1. A paramagnetic sample shows a net magnetisation of S $Am^{-1}$ when placed in an external magnetic field of 0.6 T at a temperature of 4 K. When the same sample is placed in an external magnetic field of 0.2 T at a temperature of 16K, the magnetisation will be
   a) $\frac{32}{3}\mathrm{Am}^{-1}$ b) $\frac{2}{3}\mathrm{Am}^{-1}$ c) 6 $Am^{-1}$ d) 2.4 $Am^{-1}$
2. A ring of radius 0.5 m and mass 10 kg is rotating about its diameter with angular velocity of 20 rad/s. Its KE is:
   a) 10 J b) 100 J c) 500 J d) 1000 J
3. A body floats with one third of its volume outside the water and $\frac{1}{4}$ th of its volume outside another liquid. The density of the other liquid is :
   a) 9.4 g $cm^{-3}$ b) 4 g $cm^{-3}$ c) $\frac{8}{3}$ g $cm^{-3}$ d) $\frac{3}{8}$ g $cm^{-3}$
4. In which medium sound has maximum velocity
   a) In gases b) In liquids c) In solids d) In vacuum
5. 10 eV electron is circulating in a plane at right angle to a uniform field of magnetic induction $10^{-4}\ \mathrm{Wb/m^2}$ ( =1.0. gauss). The orbital radius of the electron is_____
   a) 12 cm b) 16 cm c) 11 cm d) 18 cm
6. Which of the following operations will not change a vector?
   a) Rotation in its own plane b) Rotation perpendicular to its plane
   c) Rotation about the tail d) None of the above
7. The count rate from 100 $cm^3$ of a radioactive liquid is c. Some of this liquid is now discarded. The count rate of the remaining liquid is found to be c/10 after three half-lives. The volume of the remaining liquid, in $cm^3$, is
   a) 20 b) 40 c) 60 d) 80
8. The rate of loss of heat depends on
   a) the sum of temperature of the body and its surroundings
   b) the difference in temperature of the body and its surroundings
   c) the product of temperature of the body and its surroundings
   d) the ratio of temperature of the body and its surroundings
9. A body executing uniform circular motion has its position vector and acceleration vector
   a) along the same direction b) in opposite direction c) normal to each other
   d) not related to each other
10. Particle moves so that its position vector is given by vector $\vec{r}$=cos$\omega$t $\hat{x}$+sin $\omega$t$\hat{y}$ where $\omega$is a constant. Which of the following is true?

a) Velocity is perpendicular to vector rand acceleration is directed towards the origin.
b) Velocity is perpendicular to vector rand acceleration is directed away from the origin.
c) Velocity and acceleration both are perpendicular to vector r
d) Velocity and acceleration both are parallel to vector r

11. In two separate collisions, the coefficients of restitutions '$e_1$' and '$e_2$' are in the ratio 3: 1. In the first collision the relative velocity of approach is twice the relative velocity of separation. Then the ratio between the relative velocity of approach and relative velocity of separation in the second collision is:
    a) 1:6 b) 2:3 c) 3:2 d) 6:1
12. In changing the state of a gas adiabatically from an equilibrium state A to another equilibrium state B an amount of work equal to 22.3 J is done on the system. If the gas is taken from state A to B via a process in which the net heat absorbed by the system is 9.35 cal then the net work done by the system in latter case is (Take 1 cal = 4.2 J)
    a) 15J b) 16J c) 17J d) 18J
13. In an n-p-n transistor $10^{10}$ electron enter the emitter in $10^{-6}$ s. If 2% of the electrons are lost in the base, the current amplification factor is
    a) 0.02 b) 7 c) 33 d) 4.9
14. Two bodies with masses $M_1$ and $M_2$ are initially at rest and a distance R apart. They then move directly towards one another under the influence of their mutual gravitational. attraction. What is the ratio of the distances travelled by $M_1$ to the distance travelled by $M_2$?
    a) $\frac{M_1}{M_2}$ b) $\frac{M_2}{M_1}$ c) 1 d) $\frac{1}{2}$
15. A body of mass 0.4 kg starting at origin at t = 0 with a speed of 10 m $S^{-1}$ in the positive x-axis direction is subjected to a constant F = 8 N towards negative x-axis. The position of the body after 25 s is :
    a) -6000 m b) -8000 m c) +4000 m d) +7000 m
16. The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10 Ω is:
    a) 1.0 Ω b) 0.2 Ω c) 0.5 Ω d) 0.8 Ω
17. An electric dipole of moment $'p'$ is placed in an electric field of intensity ' E '. The dipole acquires a position such that the axis of the dipole makes an angle q with the direction of the field. Assuming that the potential energy of the dipole to be zero when $= 90^\circ$ , the torque and the potential energy of the dipole will respectively be:
    a) $pE\sin\mathrm{q}, -pE\cos\mathrm{q}$ b) $pE\sin\mathrm{q}, -2pE\cos\mathrm{q}$ c) $pE\sin\mathrm{q}, 2pE\cos\mathrm{q}$
    d) $pE\cos\mathrm{q}, -pE\cos\mathrm{q}$
18. An electrical device draws 2 kW power from ac mains voltage 223 V(rms). The current differs lag in phase by $\phi$ = $\tan^{-1}\left(-\frac{3}{4}\right)$ as compared to voltage. The resistance R in the circuit is
    a) 15 Ω b) 20 Ω c) 25 Ω d) 30 Ω
19. The SI unit of electric flux is
    a) $\frac{\text{volt}}{\text{metre}}$ b) $\frac{\text{newton}}{\text{coulomb}}$ c) $\frac{\text{newton} \times \text{metre}^2}{\text{coulomb}}$ d) $\text{volt} \times \text{metre}^2$
20. The eccentricity of Earth's orbit is 0.0167.The ratio of its maximum speed in its orbit to its minimum speed is:
    a) 2.507 b) 1.033 c) 8.324 d) 1.000

21. Which of the following statements are correct?
(i) Centre of mass of a body always coincides with the centre of gravity of the body.
(ii) Centre of mass of a body is the point at which the total gravitational torque on the body is zero.
(iii) A couple on a body produce both translational and rotational motion in a body.
(iv) Mechanical advantage greater than one means that small effort can be used to lift a large load.
a) (ii) and (iv) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv)

22. Two rotating bodies A and B of masses m and 2m with moments of inertia $I_A$ and $I_B$ ($I_B > I_A$) have equal kinetic energy. of rotation. If $L_A$ and $L_B$ be their angular momenta respectively, then :
a) $L_A > L_B$ b) $L_A = \frac{L_B}{2}$ c) $L_A = 2L_B$ d) $L_B > L_A$

23. The coefficient of static friction, $m_3$, between block A of mass 2 kg and the table as shown in the figure is 0.2. What would be the maximum mass value of block B so that the two blocks do not move? The string and the pulley are assumed to be smooth and massless.
a) 0.4kg b) 2.0kg c) 4.0kg d) 0.2kg

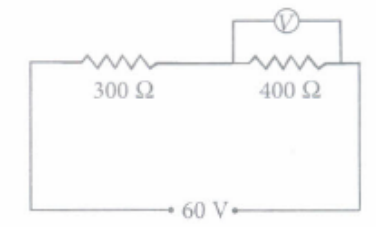
24. Given that T stands for time period and I stands for the length of simple pendulum. If g is the acceleration due to gravity, then which of the following statements about the relation $T^2 = (l/g)$ is correct?
a) It is correct both dimensionally as well as numerically.
b) It is neither dimensionally correct nor numerically.
c) It is dimensionally correct but not numerically.
d) It is numerically correct but not dimensionally.

