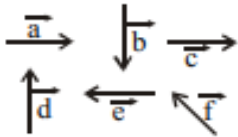


MARKS: 720

FULL TEST 4
PART A – PHYSICS
SECTION A

TIME: 3 Hrs

1. Six vectors, \vec{a} to \vec{f} have the magnitudes and directions indicated in the figures. Which of the following statements is true?



(1) $\vec{b} + \vec{c} = \vec{f}$ (2) $\vec{d} + \vec{c} = \vec{f}$ (3) $\vec{d} + \vec{e} = \vec{f}$ (4) $\vec{b} + \vec{e} = \vec{f}$

2. A man of weight W is standing on a lift which is moving downward with an acceleration 'a'. The apparent weight of the man is :-

(1) $W(1 + \frac{a}{g})$ (2) W (3) $W(1 - \frac{a}{g})$ (4) $W(1 - \frac{a^2}{g^2})$

3. A ball is thrown upwards with speed 'v' from the top of a tower and it reaches the ground with a speed $3v$, then the height of the tower is

(1) $\frac{4v^2}{g}$ (2) $\frac{8v^2}{g}$ (3) $\frac{v^2}{g}$ (4) $\frac{2v^2}{g}$

4. Two identical bodies are executing uniform circular motion in the paths of radii r_1 and r_2 respectively. If both the bodies complete one revolution in the same time interval, then the ratio of their angular speed is

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

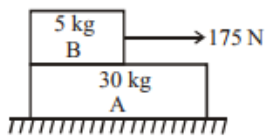
5. A double slit experiment is performed by using light of wavelength of 6000\AA . If distance of screen is 1m and slits are 0.1 cm apart then calculate angular position of 10th bright fringe.

(1) 6×10^{-4} rad (2) 6×10^{-3} rad (3) 6×10^{-5} rad (4) 6×10^{-7} rad

6. If $Q = \frac{X^n}{Y^m}$ and ΔX is absolute error in the measurement of X , ΔY is absolute error in the measurement of Y , then absolute error ΔQ in Q is:-

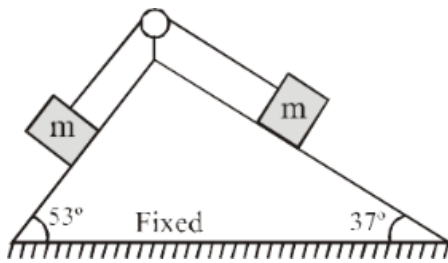
(1) $\Delta Q = \pm \left(n \frac{\Delta X}{X} + m \frac{\Delta Y}{Y} \right) Q$ (2) $\Delta Q = \pm \left(n \frac{\Delta X}{X} + m \frac{\Delta Y}{Y} \right) Q$
(3) $\Delta Q = \pm \left(n \frac{\Delta X}{X} - m \frac{\Delta Y}{Y} \right) Q$ (4) $\Delta Q = \pm \left(n \frac{\Delta X}{Y} - m \frac{\Delta Y}{X} \right) Q$

7. Block A of mass 30 kg. is resting on a frictionless floor. Another block B of mass 5 kg is resting on it as shown in the figure. The coefficient of static friction between the blocks is 0.4 while kinetic friction is 0.3. If a horizontal force of 175 N is applied to block B, then the acceleration of the block A will be ($g = 10 \text{ m/s}^2$):-



(1) 0.5 m/s^2 (2) 0.67 m/s^2 (3) 5 m/s^2 (4) 10 m/s^2

8. Two blocks which are connected to each other by means of a massless string are placed on two inclined planes as shown in fig. After releasing from rest, the magnitude of acceleration of the centre of mass of both the blocks is- ($g = 10 \text{ m/s}^2$)



- (1) 1 m/s^2 (2) $\frac{1}{\sqrt{2}} \text{ m/s}^2$ (3) $\sqrt{2} \text{ m/s}^2$ (4) zero

9. A Carnot engine has efficiency 25%. It operates between reservoirs of constant temperature with temperature difference of 80K. What is the temperature of low temperature reservoir?
 (1) -22°C (2) 25°C (3) -33°C (4) 33°C
10. What is the minimum energy required to launch a satellite of mass m from the surface of a planet of mass M and radius R in a circular orbit at an altitude of $2R$?
 1) $\frac{5GmM}{6R}$ 2) $\frac{2GmM}{3R}$ 3) $\frac{GmM}{2R}$ 4) $\frac{GmM}{3R}$
11. A hollow cylinder has a charge q coulomb within it. If ϕ is the electric flux in units of volt-meter associated with the curved surface B, the flux linked with the plane surface A in units of volt-meter will be



- (1) $\frac{1}{2}(\frac{q}{\epsilon_0} - \phi)$ (2) $\frac{q}{2\epsilon_0}$ (3) $\frac{\phi}{3}$ (4) $\frac{q}{\epsilon_0} - \phi$

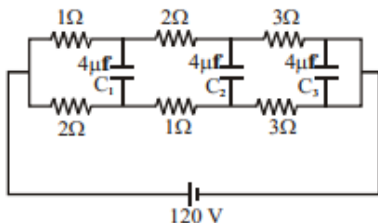
12. A space craft of mass 'M' is moving with velocity V and suddenly explodes into two pieces of part of it of mass 'm' comes to rest, then the velocity of other part will be
 (1) $\frac{mV}{M-m}$ (2) $\frac{(m+M)V}{m}$ (3) $\frac{MV}{M-m}$ (4) $\frac{MV}{m+M}$
13. A man of mass M stands at one end of a plank of length l, which lies at rest on a frictionless surface. The man walks to the other end of plank, if mass of plank is 3M, the distance moved by the man relative to the ground is-
 (1) $\frac{1}{4}$ (2) $\frac{3l}{4}$ (3) $\frac{2l}{3}$ (4) $\frac{1}{3}$
14. In the given figure $a = 16 \text{ m/s}^2$ represents the total acceleration of a particle moving in the clockwise direction in a circle of radius $R = 2.5 \text{ m}$ at a given instant of time, then the speed of the particle is (in m/s)



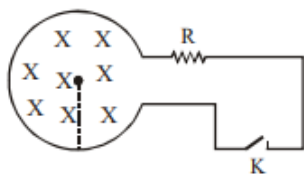
- (1) $2\sqrt{5}$ (2) $5\sqrt{2}$ (3) $2\sqrt{3}$ (4) $5\sqrt{3}$

15. The total mechanical energy of a particle in SHM is :-
 1) Always constant 2) Depend on time 3) $\frac{1}{2} KA^2 \cos^2(\omega t + \phi)$ 4) $\frac{1}{2} mA^2 \cos^2(\omega t + \phi)$
16. Consider a man standing in an elevator that is accelerating upwards. The upward normal force N exerted by the elevator floor on the man is
 (1) smaller than the downward force of gravity on the man
 (2) larger than the downward force of gravity on the man
 (3) twice to downward force of gravity on the man
 (4) identical to the downward force of gravity on the man

17. In the given circuit :-



- 1) Charge on C_1 is zero 2) Charge on C_1 is $80 \mu\text{C}$ 3) Charge on C_2 is $40 \mu\text{C}$ 4) Charge on C_2 is $20 \mu\text{C}$
18. Shown in the figure is a circular loop of radius r and resistance R . A variable magnetic field of induction $B = B_0 e^{-t}$ is established inside the coil. If the key (K) is closed, the electrical power developed right after closing the switch is equal to



- 1) $\frac{B_0^2 \pi r^2}{R}$ 2) $\frac{B_0^2 10 r^3}{R}$ 3) $\frac{B_0^2 \pi^2 r^4 R}{5}$ 4) $\frac{B_0^2 \pi^2 r^4}{R}$

19. A flint glass prism and a crown glass prism are to be combined in such a way that the deviation of the mean ray is zero. The refractive index of flint and crown glasses for the mean ray are 1.620 and 1.518 respectively. If the refracting angle of the flint prism is 6.0° , what would be the refracting angle of the crown prism?

