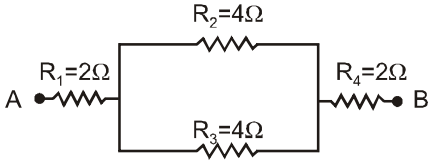
## PHYSICS

### (SECTION-A)

**1.** A conductor has $14.4 \times 10^{-19}\ coulombs$ positive charge. The conductor has
(Charge on electron $= 1.6 \times 10^{-19}\ coulombs$ )
(A) 9 electrons in excess
(B) 27 electrons in short
(C) 27 electrons in excess
(D) 9 electrons in short

**2.** A charge $Q$ is divided into two parts of $q$ and $Q-q$. If the coulomb repulsion between them when they are separated is to be maximum, the ratio of $\frac{Q}{q}$ should be
(A) 2 (B) $1/2$
(C) 4 (D) $1/4$

**3.** In the given figure, the equivalent resistance between the points A and B is




(A) 8 Ω (B) 6 Ω
(C) 4 Ω (D) 2 Ω

**4.** Two point charges $+3\mu C$ and $+8\mu C$ repel each other with a force of $40N$. If a charge of $-5\mu C$ is added to each of them, then the force between them will become
(A) $-10N$ (B) $+10N$
(C) $+20N$ (D) $-20N$

**5.** Two equal and like charges when placed 5 cm apart experience a repulsive force of 0.144 newton. The magnitude of the charge in microcoloumb will be :
(A) 0.2 (B) 2 (C) 20 (D) 12

**6.** Two charges of +1 μC & + 5 μC are placed 4 cm apart, the ratio of the force exerted by both charges on each other will be -
(A) 1 : 1 (B) 1 : 5
(C) 5 : 1 (D) 25 : 1

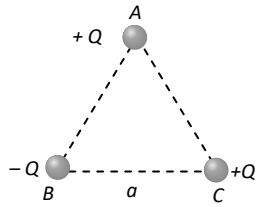
**7.** When a wire of uniform cross-section a, length $\ell$ and resistance R is bent into a complete circle, resistance between two of diametrically opposite points will be :
(A) $\frac{R}{4}$ (B) $\frac{R}{8}$ (C) 4R (D) $\frac{R}{2}$

**8.** The dielectric constant K of an insulator can be :
(A) 5 (B) 0.5
(C) –1 (D) zero

**9.** If an electron is placed in a uniform electric field, then the electron will :
(A) experience no force.
(B) moving with constant velocity in the direction of the field.
(C) move with constant velocity in the direction opposite to the field.
(D) accelerate in direction opposite to field.

**10.** Two small conducting spheres of equal radius have charges $+10\mu C$ and $-20\mu C$ respectively and placed at a distance $R$ from each other experience force $F_1$. If they are brought in contact and separated to the same distance, they experience force $F_2$. The ratio of $F_1$ to $F_2$ is
(A) 1 : 8 (B) – 8 : 1
(C) 1 : 2 (D) – 2 : 1

**11.** Three charges are placed at the vertices of an equilateral triangle of side '*a*' as shown in the following figure. The force experienced by the charge placed at the vertex *A* in a direction normal to *BC* is




(A) $Q^2/(4\pi\varepsilon_0 a^2)$ (B) $-Q^2/(4\pi\varepsilon_0 a^2)$
(C) Zero (D) $Q^2/(2\pi\varepsilon_0 a^2)$

**12.** An electron is moving round the nucleus of a hydrogen atom in a circular orbit of radius *r*. The coulomb force $\vec{F}$ between the two is (Where $K = \frac{1}{4\pi\varepsilon_0}$)
(A) $-K\frac{e^2}{r^3}\hat{r}$ (B) $K\frac{e^2}{r^3}\vec{r}$
(C) $-K\frac{e^2}{r^3}\vec{r}$ (D) $K\frac{e^2}{r^2}\hat{r}$

**13.** Equal charges $q$ are placed at the four corners $A, B, C, D$ of a square of length $a$. The magnitude of the force on the charge at *B* will be

(A) $\frac{3q^2}{4\pi\varepsilon_0 a^2}$

(B) $\frac{4q^2}{4\pi\varepsilon_0 a^2}$

(C) $\left(\frac{1+2\sqrt{2}}{2}\right)\frac{q^2}{4\pi\varepsilon_0 a^2}$

(D) $\left(2+\frac{1}{\sqrt{2}}\right)\frac{q^2}{4\pi\varepsilon_0 a^2}$

**14.** Two point charges $3 \times 10^{-6}$ *C* and $8 \times 10^{-6}$ *C* repel each other by a force of $6 \times 10^{-3}$ *N*. If each of them is given an additional charge $-6 \times 10^{6}$ *C*, the force between them will be

(A) $2.4 \times 10^{-3}$ *N* (attractive)
(B) $2.4 \times 10^{-9}$ *N* (attractive)
(C) $1.5 \times 10^{-3}$ *N* (repulsive)
(D) $1.5 \times 10^{-3}$ *N* (attractive)

**15.** A charge *q* is placed at the centre of the line joining two equal charges *Q*. The system of the three charges will be in equilibrium, if $q$ is equal to

(A) $-\frac{Q}{2}$ (B) $-\frac{Q}{4}$

(C) $+\frac{Q}{4}$ (D) $+\frac{Q}{2}$

**16.** If a unit positive charge is taken from one point to another over an equipotential surface, then

(A) Work is done on the charge
(B) Work is done by the charge
(C) Work done is constant
(D) No work is done

**17.** A uniform electric field having a magnitude $E_0$ and direction along the positive $X-$ axis exists. If the potential $V$ is zero at $x = 0$, then its value at $X = +x$ will be

(A) $V_{(x)} = +xE_0$ (B) $V_x = -xE_0$

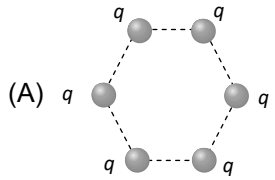
(C) $V_x = +x^2E_0$ (D) $V_x = -x^2E_0$

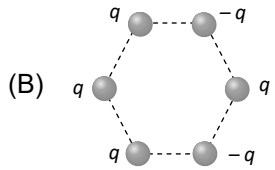
**18.** The insulation property of air breaks down at $E = 3 \times 10^6$ *volt/metre*. The maximum charge that can be given to a sphere of diameter $5\,m$ is approximately (in coulombs)

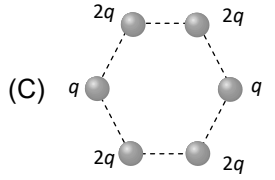
(A) $2 \times 10^{-2}$ (B) $2 \times 10^{-3}$

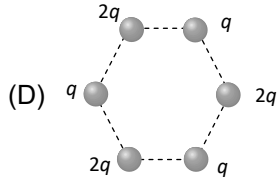
(C) $2 \times 10^{-4}$ (D) $2 \times 10^{-5}$

**19.** Figures below show regular hexagons, with charges at the vertices. In which of the following cases the electric field at the centre is not zero

(A) 


(B) 


(C) 


(D) 