25. If $V = \sqrt{\frac{\gamma P}{\rho}}$, then dimensions of $\gamma$ are:
a) $[M^0L^0T^0]$ b) $[M^0L^0T^{-1}]$ c) $[M^1L^0T^0]$ d) $[M^0L^1T^0]$

26. A particle is constrained to move on a straight line path. It returns to the starting point after 10 sec. The total distance covered by the particle during this time is 30 m. Which of the following statements about the motion of the particle is false?
a) Displacement of the particle is zero b) Average speed of the particle is 3 m/s
c) Displacement of the particle is 30 m d) Both (a) and (b)

27. The natural frequency ($\omega o$) of oscillations in LC circuit is given by
a) $\frac{1}{2\pi}\frac{1}{\sqrt{LC}}$ b) $\frac{1}{\pi}\frac{1}{\sqrt{2LC}}$ c) $\frac{1}{\sqrt{LC}}$ d) $\sqrt{LC}$

28. A heater is designed to operate with a power of 1000W in a 100 V line. It is connected in combination with a resistance of 10 $\Omega$ and a resistance R, to a 100 V mains as shown in the figure. What will be the value of R so that the heater operates with a power of 62.5 W?




a) 15Ω b) 10Ω c) 5Ω d) 25Ω

29. A ball whose density is 0.4 x $10^3$ kg/$m^3$ falls into water from a height of 9 cm. To what depth does the ball sink?
    a) 9 cm  b) 6 cm  c) 4.5 cm  d) 2.25 cm
30. Two lenses of focal lengths 20 cm and -40 cm are held in contact. The image of an object all infinity will be formed by the combination at
    a) $\infty$  b) 20 cm  c) 40 cm  d) 60 cm
31. Barrier potential of a p-n junction diode does not depend on:
    a) Doping density  b) Diode design  c) Temperature  d) Forward bias
32. Coefficient of linear expansion of brass and steel rods are $\alpha_1$ and $\alpha_2$ Lengths of brass and steel rods are $l_1$ and $l_2$ respectively. If ($l_2$- $l_1$) is maintained same at all temperatures, which one of the following relations holds good?
    a) $\alpha_1 l_2$  b) $\alpha_1 l_2 = a_2 l_2$  c) $a_2 l_2 = a_1 l_1$  d) $a_1 l_1 = a_2 l_2$
33. A small angled prism of refractive index 1.4 is combined with another small angled prism of refractive index 1.6 to produce dispersion without deviation. If the angle of first prism is 6°, then the angle of the second prism is
    a) 8°  b) 6°  c) 4°  d) 2°
34. Pressure at a point inside a liquid does not depend on
    a) the depth of the point below the surface of the liquid  b) the nature of the liquid.
    c) the acceleration due to gravity at that point.  d) total weight of fluid in the beaker.
35. $P_i$, $V_i$ and $P_f$, $V_f$ are initial and final pressures and volumes of a gas in a thermodynamic process respectively. If $PV^n$= constant, then the amount of work done is:
    a) minimum for n = γ  b) minimum for n = 1  c) minimum for n = 0  d) minimum for n =1/γ
36. A ray is incident at an angle of incidence i on one surface of a prism of small angle A and emerges normally from opposite surface. If the refractive index of the material of prism is $\mu$ , the angle of incidence i is nearly equal to
    a) $\frac{A}{\mu}$  b) $\frac{A}{2\mu}$  c) $\mu$A  d) $\frac{\mu A}{2}$
37. The earth's radius is R and acceleration due to gravity at its surface is g. If a body of mass m is sent to a height of R/4 from the earth's surface, the potential energy increases by:
    a) $mg = \frac{R}{3}$  b) $mg = \frac{R}{4}$  c) $mg = \frac{R}{5}$  d) $3mg = \frac{R}{16}$
38. A microscope is focussed on a mark on a piece of paper and then, a slab of glass of thickness 3 cm and refractive index 1.5 is placed over the mark. How should the microscope be moved to get the mark in focus again?
    a) 1 cm upward  b) 4.5 cm downward  c) 1 cm downward  d) 2 cm upward
39. A projectile is fired from the surface of the earth with a velocity of 5 m/s and angle 9 with the horizontal. Another projectile fired from another planet with a velocity of 3 m/s at the same angle follows a trajectory which is identical with the trajectory of the projectile fired from the earth. The value of the acceleration due to gravity on the planet is (in m/sz) (given g = 9.8 m/sz)
    a) 3.5  b) 5.9  c) 16.3  d) 110.8
40. A diatomic ideal gas is used in a car engine as the working substance. If during the adiabatic expansion part of the cycle, volume of the gas increases from V to 32 V, the efficiency of the engine is:

a) 0.5 b) 0.75 c) 0.99 d) 0.25

41. The maximum wavelength of electromagnetic radiation, which can create a hole-electron pair in germanium. (Given that forbidden energy gap in germanium is 0.72 eV)
a) $1.7 \times 10^{-6}$ m b) $1.5 \times 10^{-5}$ m c) $1.3 \times 10^{-4}$ m d) $1.9 \times 10^{-5}$ m

42. Two springs of spring constants 1000 N $m^{-1}$ and 2000 N $m^{-1}$ are stretched with same force. They will have potential energy in the ratio of :
a) 2:1 b) $2^2:1^2$ c) 1:2 d) $1^2:2^2$

43. The relation $\vec{F} = m\vec{a}$, cannot be deduced from Newton's second law, if
a) force depends on time b) momentum depends on time
c) acceleration depends on time d) mass depends on time

44. **Assertion:** The acceleration due to gravity on the moon is one-sixth that on the earth.
**Reason:** The law of gravitation is the same on both the moon and the earth.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

45. Wavelength of light frequency 100Hz is
a) $2 \times 10^6$ m b) $3 \times 10^6$ m c) $4 \times 10^6$ m d) $5 \times 10^6$ m

46. A body is just floating in a liquid (their densities are equal). If the body is slightly pressed down and released it will:
a) start oscillating b) sink to the bottom c) come back to the same position immediately
d) come back to the same position slowly

47. Which of the following process is correct for the given P - V diagram.


a) Adiabatic process b) Isothermal process c) Isobaric process d) Isochoric process

48. In motion of an object under the gravitational influence of another object. Which of the following quantities is not conserved?
a) Angular momentum b) Mass of an object c) Total mechanical energy
d) Linear momentum

49. **Assertion:** Electromagnetic waves exert radiation pressure.
**Reason:** Electromagnetic waves carry energy.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertionand reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

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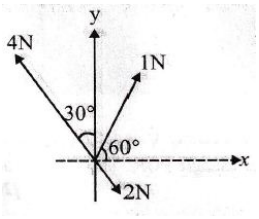
50. 

Three forces acting on a body are shown rn the figure. To have the resultant force only along the y-direction, the magnitude of the minimum additional force needed is _____ .
a) $\sqrt{3}$ N b) 0.5 N c) 1.5 N d) $\frac{\sqrt{3}}{4}$ N

51. A body of mass M and radius R is rolling horizontally without slipping with speed u. It then rolls up a hill to a maximum height h. If = $h = 5v^2/6g,$ what is the M.I. of the body?
a) $\frac{1}{2}MR^2$ b) $\frac{2}{3}MR^2$ c) $\frac{3}{4}MR^2$ d) $\frac{2}{5}MR^2$

52. If force (F), length (L), current (I) and time (T)are taken as bases then the dimensions of $\varepsilon_0$ are:
a) $[FL^2I^2T^{-2}]$ b) $[F^{-1}L^2I^2T^2]$ c) $[F^{-1}L^{-2}I^2T^2]$ d) $[F^2L^2I^2T^2]$

53. If L and R denote inductance and resistance respectively then the dimensions of L/R are:
a) $[M^1L^0T^0Q^{-1}]$ b) $[M^0L^0TQ^0]$ c) $[M^0L^1T^{-1}Q^0]$ d) $[M^{-1}LT^0Q^{-l}]$

54. Rutherford's experiments suggested that the size of the nucleus is about
a) $10^{-14}$ m to $10^{-12}$ m b) $10^{-15}$ m to $10^{-13}$ m c) $10^{-15}$ m to $10^{-14}$ m d) $10^{-15}$ m to $10^{-12}$ m

55. Which of the following is not true for stationary satellite of the earth?
a) Its time-period is 24 hrs
b) Its angular speed is equal to that of the earth about its own axis
c) It is stationary in space d) It revolves from west to east

56. A point moves with uniform acceleration and $u_1$ , $u_2$ and $u_3$ denote the average velocities in the three successive intervals of time $t_1$, $t_2$, and $t_3$. Which of the following relations is correct?
a) $(u_1-u_2) : (u2 - u3) = (t_1-t_2) : (t_2+t_3)$ b) $(u_1-u_2) : (u2 - u3) = (t_1+t_2) : (t_2+t_3)$
c) $(u_1-u_2) : (u2 - u3) = (t_1-t_2) : (t_1t_3)$ d) $(u_1-u_2) : (u2 - u3) = (t_1-t_2) : (t_2-t_3)$