- (1) 6.0° (2) 10° (3) 7.2° (4) 4°

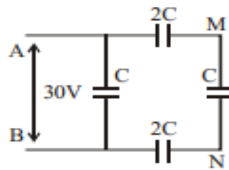
20. A light whose frequency is equal to 6×10^{14} HZ is incident on a metal whose work function is 2 eV. [$h = 6.63 \times 10^{-34}$ Js, 1 eV = 1.6×10^{-19} J]. The maximum energy of the electrons emitted will be:

- (1) 2.49 eV (2) 4.49 eV (3) 0.49 eV (4) 5.49 eV

21. Electric potential at an equatorial point of a small dipole with dipole moment P (r , distance from the dipole) is :-

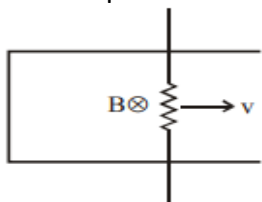
- 1) Zero 2) $\frac{P}{4\pi\epsilon_0 r^2}$ 3) $\frac{P}{4\pi\epsilon_0 r^3}$ 4) $\frac{2P}{4\pi\epsilon_0 r^3}$

22. In the circuit shown, a potential difference of 30V is applied across AB. The potential difference between the points M and N is :-



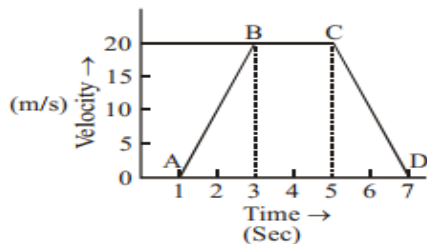
- 1) 10V 2) 15V 3) 20V 4) 30V

23. A conducting bar is pulled with a constant speed v on a smooth conducting rail. The region has a steady magnetic field of induction B as shown in the figure. If the speed of the bar is doubled then the rate of heat dissipation will:-



- (1) Remain constant (2) Become quarter of the initial value (3) Become four fold (4) Get doubled

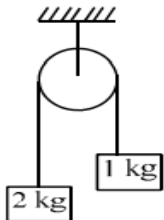
24. When 2 amperes current is passed through a tangent galvanometer, it gives a deflection of 30° . For 60° deflection, the current must be
 (1) 1 amp (2) $2\sqrt{3}$ amp (3) 4 amp (4) 6 amp
25. If the kinetic energy of the particle is increased by 16 times, the percentage change in the de Broglie wavelength of the particle is :-
 (1) 25 % (2) 75 % (3) 60 % (4) 50 %
26. The displacement-time graph for two particles A and B are straight lines inclined at angles of 30° and 60° with the time axis. The ratio of velocities of $V_A : V_B$ is :-
 1) 1 : 2 (2) 1 : $\sqrt{3}$ (3) $\sqrt{3} : 1$ (4) 1 : 3
27. When a spring is stretched by 2 cm, it stores 100 J of energy. If it is stretched further by 2 cm, the stored energy will be increased by
 (1) 100 J (2) 200 J (3) 300 J (4) 400 J
28. A fly wheel of moment of inertia 0.4 kg m^2 and radius 0.2 m is free to rotate about a central axis. If a string is wrapped around it and it is pulled with a force of 10 N, then angular velocity after 4 sec will be
 (1) 10 rad s^{-1} (2) 5 rad s^{-1} (3) 20 rad s^{-1} (4) 25 rad s^{-1}
29. A rod is placed on a smooth horizontal surface. The stress developed when temperature is increased by 40° C [$\alpha = 5 \times 10^{-5} \text{ }^\circ\text{C}^{-1}$, $\gamma = 5 \times 10^{11} \text{ N/m}^2$]
 (1) 10^9 N/m^2 (2) $2 \times 10^9 \text{ N/m}^2$ (3) 10^{11} N/m^2 (4) Zero
30. Two waves coming from two coherent sources, having different intensities interfere their ratio of maximum intensity to the minimum intensity is 25. The intensities of the sources are in the ratio?
 (1) 25 : 1 (2) 25 : 16 (3) 9 : 4 (4) 5 : 1
31. For the velocity-time graph shown in figure, the total distance covered by the particle in the last two seconds of its motion is what fraction of the total distance covered by it in all seven seconds:-



- 1) $\frac{1}{2}$ 2) $\frac{1}{4}$ 3) $\frac{1}{8}$ 4) $\frac{1}{16}$
32. What is the value of linear velocity, if $\vec{\omega} = 3\hat{i} - 4\hat{j} + \hat{k}$ and $\vec{r} = 5\hat{i} - 6\hat{j} + 6\hat{k}$:-
 1) $6\hat{i} + 2\hat{j} - 3\hat{k}$ (2) $-18\hat{i} - 13\hat{j} + 2\hat{k}$ (3) $4\hat{i} - 13\hat{j} + 6\hat{k}$ (4) $6\hat{i} - 2\hat{j} + 8\hat{k}$
33. A force $\vec{F} = 3\hat{i} + b\hat{j} + 2\hat{k}$ acting on a particle causes a displacement $\vec{s} = -4\hat{i} + 2\hat{j} + 3\hat{k}$ in its own direction, if the work done is 6J, then the value of 'b' is
 (1) 12 (2) 6 (3) 1 (4) 0
34. Two springs have their force constant as k_1 and k_2 ($k_1 > k_2$) when they are stretched by the same force
 (1) equal work is done in case of both the springs (2) more work is done in case of first spring
 (3) more work is done in case of second spring (4) no work is done in case both the springs
35. A wire is stretched between two rigid supports vibrates in its fundamental mode with a frequency of 50 Hz. The mass of the wire is 30 g and its linear density is $4 \times 10^{-2} \text{ kg/m}$. The speed of the transverse wave at the string is
 1) 25 ms^{-1} (2) 50 ms^{-1} (3) 75 ms^{-1} (4) 100 ms^{-1}

