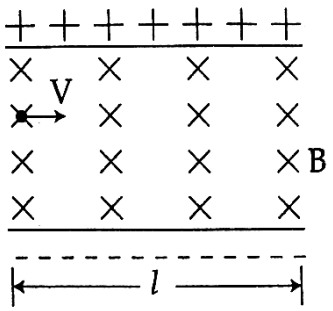
**8.** Consider a system of two particles having masses $m_1$ and $m_2$. If the particle of mass $m_1$ is pushed towards the mass centre of particles through a distance d, by what distance would the particle of mass $m_2$ move so as to keep the mass centre of particles at the original position?

(1) $\frac{m_1}{m_1+m_2}$d
(2) $\frac{m_1}{m_2}$d
(3) d
(4) $\frac{m_2}{m_1}$d

**9.** Two particles A and B are moving in uniform circular motion in concentric circles of radii $r_A$ and $r_B$ with speed $\upsilon_A$ and $\upsilon_B$ respectively. Their time period of rotation is the same. The ratio of angular speed of A to that of B will be:

(1) $\upsilon_A : \upsilon_B$ (2) $r_B : r_A$
(3) 1 : 1 (4) $r_A : r_B$

**10.** An electron moves straight inside a charged parallel plate capacitor of uniform charge density σ. The space between the plates is filled with uniform magnetic field of intensity B, as shown in the figure. Neglecting effect of gravity, the time of straight line motion of the electron in the capacitor is –




(1) $\frac{\epsilon_0 lB}{\sigma}$ (2) $\frac{\sigma}{\epsilon_0 lB}$
(3) $\frac{\epsilon_0 B}{\sigma}$ (4) $\frac{\sigma}{\epsilon_0 B}$

**11.** **Statement-I :** Angular momentum of sun and planet system about any point remains constant.

**Statement-II :** Two equal and opposite forces will act on them. Net torque of those two set of forces about any point is zero.

(1) Statement I is incorrect but statement II is correct

(2) Both Statements I and II are correct

(3) Both Statements I and II are incorrect

(4) Statement I is correct but statement II is incorrect

**12.** A particle moves so that its position vector is given by $\vec{r} = \cos \omega t\, \hat{x} + \sin \omega t\, \hat{y}$. Where $\omega$ is a constant. Which of the following is true?

(1) Velocity and acceleration both are perpendicular to $\vec{r}$.

(2) Velocity and acceleration both are parallel to $\vec{r}$.

(3) Velocity is perpendicular to $\vec{r}$ and acceleration is directed towards the origin.

(4) Velocity is perpendicular to $\vec{r}$ and acceleration is directed away from the origin.

**13.** Plane angle and solid angle have

(1) Dimensions but no units

(2) No units and no dimensions

(3) Both units and dimensions

(4) Units but no dimensions

**14.** If $\Delta U$ and $\Delta W$ represent the increase in internal energy and work done by the system respectively in a thermodynamical process, which of the following is true?

(1) $\Delta U = -\Delta W$, in a adiabatic process

(2) $\Delta U = \Delta W$, in a isothermal process

(3) $\Delta U = \Delta W$, in a adiabatic process

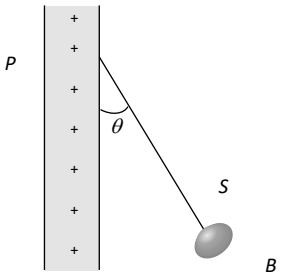
(4) $\Delta U = -\Delta W$, in a isothermal process

**15.** Relation between pressure (p) and energy (E) of a gas is

(1) $p = \frac{2}{3}E$ (2) $p = \frac{1}{3}E$

(3) $p = \frac{3}{2}E$ (4) $p = 3E$

**16.** A charged ball B hangs from a silk thread S, which makes an angle $\theta$ with a large charged conducting sheet $P$, as shown in the figure. The surface charge density $\sigma$ of the sheet is proportional to




(1) $\sin\theta$ (2) $\tan\theta$

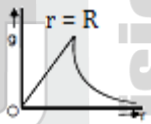
(3) $\cos\theta$ (4) $\cot\theta$

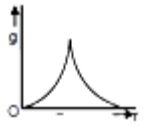
**17.** Twenty seven drops of same size are charged at 220 V each. They combine to form a bigger drop. Calculate the potential of the bigger drop.

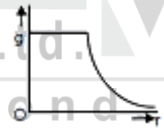
(1) 1980 V (2) 660 V

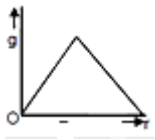
(3) 1320 V (4) 1520 V

**18.** Starting from the centre of the earth having radius R, the variation of g (acceleration due to gravity) is shown by

(1) 


(2) 


(3) 


(4) 


**19.** Two bulbs 25 W, 220 V and 100 W, 220 V are given. Which has higher resistance?

(1) 25 W bulb

(2) 100 W bulb

(3) Both bulbs will have equal resistance

(4) Resistance of bulbs cannot be compared

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

(1) $\sqrt{5}\,IL$

(2) $5IL$

(3) $\sqrt{3}\,IL$

(4) $3IL$

**21.** Two similar coils of radius R are lying concentrically with their planes at right angles to each other. The currents flowing in them are I and 2I, respectively. The resultant magnetic field induction at the centre will be –

(1) $\frac{\sqrt{5}\,\mu_0 I}{2R}$ (2) $\frac{3\mu_0 I}{2R}$

(3) $\frac{\mu_0 I}{2R}$ (4) $\frac{\mu_0 I}{R}$

**22.** A bar magnet of magnetic moment $\vec{M}$ is placed in a magnetic field of induction $\vec{B}$. The torque exerted on it is

(1) $\vec{M}.\vec{B}$

(2) $-\vec{M}.\vec{B}$

(3) $\vec{M}\times\vec{B}$

(4) $-\vec{M}\times\vec{B}$

**23.** **Assertion (A):** In change of state from solid to liquid the temperature decrease until the entire amount of the solid substance melts.

**Reason (R):** The change of state of a substance in which a solid directly changes into the gaseous state is known as sublimation.

(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.

**24.** In an AC circuit, the rms value of current, $I_{rms}$ is related to the peak current, $i_0$ by the relation

(1) $i_{rms} = \sqrt{2}i_0$ (2) $i_{rms} = \pi i_0$

(3) $i_{rms} = \frac{i_0}{\pi}$ (4) $i_{rms} = \frac{1}{\sqrt{2}}i_0$

**25.** The acceleration due to gravity on the planet A is 9 times the acceleration due to gravity on planet B. A man jumps to a height of 2m on the surface of A. What is the height of jump by the same person on the planet B?