57. A convergent lens is one which
a) Collect rays b) Spreads rays c) Forms real image d) Forms virtual image

58. The liquid drop of density$\rho$, radius r and surface tension $\sigma$ oscillates with time period T. Which of the following expressions for $T^2$ is correct?
a) $\rho r^3/\sigma$ b) $\rho\sigma/r^3$ c) $r^3\sigma/\rho$ d) None of these

59. Heat added to a system is equal to:
a) a change in its internal kinetic energy b) a change in its internal potential energy
c) work done by it d) sum of above all the three factors

60. A magnifying glass of focal length 5 cm is used to view an object by a person whose smallest distance of distinct vision is 25cm. If he holds the glass close to eye, then the magnification is
a) 5 b) 6 c) 2.5 d) 3

61. If energy (E), velocity ($v$) and time (T ) were chosen as fundamental physical quantities for measurement, then the dimensional formula for mass will be:
a) $[E]^1[v]^2[T]^1$ b) $[E]^2[v]^{-2}[T]^0$ c) $[E]^1[v]^{-2}[T]^0$ d) $[E]^{-1}[v]^2[T]^1$

62. A linear aperture whose width is 0.02 cm is placed immediately in front of a lens of focal length 60 cm. The aperture is illuminated normally by a parallel beam of wavelength 5 x $10^{-5}$ cm. The distance of the first dark band of the diffraction pattern from the center of the screen is _____ .
    a) 0.10 cm  b) 0.25 cm  c) 0.20 cm  d) 0.15 cm
63. In thermodynamic processes which of the following statements is not true?
    a) In an isochoric process pressure remains constant
    b) In an isothermal process the temperature remains constant
    c) In an adiabatic process $PV^{\gamma}$ = constant
    d) In an adiabatic process the system is insulated from the surroundings
64. Two turning forks of frequencies $n_1$ and $n_2$ produces n beats per second. If $n_2$ and n are known, $n_1$ may be given by
    a) $\frac{n_2}{n} + n_2$  b) $n_2 n$  c) $n_2 \pm n$  d) $\frac{n_2}{n} - n_2$
65. A constant power P is applied to a particle of mass m. The distance travelled by the particle when its velocity increases from $v_1$ to $v_2$ is: (neglect friction)
    a) $\frac{3P}{m}(v_2^2 - v_1^2)$  b) $\frac{m}{3P}(v_2 - v_1)$  c) $\frac{3P}{m}(v_2^3 - v_1^3)$  d) $\frac{m}{3P}(v_2^2 - v_1^2)$
66. A small sphere of radius r falls from rest in a viscous liquid. As a result, heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity, is proportional to
    a) $r^5$  b) $r^2$  c) $r^3$  d) $r^4$
67. A particle starts its motion from rest under the action ola constant force. If the distance covered in first 10 seconds is $S_1$ and that covered in the first 20 seconds is $S_2$ then _____
    a) $S_2 = 3\,S_1$  b) $S_2 = 4\,S_1$  c) $S_2 = S_1$  d) $S_2 = 2\,S_1$
68. Which of the following statements is not correct?
    a) During rolling, the instantaneous speed of the point of contact is zero.
    b) During rolling, the instantaneous acceleration of the point of contact is zero.
    c) For perfect rolling motion, work done against friction is zero
    d)
    A wheel moving down a perfectly frictionless inclined plane will slip but not roll on the plane
69. Two wires are in unison. If the tension in one of the wires is increased by 2%, 5 beats are produced per second. The initial frequency of each wire is:
    a) 200 Hz  b) 400 Hz  c) 500 Hz  d) 1000 Hz
70. If two balls, each of mass 0.06 kg moving in opposite directions with speed 4 m/s collide and rebound with the same speed, then the impulse imparted to each ball due to other is:
    a) 0.48 kg-m/s  b) 0.24 kg-m/s  c) 0.81 kg-m/s  d) zero
71. If the ball is thrown towards the surface of the earth:
    a) the earth remains stationary while the ball moves downwards
    b) the ball remains stationary while the earth moves upwards
    c) the ball and the earth move towards each other
    d) the ball and the earth move away from each other

72. A sine wave has an amplitude A and wavelength $\lambda$. The ratio of particle velocity and the wave velocity is:$(2\pi A = \lambda)$
a) $\leq 1$ b) =1 c) $\geq 1$ d) none of these

73. The radius of a spherical nucleus as measured by electron scattering is 3.6 fm. What is the mass number of the nucleus most likely to be?
a) 27 b) 40 c) 56 d) 120

74. If the radius of a solid sphere is 35 cm, calculate the radius of gyration when the axis is along a tangent:
a) $7\sqrt{10}cm$ b) $7\sqrt{35}cm$ c) $\frac{7}{5}cm$ d) $\frac{2}{5}cm$

75. The current passing through a choke coil of 5 henry is decreasing at the rate of 2 ampere/sec. The e.m.f. developing across the coil is :
a) 10 V b) -10 V c) 2.5 V d) -2.5 V

76. Total internal reflection takes place when light is incident
a) on a concave mirror b) from air on a plan glass surface at a certain given angle
c) from air on a plan surface at any angle
d) from inside glass placed in water at a certain given angle

77. A ball is thrown upwards at a certain angle with the horizontal and it returns to the ground describing a parabolic path. Which of the following remains constant?
a) Momentum of the ball b) Kinetic energy of the ball
c) Vertical component of the velocity d) Honzontal component of the velocity

78. According to Newton's formula, the speed of sound in air at STP is
(Take the mass of 1mole of air is 29 x $10^{-3}$ kg)
a) 250 m $S^{-1}$ b) 260 m $S^{-1}$ c) 270 m $S^{-1}$ d) 280 m $S^{-1}$

79. A piece of wire is bent in the shape of a parabola $y = kx^2$ (y-axis vertical) with a bead of mass m on it. The bead can slide on the wire without friction. It stays at the lowest point of the parabola when the wire is at rest. The wire is now accelerated parallel to the x-axis with a constant acceleration a. The distance of the new equilibrium position of the bead, where the bead can stay at rest with respect to the wire, from the y-axis is
a) a/gk b) a/2gk c) 2a/gk d) a/4gk

80. A conductor of length 2 m carrying current 2 A is held parallel to an infinitely long conductor carrying current of 12 A at a distance of 100 mm, the force on small conductor is
a) 8.6 x $10^{-5}$ N b) 6.6 x $10^{-5}$ N c) 7.6 x $10^{-5}$ N d) 9.6 x $10^{-5}$ N

81. A particle of mass $10^9$ is kept on the surface of a uniform sphere of mass 100 kg and radius 10 cm. Find the work to be done against the gravitational force between them to take the particle far away from the sphere. (You may take G = 6.67 x $10^{-11}$ N-$m^2/kg^2$)
a) 6.67 x $10^{-9}$ J b) 6.67 x $10^{-10}$ J c) 13.34 x $10^{-10}$ J d) 3.33 x $10^{-10}$ J

82. The angular velocity of the body changes from $\omega_1$ to $\omega_2$ without applying torque but by changing moment of inertia. The initial radius of gyration to the final radius of gyration is:
a) $\omega_2 : \omega_1$ b) $\omega_2^2 : \omega_1^2$ c) $\sqrt{\omega_2} : \sqrt{\omega_1}$ d) $\frac{1}{\omega_2} : \frac{1}{\omega_1}$

83. A satellite which is geostationary in a particular orbit is taken to another orbit, the distance of which is twice that of earlier orbit. The time period of the satellite in the second orbit is:

a) 24 hrs b) 48 hrs c) $48\sqrt{2}$ hrs d) $\frac{48}{\sqrt{2}}$ hrs

84. A thermometer graduated according to linear scale reads a value t when in contact with boiling water and $\frac{t}{4}$ when kept in contact with ice. When the thermometer is in contact with an object it reads $\frac{t}{3}$ What is the temperature of the object in $^oC$?
a) 12 b) 12.12 c) 11.11 d) 11

85. A short pulse of white light is incident from air to a glass slab at normal incidence. After travelling through the slab, the first colour to emerge is
a) blue b) green c) violet d) red