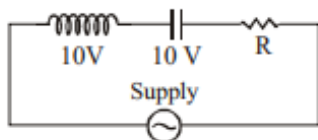
SECTION B

36. A 4 kg body moving with a speed of 2 m/s collides with a spring bumper of negligible mass and force constant 100 Nm^{-1} . The maximum compression of the spring is
 1) 1.6 m 2) 0.4 m 3) 2 m 4) 0.8 m
37. The position vector of three particles of mass $m_1 = 1\text{kg}$, $m_2 = 2\text{kg}$ and $m_3 = 3\text{kg}$ are $\vec{r}_1 = (\hat{i} + 4\hat{j} + \hat{k})\text{m}$, $\vec{r}_2 = (\hat{i} + \hat{j} + \hat{k})\text{m}$ and $\vec{r}_3 = (2\hat{i} - \hat{j} - 2\hat{k})\text{m}$ respectively. Then the position vector of their centre of mass is
 1) $\frac{1}{2}(3\hat{i} + \hat{j} - \hat{k})\text{m}$ 2) $\frac{1}{2}(3\hat{i} - \hat{j} - \hat{k})\text{m}$ 3) $\frac{1}{2}(\hat{i} - 3\hat{j} + \hat{k})\text{m}$ 4) $\frac{1}{2}(\hat{i} + \hat{j} - 3\hat{k})\text{m}$
38. A sinusoidal voltage $V_0 \sin \omega t$ is applied across a series combination of resistance R and inductance L. The amplitude of the current in this circuit is :
 1) $\frac{V_0}{\sqrt{R^2 + \omega^2 L^2}}$ 2) $\frac{V_0}{\sqrt{R^2 - \omega^2 L^2}}$ 3) $\frac{V_0}{\sqrt{R + \omega L}}$ 4) $\frac{V_0}{R}$
39. According to Newton Laws of cooling, the rate of cooling of a body is proportional to the
 1) temperature of the surroundings 2) fourth power of the temperature of the body
 3) difference of the temperature of the body and surroundings 4) temperature of the body
40. Pure Si at 500 K has equal number of electron (n_e) and hole (n_h) concentrations of $1.5 \times 10^{16} \text{ m}^{-3}$. Doping by indium increases n_h to $4.5 \times 10^{22} \text{ m}^{-3}$. The doped semiconductor is of
 1) n-type with electron concentration $n_e = 2.5 \times 10^{23} \text{ m}^{-3}$
 2) p-type having electron concentration $n_e = 5 \times 10^9 \text{ m}^{-3}$
 3) n-type with electron concentration $n_e = 5 \times 10^{22} \text{ m}^{-3}$
 4) p-type with electron concentration $n_e = 2.5 \times 10^{10} \text{ m}^{-3}$
41. Two block of masses 2 kg and 1 kg respectively are tied to the ends of a string which passes over a light frictionless pulley. The masses are held at rest at the same horizontal level and then released. The distance traversed by center of mas in 3 seconds is ($g = 10 \text{ m/s}^2$)



- (1) 5 m (2) 45 m (3) 10 m (4) 40 m

42. If the angular momentum of an electron is \vec{j} then the magnitude of the magnetic moment will be :-
 1) $\frac{eJ}{m}$ 2) $\frac{eJ}{2m}$ 3) $eJ2m$ 4) $\frac{2m}{eJ}$
43. The value of R is changed then :



- 1) Voltage across L remain same 2) Voltage across C remain same
 3) Voltage across L-C combination remains same 4) Voltage across L-C combination changes
44. Light of wavelength 6000\AA is incident on a slit of width 0.30 mm. The screen is placed 2m from slit. Find position of the first minima.
 (1) $4 \times 10^{-3} \text{ m}$ (2) $4 \times 10^{-4} \text{ m}$ (3) $4 \times 10^{-6} \text{ m}$ (4) $4 \times 10^{-5} \text{ m}$

45. Which of the following statement true :-
 (1) Doping of pure Ge with a trivalent impurity given n-type semiconductor
 (2) Resistivity of pure Ge increases with temperature
 (3) Majority carriers in p type semiconductor are holes
 (4) Doping of pure Ge with a pentavalent impurity increases its resistivity
46. A car moves a distance of 200m. It covers first half of the distance at speed 60 kmh^{-1} and the second half at speed v . If the average speed is 40 kmh^{-1} , the value of v is
 a) 30 kmh^{-1} b) 13 kmh^{-1} c) 60 kmh^{-1} d) 40 kmh^{-1}
47. Two capacitors of capacitance $2\mu\text{F}$ and $4\mu\text{F}$ respectively are connected in series. The combination is connected across a potential difference of $10v$. The ratio of energies stored by capacitors will be
 a) $1:\sqrt{2}$ b) $2 : 1$ c) $1 : 4$ d) $4 : 1$
48. The vertical component of the earth's magnetic field is zero at a place where the angle of dip is
 a) 0° b) 45° c) 60° d) 90°
49. A wave travelling along the x-axis is described by the equation $y(x,t) = 0.005 \cos(\alpha x - \beta t)$. If the wavelength and the time period of the wave are 0.08m and 2.0s , respectively, than α and β in appropriate unit are
 a) $25.00\pi, \beta\pi$ b) $\alpha = \frac{0.08}{\pi}, \beta = \frac{2.0}{\pi}$ c) $\alpha = \frac{0.04}{\pi}, \beta = \frac{1.0}{\pi}$ d) $\alpha = 12.5\pi, \beta = \frac{\pi}{2.0}$
50. A machine gun fires n bullets per second, each of mass m . If the speed of each bullet is u , then the force of recoil is
 a) mng b) mnv c) $mnvg$ d) $\frac{mnv}{g}$

PART B - CHEMISTRY
SECTION A

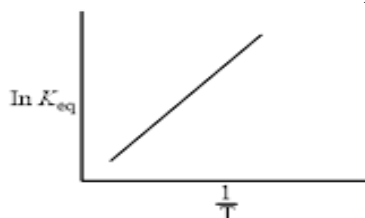
51. The statements, which is/are correct:
 a) Number of total nodes in an orbital = $n - 1$ b) Number of radial nodes in an orbital = $n - l - 1$
 c) Number of angular nodes in an orbital = l d) All of the above
52. The uncertainty in the momentum of an electron is $1.0 \times 10^{-5} \text{ kg ms}^{-1}$. The uncertainty in its position will be
 a) $1.50 \times 10^{-28} \text{ m}$ b) $1.05 \times 10^{-26} \text{ m}$ c) $5.27 \times 10^{-30} \text{ m}$ d) $5.25 \times 10^{-28} \text{ m}$
53. For alkali metals, which one of the following trends is incorrect?
 a) Hydration energy: $\text{Li} > \text{Na} > \text{K} > \text{Rb}$ b) Ionisation energy: $\text{Li} > \text{Na} > \text{K} > \text{Rb}$
 c) Density: $\text{Li} < \text{Na} < \text{K} < \text{Rb}$ d) Atomic size: $\text{Li} < \text{Na} < \text{K} < \text{Rb}$
54. Atomic radii of fluorine and neon in angstrom unit are respectively given by:
 a) $0.72, 1.60$ b) $1.60, 1.60$ c) $0.72, 0.72$ d) $1.60, 0.72$
55. If $\text{H} - \text{X}$ bond length is 2.00 \AA and $\text{H} - \text{X}$ bond has dipole moment $5.12 \times 10^{-30} \text{ C - m}$, the percentage of ionic character in the molecule will be
 a) 10% b) 16% c) 18% d) 20%
56. According to MO theory, which of the following lists ranks the nitrogen species in terms of increasing bond order?
 a) $\text{N}_2^- < \text{N}_2^{2-} < \text{N}_2$ b) $\text{N}_2^- < \text{N}_2 < \text{N}_2^{2-}$ c) $\text{N}_2^{2-} < \text{N}_2^- < \text{N}_2$ d) $\text{N}_2 < \text{N}_2^{2-} < \text{N}_2^-$