(1) 6 m (2) $\frac{2}{3}$m

(3) $\frac{2}{9}$m (4) 18 m

**26.** An em wave is propagating in a medium with a velocity $\vec{V} = V\hat{i}$. The instantaneous oscillating electric field of this em wave is along +Y axis. Then the direction of oscillating magnetic field of the em wave be along.

(1) – z direction

(2) – y direction

(3) + z direction

(4) – x direction

**27.** Light travels through a glass plate of thickness t and refractive index μ. If c is the speed of light in vacuum, the time taken by light to travel this thickness of glass is

(1) μtc (2) $\frac{tc}{\mu}$

(3) $\frac{t}{\mu c}$ (4) $\frac{\mu t}{c}$

**28.** A convex lens is dipped in a liquid whose refractive index is equal to the refractive index of the lens. Then its focal length will

(1) Become small, but non-zero

(2) Remain unchanged

(3) Become zero

(4) Become infinite

**29.** A conductor of length 0.4 m is moving with a speed of 7 m/s perpendicular to a magnetic field of intensity 0.9 Wb/ $m^2$. The induced emf across the conductor is

(1) 1.26 V (2) 2.52 V

(3) 5.04 V (4) 25.2 V

**30.** If the longest wavelength in the ultraviolet region of hydrogen spectrum is $\lambda_0$ then the shortest wavelength in its infrared region is

(1) $\frac{46}{7}\lambda_0$ (2) $\frac{20}{3}\lambda_0$

(3) $\frac{36}{5}\lambda_0$ (4) $\frac{27}{4}\lambda_0$

**31.** In the nuclear radius of $^{27}Al$ is 3.6 Fermi; the approximate nuclear radius of $^{64}Cu$ in Fermi is

(1) 2.4 (2) 1.2

(3) 4.8 (4) 3.6

**32.** Choose only false statement from the following

(1) Substances with energy gap of the order of 10 eV are insulators

(2) The conductivity of a semiconductor increases with increases in temperature

(3) In conductors the valence and conduction bands may overlap

(4) The resistivity of a semiconductor increases with increase in temperature

**33.** In a n-type semiconductor, which of the following statement is true :

(1) Electrons are majority carriers and Trivalent atoms are dopants.

(2) Electron are minority carriers and pentavalent atoms are dopants.

(3) Holes are minority carriers and pentavalent atoms are dopants.

(4) Holes are majority carriers and trivalent atoms are dopants.

**34.** A car accelerates from rest at a constant rate α for some time, after which it decelerates at a constant rate β and comes to rest. If the total time elapsed is t, then the maximum velocity acquired by the car is

(1) $\left(\frac{\alpha^2+\beta^2}{\alpha\beta}\right)t$ (2) $\left(\frac{\alpha^2-\beta^2}{\alpha\beta}\right)t$

(3) $\frac{(\alpha+\beta)t}{\alpha\beta}$ (4) $\left(\frac{\alpha\beta t}{\alpha+\beta}\right)$

**35.** A 600 kg rocket is set for a vertical firing. If the exhaust speed is 1000 $ms^{-1}$, the mass of the gas ejected per second to supply the thrust needed to overcome the weight of rocket is

(1) 117.6 $kgs^{-1}$ (2) 58.6 $kgs^{-1}$

(3) 6 $kgs^{-1}$ (4) 76.4 $kgs^{-1}$

**36.** When an elastic material with Young's modulus Y is subjected to stretching stress S, elastic energy stored per unit volume of the material is

(1) YS/2 (2) $S^2Y/2$

(3) $S^2/2Y$ (4) S/2Y

**37.** Steam at 100°C is passed into 20 g of water at 10°C. When water acquires a temperature of 80°C, the mass of water present will be – [Take specific heat of water = 1 cal $g^{-1}$ ° $C^{-1}$ and latent heat of steam = 540 cal $g^{-1}$]

(1) 24 g (2) 31.5 g

(3) 42.5 g (4) 22.5 g

**38.** A body of mass m is attached to the lower end of a spring whose upper end is fixed. The spring has negligible mass. When the mass m is slightly pulled down and released, it oscillates with a time period of 3 s. When the mass m is increased by 1 kg, the time period of oscillations becomes 5 s. The value of m kg is

(1) $\frac{4}{3}$ (2) $\frac{16}{9}$

(3) $\frac{9}{16}$ (4) $\frac{3}{4}$

**39.** An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. The direction of electric field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h. The time of fall of the electron, in comparison to the time of fall of the proton is

(1) Smaller (2) 10 times greater

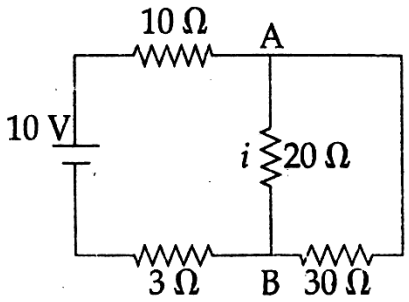
(3) 5 times greater (4) Equal

**40.** A parallel plate capacitor of capacitance 20 μF is being charged by a voltage source whose potential is changing at the rate of 3 V/s. The conduction current through the connecting wires, and the displacement current through the plates of the capacitor, would be, respectively:

(1) 60 μA, 60 μA (2) 60 μA, zero

(3) Zero, zero (4) Zero, 60 μA

**41.** In the electrical circuit shown in the figure, the current i through the side AB is –




(1) $\frac{6}{25}$ A (2) $\frac{10}{33}$ A

(3) $\frac{1}{5}$ A (4) $\frac{10}{63}$ A

**42.** A circular disc of radius 0.2 m is placed in a uniform magnetic field of induction $\frac{1}{\pi}$ (Wb/m$^2$) in such a way that its axis makes an angle of 60° with B. The magnetic flux linked with the disc is

(1) 0.02 Wb (2) 0.06 Wb

(3) 0.08 Wb (4) 0.01 Wb

**43.** If $\hat{i}$ denotes a unit vector along incident light ray, $\hat{r}$ a unit vector along refracted ray into a medium of refractive index $\mu$ and $\hat{n}$ unit vector normal to boundary of medium directed towards incident medium, then law of refraction is

(1) $\hat{i}.\hat{n} = \mu(\hat{r}.\hat{n})$

(2) $\hat{i}\times\hat{n} = \mu(\hat{n}\times\hat{r})$

(3) $\hat{i}\times\hat{n} = \mu(\hat{r}\times\hat{n})$

(4) $\mu(\hat{i}\times\hat{n}) = \hat{r}\times\hat{n}$

**44.** Two coherent sources of intensity ratio $\alpha$ interfere. The value of $\frac{I_{max} - I_{min}}{I_{max} + I_{min}}$ is –