86. Hydrogen atoms are excited from ground state of the principal quantum number 4. Then, the number of spectral lines observed will be:
a) 3 b) 6 c) 5 d) 2

87. Kepler's second law is a consequence of
a) conservation of energ b) conservation of linear momentum
c) conservation of angular momentum d) conservation of mass

88. A shell is fired from a gun with a muzzle velocity u m/sec at an angle $\theta$ with the horizontal. At the top of the trajectory the shell explodes into two fragments P and Q of equal mass. If the speed of the fragment P immediately after explosion becomes zero, where does the centre of mass of the fragments hit the ground?
a) $\frac{u^2 sin^2\theta}{g}$ b) $\frac{u^2 sin2\theta}{g}$ c) $\frac{u^2 sin^2\theta}{2g}$ d) $\frac{usin\theta}{g}$

89. Maxwell in his famous equations of electromagnetism introduced the concept of
a) ac current b) displacement current c) impedance d) reactance

90. An inductor may store energy in _____.
a) its electric field b) its coils c) it magnetic field d) Both in electric and magnetic fields

91. A rubber ball is dropped from a height of 5 m on a planet where the acceleration due to gravity is not known. On bouncing it rises to 1.8 m. The ball loses its velocity on bouncing by a factor of _____
a) 16 / 25 b) 2/5 c) 3 / 5 d) 9 / 25

92. The frequency of tuning fork A is 2% more than the frequency of a standard tuning fork. The frequency of a tuning fork B is 3% less than the frequency of same standard tuning fork. If 6 beats per second are heard when the two tuning forks A and B are excited, the frequency of A is:
a) 120 Hz b) 122.4 Hz c) 116.4 Hz d) 130 Hz

93. A vessel of area of cross-section A has liquid to a height H. There is a hole at the bottom of vessel having area of cross-section a. The time taken to decrease the level from $H_1$ to $H_2$ will be:
a) $\frac{A}{2}\sqrt{\frac{2}{g}}[\sqrt{H_2}-\sqrt{H_2}]$ b) $\sqrt{2gh}$ c) $\sqrt{2gh(H_1-H_2)}$ d) $\frac{A}{a}\sqrt{\frac{2}{g}}[\sqrt{H_1}-\sqrt{H_2}]$

94. A particle of mass m is circulating on a circle of radius r having angular momentum L; then the centripetal force will be:
a) $L^2/mr$ b) $L^2m/rL^2/mr^3$ c) $L^2/mr^3$ d) $L^2/mr^2$

95. The diagonals of a parallelogram are represented by vectors $\vec{P} = 5\hat{i} - 4\hat{j} + 3\hat{k}$ and $\vec{q} = 3\hat{i} + 2\hat{i} - \hat{k}$. Then the area of the parallelogram is:
a) $\sqrt{171}$ unit b) $\sqrt{72}$ unit c) 171 unit d) 72 unit

96. In an experiment it is found that the magnetic susceptibility of given substance is much more greater than one. The possible substance is
a) diamagnetic b) paramagnetic c) ferromagnetic d) nonmagnetic

97. The wavelength of the first line of Lyman series is 1215 $\mathring{A}$, the wavelength of first line of Balmer series will be
a) 4545 $\mathring{A}$ b) 5295 $\mathring{A}$ c) 6561 $\mathring{A}$ d) 6750 $\mathring{A}$

98. If $|\vec{A} \times \vec{B}| = \sqrt{3}\vec{A}.\vec{B}$ then the value of $|\vec{A} + \vec{B}|$ is:
a) $(A^2 + B^2 + AB)^{1/2}$ b) $(A^2 - B^2 + \frac{AB}{\sqrt{3}})^{1/2}$ c) (A+B) d) $(A^2 + B^2 + \sqrt{3}AB)^{1/2}$

99. If the value of force is 100 N and value of acceleration is 0.001 m $s^{-2}$ s, what is the value of mass in this system of units?
a) $10^3$ kg b) $10^4$kg c) $10^5$kg d) $10^6$kg

100. A body floats in water with one-third of its volume above the surface of water. If it is placed in oil, it floats with half of its volume above the surface of the oil. The specific gravity of the oil is:
a) $\frac{5}{3}$ b) $\frac{4}{3}$ c) $\frac{3}{2}$ d) 1 e) $\frac{3}{4}$

101. Which compound has planar structure?
a) $XeF_4$ b) $XeOF_3$ c) $XeO_2F_2$ d) $XeO_4$

102. Which of the following gases present in a polluted area will be adsorbed most easily on the charcoal gas mask?
a) $H_2$ b) $O_2$ c) $N_2$ d) $SO_2$

103. Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following statement is not true :
a) Dilute solutions of boric acid and hydrogen peroxide are strong antiseptics.
b) Disinfectants harm the living tissues.
c) A 0.2% solution of phenol is an antiseptic while 1% solution acts as disinfectant.
d) Chlorine and iodine are used as strong disinfectants.

104. Which of the following units is useful in relating concentration of solution with its vapour pressure?
a) Mole fraction b) Parts per million c) Mass percentage d) Molality

105. In balancing the half-reaction, $S_2O_3^{2-} \rightarrow S(s)$, the number of electrons that must be added is:
a) 2 on the right b) 2 on the left c) 3 on the right d) 4 on the left

106. A 10 It vessel contains He gas at 10 atm and TK. How many balloons of one litre capacity at 1 atm and 2TK can be filled by using the gas present in the cylinder:
a) 200 b) 190 c) 180 d) 170

107. What is the total number of inner transition elements in the periodic table?
a) 10 b) 14 c) 30 d) 28

108. Which of the compounds with molecular formula $C_5H_{10}$ yields acetone on ozonolysis?
a) 3-methane-1-butene b) cyclopentane c) 2-methyl-l-butene d) Cyclopentane

109. The pressure of $H_2$ required to make the potential of $H_2$ electrode zero in pure water at 298 K is :
a) $10^{-10}$ atm b) $10^{-4}$ atm c) $10^{-14}$ atm d) $10^{-12}$ atm

110. Which of the following elements has maximum electron affinity?
a) CL b) Br c) I d) F

111. Which one of the following is present as an active ingredient in bleaching powder for bleaching action?
a) $CaOCl_2$ b) $Ca(OCl)_2$ c) $CaO_2Cl$ d) $CaCl_2$

112. Atomicity of phosphorus is
a) one b) two c) three d) four.

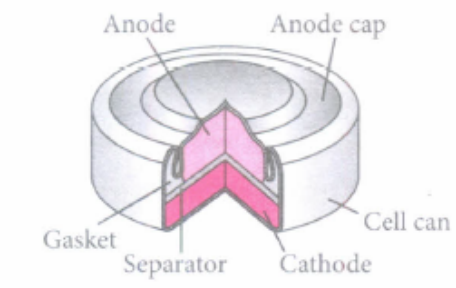
113. The lanthanides contraction refers to
a) radius of the series b) valence electrons of the series c) the density of the series
d) electronegativity of the series

114. The combination of two layers of opposite charges around the colloidal particle is called Helmholtz electrical double layer. The potential difference between the fixed layer and the diffused layer of opposite charge is called
a) electrode potential b) zeta potential c) adsorption potential d) diffused potential.