57. Gases X, Y, Z, P and Q have the van der Waals' constants a and b (in CGS units) as shown below

	X	Y	Z	P	Q
a	6	6	20	0.05	30
b	0.025	0.15	0.1	0.02	0.2

The gas with the highest critical temperature is

- a) P b) Q c) Y d) Z
58. A system absorbs 10 kJ of heat and does 4 kJ of work. The internal energy of the system
 a) Increases by 6 kJ b) Decreases by 6 kJ c) Decreases by 14 kJ d) Increases by 14 kJ
59. Given that $\Delta H_{r298\text{ K}} = -54.07 \text{ kJ mol}^{-1}$ and $\Delta S_{r298\text{ K}}^\circ = 10 \text{ J mol}^{-1}$ and $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$. The value of $\log_{10} K$ for a reaction, $A \rightleftharpoons B$ is:
 a) 5 b) 10 c) 95 d) 100
60. Heat of combustion of $\text{CH}_4, \text{C}_2\text{H}_4, \text{C}_2\text{H}_6$ are $-890, -1411$ and -1560 kJ/mol respectively. Which has the lowest calorific fuel value in kJ/g ?
 a) CH_4 b) C_2H_4 c) C_2H_6 d) All same
61. Solubility product constant $[K_{sp}]$ of salts of types MX, MX_2 and M_3X at temperature ' T ' are $4.0 \times 10^{-8}, 3.2 \times 10^{-14}$ and 2.7×10^{-15} respectively. Solubilities (mol, dm^{-3}) of the salts at temperature ' T ' are in the order
 a) $\text{MX} > \text{MX}_2 > \text{M}_3\text{X}$ b) $\text{M}_3\text{X} > \text{MX}_2 > \text{MX}$ c) $\text{MX}_2 > \text{M}_3\text{X} > \text{MX}$ d) $\text{MX} > \text{M}_3\text{X} > \text{MX}_2$
62. A buffer solution is prepared by mixing 0.1 M ammonia and 1.0 M ammonium chloride. At 298 K, the $\text{p}K_b$ of NH_4OH is 5.0. The pH of the buffer is
 a) 10.0 b) 9.0 c) 6.0 d) 8.0
63. The graph relates $\ln K_{eq}$ vs $\frac{1}{T}$ for a reaction. The reaction must be:



- a) Exothermic b) Endothermic c) ΔH is negligible
 d) Highly spontaneous at ordinary temperature
64. The eq. wt. of $\text{Na}_2\text{S}_2\text{O}_3$ as reductant, in the reaction, $\text{Na}_2\text{S}_2\text{O}_3 + 5\text{H}_2\text{O} + 4\text{Cl}_2 \rightarrow 2\text{NaHSO}_4 + 8\text{HCl}$:
 a) (Mol. wt.)/1 b) (Mol. wt.)/2 c) (Mol. wt.)/6 d) (Mol. wt.)/8
65. Permutit is:
 a) Hydrated sodium aluminium silicate b) Sodium hexa meta-phosphate
 c) Sodium silicate d) Sodium meta-aluminate
66. Na_2CO_3 can be manufactured by Solvay process but K_2CO_3 cannot be prepared because:
 a) K_2CO_3 is more soluble b) K_2CO_3 is less soluble
 c) KHCO_3 is more soluble than NaHCO_3 d) KHCO_3 is less soluble than NaHCO_3
67. Which one of the following order of stability is correct?
 a) $\text{MgCO}_3 > \text{CaCO}_3 > \text{SrCO}_3 > \text{BaCO}_3$ b) $\text{BaCO}_3 > \text{SrCO}_3 > \text{CaCO}_3 > \text{MgCO}_3$
 c) $\text{MgCO}_3 > \text{BaCO}_3 > \text{SrCO}_3 > \text{CaCO}_3$ d) $\text{CaCO}_3 > \text{BaCO}_3 > \text{MgCO}_3 > \text{SrCO}_3$

68. The correct Lewis acid order for boron halides is:

- a) $\text{BF}_3 > \text{BCl}_3 > \text{BBr}_3 > \text{BI}_3$ b) $\text{BCl}_3 > \text{BF}_3 > \text{BBr}_3 > \text{BI}_3$
 c) $\text{BI}_3 > \text{BBr}_3 > \text{BCl}_3 > \text{BF}_3$ d) $\text{BBr}_3 > \text{BCl}_3 > \text{BI}_3 > \text{BF}_3$

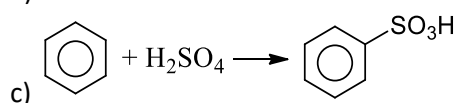
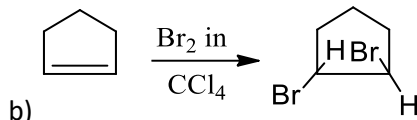
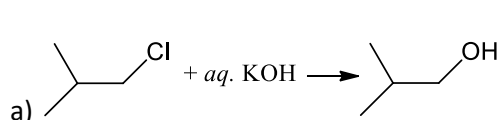
69. The correct formula of borax is:

- a) $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 8\text{H}_2\text{O}$ b) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 4\text{H}_2\text{O}$ c) $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 10\text{H}_2\text{O}$ d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 8\text{H}_2\text{O}$

70. In SiF_6^{2-} and SiCl_6^{2-} which one is known and why?

- a) SiF_6^{2-} because of small size of F b) SiF_6^{2-} because of large size of F
 c) SiCl_6^{2-} because of small size of Cl d) SiCl_6^{2-} because of large size of Cl

71. The addition reaction among the following is

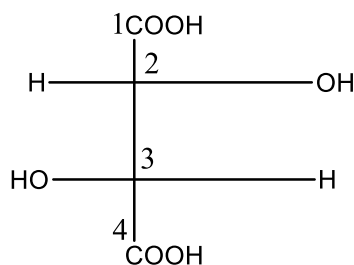


d) All of the above

72. The compound formed in the positive test for nitrogen with the Lassaigne solution of an organic compound is

- a) $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$ b) $\text{Na}_3[\text{Fe}(\text{CN})_6]$ c) $\text{Fe}(\text{CN})_3$ d) $\text{Na}_4[\text{Fe}(\text{CN})_5\text{NOS}]$

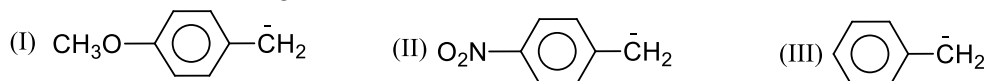
73. In the compound,



Configuration at C_2 and C_3 atoms are

- a) *S, S* b) *R, S* c) *S, R* d) *R, R*

74. Consider the following carbanions



Correct order of stability is

- a) I > II > III b) III > II > I c) II > III > I d) I > III > II

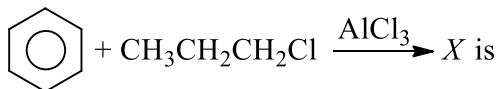
75. Propane cannot be prepared from which reaction?

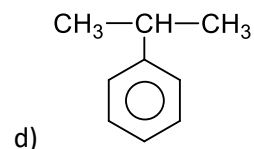
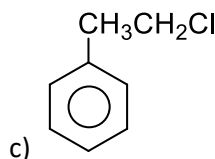
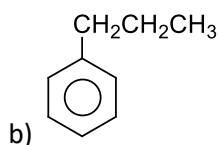
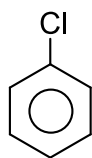
- a) $\text{CH}_3 - \text{CH} = \text{CH}_2 \xrightarrow{\text{H}_2/\text{Ni}}$ b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{I} \xrightarrow[\text{P}]{\text{HI}}$
 c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COONa} \xrightarrow{\text{NaOH}/\text{CaO}, \Delta}$ d) None of the above

76. Which of the following reagent can distinguish between 1-butyne and 2-butyne?

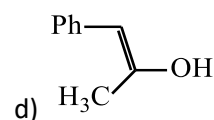
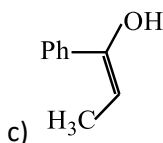
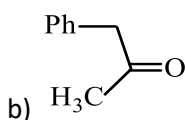
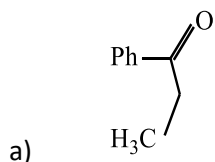
- a) Aqueous NaOH b) Bromine water c) Fehling's solution d) Ammoniacal AgNO_3