**20.** The charge given to a hollow sphere of radius 10 *cm* is $3.2\times10^{-19}$ *coulomb*. At a distance of 4 *cm* from its centre, the electric potential will be

(A) $28.8 \times 10^{-9}\ volts$ (B) $288\ volts$

(C) 2.88 *volts* (D) Zero

**21.** An electric dipole of moment $\vec{p}$ is placed normal to the lines of force of electric intensity $\vec{E}$, then the work done in deflecting it through an angle of $180°$ is

(A) $pE$ (B) $+2pE$

(C) $-2pE$ (D) Zero

**22.** The distance between the two charges $+q$ and $-q$ of a dipole is $r$. On the axial line at a distance $d$ from the centre of dipole, the intensity is proportional to

(A) $\frac{q}{d^2}$ (B) $\frac{qr}{d^2}$

(C) $\frac{q}{d^3}$ (D) $\frac{qr}{d^3}$

**23.** Resistance of a wire is 20 ohm, it is stretched upto, three times of its length, then its new resistance will be

(A) 6.67 Ω (B) 60 Ω

(C) 120 Ω (D) 180 Ω

**24.** A wire has a resistance 12 ohms. if it is bent in the form of a equilateral triangle. The resistance between any two terminals is
(A) 8/3 (B) 3/4 (C) 4 (D) 3

**25.** A certain wire has a resistance $R$. The resistance of another wire identical with the first except having twice its diameter is
(A) $2R$ (B) $0.25R$
(C) $4R$ (D) $0.5R$

**26.** A metallic block has no potential difference applied across it, then the mean velocity of free electrons is $T$ = absolute temperature of the block)
(A) Proportional to $T$
(B) Proportional to $\sqrt{T}$
(C) Zero
(D) Finite but independent of temperature

**27.** The resistance of P, Q, R S arms of a Wheatstone bridge are 5, 15, 20 and 60Ω. A cell of 4 volt emf and 4Ω internal resistance is connected with them, then the current flowing (in ampere) is
(A) 0.1 (B) 0.2 (C) 1 (D) 2

**28.** The torque acting on a dipole of moment $\vec{P}$ in an electric field $\vec{E}$ is
(A) $\vec{P}\cdot\vec{E}$ (B) $\vec{P}\times\vec{E}$
(C) Zero (D) $\vec{E}\times\vec{P}$

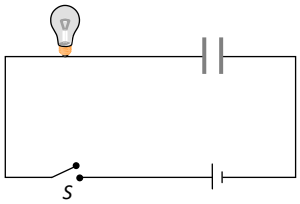
**29.** The potential at a point due to an electric dipole will be maximum and minimum when the angles between the axis of the dipole and the line joining the point to the dipole are respectively
(A) $90^o$ and $180^o$ (B) $0^o$ and $90^o$
(C) $90^o$ and $0^o$ (D) $0^o$ and $180^o$

**30.** A cylinder of radius *R* and length *L* is placed in a uniform electric field *E* parallel to the cylinder axis. The total flux for the surface of the cylinder is given by
(A) $2\pi R^2 E$ (B) $\pi R^2 / E$
(C) $(\pi R^2 - \pi R)/E$ (D) Zero

**31.** A parallel plate condenser is immersed in an oil of dielectric constant 2. The field between the plates is
(A) Increased proportional to 2
(B) Decreased proportional to $\frac{1}{2}$
(C) Increased proportional to $\sqrt{2}$
(D) Decreased proportional to $\frac{1}{\sqrt{2}}$

**32.** 64 drops each having the capacity $C$ and potential $V$ are combined to form a big drop. If the charge on the small drop is $q$, then the charge on the big drop will be
(A) $2q$ (B) $4q$
(C) $16q$ (D) $64q$

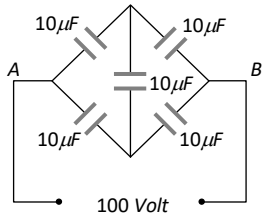
**33.** A light bulb, a capacitor and a battery are connected together as shown here, with switch $S$ initially open. When the switch $S$ is closed, which one of the following is true




(A) The bulb will light up for an instant when the capacitor starts charging
(B) The bulb will light up when the capacitor is fully charged
(C) The bulb will not light up at all
(D) The bulb will light up and go off at regular intervals

**34.** The condensers of capacity $C_1$ and $C_2$ are connected in parallel, then the equivalent capacitance is
(A) $C_1 + C_2$ (B) $\frac{C_1 C_2}{C_1 + C_2}$
(C) $\frac{C_1}{C_2}$ (D) $\frac{C_2}{C_1}$

**35.** Five capacitors of $10\,\mu F$ capacity each are connected to a *d.c.* potential of $100\ volts$ as shown in the adjoining figure. The equivalent capacitance between the points $A$ and $B$ will be equal to




(A) $40\,\mu F$ (B) $20\,\mu F$
(C) $30\,\mu F$ (D) $10\,\mu F$

## (SECTION-B)

**36.** According to Gauss' Theorem, electric field of an infinitely long straight wire is proportional to

(A) $r$ (B) $\frac{1}{r^2}$

(C) $\frac{1}{r^3}$ (D) $\frac{1}{r}$

**37.** The energy stored in a condenser of capacity $C$ which has been raised to a potential $V$ is given by

(A) $\frac{1}{2}CV$ (B) $\frac{1}{2}CV^2$

(C) $CV$ (D) $\frac{1}{2VC}$

**38.** The insulated spheres of radii $R_1$ and $R_2$ having charges $Q_1$ and $Q_2$ respectively are connected to each other. There is

(A) No change in the energy of the system
(B) An increase in the energy of the system
(C) Always a decrease in the energy of the system
(D) A decrease in the energy of the system unless $Q_1R_2 = Q_2R_1$

**39.** Eight drops of mercury of equal radii possessing equal charges combine to form a big drop. Then the capacitance of bigger drop compared to each individual small drop is

(A) 8 times (B) 4 times
(C) 2 times (D) 32 times

**40.** An electric current is passed through a circuit containing two wires of the same material, connected in parallel. If the lengths and radii of the wires are in the ratio of 4/3 and 2/3, then the ratio of the currents passing through the wire will be :

(A) 3 (B) 1/3 (C) 8/9 (D) 2

**41.** Masses of 3 wires of same metal are in the ratio 1 : 2 : 3 and their lengths are in the ratio 3 : 2 : 1. The electrical resistances are in ratio

(A) 1 : 4 : 9 (B) 9 : 4 : 1
(C) 1 : 2 : 3 (D) 27 : 6 : 1

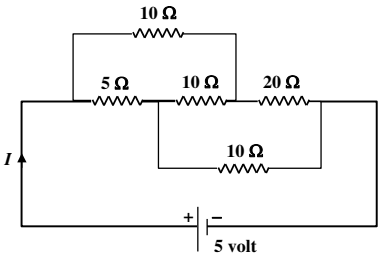
**42.** A current of 1 *mA* is flowing through a copper wire. How many electrons will pass a given point in one *second*
[$e = 1.6 \times 10^{-19}$ *Coulomb*]