115. One word answers are given for the following. Mark the example which is not correct
a) Alkali metal with lowest melting point - Cs
b) Alkaline earth metal with highest hydration enthalpy - $Ba^{2+}$
c) Alkaline earth metal which imparts brick red colour to the flame - $Ca^{2+}$
d) Oxide of alkaline earth metal which is amphoteric in nature - BeO

116. Complete the following reactions.
(i) $MnO_4^- + 2H_2O + 3e^- \rightarrow \_\_\_ + 4OH^-$
(ii) $MnO_4^- + 8H^+ + 5e^- \rightarrow \_\_\_ + 4H_2O$
(iii) $MnO_4^- + e^- \rightarrow \_\_\_\_$
a) $MnO_2$, $Mn^{2+}$,$MnO_4^-$ b) $Mn^{2+}$, $MnO_2$,$MnO_4^-$ c) $MnO_4^-$,$Mn^{2+}$, $MnO_2$
d) $MnO_2$,$MnO_4^-$,$Mn^{2+}$

117. Which of the given statements for mercury cell are incorrect?




(i) Mercury cell is suitable for low current devices like hearing aids, watches, ete.
(ii) It consists of zinc-mercury amalgam as anode and a paste of HgO and carbon as the cathode.
(iii) The electrolyte is a paste of $Zn(OH)_2$ and $KO_2$.
(iv) The electrode reactions for the cell are
At anode: $Zn(Hg)+H_2O \rightarrow ZnO_{(s)}+2OH^- +2e^-$
At cathode: $HgO + H_2O+ 2e^- \rightarrow Hg_{(l)} + 2OH^-$

a) (ii) and (iii) only  b) (i) and (ii) only  c) (i), (iii) and (iv) only  d) (iii) and (iv) only

118. Assertion: Sulphuric acid reacts with sodium chloride in the following way:
$2NaCl+H_2SO_4 \longrightarrow 2HCl+Na_2SO_4$
Reason: Sulphuric acid because of its low volatility can be used to manufacture more volatile acids from their corresponding salts.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.  d) If both assertion and reason are false

119. Name of structure of silicates in which three oxygen atoms of $[SiO_4]^{4-}$ are shared is
a) pyrosilicate  b) sheet silicate  c) linear chain silicate  d) three dimensional silicate

120. The property of halogens which is not correctly matched is
a) F> Cl> Br > I (Ionisation energy)  b) F> Cl > Br > I (Electronegativity)
c) I> Br > Cl > F (Density)  d) F > Cl > Br > I (Electron affinity)

121. For the reaction $PCl_{5(g)} \rightleftharpoons PCl_{3(g)}+ Cl_{2(g)}$, the forward reaction at constant temperature is favoured by
a) introducing an inert gas at constant volume  b) introducing $Cl_2$ at constant volume
c) introducing inert gas at constant pressure  d) reducing the volume of the container

122. An element has the electronic configuration
$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$
What will be its position in the periodic table?
a) Period 4, Group 10  b) Period 2, Group 2  c) Period 4, Group 2  d) Period 2, Group 8

123. Given below are the spectral lines for an atom of hydrogen. Mark the lines which are not correctly matched with the value of $n_1$ and $n_2$?

| | Series | $n_1$ | $n_2$ | Region |
|---|---|---|---|---|
| (i) | Lyman | 1 | 2,3,.... | Ultraviolet |
| (ii) | Balmer | 2 | 3,4,.... | Infrared |
| (iii) | Paschen | 3 | 4,5,.... | Infrared |
| (iv) | Pfund | 4 | 5,6,... | Infrared |

a) (i) and (ii)  b) (i) and (iii)  c) only (iv)  d) (i) and (iv)

124. Which of the following elements will have highest ionisation energy?
a) $1s^2\ 2s^2\ 2p^6\ 3s^1$  b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$  c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$  d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

125. The rate of formation of a dimer in a second order dirnerisation reaction is $9.1 \times 10^{-6}$ mol $L^{-1}$ $s^{-1}$ at 0.01 mol $L^{-1}$ monomer concentration. What will be the rate constant for the reaction?
a) $9.1 \times 10^{-2}$ L $mol^{-1}$ $s^{-1}$  b) $9.1 \times 10^{-6}$ L $mol^{-1}$ $s^{-1}$  c) $3 \times 10^{-4}$ L $mol^{-1}$ $s^{-1}$
d) $27.3 \times 10^{-2}$ L $mol^{-1}$ $s^{-1}$

126. Which of the following pairs of isomers is not correctly matched with its type of isomerism?
a) $[Cr(NH_3)_6]$ $[Cr(CN)_6]$ and $[Cr(NH_3)_4(CN)_2]$ $[Cr(NH_3)_2(CN)_4]$ - Coordination isomerism
b) $[Co(NH_3)_5NO_2]Cl_2$ and $[Co(NH_3)_5ONO]Cl_2$ - Linkage isomerism

c) $[Co(py)_2(H_2O)_2Cl_2]Cl$ and $[Co(py)_2(H_2O)Cl_3]H_2O$ - Coordination isomerism

d) $[Pt(NH_3)_4Br_2]Cl_2$ and $[Pt(NH_3)_4Cl_2]Br_2$ - Ionisation isomerism

127. Match the column I with column II and mark the appropriate choice.

| Column I | | Column II | |
|---|---|---|---|
| (A) | $[Fe(CN)_6]^{3-}$ | (i) | Zero |
| (B) | $[CoF_6]^{3-}$ | (ii) | 5.92 B.M |
| (C) | $[Fe(H_2O)_6]^{3+}$ | (iii) | 4.89 B.M |
| (D) | $[Co(NH_3)_6]^{3+}$ | (iv) | 1.732 B.M |

a) $(A) \longrightarrow (ii), \quad (B) \longrightarrow (iii), \quad (C) \longrightarrow (iv), \quad (D) \longrightarrow (i)$

b) $(A) \longrightarrow (iii), \quad (B) \longrightarrow (ii), \quad (C) \longrightarrow (i), \quad (D) \longrightarrow (iv)$

c) $(A) \longrightarrow (i), \quad (B) \longrightarrow (iii), \quad (C) \longrightarrow (iv), \quad (D) \longrightarrow (ii)$

d) $(A) \longrightarrow (iv), \quad (B) \longrightarrow (iii), \quad (C) \longrightarrow (ii), \quad (D) \longrightarrow (i)$

128. Which of the following is an atom of tritium?

a) 

b) 

c) 

d) 


129. An aqueous solution is 1.00 molal in KI. Which change will cause the vapour pressure of the solution to increase?

a) Addition of NaCl b) Addition of $Na_2SO_4$ c) Addition of 1.00 molal KI

d) Addition of water

130. **Assertion:** $H_2O_2$ is stored in wax-lined glass or plastic vessels.

**Reason :** $H_2O_2$ decomposes slowly on exposure to light.

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

b)

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

c) If assertion is true but reason is false. d) If both assertion and reason are false.

131. When silicon is heated with $CH_3Cl$ at higher temperature in the presence of Cu

a) $CH_3SiCl_3 + (CH_3)_2SiCl_2$ obtained b) $(CH_3)_3$ SiCl is obtained c) $(CH_3)_4$ Si is obtained

d) a mixture of all of the above is obtained

132. Which of the following can possibly be used as analgesic without causing addiction and moon modification?

a) Diazepam b) Tetrahydrocationl c) Morphine d) N-Acetyl-para-aminophenol

133. The equilibrium constant for the reaction. Az ⇌2A at 500 K and 700K are $1 \times 10^{-10}$ and $1 \times 10^{-5}$.The given reaction is :

a) Exothermic b) Slow c) Endothermic d) Fast

134. The shortest C - C bond distance is found in:

a) acetylene b) diamond c) ethane d) benzene

135. Alkali metals cannot be extracted by reduction of their oxides and other compounds because:

a) alkali metals are strong reducing agents b) alkali metals have low ionisation enthalpy

c) alkali metals have high lattice enthalpy d) alkali metals are strongly basic in nature

136. In which pair of ions both the species contain S - S bond?

a) $S_4O_6^{2-}, S_2O_3^{2-}$ b) $S_2O_7^{2-}, S_2O_8^{2-}$ c) $S_4O_6^{2-}, S_2O_7^{2-}$ d) $S_4O_7^{2-}, S_2O_3^{2-}$

137. The Correct set of four quantum numbers for the valence electron of Rubidium (Z = 37) is
a) 5, 0, 0, +1/2 b) 5, 1, 0, +1/2 c) 5, 1, 1, +1/2 d) 6, 0, 0, +1/2

138. Consider the reaction: $2N_2O_4 \rightleftharpoons 4NO_2$ if $-\frac{d[N_2O_4]}{dt}$ =k and $\frac{d[NO_2]}{dt}$ =k' then
a) 2k'=k b) k'=2k c) k'=k d) k=$\frac{1}{4}$k'

139. Which of the following is employed as a tranquilizer?
a) Naproxen b) Tetracycline c) Chlorpheninamine d) Equanil

140. Which of the following pairs illustrates the law of multiple proportions?
a) $PH_3$,HCl b) PbO, $PbO_2$ c) $H_2S$,$SO_2$ d) $CuCl_2$,$CuSO_4$

141. Select the correct statement(s) about $H_3BO_3$
a) It has triangle $BO_3^{3-}$ units b) In solid states, molecules are hydrogen bonded
c) Both (a) and (b) are correct d) None of the above statements is correct

142. The velocity of an $e^-$ in excited state of H-atom is 1.093 x $10^6$ m/s. What is the circumference of this orbit?
a) 3.32 x $10^{-10}$m b) 6.64 x $10^{-10}$m c) 13.30 x $10^{-10}$m d) 13.28 x $10^{-8}$m

143. Identify the statement which is not correct.
a) Coordination compounds are mainly known for transition metals.
b) Coordination number and oxidation state of a metal are same
c) A ligand donates at least one electron pair to the metal atom to form a bond.
d) $[Co(NH_3)4Cl_2]^+$ is a heteroleptic complex.