77. Predict structure of X in following reaction

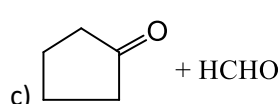
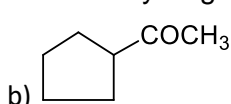
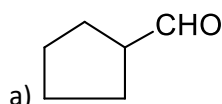




78. $\text{Ph}-\text{C}\equiv\text{C}-\text{CH}_3 + \text{H}_2\text{O} \xrightarrow{\text{Hg}^{2+}/\text{H}^+} \text{A}$. A is:

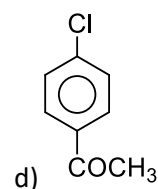
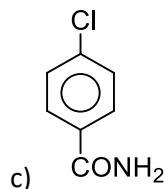
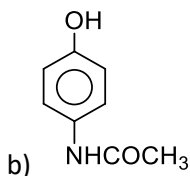
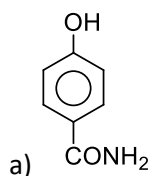


79. on reductive ozonolysis gives



d) None of these

80. The correct structure of the drug paracetamol is



81. The catalyst used in the polymerization of high density polythene is

a) Titanium oxide

b) Titanium isoperoxide

c) Lithium tetrachloride and triphenyl aluminium

d) Titanium tetrachloride and trimethyl aluminium

82. Which is used for making rayon (artificial silk)?

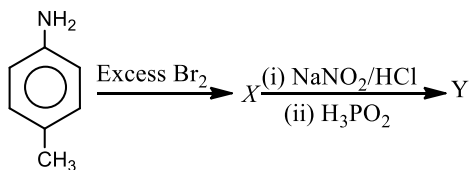
a) Starch

b) Cellulose

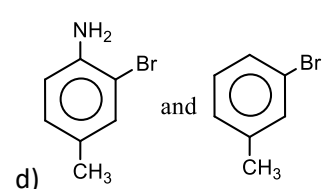
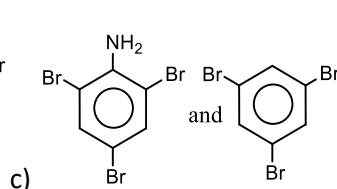
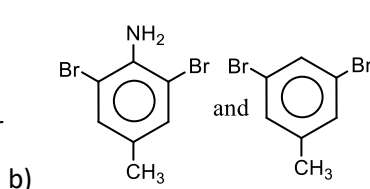
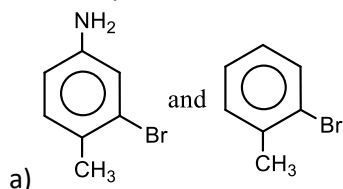
c) Terephthalic acid

d) Adipic acid

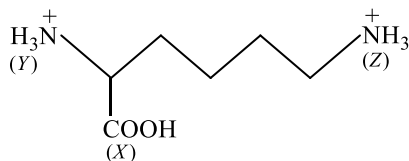
83. In the following reaction sequence predict the compound X and Y.



The compound X and Y are



84. In the compound given below, the correct order of acidic nature of the positions (X), (Y) and (Z) is:



a) $Z > X > Y$

b) $X > Y > Z$

c) $X > Z > Y$

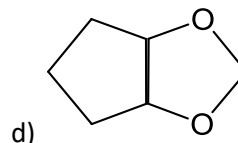
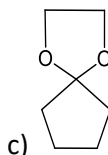
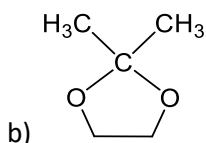
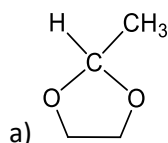
d) $Y > X > Z$

85. What volume of CH_4 at NTP is formed when 20.5 g of CH_3COONa is treated with sodalime?
 a) 4.4 litre b) 2.2 litre c) 3.2 litre d) 5.6 litre

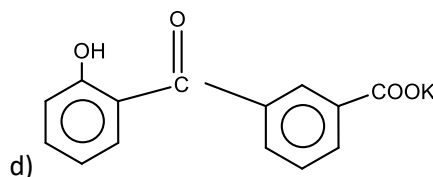
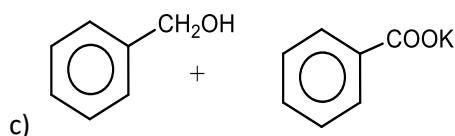
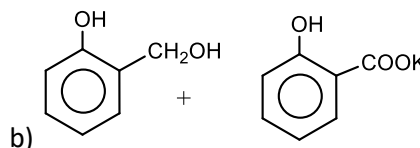
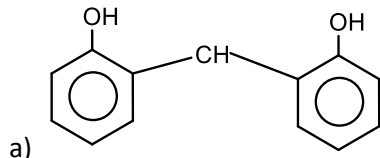
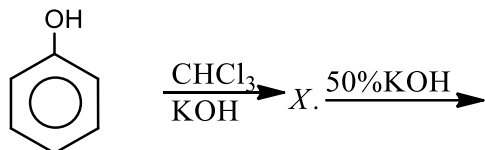
SECTION B



Product is



87. In the Cannizzaro's reaction given below, $2\text{Ph}-\text{CHO} \xrightarrow{\text{OH}^-} \text{Ph}-\text{CH}_2\text{OH} + \text{PhCOO}^-$ the slowest step is:
 a) The attack of OH^- at the carbonyl group b) The transfer of hydride to the carbonyl group
 c) The abstraction of proton from the carboxylic acid d) The deprotonation of $\text{Ph}-\text{CH}_2\text{OH}$
88. The final product of the following reaction is/are



89. What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromo phenol?
 a) 4.00 b) 6.00 c) 10.22 d) 20.44
90. The compound on dehydrogenation gives a ketone. The original compound is
 a) Primary alcohol b) Secondary alcohol c) Tertiary alcohol d) Carboxylic acid
91. The complex used as an anticancer agent is
 (a) *trans* $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$ (b) *cis* $[\text{PtCl}_2(\text{NH}_3)_2]$ (c) *cis* $[\text{K}_2[\text{PtCl}_2\text{Br}_2]]$ (d) Na_2CO_3
92. Which reagent is useful in increasing the carbon chain of an alkyl halide?
 a) HCN b) KCN c) NH_4CN d) AgCN
93. Chloroform on reaction with conc. HNO_3 gives an insecticide and war gas known as:
 a) Chloropicrin b) Nitromethane c) Picric acid d) Acetylene
94. A solid has structure in which 'W' atoms are located at the corners of a cubic lattice 'O' atoms at the centre of edge and Na atoms at the centre of cube. The formula for the compound is
 a) Na_2WO_3 b) Na_2WO_2 c) NaWO_2 d) NaWO_3