(1) $2\sqrt{\frac{\alpha}{1+\alpha}}$ (2) $\frac{2\sqrt{\alpha}}{1+\alpha}$

(3) $\frac{1+\alpha}{2\sqrt{\alpha}}$ (4) $\frac{1-\alpha}{1+\alpha}$

**45.** Photons with energy 5 eV are incident on a cathode C in a photoelectric cell. The maximum energy of emitted photoelectrons is 2 eV. When photons of energy 6 eV are incident on C, no photoelectrons will reach the anode A, if the stopping potential of A relative to C is:

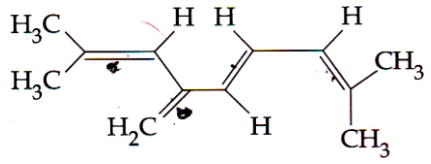
(1) + 4 V

(2) – 1 V

(3) – 3 V

(4) + 3 V

**46.** The total number of π - bond electrons in the following structure is:



(1) 4 (2) 8

(3) 12 (4) 16

**47.** 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 $9.10939 \times 10^{-31}$ kg.

C. All the isotopes of a given element show same chemical properties.

D. Protons and electrons are collectively known as nucleons.

E. Dlaton's atomic theory, regarded the atom as an ultimate particle of matter.

Choose the correct answer from the options given below:

(1) C, D and E only

(2) A and E only

(3) B, C and E only

(4) A, B and C only

**48.** In which of the following compounds, nitrogen exhibits highest oxidation state?

(1) $N_2H_4$ (2) $NH_3$

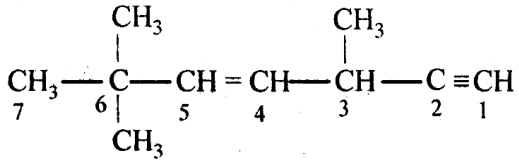
(3) $N_3H$ (4) $NH_2OH$

**49.** Which one of the following elements is unable to form $MF_6^{3-}$ ion?

(1) $Ga$ (2) $B$

(3) $Al$ (4) $In$

**50.** The state of hybridization of $C_2$, $C_3$, $C_5$ and $C_6$ of the hydrocarbon,



is in the following sequence:

(1) $sp^3$, $sp^2$, $sp^2$and sp

(2) sp, $sp^2$, $sp^2$and $sp^3$

(3) sp, $sp^2$, $sp^3$and $sp^2$

(4) sp, $sp^3$, $sp^2$and $sp^3$

**51.** Compound X on reaction with $O_3$ followed by Zn/ $H_2O$ gives formaldehyde and 2-methyl propanal as products. The compound X is :

(1) 2-Methylbut-1-ene

(2) 2-Methylbut-2-ene

(3) Pent-2-ene

(4) 3-Methylbut-1-ene

**52.** **Assertion (A):** the pre-exponential factor A has the same units for all reactions.

**Reason (R):** $e^{-E_a/RT}$ has no unit.

(1) (A) is correct but (R) is not correct

(2) (A) is not correct but (R) is correct

(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

**53.** Which of the following statement is not correct?

(1) Double bond is shorter than a single bond

(2) Sigma bond is weaker than a π (pi) bond

(3) Double bond is stronger than a single bond

(4) Covalent bond is stronger than hydrogen bond

**54.** The correct option for free expansion of an ideal gas under adiabatic condition is:

(1) q = 0, ΔT = 0 and w = 0

(2) q = 0, ΔT < 0 and w > 0

(3) q < 0, ΔT = 0 and w = 0

(4) q > 0, ΔT > 0 and w > 0

**55.** For the reaction

$CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g), \frac{K_P}{K_c}$ is equal to :

(1) $(RT)^2$ (2) $\frac{1}{RT}$

(3) $RT$ (4) $\sqrt{RT}$

**56.** Which one of the following conditions will favour maximum formation of the product in the reaction?

$A_2(g) + B_2(g) \rightleftharpoons X_2(g)$, ΔH = –X KJ

(1) Low temperature and high pressure

(2) High temperature and high pressure

(3) Low temperature and low pressure

(4) High temperature and low pressure

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

(1) $H_2O$ (2) $BF_3$

(3) $OH^-$ (4) $NH_3$

**58.** The pair of compounds that can exist together is:

(1) $FeCl_3$, $SnCl_2$ (2) $HgCl_2$, $SnCl_2$

(3) $FeCl_2$, $SnCl_2$ (4) $FeCl_3$, KI

**59.** The oxidation states of sulphur in the anions $SO_3^{2-}, S_2O_4^{2-}$ and $S_2O_6^{2-}$ follow the order

(1) $S_2O_6^{2-} < S_2O_4^{2-} < SO_3^{2-}$

(2) $S_2O_4^{2-} < SO_3^{2-} < S_2O_6^{2-}$

(3) $SO_3^{2-} < S_2O_4^{2-} < S_2O_6^{2-}$

(4) $S_2O_4^{2-} < S_2O_6^{2-} < SO_3^{2-}$

**60.** If molarity of the dilute solution is doubled, the value of molal depression constant ($K_f$) will be

(1) Halved (2) Tripled

(3) Unchanged (4) Doubled

**61.** Consider the following relations for emf of a electrochemical cell:

(i) emf of cell=(Oxidation potential of anode) –(Reduction potential of cathode)

(ii) emf of cell =(Oxidation potential of anode + (Reduction potential of cathode)

(iii) emf of cell=(Reduction potential of anode) + (Reduction potential of cathode)

(iv) emf of cell=(Oxidation potential of anode) – (Oxidation potential of cathode)

(1) (ii) and (iv)

(2) (iii) and (i)

(3) (i) and ((ii)

(4) (iii) and (iv)

**62.** 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) increase by a factor of six.

(2) increase by a factor of nine.

(3) increase by a factor of three.

(4) decrease by a factor of nine.

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

(1) enthalpy of atomizaiton.

(2) hydration energy.

(3) second ionisation enthalpy.

(4) first ionisation enthalpy.

**64.** Identify the incorrect statement.

(1) $Cr^{2+}(d^4)$ is a stronger reducing agent than $Fe^{2+}(d^6)$ in water.

(2) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.

(3) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.

(4) The oxidation states of chromium in $CrO_4^{2-}$ and $Cr_2O_7^{2-}$ are not the same.