144. For an $e^-$ in a hydrogen atom, the wave function $\Psi$.If is proportional to $e^{-(r/a_0)}$ where $a_0$ as Bohrs radius; what is the ratio of probability of finding the $e^-$ at the nucleus to the probability of finding it at $a_0$ the wave function is $\Psi = \frac{1}{\sqrt{\pi}}\left(\frac{1}{a_0}\right)^{3/2} e^{-(r/a_0)}$
a) e b) $e^2$ c) $1/e^2$ d) Zero

145. Set of elements with the following atomic numbers belong to the same group
a) 9, 16, 35, 3 b) 12, 20, 4, 38 c) 11, 19, 27, 5 d) 24, 47, 42, 55

146. The process of separation of a racemic modification into d and l-enantiomers is called.
a) resolution b) dehydration c) revolution d) dehydrogenation

147. Compared with the alkaline earth metals, the alkali metals exhibit
a) smaller ionic radii b) higher boiling points c) greater hardness
d) lower lonisation energies

148. The sharp melting point of crystalline solids is due to_____.
a)
a regular arrangement of constituent particles observed over a short distance in the crystal lattice
b)
a regular arrangement of constituent particles observed over a long distance in the crystal lattice.

c) same arrangement of constituent particles in different directions

d) different arrangement of constituent particles in different directions

149. The number of structural isomers possible from the molecular formula $C_3H_9N$ is _____.

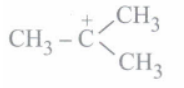
a) 4 b) 5 c) 2 d) 3

150. The interaction energy of London force is inversely proportional to sixth power of the distance between two interacting particles but their magnitude depends upon:

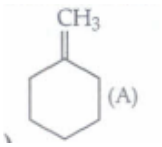
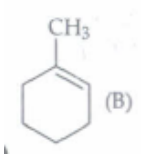
a) charge of interacting particles b) mass of interacting particles

c) polaris ability of interacting particles d) strength of permanent dipoles in the particles.

151. Hyperconjugation is not possible in:

a) $CH_3$-CH=$CH_2$ b) $CH_2$=$CH_2$ c)  d) $CH_3 - \underset{\underset{CH_3}{|}}{C} = \underset{\underset{CH_3}{|}}{C} - CH_3$

152. In the reaction with HCl, an alkene reacts in accordance with the Markovnikov's rule to give a product 1-chloro-1 methyl cyclohenxane. The possible alkene is:

a)  b)  c) (a) and (b) d) 

153. Which is the non-lanthanide element?

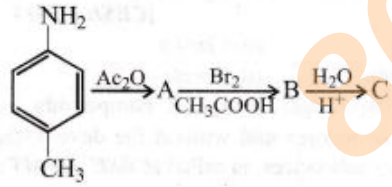
a) La b) Lu c) Pr d) Pm

154. Which statement about aspirin is not true?

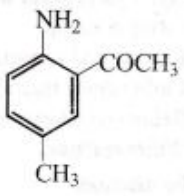
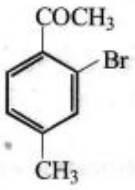
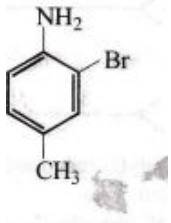
a) Aspirin belongs to narcotic analgesics b) It is effective in relieving pain.

c) It has antiblood clotting action d) It is a neurologically active drug

155. The final product C, obtained in this reaction



would be _____.

a)  b)  c)  d) 

156. In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M $MgCl_2$ solution is

a) the same b) about twice c) about three times d) about six times

157. In the reaction, $B_2O_3$+C+$Cl_2 \longrightarrow$ A+CO. The A is

a) $BCl_2$ b) $B_2Cl_2$ c) $CCl_2$ d) $BCl_3$

158. In context with beryllium, which one of the following statements is correct?

a) It is rendered passive by nitric acid. b) It forms $Be_2C$. c) Its salts rarely hydrolyze.
d) Its hydride is electron-deficient and polymeric.

159. The rate of a first order reaction is 0.04 mol $l^{-1}$ $s^{-1}$ at 10 seconds and 0.03 mol $l^{-1}s^{-l}$ at 20 seconds after initiation of the reaction. The half-life period of the reaction is:
a) 24.1 s b) 34.1 s c) 44.1 s d) 54.1 s

160. Assertion: White phosphorus is more reactive than red phosphorus.
Reason: It readily catches fire in air to give dense white fumes of $P_4O_{10}$.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

161. The type of hybridization of boron in diborane is
a) sp-hybridization b) $sp^2$-hybridization c) $sp^3$-hybridization d) $sp^3d^2$-hybridization

162. Which of the following is an analgesic?
a) Novalgin b) penicilin c) Streptornycin d) Chloromycetin

163. Which of the following is isoelectronic?
a) $CO_2$, $NO_2$ b) $NO_2^-$, $CO_2$ c) $CN^-$, CO d) $SO_2$, $CO_2$

164. The unit cell of aluminium is a cube with an edge length of 405 pm. The density of aluminium is 2.70 g $cm^{-3}$. What is the structure of unit cell of aluminium?
a) Body-centred cubic cell b) Face-centred cubic cell c) End-centred cubic cell
d) Simple cubic cell

165. Two atoms are said to be isobars if
a) they have same atomic number but different mass number
b) they have same number of electrons but different number of neutrons
c) they have same number of neutrons but different number of electrons
d) sum of the number of protons and neutrons is same but the number of protons is different

166. Which of the following is used to prepare $Cl_2$ gas at room temperature from concentrated HCI?
a) $MnO_2$ b) $H_2S$ c) $KMnO_4$ d) $Cr_2O_3$

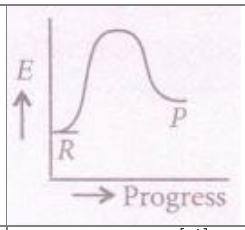
167. A helium atom at 300 K is moving with a velocity of $2.40 \times 10^2$ $ms^{-1}$. The de-Broglie wavelength is about [At. Wt. of He = 4.0]
a) 0.416 nm b) 0.83 nm c) 803 Å d) 8000 Å

168. Which of the following reactions does not involve the change in oxidation state of metal?
a) $VO^{-2} \rightarrow V_2O_3$ b) $K \rightarrow K^+$ c) $Cu^{2+} \rightarrow Cus$ d) $Cu^{2+} \rightarrow Cu$

169. Zn gives hydrogen with $H_2S0_4$ and HCI but not with $HNO_3$ because
a) Zn acts as oxidising agent when reacts with $HNO_3$
b) $HNO_3$ is weaker acid than $H_2SO_4$ and HCI
c) Zn is above the hydrogen in electrochemical series
d) $No_3^-$ is reduced in preference to $H^+$ ion.