95. An aqueous solution of glucose was prepared by dissolving 18 g of glucose in 90 g of water. The relative lowering in vapour pressure is
 a) 0.01 b) 0.02 c) 1 d) 20
96. $\Lambda_{\text{ClCH}_2\text{COONa}}^\infty = 224\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$
 $\Lambda_{\text{NaCl}}^\infty = 38.5\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$
 $\Lambda_{\text{HCl}}^\infty = 203\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$; What is the value of $\lambda_{\text{ClCH}_2\text{COOH}} = ?$
 a) $288.5\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$ b) $289.5\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$
 b) $388.5\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$ d) $59.5\Omega^{-1} \text{ cm}^2 \text{ g equiv}^{-1}$
97. If the ΔG of a cell reaction $\text{AgCl} + e^- \rightarrow \text{Ag} + \text{Cl}^-$ is -21.20 kJ , the standard emf of cell is
 a) 0.239 V b) 0.220 V c) -0.320 V d) -0.110 V
98. The rate constant of a first order reaction is $4 \times 10^{-3} \text{ sec}^{-1}$. At a reactant concentration of 0.02 M , the rate of reaction would be:
 a) $8 \times 10^{-5} \text{ M sec}^{-1}$ b) $4 \times 10^{-3} \text{ M sec}^{-1}$ c) $2 \times 10^{-1} \text{ M sec}^{-1}$ d) $4 \times 10^{-1} \text{ M sec}^{-1}$
99. The rate constant for the reaction, $2\text{N}_2\text{O}_5 \rightarrow 4\text{NO}_2 + \text{O}_2$ is $3.0 \times 10^{-5} \text{ s}^{-1}$. If the rate is $2.4 \times 10^{-5} \text{ molL}^{-1} \text{ s}^{-1}$ then the concentration of N_2O_5 (in mol L^{-1}) is
 a) 0.04 b) 0.8 c) 0.07 d) 1.4
100. Which inert gas has the highest boiling point?
 a) Xe b) Kr c) Ar d) Ne

**PART C – BOTANY
SECTION A**

101. The number of glucose molecules required to produce 38 ATP molecules under anaerobic conditions by a yeast cells is
 1) 2 2) 1 3) 19 4) 38
102. Which of the following represents the correct molecular formula of chlorophyll-b?
 1) $\text{C}_{55}\text{H}_{172}\text{O}_6\text{N}_4\text{Mg}$ 2) $\text{C}_{55}\text{H}_{72}\text{O}_5\text{N}_4\text{Mg}$ 3) $\text{C}_{55}\text{H}_{72}\text{O}_4\text{N}_4\text{Mg}$ 4) $\text{C}_{55}\text{H}_{70}\text{O}_6\text{N}_4\text{Mg}$
103. What does proton motive force refer to?
 1) It is another name for substrate level phosphorylation
 2) It refers to the pumping of protons into the lumen of Lysosome
 3) It refers to the movement of electrons within the antenna chlorophyll of chloroplast photosystem
 4) It refers to the combined electrochemical gradient that drives protons into the matrix through ATP synthase complex
104. Siphonogamy occurs in
 1) Pteridophytes 2) Gymnosperms only 3) Gymnosperms and angiosperms 4) Angiosperms only
105. (A): Tracheids constitute main part of wood in gymnosperms
 (R): Tracheids are absent in angiosperms.
 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
 2) Both (A) and (R) are true and (R) is not the correct explanation of ((A)
 3) (A) is true but (R) is false 4) Both (A) and (R) are wrong.
106. If a man with blood type AB and N marries a woman with blood type A and M (The wife's parents were AB and B), what can not be the genotype of the children? (Hint: MN blood group is codominant)
 1) AA-MN 2) AO-MN 3) AB-MN 4) BB-MN

- 107.** Diffusion pressure of pure solvent is:
- 1) Always more than its solution
 - 2) Sometimes more than its solution
 - 3) Less than its solution
 - 4) Equal to its solution
- 108.** The ratio of phloem, Xylem and cambium groups respectively in the vascular bundle of monocot stem is
- 1) 1 : 1 : 1
 - 2) 1 : 0 : 1
 - 3) 1 : 1 : 0
 - 4) 1 : 1 : 2
- 109.** Collenchyma is found as sub-epidermal tissue in the following plants except
- 1) *Petunia alba*
 - 2) *Helianthus annuus*
 - 3) *Zea mays*
 - 4) *Pisum sativum*
- 110.** Glycolate accumulates in chloroplasts, when there is
- 1) High CO₂
 - 2) Bright light
 - 3) Low temperature
 - 4) Low CO₂
- 111.** The first cell of the gametophytic generation is
- 1) Meiocyte
 - 2) Meiospore
 - 3) Gamete
 - 4) Zygote
- 112.** (A): In definite inflorescence, flowers are arranged in basipetal manner
 (R): In basipetal arrangement, older flowers are at base and younger flowers are at the top.
- 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
 - 2) Both (A) and (R) are true and (R) is not the correct explanation of ((A)
 - 3) (A) is true but (R) is false
 - 4) Both (A) are (R) wrong.
- 113.** In which of the following plants, ovule does not contain integuments?
- 1) *Cycas*
 - 2) *Mangifera*
 - 3) *Loranthus*
 - 4) *Lily*
- 114.** A bivalent of Meiotic prophase-I consists of
- 1) Two chromatids -One centromere
 - 2) Two chromatids - Two centromere
 - 3) Four chromatids - Two centromeres
 - 4) Four chromatids - Four centromere
- 115.** A girdled tree (upto bast) may survive for some time but it will eventually die because:
- 1) Water will not move upwards
 - 2) Water will not move downwards
 - 3) Sugars and other organic materials will not move downwards
 - 4) Sugars and other organic materials move upwards
- 116.** Match the column
- | Column I | Column II |
|---------------------------|--|
| I. Bio piracy | A. Gene therapy |
| II. Retrovirus | B. Illegal use of biological materials |
| III. Biopatent | C. Right granted for biological entities |
| IV. Kohler and Milstein | D. Monoclonal antibody |
| 1) I-B, II-A, III-D, IV-C | 2) I-B, II-A, III-C, IV-D |
| | 3) I-B, II-C, III-A, IV-D |
| | 4) I-D, II-A, III-B, IV-C |
- 117.** Common character found in China rose and lily is
- 1) Reticulate venation
 - 2) Compound leaves
 - 3) Fleshy leaf bases
 - 4) Simple leaves
- 118.** Which part of the tobacco plant is infected by the nematode *Meloidegryne*?
- 1) Stem
 - 2) Root
 - 3) Leaf
 - 4) Flower
- 119.** In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to
- 1) Action of gut micro-organism
 - 2) Presence of conversion factors in insect gut
 - 3) pH > 7 in the insect gut
 - 4) pH < 7 in the insect gut
- 120.** The total sum of chromatids of 4 daughter cells of Meiosis II are equal to the
- I) The sum of chromatids of 2 daughter cells of Meiosis I
 - II) The total sum of chromatids of Metaphase I meiocyte
 - III) The total sum of chromatids of Anaphase I meiocyte
 - 1) I & II
 - 2) I & III
 - 3) II & III
 - 4) I, II & III