**65.** Homoleptic complex from the following complexes is:

(1) Diamminechloridonitrito – N platanium (II)

(2) Pentaamminecarbonatocobalt (III) chloride

(3) Triamminetriaquachormium (III) chloride

(4) Potassium trioxalatoaluminate (III)

**66.** **Assertion (A):** The oxidation state of S in $H_2S_2O_8$ is +6.

**Reason (R):** max. oxidation state of S is +6 because the max. Oxidation state of an element is it's no. of valence electron.

(1) (A) is correct but (R) is not correct

(2) (A) is not correct but (R) is correct

(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

**67.** Which of the following statements is/are correct?

(a) The conductance of one $cm^3$ of a solution is called specific conductance

(b) Specific conductance increases while molar conductivity decreases on progressive dilution

(c) The limiting equivalent conductivity of weak electrolyte cannot be determent exactly by extrapolation of the plot of $\wedge_{eq}$ against $\sqrt{c}$

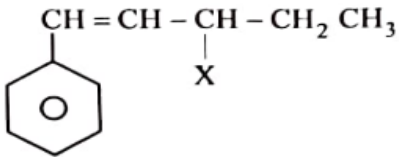
(d) The conductance of metals is due to the movement of free electrons

The correct statements are

(1) (a) and (b) only (2) (b) and (c)

(3) (a), (c) and (d) (4) (a), (b), (c) and (d)

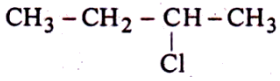
**68.** The given compounds



Is an example of _____

(1) Arly halide (2) Allylic halide

(3) Vinylic halide (4) Benzylic halide

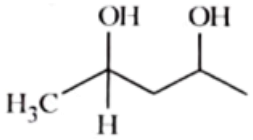
**69.** 

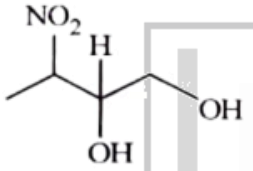
Obtained by chlorination of n – butane, will be

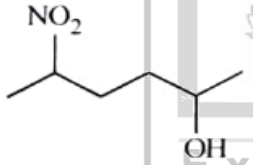
(1) *l* – form (2) d – form

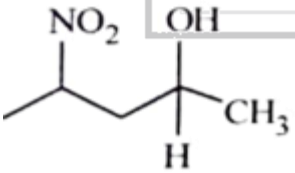
(3) Meso form (4) Racemic mixture

**70.** Which amongst the following will be most readily dehydrated under acidic conditions?

(1) 

(2) 

(3) 

(4) 

**71.** Which of the following is correct about the chemical equilibrium?

(a) $(\Delta G)_{T,P} = 0$

(b) Equilibrium constant is independent of initial concentration of reactants

(c) Catalyst has no effect on equilibrium state

(d) Reaction stops at equilibrium

The correct statements are

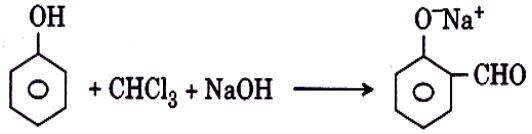
(1) a and b only

(2) b and c

(3) a and d only

(4) a, b and c

**72.** In the reaction



The electrophile involved is

(1) Dichloromethyl cation ($\overset{\oplus}{C}HCl_2$)

(2) Dichloromethyl anion ($\overset{\ominus}{C}HCl_2$)

(3) Formyl cation ($\overset{\oplus}{C}HO$)

(4) Dichlorocarbene (:$CCl_2$)

**73.** Reaction between benzaldehyde and acetophenone in presence of dilute NaOH is known as:

(1) Aldol condensation

(2) Cannizzaro's reaction

(3) Cross Cannizzaro's reaction

(4) Cross Aldol condensation

**74.** Zr (Z = 40) and Hf (Z = 72) have similar atomic and ionic radii because of :

(1) having similar chemical properties

(2) belonging to same group

(3) diagonal relationship

(4) lanthanoid contraction

**75.** **Assertion (A):** All combustion reactions are exothermic.

**Reason (R):** Enthalpies of products are greater than enthalpies of reactants

$$(\Sigma v_p \Delta_f H(P) > \Sigma v_R \Delta H(R))$$

(1) (A) is correct but (R) is not correct

(2) (A) is not correct but (R) is correct

(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(4) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

**76.** Molarity of liquid HCl will be, if density of solution is 1.17 gm/cc

(1) 36.5

(2) 32.05

(3) 18.25

(4) 42.10

**77.** According to Thomson model of atom :

(a) Negative charge is uniformly distributed in an atom.

(b) Atom possesses spherical shape.

(c) Mass of the atom is assumed to be uniformly distributed over the atom.

(d) Overall neutrality of atom cannot explain.

(1) b, c (2) a, c, d

(3) a, b, c (4) a, c, d

**78.** Sucrose on hydrolysis gives:

(1) β-D-Glucose + α-D-Fructose

(2) α-D- Glucose + β-D-Glucose

(3) α-D-Glucose + β-D-Fructose

(4) α-D-Fructose+ β-D-Fructose

**79.** Identify the intensive quantities from the following:

(a) Enthalpy (b) Temperature

(c) Pressure (d) Mass

The correct statements are

(1) (a) and (b) only (2) (b) and (c)

(3) (a) and (c) only (4) (a), (b) and (c)

**80.** **Statement – I:** $H_2S$ is more polar than $H_2O$.

**Statement – II:** $H_2O$ and $H_2S$ are isostructural molecules.

(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 and statement II is correct

**81.** Match the complex ions given in column – I with their hybridisation and number of unpaired electrons given in column – II and choose the correct option.

| Column – I (Complex ion) | | Column – II (Hybridisation, number of unpaired e$^-$s) | |
|---|---|---|---|
| (a) | $[Cr(H_2O)_6]^{3+}$ | (i) | $dsp^2$, 1 |
| (b) | $[Co(CN)_4]^{2-}$ | (ii) | $sp^3d^2$, 5 |
| (c) | $[Ni(NH_3)_6]^{2+}$ | (iii) | $d^2sp^3$, 3 |
| (d) | $[MnF_6]^{4-}$ | (iv) | $sp^3d^2$, 2 |

(1) (a) – (iv), (b) – (iii), (c) – (ii), (d) – (i)

(2) (a) – (ii), (b) – (iv), (c) – (i), (d) – (iii)

(3) (a) – (iii), (b) – (i), (c) – (iv), (d) – (ii)

(4) (a) – (i), (b) – (ii), (c) – (iv), (d) – (iii)

**82.** The weight of one molecule of a compound $C_{60}H_{122}$ is

(1) $1.2 \times 10^{-20}$ gram (2) $1.4 \times 10^{-21}$ gram

(3) $5.025 \times 10^{-23}$ gram (4) $6.023 \times 10^{-23}$ gram

**83.** A particular station of All India Radio, New Delhi, broadcasts on a frequency of 1368 kHz (kilohertz). The wavelength of the electromagnetic radiation emitted by the transmitter is:

[speed of light, $c = 3.0 \times 10^8$ms]

(1) 21.92 cm (2) 219.3 m

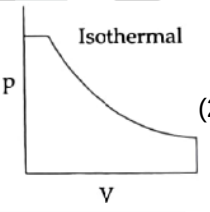
(3) 0. 2192 m (4) 2192 m

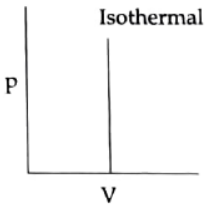
**84.** Which of the following molecules is non – polar in nature?