170. Match the column I with column II and mark the appropriate choice.

| Column I | | Column II | |
|---|---|---|---|
| (A) | Zero-order | (i) | $\log\frac{k_2}{k_1} = \frac{E_a}{2.303R}\left[\frac{T_2-T_1}{T_1T_2}\right]$ |

| | | | |
|---|---|---|---|
| (B) | First-order | (ii) |   |
| (C) | Endothermic reaction | (iii) | k = $\frac{2.303}{t} log \frac{[A]_0}{[A]}$ |
| (D) | Activation energy | (iv) | k = $\frac{1}{t}$ ([A]$_0$-[A] |

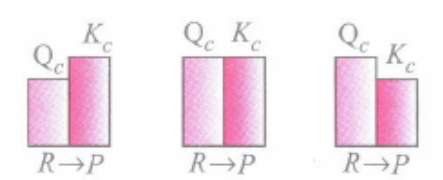
a) (A) ⟶ (iv), (B) ⟶ (iii), (C) ⟶ (ii), (D) ⟶ (i) b) (A) ⟶ (i), (B) ⟶ (ii), (C) ⟶ (iii), (D) ⟶ (iv)
c) (A) ⟶ (ii), (B) ⟶ (iii), (C) ⟶ (iv), (D) ⟶ (i) d) (A) ⟶ (iii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (ii)

171. Match the column I with column II and mark the appropriate choice

| Column I | | Column II | |
|---|---|---|---|
| (A) | $K_b$ | (i) | $\frac{K_b \times W_2 \times 1000}{\triangle T_b \times W_1}$ |
| (B) | $M_2$ | (ii) | $\frac{W_2 \times 1000}{M_2 \times W_1}$ |
| (C) | $\pi$ | (iii) | $\frac{RT_b^2}{1000 \times L_V}$ |
| (D) | m | (iv) | $\frac{\triangle T_b \times dRT}{1000 \times k_b}$ |

a) (A) ⟶(i), (B) ⟶ (iii), (C) ⟶ (ii), (D) ⟶ (iv) b) (A) ⟶ (iv), (B) ⟶ (ii), (C) ⟶ (i), (D) ⟶ (iii)
c) (A)⟶ (ii), (B)⟶ (iv), (C)⟶ (iii), (D)⟶ (i) d) (A) ⟶ (iii), (B) ⟶ (i), (C) ⟶ (iv), (D) ⟶ (ii)

172. Predict the direction of the reaction from the comparison of $Q_c$ and $K_c$ Mark the incorrect statement.




a) If $Q_c < K_c$ reaction goes from left to right. b) If $Q_c = K_c$ reaction goes from right to left.
c) If $Q_c > K_c$, net reaction goes from right to left.
d) If $Q_c = K_c$, reactants and products are at equilibrium.

173. If an element 'X' is assumed to have the types of radii, then their order is
a) Crystal radius> Van der waals radius> Covalent radius
b) van der waals radius > Crystal radius > Covalent radius
c) Covalent radius > Crystal radius > van der waals radius
d) Van der waals radius > Covalent radius > Crystal radius

174. 5.0 $cm^3$ of $H_2O_2$ liberates 0.508 g of iodine from an acidified KI solution. The strength of $H_2O_2$ solution in terms of volume strength at STP is
a) 6.48 volumes b) 4.48 volumes c) 7.68 volumes d) none of these.

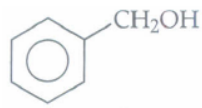
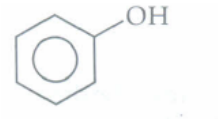
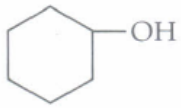
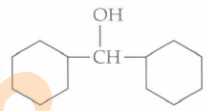
175. Graphics is a soft solid lubricant extreamly difficult to melt.The reason for this anomalous behaviour is that graphite:
a) is a non-crystalline substances b) is an allotropic form of diamond
c) has molecules of variable molecular masses like polymers
d)
has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds

176. The dissolution of ozone layer causes ozone hole in the blanket surrounding the atmosphere. What are the ill effects of ozone hole?
a) Greenhouse effect b) Global warming c) Acid rain d) UV rays reaching the earth

177. Propanone on reaction with alkyl magnesium bromide followed by hydrolysis will produce
a) primary alcohol b) secondary alcohol c) tertiary alcohol d) carboxylic acid

178. Which of the following is not an example of roasting?
a) $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$ b) $2PbS + 3O_2 \rightarrow 2PbO + 2SO_2$
c) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$ d) $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$

179. A pair of electrons present between two identical non-metals
a) is shifted to one of the atoms b) is shared equally between them
c) undergoes addition reactions d) have same spin.

180. Which of the following compounds has the most acidic nature?
a)  b)  c)  d) 

181. Which of the following reagents would distinguish cis-cyclopenta-1, 2-diol from the trans-isomer?
a) $MnO_2$ b) Aluminium isopropoxide c) Acetone d) Ozone

182. Which of the following elements does not show disproportionation tendency?
a) Cl b) Br c) F d) I

183. Assuming the molecules of gas as hard spheres of radius $2.0 \times 10^{-10}$ m the fraction of volume occupied by the molecules to the total volume of a given amount of gas at 27°C and at 1 bar pressure and 10 bar pressure respectively are:
a) 99.9%, 99% b) 0.082%, 0.82% c) 99%, 90% d) 11%, 10%

184. Choose the correct words to fill in the blanks. Pollutant is defined as, a substance or an agent which causes pollution. _____(i)_____ and _____(ii)_____ are chemical pollutants. Pollutants can be _____(iii)_____ which rapidly break down by _____(iv)_____ processes.

a)

| i | ii | iii | iv |
|---|---|---|---|
| Heavy metals | DDT | degradable | natural |

b)

| i | ii | iii | iv |
|---|---|---|---|
| Particulates | Heavy metals | non-degradable | artificial |

c)

| i | ii | iii | iv |
|---|---|---|---|
| non-degradable | petroleum | degradable | artificial |

d)

| i | ii | iii | iv |
|---|---|---|---|
| Micro-organisms | natural gas | non-degradable | natural |

185. The radius of hydrogen atom in the ground state is 0.53 A. one radius of $Li^{2+}$ ion (at no = 3) in a similar state is:
a) 0.17 A b) 0.53 A c) 0.265 A d) 1.06 A

186. The colour of the Coordination compounds depends on the crystal field splitting. What will be the correct order of absorption of wavelength of light in the visible region, for the complexes, $[Co(NH_3)_6]^{3+}$ , $[Co(CN)_6]^{3-}$, $[Co(H_2O)_6]^{3+}$?

a) $[Co(CN)_6]^{3-} > [Co(NH_3)_6]^{3+} > [Co(H_2O)_6]^{3-}$ b) $[Co(NH_3)_6]^{3+} > [Co(H_2O)_6]^{3+} > [Co(CN)_6]^{3-}$
c) $[Co(H_2O)_6]^{3+} > [Co(NH_3)_6]^{3+} > [CO(CN)_6]^{3+}$
d) $[Co(NH_3)6]^{3+} > [Co(CN)_6]^{3-} > [Co(H_2O)_6]^{3+}$

187. Biological Oxygen Demand (BOD) can be defined as:
a)
the amount of oxygen required by bacteria to break down the organic matter of a sample of water
b) the amount of chemicals required to break down the organic matter of a sample of water
c) the amount of phosphate required to oxidise the organic matter of a sample of water
d) the amount of organic matter present in the given sample of water.

188. Which of the following statements is not correct?
a) Only α-amino acids are obtained on hydrolysis of proteins.
b)
The amino acids which are synthesised in the body are known as non-essential amino acids.
c) There are 20 essential amino acids.
d) L-amino acids are represented by writing the $NH_2$ group on the left side.