- 121.** A male rabbit of genotype 'AABBDEE' is crossed with a female rabbit of genotype 'aabbdee' to produce F1 hybrid offspring. How many genetically different gametes can be produced by this F1 hybrid?
 1) 4 2) 8 3) 16 4) 32
- 122.** Suppose the experiment of Meselson and Stahl was performed on a sample of 8 cells, each cell containing one nucleoid that had been growing on normal N-14 medium. You then grew cells for 3 generations in medium containing N-15. The outcome would be after 3 generations
 1) 32 cells with N-14 & N-15 heteroduplex and 32 cells with N-15 homoduplex
 2) 16 cells with N-14 & N-15 heteroduplex and 48 cells with N-15 homoduplex
 3) 24 cells with N-14 & N-15 heteroduplex and 40 cells with N-15 homoduplex
 4) 8 cells with N-14 & N-15 heteroduplex and 56 cells with N-15 homoduplex
- 123.** A: All elements found in the plant body satisfy the criteria of essentiality
 R: Both essential and non-essential elements are absorbed by plants from soil
 1) Both (A) and (R) are true and (R) is the correct explanation of (A)
 2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
 3) (A) is true but (R) is false
 4) (A) is false but (R) is true
- 124.** In a test tube m-RNA of Rhizobium, t-RNAs from pancreas of goat and r-RNA from sunflower are taken and sufficient number of amino acids and ATP are put, then the polypeptide synthesized will be of the nature of
 1) Body cells of goat 2) Rhizobium 3) Both 1 and 2 4) Sunflower
- 125.** Assertion: Living systems have a high degree of tendency for undergoing entropy.
 Reason: Living systems are unable to overcome entropy.
 1) Both A and R are correct and R is the correct explanation of A
 2) Both A and R are correct but R is not the correct explanation of A.
 3) A is true but R is false.
 4) R is true but A is false
- 126.** Read the following steps that are involved in recombinant DNA technology – arrange them in the correct order
 I. Transfer the r-DNA into the host II. Isolation of DNA From the selected organism
 III. Fragmentation of DNA by restriction enzymes IV. Ligation of DNA into a vector
 1) II, IV, I, III 2) I, IV, II, III 3) II, III, IV, I 4) IV, III, I, II
- 127.** Which of the following is not present on same Rank?
 (1) Primata (2) Poales (3) Insecta (4) Diptera
- 128.** When water is added to a living cell, the following is not observed.
 1) Increase in free energy for water 2) Decrease in the amount of solute
 3) Increase in pressure potential 4) Increase in water potential
- 129.** The hormone produced during adverse environmental conditions is a
 (1) Adenine derivative (2) Terpenoid derivative
 (3) Indole derivative (4) Carotenoid derivative
- 130.** A fern differs from a moss in having
 1) Swimming archegonia 2) Swimming antherozoids
 3) Independent gametophytes 4) Independent sporophytes
- 131.** The correct sequence of the nitrogen cycle is _____
 (1) Assimilation, fixation, ammonification, nitrification, denitrification
 (2) Fixation, assimilation, ammonification, nitrification, denitrification

- (3) Nitrification, assimilation, fixation, denitrification, ammonification
 (4) Fixation, ammonification, assimilation, denitrification, nitrification
- 132.** Pick the right difference between a DNA and RNA
 1) Sugar and phosphate 2) Sugar and purine 3) Purine and phosphate 4) Sugar and pyrimidine
- 133.** Which of the following statements best describes DNA polymerase?
 1) It is an enzyme required to glue pieces of DNA polymer fragments together
 2) It is an enzyme required to produce a primer needed for DNA replication
 3) It is an enzyme that catalyzes the addition of nucleotides to the 5' end of a growing DNA strand
 4) It is an enzyme that catalyzes the addition of nucleotides to the 3' end of a growing DNA strand
- 134.** The concept of evidence for the existence of two photosystems in photosynthesis was given by
 1) Hill 2) Blackman 3) Emerson 4) Arnon
- 135.** Which of the following hormones can bypass stratification?
 (1) Auxin (2) Cytokinin (3) Gibberellins (4) Ethylene

SECTION B

- 136.** A pure tall plant was grown in nutrient deficient soil and remained dwarf. When it is crossed with dwarf plant, the F₁ will be
 1) 100% dwarf 2) 100% tall 3) 50% tall and 50% dwarf 4) 75% tall and 25% dwarf
- 137.** Seed formation without fertilization in flowering plants involves the process of
 1) Somatic hybridization 2) Apomixis 3) Sporulation 4) Budding
- 138.** Atlas-66 is a variety of
 1) Maize 2) Barley 3) Wheat 4) Rice
- 139.** Any part of the plant which is introduced to the culture medium to grow into full-fledged plant or organs in vitro is called
 1) Propagule 2) Clone 3) Plantlet 4) Explant
- 140.** Chromosome number in endosperm cell of plant 'x' and the gamete of plant 'y' are equal. Plants 'x' and 'y' respectively are
 1) Apple and rice 2) Maize and potato 3) Rice and onion 4) Onion and potato
- 141.** Monoecious condition is found in
 1) Papaya 2) *Pinus* 3) Date palm 4) *Cycas*
- 142.** Which of the following is noncellular?
 1) Bacteria 2) PPLO 3) Diatoms 4) Bacteriophage
- 143.** In Solanaceae members, the distal end of the filament of a stamen is attached to the
 1) Thalamus 2) Petal 3) Anther 4) Stigma
- 144.** *Agaricus* belongs to the class
 1) Ascomycetes 2) Phycomycetes 3) Basidiomycetes 4) Deuteromycetes
- 145.** Plastids are totally absent in
 1) Fungi 2) Blue green algae 3) Bacteria 4) All of these
- 146.** Who is considered as the Darwin of 20th century?
 1) Newton 2) Linnaeus 3) Ernst Mayr 4) T. H. Morgan
- 147.** Red tides are due to
 1) Chrysophytes 2) Cyanobacteria 3) Deuteromycetes 4) Dinoflagellates

- 148.** Identify the vascular cryptogam
 1) *Anthoceros* 2) *Adiantum* 3) *Cycas* 4) *Aloe*
- 149.** Competitive inhibitor of Succinic dehydrogenase is
 1) Mevalonic acid 2) Myristic acid 3) Malonic acid 4) Malic acid
- 150.** Study the following table and identify the *incorrect* combinations
- | | | |
|------------------------------|------------------------------|-----------------|
| I. Stroma of the chloroplast | Circular double-stranded DNA | 80s Ribosomes |
| II. Chromoplasts | Carotenoid pigments | Water soluble |
| III. Chloroplast | Thylakoids | Stroma lamellae |
| IV. Peroxisomes | Glyoxysomes | Microbodies |
| 1) I, II | 2) II, III | 3) III, IV |
| | | 4) I, IV |

PART D – ZOOLOGY
SECTION A

- 151.** Which of the following is bilaterally symmetrical during larval stage and radially symmetrical during adult stage?
 (a) Cuttle fish (b) Star fish (c) Jelly fish (d) Silver fish
- 152.** Match the locomotor organs given under Column I with the group listed under Column II & select the correct option from the codes given below
- | | |
|----------------|--------------------|
| Column I | Column II |
| a) Pseudopodia | i) mollusca |
| b) Combplates | ii) chondrichthyes |
| c) Foot | iii) protozoa |
| d) Fins | iv) Ctenophora |
- (1) a - (iii) b - (i) c - (iv) d - (ii) (2) a - (i) b - (iii) c - (iv) d - (ii)
 (3) a - (iv) b - (iii) c - (ii) d - (i) (4) a - (iii) b - (iv) c - (i) d - (ii)
- 153.** Moulting in arthropods facilitates
 (a) Protection (b) Reproduction (c) Growth (d) Communication
- 154.** All of the following Characters are shared by crocodiles & birds except
 (a) Extra embryonic membranes (b) Dry Skin
 (c) Homeothermy (d) Four chambered heart
- 155.** Thrombocytes secrete
 (a) Fibrinogen (b) Prothrombin (c) Thromboplastin (d) Fibrin
- 156.** The Nissl's bodies of cyton represent
 (a) Golgi complex of neuron (b) RER, the sites of protein synthesis
 (c) Nucleus, site of synthesis Aminoacids (d) SER, the site of lipids
- 157.** Amount of urea excreted out per day is
 (a) 1-1.5 lit (b) 25-30 gm (c) 180 lit (d) 10-15 gms
- 158.** Cockroach nymph undergoes _____ number of moultings
 (a) 10 (b) 13 (c) 12 (d) 8
- 159.** In male Cockroach sperms are stored in which part of reproductive system?
 (a) Testes (b) Vas deferens (c) Seminal vesicles (d) Mushroom glands
- 160.** The following gas was most likely absent from the primordial atmosphere at the time of origin of life
 (a) Ammonia (b) Oxygen (c) Hydrogen (d) Methane