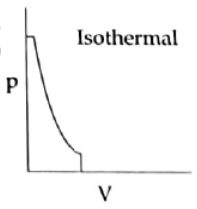
(1) $NO_2$ (2) $POCl_3$

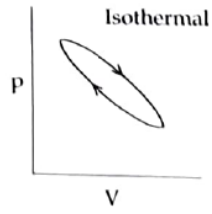
(3) $CH_2O$ (4) $SbCl_5$

**85.** Which of the following p-V curve represents maximum work done?

(1) 


(2) 


(3) 


(4) 


**86.** If the e.m.f. of a galvanic cell is negative, it implies that:

(a) The cell reaction is spontaneous

(b) The cell reaction is non–spontaneous

(c) The cell reaction is exothermic

(d) The cell is working in reverse direction

The correct statements are

(1) (a) and (b) only

(2) (b) and (c)

(3) (a) and (d) only

(4) (b) and (d)

**87.** Consider the below reaction and identify the missing reagent / chemical.

$$CH_3CH_2COO^-Na^+ \xrightarrow[\text{Heat}]{NaOH, + ?} CH_3CH_3 + Na_2CO_3.$$

(1) DIBAL - H (2) $B_2H_6$

(3) Red Phosphorus (4) CaO

**88.** Match the reaction given in List – I with the name associated given in List – II

| List - I | |
|---|---|
| (a) | $CH_3-CH_2-\overset{\overset{O}{\|\|}}{C}-NH_2 \xrightarrow[NaOH]{Br_2}$ |
| (b) | $CH_3-CH_2-NH_2 \xrightarrow[\Delta]{CHCl_3/KOH}$ |
| (c) | $CH_3-CH_2-COOH \xrightarrow[(ii)\,H_2O]{(i)\,Br_2/Red\,P}$ |
| (d) | $CH_3-CH_2-\overset{\overset{O}{\|\|}}{C}-CH_3 \xrightarrow[HCl]{Zn-Hg}$ |

| List - II | |
|---|---|
| (i) | Clemmensen reduction |
| (ii) | Hoffmann bromamide degradation reaction |
| (iii) | Carbylamine reaction |
| (iv) | Hell – Holhard Zelinsky reaction |

(1) (a) – (iv), (b) – (ii), (c) – (iii), (d) – (i)

(2) (a) – (iii), (b) – (ii), (c) – (iv), (d) – (i)

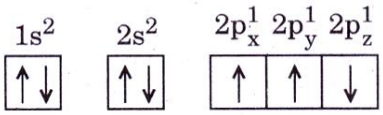
(3) (a) – (i), (b) – (iii), (c) – (iv), (d) – (ii)

(4) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i)

**89.** Which one is a **wrong** statement?

(1) Total orbital angular momentum of electron in 's' orbital is equal to zero.

(2) The electronic configuration of N atom is




(3) An orbital is designated by three quantum numbers while an electron in an atom is designated by four quantum numbers.

(4) The value of m for $dz^2$ is zero.

**90.** **Statement – I:** In positive electromeric effect the π – electrons of the multiple bond are transferred to that atom to which the attacking reagent gets attached.

**Statement – II:** Electromeric effect is a permanent effect.

(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 and statement II is correct

**91.** How many sperms are formed from a secondary spermatocyte?

(1) 4 (2) 8

(3) 2 (4) 1

**92.** Which one of the following does not follow the central dogma of molecular biology?

(1) Pea

(2) Mucor

(3) Chlamydomonas

(4) HIV

**93.** Nomenclature is governed by certain universal rules. Which one of the following is contrary to the rules of nomenclature?

(1) Biological names can be written in any language

(2) The first word in a biological name represents the genus name, and the second is a specific epithet

(3) The names are written in Latin and are italicized

(4) When written by hand, the names are to be underlined

**94.** **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 **correct** answer from the options given below:

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

(2) **A** is correct but **R** is not correct.

(3) **A** is not correct but **R** is correct.

(4) Both **A** and **R** are correct and R is the correct explanation of A.

**95.** Maximum nutritional diversity is found in the group:

(1) Fungi (2) Animalia

(3) Monera (4) Plantae

**96.** Basic unit or smallest taxon of taxonomy/classification is

(1) Species (2) Kingdom

(3) Family (4) Variety

**97.** Which one of the following is wrong for fungi?

(1) All fungi possess a purely cellulosic cell wall

(2) They are heterotrophic

(3) They are both unicellular and multicellular

(4) They are eukaryotic

**98.** Which one of the following statements is wrong?

(1) Algin and carrageen are product of algae

(2) Agar – agar is obtained from Gelidum and *Gracilaria*

(3) Chlorella and Spirulina are used as space Food

(4) Mannitol is stored food in Rhodophyceae

**99.** XO type of sex determination can be found in :

(1) Birds (2) Grasshoppers

(3) Monkeys (4) Drosophila

**100.** 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) B and C only

(2) B, D and E only

(3) C, D and E only

(4) A, C and D only

**101.** In Down's syndrome of a male child the sex complement is

(1) XO (2) XY

(3) XX (4) XXY

**102.** Select the correct statement:

(1) Gymnosperms are both homosporous and heterosporous

(2) Salvinia, *ginkgo* and *Pinus* all are gymnosperms

(3) Sequoia is one of the tallest trees

(4) The leaves of gymnosperms are not well adapted to extremes of climate

**103.** Match the following :

| List – I | List – II |
|---|---|
| (a) Physalia | (i) Pearl oyster |
| (b) Limulus | (ii) Portuguese Man of War |
| (c) Ancylostoma | (iii) Living fossil |
| (d) Pinctada | (iv) Hookworm |

Choose the **correct** answer from the options given below.