(A) $6.25 \times 10^{19}$ (B) $6.25 \times 10^{15}$
(C) $6.25 \times 10^{31}$ (D) $6.25 \times 10^{8}$

**43.** A copper wire has a square cross-section, 2.0 *mm* on a side. It carries a current of 8 *A* and the density of free electrons is $8 \times 10^{28}\ m^{-3}$. The drift speed of electrons is equal to

(A) $0.156 \times 10^{-3}$ $m.s^{-1}$
(B) $0.156 \times 10^{-2}$ $m.s^{-1}$
(C) $3.12 \times 10^{-3}$ $m.s^{-1}$
(D) $3.12 \times 10^{-2}$ $m.s^{-1}$

**44.** The current I drawn from the 5 volt source will be

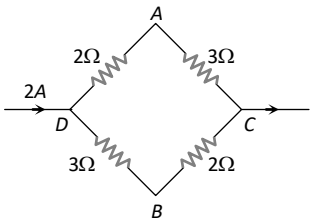



(A) 0.67 A (B) 0.17 A
(C) 0.33 A (D) 0.5 A

**45.** The electric resistance of a certain wire of iron is *R*. If its length and radius are both doubled, then

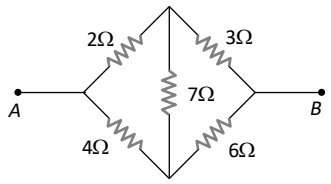
(A) The resistance will be doubled and the specific resistance will be halved
(B) The resistance will be halved and the specific resistance will remain unchanged
(C) The resistance will be halved and the specific resistance will be doubled
(D) The resistance and the specific resistance, will both remain unchanged

**46.** A current of 2 A flows in a system of conductors as shown. The potential difference $(V_A - V_B)$ will be




(A) $+2\,V$ (B) $+1\,V$
(C) $-1\,V$ (D) $-2\,V$

**47.** Five resistances are connected as shown in the figure. The effective resistance between the points *A* and *B* is




(A) $\frac{10}{3}\Omega$ (B) $\frac{20}{3}\Omega$

(C) $15\,\Omega$ (D) $6\,\Omega$

**48.** A 50*V* battery is connected across a 10 *ohm* resistor. The current is 4.5 *amperes*. The internal resistance of the battery is

(A) Zero (B) 0.5 *ohm*

(C) 1.1 *ohm* (D) 5.0 *ohm*

**49.** The potential difference applied to an X-ray tube is 5 kV and the current through it is 3.2 mA.

Then the number of electrons striking the target per second is

(A) $2 \times 10^{16}$ (B) $5 \times 10^{16}$

(C) $1 \times 10^{17}$ (D) $4 \times 10^{15}$

**50.** **Assertion :** There is no current in the metals in the absence of electric field.

**Reason :** Motion of free electron are randomly.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If the assertion and reason both are false.

## CHEMISTRY

### (SECTION-A)

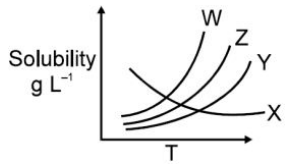
**51.** Hydrochloric acid solution A and B have concentration of 0.5 N and 0.1 N respectively.
The volume of solutions A and B required to make 2 litres of 0.2 N HCl are :-
(A) 0.5 lit. of A + 1.5 lit. of B
(B) 1.5 lit. of A + 0.5 lit. of B
(C) 1.0 lit. of A + 1.0 lit. of B
(D) 0.75 lit. of A + 1.25 lit. of B

**52.** 0.2 mole of HCl and 0.1 mole of $CaCl_2$ were dissolved in water to have 500 mL of solution, the molarity of $Cl^-$ ions is-
(A) 0.04 M (B) 0.8 M
(C) 0.4 M (D) 0.08 M

**53.** An aqueous solution of glucose is 10% in strength.
The volume in which 2 mole of it is dissolved will be :-
(A) 18 litre (B) 3.6 litre
(C) 0.9 litre (D) 1.8 litre

**54.** The solubility of gases in liquids :
(A) increases with increase in pressure and temperature
(B) decreases with increase in pressure and temperature
(C) Increases with increase in pressure and decrease in temperature
(D) decreases with increase in pressure and increase in temperature

**55.** Solubility curves of four ionic salts X, Y, Z, W are given below :




In which case the value of $\Delta H_{sol.} < 0$
(A) X (B) Y (C) Z (D) W

**56.** Select in correct statements :
(A) Gases which have high value of van der Waals constant 'a' are easily liquefied
(B) Easily liquefied gases are water soluble
(C) Ions forming gases in a solvent are soluble in that solvent
(D) Under same conditions, $NH_3$ has low solubility than that of $CO_2$

**57.** Select incorrect statement :
(A) Higher the value of $k_H$ (Henry's law constant) at a given pressure, the lower is the solubility of the gas in the liquid
(B) Solubility of a gas in a liquid decreases with increases in temperature and pressure
(C) to minimise the painful effects accompanying the decompression of deep sea divers, $O_2$ diluted with less soluble He gas is used as breathing gas
(D) The solubility of a gas in a liquid is governed by Henry's law

**58.** Which of the following plots does not represent the behaviour of an ideal binary liquid solution :-
(A) Plot of $P_A$ versus $X_A$ (mole fraction of A in liquid phase) is linear
(B) Plot of $P_B$ versus $X_B$ is linear
(C) Plot of ptotal versus $X_A$ (or $X_B$) is linear
(D) Plot of ptotal versus $X_A$ is non linear

**59.** Arrange the following aqueous solutions in the order of their increasing boiling points :-
(i) $10^{-4}$ M NaCl (ii) $10^{-4}$ M Urea
(iii) $10^{-3}$ M $MgCl_2$ (iv) $10^{-2}$ M NaCl
(A) (i) < (ii) < (iv) < (iii)
(B) (ii) < (i) = (iii) < (iv)
(C) (ii) < (i) < (iii) < (iv)
(D) (iv) < (iii) < (i) = (ii)

**60.** Increasing the temperature of an aqueous solution will cause :-
(A) Decrease in molality
(B) Decrease in molarity
(C) Decrease in mole fraction
(D) Decrease in % w/w

**61.** Osmosis of A into solution B will not take place if :-
(A) A is hypertonic
(B) A is hypotonic
(C) A is isotonic
(D) Either A or C may correct

**62.** Among 0.1M solutions of urea,$Na_3PO_4$ and $Al_2(SO_4)_3$:-
(a) The vapour pressure and freezing point are the lowest for urea
(b) The vapour pressure and freezing point are the highest for urea
(c) The elevation in boiling point is the highest for $Al_2(SO_4)_3$
(d) The depression in freezing point is the highest for $Al_2(SO_4)_3$
(A) Only a (B) b & c both
(C) b, c and d (D) a, b, c and d

**63.** Glucose is added to 1 litre water to such an extent that $\frac{\Delta T_f}{K_f}$ becomes equal to $\frac{1}{1000}$ the wt. of glucose added is :-

(A) 180 g (B) 18 g
(C) 1.8 g (D) 0.18 g

**64.** The vapour pressure of two pure liquids (A) and (B) are 100 and 80 torr respectively. The total pressure of the solution obtained by mixing 2 mol of (A) and 3 mol of (B) would be