161. Coloured rock paintings were presumably first made by
 (a) Cro-magnon man (b) Neanderthal man (c) Java ape man (d) Peking man
162. The factors involved in the formation of new species are
 (a) isolation and gene flow (b) gene flow and competition
 (c) competition & mutation (d) isolation and variation
163. At a particular locus, frequency of allele A is 0.6 and that of allele 'a' is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium?
 (a) 0.36 (b) 0.16 (c) 0.24 (d) 0.48
164. Migratory fishes are
 (a) Stenohaline (b) Eurythermal (c) Euryhaline (d) Homeothermic
165. Age pyramid of a stable population is
 (a) Urn shaped (b) triangular (c) Bell shaped (d) Inverted
166. Competitive Exclusion principle was given by
 (a) Allen (b) Pearl-verhulst (c) Gause (d) N. Borlaug
167. Gross primary productivity minus respiration losses of an ecosystem is
 (a) Primary productivity (b) net productivity
 (c) net primary productivity (d) secondary productivity
168. According to David Tilman, greater the diversity, greater is the primary productivity. Which of the following has least diversity but high primary productivity?
 (a) Desert ecosystem (b) Tropical rainforest
 (c) Composite fish culture pond (d) Cropland ecosystem
169. Which of the following have the highest no of species in nature?
 (a) Fungi (b) Insects (c) Birds (d) Angiosperms
170. Match the items in Column I with those in Column II & Choose the Correct option from the codes given below :

Column I	Column II
(a) catalytic converter	i) Hospital waste
(b) muffler	ii) SO ₂
(c) Incinerator	iii) Noise
(d) scrubber	iv) CO

- (1) a - (iii) b - (iv) c - (i) d - (ii) (2) a - (iv) b - (iii) c - (ii) d - (i)
- (3) a - (iv) b - (i) c - (iii) d - (ii) (4) a - (iv) b - (iii) c - (i) d - (ii)
171. Major air pollutant is
 (a) CO₂ (b) N₂ (c) CO (d) S
172. Which of the following does not pass through Pancreatic duct?
 (a) Enzymes (b) Alkaline bile (c) Insulin (d) Bilirubin
173. A doctor suggested a person to take ORS. That person might be suffering from
 (a) Diarrhoea (b) Jaundice (c) Constipation (d) Indigestion
174. RV + VC =
 (a) EC (b) TLC (c) IC (d) RV
175. On an average healthy human breaths _____ times per hour
 (a) 12-16 (b) 720-960 (c) 4-5 (d) 120-160
176. Which of the following hormones play a significant role in osteoporosis?
 (a) Aldosterone & prolactin (b) Progesterone and Aldosterone

- (c) Parathyroid hormone & prolactin (d) Estrogen and parathyroid hormone
- 177.** A 10 year child with deficient anterior pituitary function is likely to
 (a) develop acromegaly (b) be a short stature but have relatively normal body
 (c) be a constant danger of becoming dehydrated (d) have a high basal metabolic rate
- 178.** Which part of human ear plays no role in hearing as such but is otherwise very much required?
 (a) vestibular apparatus (b) Ear ossicles (c) Eustachian tube (d) Organ of Corti
- 179.** A resting axonal membrane is comparatively more permeable to _____ and nearly impermeable to _____
 (a) Na⁺ ions & K⁺ ions (b) K⁺ ions & Na⁺ ions (c) Ca⁺ ions & Na⁺ ions (d) K⁺ ions & Ca⁺ ions
- 180.** Irrespective of seasonal temperature changes the body temp of humans remains at 37° C. This is possible due to
 (a) Epithalamus (b) Hypothalamus (c) Cerebrum (d) Diencephala
- 181.** The bone with glenoid cavity is
 (a) Clavicle (b) Ilium (c) Scapula (d) Pubis
- 182.** Identify the correct Match
- | | |
|---|--|
| <p style="text-align: center;">Muscle Contraction</p> <p>(a) Troponin tropomyosin complex
 Moves away from the active site</p> <p>(b) Z-membranes moves away from m-line</p> <p>(c) Recovery stroke occurs</p> <p>(d) Calcium ions reenter into cisternae</p> | <p style="text-align: center;">Muscle Relaxation</p> <p>Troponin tropomyosin complex masks the active site</p> <p>Z-membranes move towards m-line</p> <p>Power stroke occurs</p> <p>Calcium ions move into sarcoplasm from Cisternae</p> |
|---|--|
- 183.** Knee joint & elbow joint are examples of
 (a) Saddle joint (b) ball & socket joint (c) pivot joint (d) hinge joint
- 184.** Angiotensin II is
 (a) a vasoconstrictor (b) a vasodilator (c) activating adrenal medulla (d) decreasing GFR
- 185.** Increase in body fluid volume
 (a) activates the osmoreceptors (b) suppresses release of ADH
 (c) increases ADH secretion (d) prevents diuresis

SECTION B

- 186.** The Structures involved in storage excretion are
 (a) malpighian tubules (b) corpora adiposa (c) corpora cardiaca (d) uricose glands
- 187.** Lactic acid is excreted by
 (a) sebaceous glands (b) sudoriferous glands (c) liver (d) kidneys
- 188.** Which of the following is not represented in normal human ECG?
 (a) Depolarisation of atria (b) Depolarisation of ventricles
 (c) Repolarisation of atria (d) Repolarisation of Ventricles
- 189.** In mammals which blood vessel would normally carry largest amount of urea?
 (a) Renal vein (b) Dorsal Aorta (c) Hepatic Vein (d) Hepatic portal vein
- 190.** In MOET (multiple ovulation Embryo technology), the fertilized eggs from a cow collected in this stages
 (a) 6 to 7 cells (b) 8 to 32 cells (c) 2 to 4 cells (d) 36 to 40 cells
- 191.** The aquaculture involves the production of useful
 (a) aquatic plants (b) Shrimps and prawns (c) Fishes & oysters (d) All of these

- 192.** Which of the following is true pair of biofertilizers?
 (a) Azolla & BGA (b) Nostoc & legume (c) Rhizobium & grasses (d) Salmonella & E.coli
- 193.** Antivenom against snake poison contains
 (a) Antigens (b) Antigen-antibody complexes (c) antibodies (d) Catechin
- 194.** Which of the following is not useful in reducing the symptoms of allergy?
 (a) Steroids (b) Antihistamines (c) Adrenalin (d) Histamines
- 195.** α -Interferons are used in cancer treatment to
 (a) Activate the immune system (b) Suppress the immune system
 (c) Activate the nervous system (d) Suppress the endocrine system
- 196.** Four pairs of gills which are covered by operculum on each side in which of the following?
 (a) Myxine (b) Betta (c) Pristis (d) Trygon
- 197.** Vesicles filled with neurotransmitters are present in
 (a) Dendrites (b) Cyton (c) Synaptic Knobs (d) Axonhillock
- 198.** Depletion of which gas in the atmosphere can lead to an increase incidence of skin cancers
 (a) Nitrous oxide (b) Ozone (c) Ammonia (d) Methane
- 199.** Infected females may often be asymptomatic during the infection of
 (a) Hepatitis – A (b) SCID (c) STD (d) Cholera
- 200.** Which of the following options, best represents enzymes composition of succus entericus?
 (a) Sucrase, nuclease, steapsin (b) Lactase, pepsin, procarboxypeptidase
 (c) maltase, aminopeptidase, lipase (d) Amylase, lipase, Pepsinogen