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

**104.** Which one of the following characteristics is not shared by birds and mammals?

(1) Ossified endoskeleton
(2) Breathing using lungs
(3) Viviparity
(4) Warm blooded nature

**105.** Identify the correct set of statements :

(a) The leaflets are modified into pointed hard thorns in Citrus and Bougainvillea
(b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin
(c) Stem is flattened and fleshy in Opuntia and modified to perform the function of leaves.
(d) Rhizophora shows vertically upward growing roots that help to get oxygen for respiration
(e) Subaerially growing stems in grasses and strawberry help in vegetative propagation

Choose the correct answer from the options given below :

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

**106.** Axile placentation is observed in

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

**107.** Vexillary aestivation is characteristic of the family:

(1) Fabaceae
(2) Asteraceae
(3) Solanaceae
(4) Brassicaceae

**108.** Phloem in gymnosperms lacks

(1) Sieve tubes only
(2) Companion cells only
(3) Both sieve tubes and companion cells
(4) Albuminous cells and sieve cells

**109.** What is not true about sclereids?

(1) These are parenchyma cells with thickened lignified walls
(2) These are elongated and flexible with tapered ends
(3) These are commonly found in the shells of nuts and in the pulp of guava, pear, etc
(4) These are also called the stone cells

**110.** Four radial vascular bundles are found in

(1) dicot root (2) monocot root
(3) dicot stem (4) monocot stem

**111.** **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 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.

**112.** Which of the following is characteristics feature of cockroach regarding sexual dimorphism?

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

**113.** In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on:

(1) $5^{th}$ segment
(2) $10^{th}$ segment
(3) $11^{th}$ segment
(4) $8^{th}$ and $9^{th}$ segment

**114.** Which of the following statements about inclusion bodies is incorrect?

(1) They are not bound by any membrane

(2) These are involved in ingestion of food particles.

(3) They lie free in the cytoplasm.

(4) These represent reserve material in cytoplasm.

**115.** Match List I with List II:

| | List-I | | List-II |
|---|---|---|---|
| A. | *Pterophyllum* | I. | Hag fish |
| B. | *Myxine* | II. | Saw fish |
| C. | *Pristis* | III. | Angel fish |
| D. | *Exocoetus* | IV. | Flying fish |

Choose the correct answer from the options given below:

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

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

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

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

**116.** In bacteria, plasmid is

(1) Extra chromosomal material

(2) Main DNA

(3) Non functional DNA

(4) Repetitive gene.

**117.** The organelles that are included in the endomembrane system are:

(1) Golgi complex, Endoplasmic reticulum, Mitochondria and Lysosomes

(2) Endoplasmic reticulum, Mitochondria, Ribosomes and Lysosomes

(3) Endoplasmic reticulum, Golgi complex, Lysosomes and Vacuoles

(4) Golgi complex, Mitochondria, Ribosomes and Lysosomes

**118.** Filliform apparatus is a characteristic feature of:

(1) Egg (2) Synergid

(3) Zygote (4) Suspensor

**119.** Plasmodesmata are

(1) Locomotary structures

(2) Membranes connecting the nucleus with plasmalemma

(3) Connections between adjacent cells

(4) Lignified cemented layers between cells

**120.** A fat molecule is formed from:

(1) Three glycerol molecules and one fatty acid molecule

(2) One glycerol molecule and one fatty acid molecule

(3) Three glycerol molecule and three fatty acid molecule

(4) One glycerol molecule and three fatty acid molecules

**121.** Cellulose does not from blue colour with Iodine because

(1) It is a helical molecule.

(2) It does not contain complex helices and hence cannot hold iodine molecules.

(3) It breaks down when iodine reacts with it.

(4) It is a disaccharide.

**122.** Prosthetic groups differ from co-enzymes in that

(1) They require metal ions for their activity

(2) they (prosthetic groups) are tightly bound to apoenzymes

(3) Their associaton with apoenzymes is transient

(4) They can serve as co-factors in a number of enzyme-catalyzed reactions.

**123.** **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.

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

**124.** Proximal end of the filament of stamen is attached to the:

(1) Anther

(2) Connective

(3) Placenta

(4) Thalamus or petal

**125.** Select the correct statements.

A. Tetrad formation is seen during leptotene.

B. During Anaphase, the centromeres spit and chromatids separate.

C. Terminalisation 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 D only

(2) A, C and E only

(3) B and E only

(4) A and C only

**126.** Oxygen is not produced during photosynthesis by

(1) Green sulphur bacteria

(2) Cycas

(3) Nostoc

(4) Chara

**127.** Which of the following combinations is required for chemiosmosis?

(1) membrane, proton pump, proton gradient, NADP synthase

(2) proton pump, electron gradient, ATP synthase

(3) proton pump, electron gradient, NADP synthase

(4) membrane, proton pump, proton gradient, ATP synthase

**128.** Match List I with List II

| | List-I | | List-II |
|---|---|---|---|
| A. | Citric acid cycle | I. | Cytoplasm |
| B. | Glycolysis | II. | Mitochondrial matrix |
| C. | Electron transport system | III. | Intermembrane space of mitochondria |
| D. | Proton gradient | IV. | Inner mitochondrial membrane |

Choose the correct answer from the options given below:

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

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

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

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

**129.** In which one of the following processes $CO_2$ is not released?

(1) Aerobic respiration in plants

(2) Aerobic respiration in animals

(3) Alcoholic fermentation

(4) Lactate fermentation

**130.** Plants follow different pathways in response to environment or phases of life to form different kinds of structures. This ability is called:

(1) Maturity (2) Elasticity

(3) Flexibility (4) Plasticity

**131.** Fruit and leaf drop at early stages can be prevented by the application of

(1) Ethylene (2) Auxins

(3) Gibberellic acid (4) Cytokinins

**132.** Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin

(1) promotes apical dominance.

(2) promotes abscission of mature leaves only.