(A) 20 torr (B) 36 torr
(C) 88 torr (D) 180 torr

**65.** The Van't Hoff factor for a dilute aqueous solution of glucose is

(A) zero (B) 1.0 (C) 1.5 (D) 2.0

**66.** A complex containing $K^+$, Pt (IV) and $Cl^-$ is 100% ionised giving i = 3. Thus, complex is

(A) $K_2[PtCl_4]$ (B) $K_2[PtCl_6]$
(C) $K_3[PtCl_5]$ (D) $K[PtCl_3]$

**67.** The osmotic pressure of a solution of benzoic acid dissolved in benzene is less than expected because

(A) Benzoic acid is an organic solute
(B) Benzene is a non-polar solvent
(C) Benzoic acid dissociates in benzene
(D) Benzoic acid gets associated in benzene

**68.** Elevation of boiling point of 1 molar aqueous glucose solution (density = 1.2 g/mL) is

(A) $K_b$ (B) 1.20 $K_b$
(C) 1.02 $K_b$ (D) 0.98 $K_b$

**69.** 1.0 molal aqueous solution of an electrolyte $A_2B_3$ is 60% ionised. The boiling point of the solution at 1 atm is ($K_{b(H_2O)}$ = 0.52K kg $mol^{-1}$)

(A) 274.76 K (B) 377 K
(C) 376.4 K (D) 374.76 K

**70.** Assuming each salt to be 90% dissociated, which of the following will have highest boiling point?

(A) Decimolar $Al_2(SO_4)_3$
(B) Decimolar $BaCl_2$
(C) Decimolar $Na_2SO_4$
(D) A solution obtained by mixing equal volumes of (B) and (C)

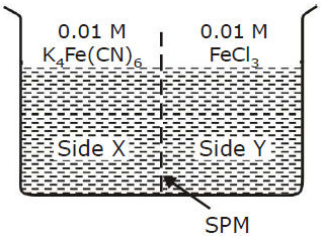
**71.** Select correct statement -

(A) b.p. of 1 molal NaCl solution is twice that of 1 molal sucrose solution
(B) b.p. elevation of 1 molal glucose solution is half of the 1 molal KCl solution
(C) b.p. is a colligative property
(D) All of the above

**72.** Decimolar solution of potassium ferricyanide, $K_3[Fe(CN)_6]$ has osmotic pressure of 3.94 atm at 27ºC. Hence percent ionisation of the solute is -

(A) 10% (B) 20%
(C) 30% (D) 40%

**73.** $FeCl_3$ on reaction with $K_4[Fe(CN)_6]$ in aqueous solution gives blue colour. These are separated by a semipermeable membrane AB as shown. Due to osmosis there is




(A) Blue colour formation in side X.
(B) Blue colour formation in side Y.
(C) Blue colour formation in both of the sides X and Y.
(D) No blue colour formation.

**74.** Mole fraction of A vapours above the solution in mixture of A and B ($X_A$ = 0.4) will be

[Given : $P_A^0$ = 100 mm Hg and $P_B^0$ = 200 mm Hg]

(A) 0.4 (B) 0.8
(C) 0.25 (D) None of these

**75.** An unripe mango placed in a concentrated solution to prepare pickle. Shrivels because_____.

(A) It gains water due to osmosis.
(B) It loses water due to reverse osmosis.
(C) It gains water due to reverse osmosis.
(D) It loses water due to osmosis.

**76.** Which of the following aqueous solution will show maximum vapour pressure at 300 K?

(A) 1 M NaCl (B) 1 M $CaCl_2$
(C) 1 M $AlCl_3$ (D) 1 M $C_{12}H_{22}O_{11}$

**77.** The Van't Hoff factor for a dilute aqueous solution of glucose is
(A) zero (B) 1.0
(C) 1.5 (D) 2.0

**78.** The correct relationship between the boiling points of very dilute solution of $Na_2SO_4$ ($T_1K$) and NaCl($T_2K$) having the same molar concentration is
(A) $T_1 = T_2$ (B) $T_1 > T_2$
(C) $T_2 > T_1$ (D) $T_2 \leq T_1$

**79.** The vapour pressure of a solution of a non-volatile electrolyte B in a solvent A is 95% of the vapour pressure of the solvent at the same temperature. If the molecular weight of the solvent is 0.3 times the molecular weight of solute, the weight ratio of the solvent and solute are
(A) 0.15 (B) 5.7
(C) 0.2 (D) 4.0

**80.** A molal solution is one that contains one mole of a solute in-
(A) 1000 g of the solution
(B) 1000 c.c. of the solution
(C) 1000 c.c of the solvent
(D) 1000 g of the solvent

**81.** Molarity of a solution relates the-
(A) Moles of solute and solvent
(B) Moles of solute and mass of solution
(C) Volume of solute and volume of solvent
(D) Volume of solution and moles of solute

**82.** Density of water is 1g/mL. The concentration of water in mol/litre is-
(A) 1000 (B) 18
(C) 0.018 (D) 55.5

**83.** How many grams of glucose should be dissolved to make one litre solution of 10%(w/v) glucose-
(A) 10 g (B) 180 g
(C) 100 g (D) 1.8 g

**84.** 10 mL of concentrated $H_2SO_4$ (18 M) is diluted to one litre. The approximate strength of the dilute acid is-
(A) 18 M (B) 180 M
(C) 0.18 M (D) 1.8 M

**85.** The vapour pressures of ethanol and methanol are 42.0 mm and 88.5 mm Hg respectively. An ideal solution is formed at the same temperature by mixing 46.0 g of ethanol with 16.0 g of methanol. The mole fraction of methanol in the vapour is -
(A) 0.467 (B) 0.502
(C) 0.513 (D) 0.556

## (SECTION-B)

**86.** The relative lowering in vapour pressure is-
(A) $\propto X_{solute}$ (B) $\propto \frac{1}{X_{solute}}$
(C) $= X_{solute}$ (D) $\propto m$

**87.** When a substance is dissolved in a solvent, the vapour pressure of solvent decreases. This brings
(A) An increase in b.pt. of the solution
(B) A decrease in b.pt of a solution
(C) An increase in f.pt of the solvent
(D) none

**88.** Binary liquid mixtures which exhibit positive deviations from Raoult's law boil at ..... temperature than the expected b.pt -
(A) Lower (B) Higher
(C) Same (D) Can't be said

**89.** Which of the following conditions is not correct for ideal solution-
(A) no change in volume on mixing
(B) no change in enthalpy on mixing
(C) it obey's Raoult's law
(D) Ionisation of solute should occurs to a small extent

**90.** Which of the following aqueous solutions should have the highest boiling point?
(A) 1.0 M NaOH (B) 1.0 M $Na_2SO_4$
(C) 1.0 M $NH_4NO_3$ (D) 1.0 M $KNO_3$

**91.** Solutions distilled without change in composition at a temperature are called-
(A) Amorphous
(B) Azeotropic mixture
(C) Ideal solution
(D) Super saturated solution

**92.** Azeotropic mixture of water and HCl boils at 381.5 K. By distilling the mixture it is possible to obtain-
(A) Pure HCl only
(B) Pure water only
(C) Neither HCl nor water
(D) Both water and HCl in pure state

**93.** Which of the following is not a colligative property –
(A) $\Delta T_f$ (B) $\pi$ (C) $\Delta T_b$ (D) $K_b$

**94.** The elevation of boiling point method is used for the determination of molecular weight of-
(A) Non-volatile and soluble solute
(B) Non-volatile and insoluble solute
(C) Volatile and soluble solute
(D) Volatile and insoluble solute

**95.** Which of the following 0.1 M aqueous solutions will have the lowest freezing point-
(A) Potassium sulphate
(B) Sodium chloride
(C) Urea
(D) Glucose

**96.** 0.5 M solution of urea is isotonic with-
(A) 0.5 M NaCl solution
(B) 0.5 M sugar solution
(C) 0.5 M $BaCl_2$ solution
(D) 0.5 M solution benzoic acid in benzene

**97.** In the case of osmosis, solvent molecules move from-
(A) Higher vapour pressure to lower vapour pressure
(B) Higher concentration to lower concentration
(C) Lower vapour pressure to higher vapour pressure
(D) Higher osmotic pressure to lower osmotic pressure

**98.** **Assertion :** Reverse osmosis is used in the desalination of sea water.
**Reason :** When pressure more than osmotic pressure is applied, pure water is squeezed out of the sea water through the membrane.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If assertion is false but reason is true.

**99.** **Assertion :** Camphor is used as solvent in the determination of molecular masses of naphthalene, anthracene etc.
**Reason :** Camphor has high molal elevation constant.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If assertion is false but reason is true.

**100.** **Assertion :** Elevation in boiling point and depression in freezing point are colligative properties.
**Reason :** All colligative properties are used for the calculaltion of molecular masses.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If assertion is false but reason is true.

## BIOLOGY

## BOTANY (SECTION-A)

**101.** The proximal end of the filament of stamen is attached to
(A) The thalamus (B) The petal
(C) Both (A) and (B) (D) Anther

**102.** Select the incorrectly matched pair.
(A) Endothecium-Presence of a-cellulose bands fibrous
(B) Middle layers-Contains dense cytoplasm and more than one nucleus
(C) Tapetum-Provides nourishment to the developing microspore
(D) Sporogenous tissue-Undergoes meiosis to form microspore tetrad

**103.** Total number of microspore tetrad formed in a dithecous anther if each microsporangia has 25 microspore mother cells would be
(A) 100 (B) 50
(C) 400 (D) 200

**104.** Pollen grains
(a) Are generally spherical
(b) Can be preserved as fossils
(c) Of some anemophilous species may cause pollen allergy
(d) Are always diploid
(A) Only (b) and (c) are correct
(B) Only (a), (b), and (c) are correct
(C) Only (b), (c), and (d) are correct
(D) (a), (b), (c), and (d) are correc

**105.** Pollen banks
A: Store pollen grain in liquid nitrogen
B: Are centers for storage of pollen grains for various artificial plants breeding programs
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Both (A) and (B) are correct.
(D) Both (A) and (B) are incorrect.

**106.** In ovules, a single megaspore mother cell
(a) Is generally differentiated in the micropylar
(b) Is derived from integument region
(c) Contains dense cytoplasm and prominent nucleus
(A) Only (a) is correct.
(B) Only (a) and (b) are correct.
(C) Only (a) and (c) are correct.
(D) All (a), (b), and (c) are correct.

**107.** Match the columns, and select the correct option.

| Column I | Column II |
|---|---|
| a. Hilum | (i) Parenchymatous tissue |
| b. Micropyle | (ii) Female gametophyte |
| c. Embryo sac | (iii) Junction between ovules and funicles |
| d. Nucleus | (iv) Small opening present at the tip of the ovule |

(A) a-iii; b - ii; c - iv; d- i
(B) a- ii; b-iii; c - iv; d-i
(C) a- iii; b - iv; c - ii; d- i
(D) a- i; b-iv; c-ii; d - iii

**108.** The most common of ovules in angiosperm is
(A) Orthotropous (B) Anatropous
(C) Amphitropous (D) Circinotropous

**109.** Consider following statements about embryo sac.
(a) Polygonum-type embryo sac is monosporic and is a 7-celled and 8-nucleated structure.
(b) Six of the eight nuclei are surrounded by a cell wall and organized into cells.
(c) Polar nuclei are situated below the egg apparatus in the central cell.
(A) Only (a) is correct.
(B) Only (a) and (c) are correct.
(C) Only (a) and (b) are correct.
(D) All (a), (b), and (c) are correct.

**110.** How many meiotic and mitotic divisions are required to form 7-celled and 8-nucleated embryo sac from megaspore mother cell?
(A) One meiotic and 3 mitotic divisions
(B) One meiotic and 2 mitotic divisions
(C) Three mitotic divisions only
(D) One meiotic and 4 mitotic divisions

**111.** Geitonogamy is
(A) Functionally a self-pollination
(B) Genetically a cross-pollination
(C) Ecologically a cross-pollination
(D) Both (A) and (B)

**112.** Read the following statements, and appropriate option. Choose the
A. Transfer of pollen grains from anther to stigma of same flower
B. Transfer of pollen grain from anther to stigma of anther flower of same plant
C. Transfer of pollen grain from anther to stigma of flower of different plant
(A) A-Autogany; B-Geitonogamy; C-Xenogamy
(B) A-Autogamy; B-Xenogamy; C-Geitonogamy
(C) A-Allogamy; B-Geitonogamy; C-Allogamy
(D) A-Homogamy; B-Autogamy; C-Allogamy

**113.** Maturation of both androecium and gynoecium at the same time is called
(A) Cleistogamy (B) Homogamy
(C) Monocliny (D) Herkogamy

**114.** Which of the following features is not related to the anemophilous plants?
(A) Light and non-sticky pollen grains.
(B) Flowers have well-exposed versatile stamens.
(C) Presence of single ovule in each ovary.
(D) Numerous colorful flowers are packed into inflorescence.

**115.** The plants in which their flowers are pollinated by water are
(A) Water hyacinth and water lily
(B) Hydrilla and water lily
(C) Vallisneria and Zostera
(D) Seagrass and water hyacinth

**116.** Mark the odd one out with respect to the advantages of cross-pollination.
(A) It increases resistance to diseases.
(B) It introduces genetic variations.
(C) It enhances adaptability of the offspring to change in the environment.
(D) It maintains pure lines.

**117.** Read the following statements.
A. Wind pollination is quite common is grasses.
B. Hydrophily is linked to about 30 genera-mostly monocots.
C. Both wind and water pollination flowers are not very colorful and do not produce nectar.
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Only (B) and (C) are correct .
(D) All (A), (B), and (C) are correct.