(3) does not affect mature monocotyledonous plants

(4) can help in cell division in grasses, to produce growth

**133.** Select the **correct** events that occur during inspiration.

(a) Contraction of diaphragm

(b) Contraction of external inter – costal muscles

(c) Pulmonary volume decreases

(d) Intra pulmonary pressure increases

(1) (a) and (b)

(2) (c) and (d)

(3) (a), (b) and (d)

(4) Only (d)

**134.** Uricotelism is found in

(1) Mammals and birds

(2) Fishes and fresh water protozoans

(3) Birds, reptiles and insects

(4) Frogs and toads

**135.** Match List I with List II:

| | List-I | | List-II |
|---|---|---|---|
| A. | Expiratory capacity | I. | Expiratory reserve volume +Tidal +volume Inspiratory reserve volume |
| B. | Functional residual capacity | II. | Tidal volume +Expiratory reserve volume |
| C. | Vital capacity | III. | Tidal volume+ Inspiratory reserve volume |
| D. | Inspiratory capacity | IV. | Expiratory reserve volume + Residual volume |

Choose the correct answer from the options given below:

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

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

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

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

**136.** 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) C and E only (2) B and C only

(3) A and B only (4) D and E only

**137** The correct route through which pulse-making impulse travels in the heart is

(1) AV node → bundle of His → SA node → Purkinje fibres → heart muscles

(2) AV node → SA node → Purkinje fibres → bundle of His → heart muscles

(3) SA node → Purkinje fibres → bundles of His → AV node → heart muscles

(4) SA node → AV node → bundle of His → Purkinje fibres → heart muscles

**138.** **Statement I:** In the nephron, the descending limb of loop of Henle is impermeable to water and permeable to electrolytes.

**Statement II :** The proximal convoluted tubule is lined by simple columnar brush border epithelium and increase the surface area for reabsorption.

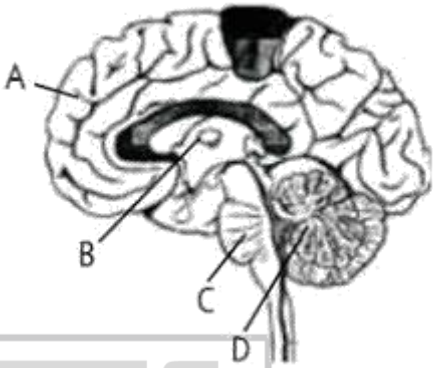
(1) Both Statement I and Statement II are true

(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

**139.** A sagittal section of human brain is shown here. Identify at least two labels from A-D.




(1) C-Midbrain, D-Cerebellum

(2) A-Cerebrum, C-Pons

(3) B-Corpus callosum, D-Medulla

(4) A-Cerebral hemispheres, B-Cerebellum

**140.** 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:

(1) A - III, B – II, C – IV, D - I

(2) A - II, B – IV, C – I, D - III

(3) A - IV, B – II, C – III, D - I

(4) A - IV, B – III, C – II, D - I

**141.** Which of the following statements is not true?

(1) Sweet potato and potato is an example of Analogy

(2) Homology indicates common ancestry

(3) Flippers of penguins and dolphins are a pair of homologous organs.

(4) Analogous structures are a result of Convergent evolution

**142.** **Assertion (A):** Osteoporosis is characterised by decreased bone mass and increased chances of fractures.

**Reason (R):** Common cause of osteoporosis is increased levels of estrogen.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

**143.** A typical angiosperm embryo sac at maturity is**:**

(1) 8-nucleate and 8-celled

(2) 8-nucleate and 7-celled

(3) 7-nucleate and 8-celled

(4) 7-nucleate and 7-celled

**144.** Choose the correct sequence representing the ploidy of Nucellus; Megaspore mother cell; Megaspore; Egg cell; Zygote; A polar nucleus of embryo sac; Secondary nucleus and primary endosperm nucleus.

(1) n; 2n; 2n; n; 2n; n; 2n; and 2n

(2) 2n; 2n; n; 2n; n; 2n; 3n; and 2n

(3) 2n; 2n; n; n; 2n; n; 2n; and 3n

(4) 2n; n; n; 2n; 3n; 2n; n; and 3n

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

(1) Antipodals, synergids, and primary endosperm nucleus

(2) Synergids, Zygote and Primary endosperm nucleus

(3) Synergids, antipodals and Polar nuclei

(4) Synergids, Primary endosperm nucleus and Zygote

**146.** Seminal plasma in human males is rich in

(1) fructose and calcium

(2) Glucose and calcium

(3) DNA and testosterone

(4) Ribose and potassium

**147.** In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by

(1) 2pq (2) pq

(3) $q^2$ (4) $p^2$

**148.** Amniocentesis is a technique

(1) By which the essential amino acids in the body can be estimated

(2) by which any chromosomal anomalies in the foetus can be detected

(3) In which the sex of' the foetus can be reversed

(4) That can be used for correcting genetic disorders of the foetus

**149.** Match List I with List II

| | List-I | | List-II |
|---|---|---|---|
| A | Non-medicated IUD | I | Multiload 375 |
| B | Copper releasing IUD | II | Progestogens |
| C | Hormone releasing IUD | III | Lippes loop |
| D | Implants | IV | LNG-20 |

Choose the correct answer from the options given below:

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

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

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

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

**150.** **Statement I:** Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance.

**Statement II:** Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height.

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

(3) Statement is incorrect but Statement II is correct

(4) Both Statement I and Statement II are correct

**151.** A test cross is carried out to:

(1) Predict whether two traits are linked

(2) Assess the number of alleles of a gene

(3) Determine whether two species or varieties will breed successfully

(4) Determine the genotype of a plant at $F_2$

**152.** 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) Sutton and Boveri

(2) Alfred Sturtevant

(3) Henking

(4) Thomas Hunt Morgan

**153.** Which of the following characteristics represent 'Inheritance of blood groups' in humans?

a. Dominance

b. Co-dominance

c. Multiple allele

d. Incomplete dominance

e. Polygenic inheritance

(1) b, c and e (2) b, d and e

(3) a, b and c (4) a, c and e

**154.** Which one of the following is an example of polygenic inheritance?

(1) Production of male honey bee

(2) Pod shape in garden pea

(3) Skin colour in humans

(4) Flower colour in Mirabilis jalapa

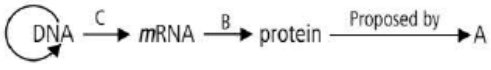
**155.** If Adenine makes 30% of the DNA molecule, what will be the percentage of Thymine, Guanine and Cytosine in it?

(1) T: 20; G: 25; C: 25

(2) T: 20; G: 30; C: 20

(3) T: 20; G: 20; C: 30

(4) T: 30; G: 20; C: 20

**156.** 


The figure gives an important concept in the genetic implication of DNA. Fill the blanks A, B and C.

(1) A-Maurice Wilkins, B-Transcription, C-Translation

(2) A-James Watson, B-Replication, C-Extension

(3) A-Erwin Chargaff, B-Translation, C-Replication

(4) A-Francis Crick, B-Translation, C-Transcription

**157.** Identify the **correct** statement.

(1) Split gene arrangement is characteristic of prokaryotes,

(2) In capping, methyl guanosine triphosphate is added to the 3' end of hnRNA.

(3) RNA polymerase binds with Rho factor to terminate the process of transcription in bacteria.