**118.** Flowers of Amorphophallus offer its pollinators
(A) Edible pollen
(B) Safe place to lay eggs
(C) Protein-rich nectar
(D) Mating platform

**119.** In sea grasses,
(A) Female flowers remain submerged in water
(B) Pollen grains are long and ribbon-like
(C) Epihydrophily occurs
(D) All except (3)

**120.** Which of the following are important floral rewards to the animal pollinators?
(A) Color and large size of the flower
(B) Nectar and pollen grains
(C) Floral fragrance and calcium crystals
(D) Protein and stigmatic exudates

**121.** Long, silky hair coming out of the cob of maize are
(A) Meant for fruit dispersal
(B) Act as insect attractant
(C) Meant for protection
(D) Long styles and stigma

**122.** Yucca is pollinated by
(A) Pronuba moth (B) Colpa wasp
(C) Honeybee (D) Lemur

**123.** Which of the following is pollinated by bats?
(A) Kigelia (B) Ophrys
(C) Salvia (D) Calotropis

**124.** The ability of the pistil to recognize the pollen followed is the result of a continuous dialogue that is mediated by
(A) Chemical component of pollen cytoplasm with those of the pistil
(B) Chemical composition of pollen wall with those of the pistil
(C) Chemical composition of pollen wall interacting with those of the style
(D) Sporopollenin of the pollen exine interacting with those of stigma

**125.** Emasculation in artificial hybridization is done by removal of
(A) Anthers from unisexual flower of female parent
(B) Anthers from bisexual flowers of female parent
(C) Stigma from unisexual flowers of male parent
(D) Stigma form bisexual flower of male parent

**126.** Read the following statements, and select the correct option.
A. Angiosperms exhibit double fertilization because two fusion events occur in the embryo sac.
B. Three gametes are involved in the process of double fertilization.
(A) Only (A) is correct.
(B) Only (B) is correct.
(C) Both (A) and (B) are correct.
(D) Both (A) and (B) are incorrect.

**127.** Double fertilization was first discovered in 1898 in Lilium and Fritillaria by
(A) Nawaschin (B) Strasburger
(C) Amici (D) Focke

**128.** Pollen tube after reaching the ovary generally enters the ovule through the
(A) Nucleus (B) Integument
(C) Chalaza (D) Micropyle

**129.** Identify the following statement as true (T) or false (F), and select correct option.
A. Pistil has the ability to recognize the pollen with respect to its compatibility.
B. Pollen tube discharged their male gametes on degenerating synergids.
C. Emasculation is required when female parent produces unisexual flowers.
D. Bagging prevents contamination on stigma with unwanted pollen.
(A) A-T; B-F; C-F; D-T
(B) A-T; B-T; C-F; D-T
(C) A-F; B-F; C-T; D-F
(D) A-F; B-F; C-T; D-T

**130.** Growth of pollen tube is
(A) Apical and chemotactic
(B) Basal and chemotropic
(C) Apical and chemotropic
(D) Basal and chemotactic

**131.** Milky water of green coconut is
(A) Liquid female gametophyte
(B) Liquid nucellar cells
(C) Multinucleated liquid perisperm
(D) Liquid endosperm

**132.** Seed of dicots have no residual endosperm as
(A) It does not show triple fusion
(B) It is completely consumed during embryo development
(C) It is consumed partially during embryo development
(D) It produces albuminous seeds

**133.** Remnants of nucellus are found in
(A) Wheat and maize
(B) Black pepper and beet
(C) Sunflower and groundnut
(D) Black pepper and bean

**134.** The correct sequence of embryo development in dicots is
(A) Octant → Globular stage → Heart shaped Torpedo →Mature embryo
(B) Quadrant → Octant → Heart shaped → Globular →→→ Mature embryo
(C) Torpedo Globular Heart shaped Mature embryo
(D) Quadrant → Octant → Heart shaped → Globular →→Mature embryo

**135.** A dicot embryo consists of
(A) Two cotyledons only
(B) Embryonal axis and two cotyledons
(C) Embryonal axis, two cotyledons, and endosperm
(D) Embryonal axis and scutellum

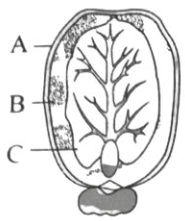
## (SECTION-B)

**136.** In date palm, the size of fruits and maturity time depend upon
(A) Placental growth
(B) Foreign pollen
(C) Color of endosperm
(D) Size of pollen grain

**137.** False (pseudocarpic) fruits are present in all except
(A) Cashew nut (B) Strawberry
(C) Apple (D) Orange

**138.** The seed of which among the following plant germinated and flowered after about 2000 years to dormancy?
(A) Lupindi
(B) Orobanche
(C) Phoenix dactylifera
(D) Orchids

**139.** Identify the labels A, B, and C in the given figure.




(A) A-Seed coat; B-Endosperm; C-Cotyledon
(B) A-Pericarp; B-Endosperm; C-Perisperm
(C) A-Seed coat; B-Perisperm; C-Cotyledon
(D) A-Pericarp; B-Cotyledon; C-Endosperm

**140.** Read the following statements with respect to partheno- carpic fruits.
A. They develop without fertilization.
B. They are seedless fruits.
C. They can be produced through the application of growth hormones.
Correct statements is/are
(A) Only (A)
(B) Only (A)and (B)
(C) Only (A) and (C)
(D) All (A), (B), and (C)

**141.** How many meiotic divisions are required in a typical flowering plant for the formation of 200 seeds?
(A) 250 (B) 400
(C) 225 (D) 100

**142.** Apomixis is
(A) Production of asexual seed
(B) Production of sexual seed
(C) Transfer of apomictic genes into hybrid varieties
(D) A kind of sexual reproduction that mimics the asexual reproduction

**143.** What is the possible advantage if hybrids are made into apomictic?
(A) Segregation of characters in the hybrid progeny
(B) Absence of segregation of characters in hybrid progeny
(C) Farmers can keep on using the hybrid seeds to raise new crops for many years
(D) Both (B) and (C)

**144.** Which of these can lead to polyembryony?
(A) Proliferation of nucellar cells in embryo
(B) Fertilization of helper cells by sperms carried by another pollen tube in embryo sac
(C) Cleavage in pro embryo during embryo development
(D) All of the above

**145.** What is the fate of the male gametes discharged in the synergid ?
(A) One fuses with egg other(s)degenerate (s) in the synergid.
(B) All fuse with the egg.
(C) One fuses with the egg, other(s)fuse(s) with synergid nucleus.
(D) One fuses with the egg and other fuses with central cell nuclei.

**146.** The body of the ovule is fused within the funicle at
(A) Chalaza (B) Hilum
(C) Micropyle (D) Nucellus

**147.** The term used for transfer of pollen grains from anthers of one plant to stigma of a different plant which, during pollination, brings genetically different types of pollen grains to stigma, is :
(A) Xenogamy (B) Geitonogamy
(C) Chasmogamy (D) Cleistogamy

**148.** Diadelphous stamens are found in:
(A) China rose
(B) Citrus
(C) Pea
(D) China rose and citrus

**149.** A typical angiosperm embryo sac at maturity is :
(A) 8-nucleate and 7-celled
(B) 7-nucleate and 8-celled
(C) 7-nucleate and 7-celled
(D) 8-nucleate and 8-celled

**150.** In some members of which of the following pairs of families, pollen grains retain their viability for months after release ?
(A) Poaceae ; Rosaceae
(B) Poaceae; Leguminosae
(C) Poaceae; Solanaceae
(D) Rosaceae ; Leguminosae

## ZOOLOGY (SECTION-A)

**151.** Identify the wrong statement.
(A) Androgens are secreted by Leydig cells.
(B) Ovary is the chief source of estrogen and progesterone in females.
(C) Gonadotropins secreted by anterior pituitary are steroidal in nature.
(D) Testosterone maintains hormonal balance in males by giving negative feedback to hypothalamus.