(4) The coding strand in a transcription unit is copied to an mRNA.

**158.** In an *E.coli* strain *i* gene gets mutated and its product can not bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?

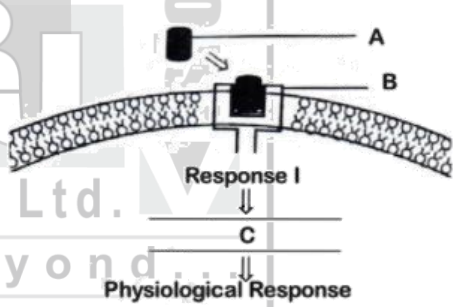
(1) *z, y, a* genes will be transcribed

(2) *z, y, a* genes will not be translated

(3) RNA polymerase will bind the promote region

(4) Only *z* gene will get transcribed

**159.** Identify A, B and C in the diagram representation of the mechanism of hormone action. .




Select the correct option from the following

(1) A – steroid Hormone; B – hormone – receptor Complex; C - protein

(2) A – Protein Hormone; B – Receptot; C – Cyclic AMP

(3) A – Steroid Hormone; B – Receptor; C – second messenger

(4) A – protein hormone; B- Cyclic AMP; C – Hormone –recptor complex

**160.** Which of the following in sewage treatment removes suspended solids?

(1) Secondary treatment

(2) Primary treatment

(3) Sludge treatment

(4) Tertiary treatment

**161.** **Statement I:** The release of sperms into the seminiferous tubules is called spermiation.

**Statement II:** Spermiogenesis is the process of formation of sperms from spermatogonia.

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

**162.** Given below are some stages of human evolution. Arrange them in correct sequence.(Past to Recent).

A. *Homo habilis*
B. *Homo sapiens*
C. *Homo neanderthalensis*
D. *Homo erectus*

Choose the correct sequence of human evolution from the options given below:

(1) D-A-C-B (2) B-A-D-C
(3) C-B-D-A (4) A-D-C-B

**163.** Common cold is not cured by antibiotics because it is

(1) Caused by a virus
(2) Caused by a Gram-positive bacterium
(3) Caused by a Gram-negative bacterium
(4) Not an infectious disease

**164.** Drug called 'Heroin' is synthesized by:

(1) acetylation of morphine
(2) Glycosylation of morphine
(3) Nitration of morphine
(4) Methylation of morphine

**165.** Match List I with List II

| | List-I | | List-II |
|---|---|---|---|
| A. | *Clostridium butylicum* | I. | Ethanol |
| B. | *Saccharomyces cerevisiae* | II. | Streptokinase |
| C. | *Trichoderma polysporum* | III. | Butyric acid |
| D. | *Streptococcus sp.* | IV. | Cyclosporin-A |

Choose the correct answer from the option given below:

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

**166.** The taq polymerase enzyme is obtained from:

(1) Thermus aquaticus
(2) Thiobacillus ferroxidans
(3) Bacillus subtilis
(4) Pseudomonas putida

**167.** The "Ti plasmid" of Agrobacterium tumefaciens stands for

(1) Tumour inhibiting plasmid
(2) Tumour independent plasmid
(3) Tumour inducing plasmid
(4) Temperature independent plasmid

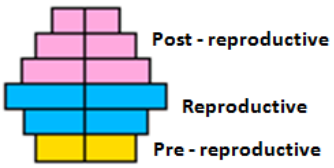
**168.** Human insulin is being commercially produced from transgenic species of

(1) Rhizobium
(2) Saccharomyces
(3) Escherichia
(4) Mycobacterium.

**169.** The transgenic animals are those which have

(1) Foreign RNA in all its cells
(2) Foreign DNA in some of its cells.
(3) Foreign DNA in all its cells.
(4) Both (1) and (2).

**170.** What type of human population is represented by the following age pyramid?




(1) Stable population
(2) Declining population
(3) Expanding population
(4) Vanishing population

**171.** Homestasis is...

(1) Tendency to charge with change in environment
(2) Tendency to resist change
(3) Disturbance in regulatory control.
(4) Plants and animal extracts used in homeopathy

**172.** In the equation GPP – R = NPP

R represents:

(1) Respiration losses

(2) Radiant energy

(3) Retardation factor

(4) Environment factor

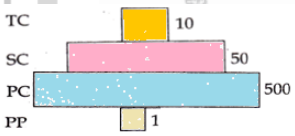
**173.** Match the trophic levels with their correct species examples in grassland ecosystem.

| | | | |
|---|---|---|---|
| (a) | Fourth trophic level | (i) | Crow |
| (b) | Second trophic level | (ii) | Vulture |
| (c) | First trophic level | (iii) | Rabbit |
| (d) | Third trophic level | (iv) | Grass |

Select the correct option.

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

**174.** Given below is an imaginary pyramid of numbers. What could be one of the possibilities about certain organisms at some of the different levels?




(1) Level PC is "insects" and level SC is "small insectivorous birds"

(2) Level PP is "phytoplanktons" in sea and "whale" on top level TC

(3) Level one PP is "pipal trees" and the level SC is "sheep"

(4) Level PC is "rats" and level SC is "cats"

**175.** Niche is

(1) All the biological factors in the organism's environment

(2) The range of temperature that the organism needs to live

(3) The physical space where an organism lives

(4) The functional role played by the organism where it lives

**176.** **Statement I:** Autoimmune disorder is a condition where body defence mechanism recognizes its own cells as foreign bodies.

**Statement II:** Rheumatoid arthritis is a condition where body does not attack self-cells.

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

(3) Statement I is incorrect but Statement II is correct

(4) Both Statement I and Statement II are correct

**177.** Which of the following is the most important cause of animals and plants being driven to extinction?

(1) Over-exploitation

(2) Alien species invasion

(3) Habitat loss and fragmentation

(4) Co-extinctions

**178.** 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) B and C only (2) A, c and D only

(3) C and D only (4) A, B and C only

**179.** Transfer of pollen grains from the anther to the stigma of another flower of the same plant is called

(1) Xenogamy (2) Geitonogamy

(3) Karyogamy (4) Autogamy

**180.** The term ecosystem was coined by:

(1) E.P.Odum (2) A.G. Tansley

(3) E. Haeckel (4) E. Warming

# Syllabus

## FT – 12

| | | |
|---|---|---|
| **Day & Date** | **:** | **14 June, 2026** |
| **Time** | **:** | **2: 00 PM to 5: 00 PM** |
| **Physics** | **:** | **FULL COURSE** |
| **Chemistry** | **:** | **FULL COURSE** |
| **Biology** | **:** | **FULL COURSE** |