**152.** Parasympathetic nerves cause
(A) Ejaculation of semen
(B) Erection of penis
(C) Emission of semen
(D) Both (A) and (C)

**153.** The part of fallopian tube with finger-like projection 7 called fimbriae is
(A) Ampulla (B) Isthmus
(C) Infundibulum (D) Corpus

**154.** The hormones that act on ovaries for the secretion of estrogen and progesterone are
(A) Gonadotropin releasing hormone (GnRH)
(B) Gonadotropic hormones
(C) Human chronic gonadotropin (hCG)
(D) Adrenocorticotropic hormone (ACTH)

**155.** Which of the following are accessory glands of the male reproductive system?
(A) Prostate gland and Bartholin's system
(B) Glands of Skene and seminal vesicle
(C) Bulbourethral glands and greater vestibular glands
(D) Bulbourethral glands and seminal vesicle

**156.** Which of the following mammals have intra-abdominal testes?
(A) Rat, bat, and kangaroo
(B) Marsupials and elephant
(C) Egg-laying mammals, whale, and elephant
(D) Cat, dog, and whale

**157.** Match the options given in Column I with those of Column II.

| **Column - I** | **Column - II** |
|---|---|
| (A) Uterus | (i) Ciliated columnar epithelium |
| (B) Fallopian tube | (ii) Fimbriae |
| (C) Ampulla | (iii) Hystera |
| (D) Infundibulum | (iv) Site of fertilization |

(A) A-i; B-iii; C-ii; D-iv.
(B) A-iii; B-i; C-iv; D-ii
(C) A-ii; B-i; C-iii; D-iv
(D) A-iv; B-iii; C-ii; D-i

**158.** Which part of the male reproductive system has developed from same embryonic structure from which clitoris and labia majora develops, respectively?
(A) Ejaculatory duct and penis
(B) Penis and scrotum
(C) Scrotum and penis
(D) Vas deferens and epididymis

**159.** Which of the following is a non-cellular layer in Graafian follicle?
(A) Theca interna
(B) Corona radiata
(C) Zona pellucida
(D) Cumulus oophorus

**160.** Menstruation occurs due to abrupt decrease in the level of
(A) LH (B) FSH
(C) Progesterone (D) Estrogen

**161.** Menstruation can be postponed by
(A) Using anti-progesterone drugs
(B) Giving FSH
(C) Giving progesterone-like drugs
(D) Giving estrogen antagonist

**162.** At the time of ovulation
(A) The peak of estrogen is higher than LH
(B) The peak of FSH is higher than LH
(C) The peak of LH is higher than FSH
(D) The peak of progesterone is higher than estrogen

**163.** Mark the incorrect statement with respect to menopause.
(A) At menopause, there is increase in urinary excretion of FSH
(B) Follicular atresia is the primary reason for cessation of menstruation at 45-50 years of age
(C) Females experience night sweats, hot flashes, mood fluctuations, and cognitive changes at enopause
(D) Hormone replacement therapy with gonadotropins can treat menopausal syndrome

**164.** Read the following statements. Which of the following are correct?
A. Middle piece of sperm provides the energy for locomotion of sperm to the site of fertilization.
B. It takes nearly 2 hours for sperms to reach the site of fertilization following ejaculation.
C. Secondary spermatocyte is the first haploid interme-diate during spermatogenesis.
D. New oogonial cells are formed in female body throughout life.
(A) (A) and (B) (B) (B) and (C)
(C) (A) and (C) (D) (C) and (D)

**165.** Mark the odd item in each series, and select the correct option.
A. Primary oocyte, ovum, secondary oocyte, spermatid
B. Secondary spermatocyte, spermatozoa, polar body, primary spermatocyte
C. Bulbourethral glands, seminal vesicle, prostate gland, paraurethral gland
D. Uterus, fallopian tube, vagina, testis
(A) A-Spermatid; B-Spermatozoa; C-Prostate gland; D-Uterus
(B) A-Spermatid; B-Polar body; C-Paraurethral gland;D-Testis
(C) A-Ovum; B-Primary spermatocyte; C-Seminal vesicle; D-Fallopian tubeumont
(D) A-Primary oocyte; B-Polar body; C-Prostate gland;D-Uterus

**166.** During the process of fertilization, the enzyme responsible for dissolving zona pellucida is
(A) Hyaluronidase
(B) Acrosin
(C) Corona-penetrating enzyme
(D) Permease

**167.** Which of the following statement is correct with respect to the morula stage of embryof!
(A) It has more cytoplasm and more DNA than an uncleaved zygote
(B) It has almost the same quantity of cytoplasm and DNA as found in an uncleaved zygote
(C) It has less cytoplasm as well as DNA than in an uncleaved zygote
(D) It has almost equal quantity of cytoplasm but much more DNA compared with uncleaved zygote

**168.** Morula stage does not show increase in size because 8
(A) Zona pellucida dissolves
(B) Zona pellucida is intact
(C) Corona radiata dissolves
(D) Corona radiata is intact

**169.** The umbilical cord links fetus and placenta. It is composed of
(A) One pair of umbilical artery having oxygenated blood and single umbilical vein with deoxygenated blood
(B) One pair of umbilical artery with deoxygenated blood and single umbilical vein with oxygenated blood
(C) One umbilical artery with deoxygenated blood and a pair of umbilical vein with oxygenated blood
(D) One umbilical artery with deoxygenated blood and single umbilical vein with oxygenated blood

**170.** Which hormone is responsible for switch over in res- piratory and circulatory systems as soon as the umbilical cord is cut?
(A) Progesterone (B) Estrogen
(C) Cortisol (D) Nitric oxide

**171.** The fetal ejection reflex in humans triggers the release
(A) Oxytocin from fetal pituitary of
(B) Human chorionic gonadotropin (hCG) from placenta
(C) Human placental lactogen (hPL) from placenta
(D) Oxytocin from maternal pituitary

**172.** Fill in the blanks with correct options.
The outer layer of blastula is called ___A___ It does not take part in the formation of ___B___ The first germinal layer to differentiate is ___C___ .
(A) A-Trophoblast; B-Embryo proper; C-Ectoderm
(B) A-Epiblast; B-Placenta; C-Endoderm
(C) A-Trophoblast; B-Embryo proper; C-Endoderm
(D) A-Hypoblast; B-Placenta; C-Mesoderm

**173.** Which of the following statement is incorrect?
(A) For fertilization to occur, the sperm and ovum are transported simultaneously at the site of fertilization
(B) Several changes take place in zona pellucida after a sperm binds to it to prevent polyspermy
(C) The functional maturation of spermatozoa in order tofertilize a secondary oocyte in female genital tract is called spermiogenesis
(D) Fertilization restores the normal diploid state of nucleus in the zygote

**174.** Which of the following is not included in the external genitalia of females?
(A) Labia majora (B) Labia minora
(C) Cervix (D) Clitoris

**175.** The secretions of seminal plasma are
(A) Rich in fructose and calcium and don't have any enzymes
(B) Rich in fructose and calcium and have certain enzymes
(C) Rich in glucose and calcium
(D) Rich in glucose but lack calcium

**176.** The collection of fluid in tunica vaginalis is called
(A) Cryptorchidism (B) Hydrocele
(C) Varicocele (D) Hydrothorax

**177.** Tearing of inguinal tissue may result in protrusion of a part of intestine into scrotum and is called
(A) Cryptorchidism
(B) Inguinal hernia
(C) Hiatal hernia
(D) Circumcision

**178.** Choose the correct statement with respect to the female reproductive system.
(A) The vagina is lined by stratified cuboidal epithelium.
(B) The opening of cervix into uterine cavity is called external os.
(C) Ovarian follicles are present in medullary region of ovarian stroma.
(D) Vestibule is the space between the two folds of labia minora and has anterior urethral orifice and posterior vaginal orifice.

**179.** Which of the following structure is not included among female accessory ducts?
(A) Uterus (B) Vagina
(C) Fallopian tubes (D) Labia majora

**180.** Which of the following is an incorrect statement?
(A) Surgical removal of uterus is called hysterectomy.
(B) Oophorectomy is the removal of ovaries.
(C) Bartholin's glands are homologous with bulbourethral glands.
(D) Most confirmatory forensic test for rape is the presence of glucose in vagina.

**181.** The opening of vagina is covered partially by a membrane called
(A) Labia minora (B) Hymen
(C) Clitoris (D) Labia majora

**182.** Read the following statement. Which of the following is incorrect?
(A) Wolffian duct gives rise to epididymis in males.
(B) Mullerian ducts form a pair of fallopian tubes, uterus, and cervix in females.
(C) Bartholin's glands of females produce alkaline fluid for neutralizing urethral acidity.
(D) The primary regulator of Leydig cell secretion is FSH

**183.** Pick the odd one out from each series given below, and select the correct option.
A: Vasa efferentia, epididymis, vas deferens, oviduct
B: Fallopian tube, uterus, vagina, scrotum
C: Seminal vesicle, prostate gland, bulbourethral glands, Bartholin's glands
D: Graafian follicle, corona radiata, acrosome, zona pellucida
(A) A–oviduct; B–vagina; C–seminal vesicle; D–acrosome
(B) A–vas deferens; B–uterus; C–Bartholin's gland; D–acrosome
(C) A–oviduct; B–scrotum; C–Bartholin's gland; D–acrosome
(D) A–epididymis; B–uterus; C–prostate gland, D–zona pellucida

**184.** Which of the following muscles will help in changing the position of testis to keep them at proper temperature for the process of spermatogenesis?
(A) Dartos muscles
(B) Cremaster muscles
(C) Detrusor muscle
(D) Both (A) and (B)

**185.** Decline in which of the following hormones results in degeneration of corpus luteum during a menstrual cycle?
(A) FSH (B) Progesterone
(C) LH (D) Estrogen

**(SECTION-B)**

**186.** Which of the following statement is applicable to the luteal phase of menstrual cycle?
(A) Development of follicle takes place
(B) Regeneration of endometrium occurs through proliferation
(C) Endometrium becomes more vascular and glandular
(D) Strong contractions of myometrium are observed

**187.** The secretory phase in human menstrual cycle is also called
(A) Luteal phase and lasts 7 days
(B) Proliferative phase and lasts 14 days
(C) Luteal phase and lasts 14 days
(D) Follicular phase and lasts 7 days

**188.** During oogenesis, the secondary oocyte is formed in
(A) Ovary (B) Uterus
(C) Fallopian tube (D) Vagina

**189.** Find the wrong statement.
(A) Reduced motility of sperms is called asthenozoospermia
(B) The seminal plasma along with sperms constitutes semen
(C) "9 + 0" arrangement of microtubules is seen in the neck of sperm
(D) Semen is slightly acidic with pH 6.5

**190.** Capacitation of sperms does not involve
(A) Dilution of decapacitation factor
(B) Entry of calcium into sperms causing rapid whiplash motion of the tail part
(C) Removal of cholesterol adhering acrosomal membrane
(D) Deposition of uterine secretions on sperms

**191.** The extrusion of second polar body from the egg nucleus occurs
(A) Inside ovary
(B) In uterine cavity
(C) In the fallopian tube after the contact of the sperm with zona pellucida and before the completion of fertilization
(D) In the fallopian tube after the entry of the sperm into the cytoplasm of ovum and before the completion of fertilization

**192.** Which of the following forms the outer wall of blastocyst?
(A) Zona pellucida
(B) Corona radiata
(C) Trophoblast
(D) Inner cells mass

**193.** Which of the following is incorrect with respect to fetal om development?
(A) Trophoblast differentiates into cytotrophoblast and syncytiotrophoblast
(B) By the end of the second month of pregnancy, the fetus develops limbs and digits
(C) By the end of 24 weeks, the body is covered with fine hair, eyelids separate, and eyelashes are formed
(D) First heartbeats of fetus are observed in the fifth month

**194.** Which of the following is a correct reason for the spurt in growth of embryo following implantation?
(A) Higher levels of progesterone
(B) Plenty of space available in uterus
(C) Rich supply of nutrients in uterus
(D) Present of zona pellucida around embryo

**195.** Which of the following contains stem cells?
(A) Colostrum
(B) Inner cells mass
(C) Decidua capsularis
(D) Uterine endometrium

**196.** The type of cleavage division that occurs during early embryonic development of humans is
(A) Determinate
(B) Holoblastic
(C) Indeterminate
(D) Both (B) and (C)

**197.** **Assertion:** Androgens stimulate the process of spermatogenesis.
**Reason:** FSH acts on sertoli cells and stimulates the secretion of some factors which helps in the process of spermiogenesis.
(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
(C) If the assertion is true but the reason is false.
(D) If both the assertion and reason are false.

**198.** **Assertion:** Only one sperm can fertilize ovum.
**Reason:** A sperm when comes in contact with zona pellucida layer of the ovum, some changes occur in membrane that blocks the entry of other sperm.
(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.
(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.
(C) If the assertion is true but the reason is false.
(D) If both the assertion and reason are false.

**199.** **Assertion:** Proximal end of fallopian tube (infundibulum) possess fimbriae (finger like projection).

**Reason:** Fimbriae help in catching of ovum after ovulation.

(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.

(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.

(C) If the assertion is true but the reason is false.

(D) If both the assertion and reason are false.

**200.** **Assertion:** Sex of human baby is determined by father not by mother.

**Reason:** XY sex chromosome is present in human male.

(A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion.

(B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion.

(C) If the assertion is true but the reason is false.

(D) If both the assertion and reason are false.