189. When sand is heated with hydrofluoric acid and a wet rod is brought in contact with vapours evolving a white deposit is due to
a) $SiF_4$ b) $SiF_2$ c) $H_4SiO_4$ d) None of these

190. An element X has atomic number 19. What will be the formula of its oxide?
a) $X_2O$ b) XO c) $XO_2$ d) $X_2O_3$

191. During the formation of a molecular orbital from atomic orbital, the electron density is:
a) minimum in nodal plane b) maximum in nodal plane c) zero in the nodal plane
d) zero on the surface of lobe

192. Mercury is a liquid metal because
a) it has a completely filled d-orbital that prevents d-d overlapping of orbitals
b) it has a completely filled d-orbital that causes d-d overlapping
c) it has a completely filled s-orbital d) it has a small atomic size

193. Which of the following electron transistions in hydrogen atom will require largest amount of energy?
a) From n = 1 to n = 2 b) From n = 1 to n =3 c) From n = 2 to n =1
d) From n = 3 to n =4

194. The anion $(Si_6O_{18})^{12-}$ is present in
a) pyroxene b) beryl c) mica d) albite e) asbestos

195. A buffer solution is prepared in which the concentration of $NH_3$ is 0.30 M and the concentration of $NH_4^+$ is 0.20 M. If the equilibrium constant, $K_b$ for $NH_3$ equals $1.8 \times 10^{-5}$, what is the pH of this solution?
a) 9.08 b) 9.43 c) 11.72 d) 8.73

196. $KMnO_4$ acts as an oxidising agent in alkaline medium. When alkaline $KMnO_4$ is treated with KI, iodide ion is oxidised to
a) $I_2$ b) $IO^-$ c) $IO_3^-$ d) $IO_4^-$

197. Which statement about energy level in H-atom is correct?
a) Only n and l decide energy level b) Only l decides energy level
c) Only n decides energy level d) n, l and m decide energy level

198. The RMS velocity of an ideal gas at 300 K is 12240 cm/see, then its most probable velocity in cm/see at the same temperature is:
a) 10000 b) 11280 c) 1000 d) 12240

199. **Assertion:** Scientific notation for the number 100 is expressed as $1 \times 10^2$.
**Reason:** The number $1 \times 10^2$ has two significantfigures.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

200. In face-centred cubic lattice, a unit cell is shared equally by how many unit cell?
a) 2 b) 4 c) 6 d) 8

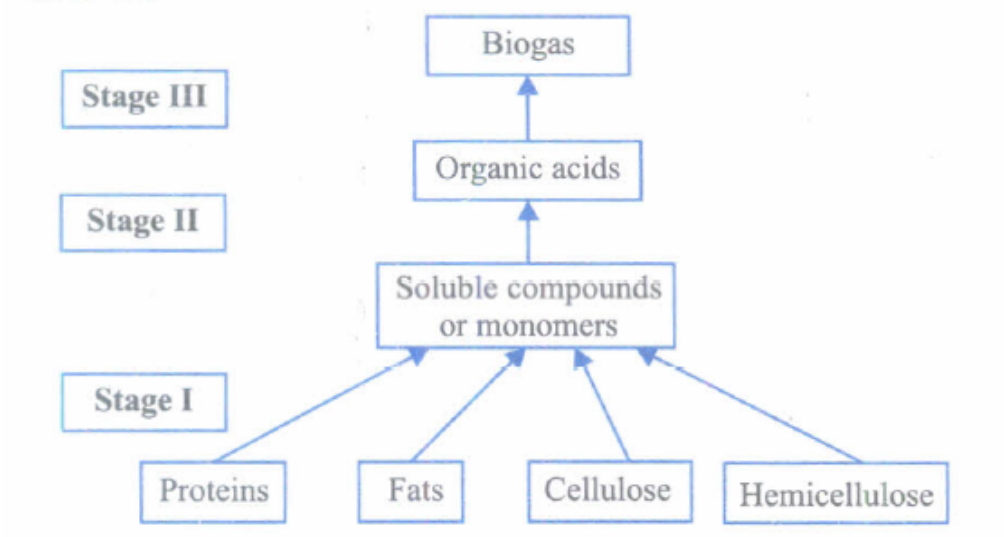
201. Given below are the three statements each with one or two blanks. Select the option which correctly fills up the blank in any two statements.
A. Inbreeding helps in accumulation of ___(i)_____and elimination of ____(ii)_____.
B. In MOET a cow is administered hormones, with _____(i)____ Like activity, to induce follicular maturation and super ovulation.
C. Hisardale is a new breed of sheep developed in Punjab by crossing ____(i)___and ___(ii)_____.
A - (i) less desirable genes, (ii) superior genes
a) B - (i) FSH
A - (i) superior genes, (ii) less desirable genes B - (i) LH
b) C - (i) Bikaneri ewes (ii) Marino rams c) C - (i) Sahiwal ewes, (ii) Deoni rams
B - (i) progesterone
d) C - (i) Kankrej ewes, (ii) Dangi rams

202. The prickly pear cactus became unusually abundant after its introduction in Australia, because it
a) had no coevolved herbivores b) formed new mycorrhizal association c) lost its thorns
d) all of these

203. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
**Assertion**: Human beings have two sets of teeth during their life.
**Reason**: Human beings have thecodont dentition.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false.

204. If a colour blind man marries woman who is homozygous for normal colour vision, the probability of their son being colour blind is.
a) 1 b) 0 c) 0.5 d) 0.75

205. Biogas generation is a three stage anaerobic digestion of animal and other organic wastes. Study the following flow chart and select the correct option for stages I, II and III




a)
In stage - I, anaerobic microorganisms bring about enzymatic breakdown of complex organic compounds into simple soluble compounds or monomers.
b)
In stage - II, monomers are converted into organic acids by fermentation causing microbes.
c) In stage - III, organic acids are acted upon by methanogenic bacteria to produce biogas.
d) All of these.

206. In the textbook you came across Three Mile Island and Chernobyl disasters associated with accidental leakage of radioactive wastes. In India we had Bhopal gas tragedy. It is associated with which of the following?
a) $CO_2$ b) Methyl Isocyanate c) CFC's d) Methyicyanate

207. Senescence as an active developmental cellular process in the growth and functioning of a flowering plant, is indicated in___
a) vessels and tracheid differentiation b) leaf abscission c) annual plants d) floral parts

208. If the filaments are fused in a single group the condition is
a) Monoadelphous b) Polyadelphous c) Both 1 & 2 d) Diadelphous

209. Algin is phycocolloid , obtained form the cell wall of
a) Polysiphoina and Porphyra b) Gelidium and Laminaria c) Microcystis and Volvox
d) Focus and Dictyota

210. Match the column I to column II

| **Column I** | **Column II** |
|---|---|
| (A) Mango | (i) Cotyledons & peduncle |
| (B) Strawberry | (ii) Mesocarp |
| (C) Cashew nut | (iii) Endosperm |
| (D) Coconut | (iv) Thalamus |

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

211. Protein synthesis in an animal cell takes place _____ .
a) Only in cytoplasm b) In the nucleolus as well as in the cltoplasm
c) In the cytoplasm as well as in mitochondria d) Only on ribosomes attached to nucleus

212. Assertion: Prolonged intraspecific competition cause an increase in the size of the niche of a population.
Reason : In such a population, use of a new type of resource will increase through the generations.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

213. As they release hydrolase that digest old and damaged cells, the term suicide bags is aptly used by cell biologists for
a) Golgi bodies b) lysosomes c) glyoxysomes d) peroxisomes.

214. Find the correct match w.r.t plant and its family
a) Colochicine - Lilliaceae b) Chilli - Brassicaceae c) Mulethi - Solanaceae
d) Capsella - Fabaceae

215. Plants with ovaries having only one or a few ovules are generally pollinated by:
a) bees b) butterflies c) birds d) wind

216. The first carbon dioxide acceptor in $C_4$- plants is _____ .
a) phosphoenol-pyruvate b) ribulose 1, 5-diphosphate c) oxalo acetic acid
d) phosphoglyceric acid

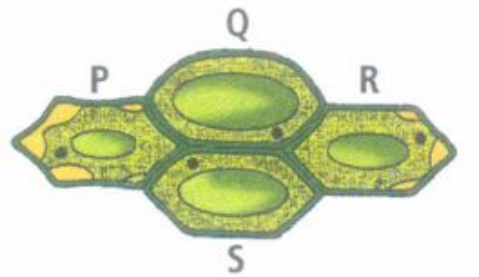
217. In grass-deer-tiger food chain, grass biogass is one tonne. The tiger biomass shall be _____.
a) 100 kg b) 10 kg c) 200 kg d) 1 kg

218. After meiosis - I the two chromatids of a chromosome are ;
a) Gnetically similar b) Gnetically different
c) There occurs only one chromatld in each chrmosome d) None of the above

219. Acquired Immuno Deficiency Syndrome [AIDS]. Which diagnostic technique will you recommend doe its detection?
a) ELISA b) MRI c) Ultrasound d) WIDAL

220. Meristem is characterised by
a) Isodiametric cells with cellulosic thin wall b) Absence of intercellular space and vacuole
c) Absence of reserve food material, plastids and ER d) All of these

221. Which out of the four plant cells (P, Q, R and S) would not exhibit any wall pressure?




a) P and Q b) Q and S c) P and R d) R and S

222. Select the wrong statement with respect to glycolysis.
a) It occurs outside mitochondria. b) It is an anaerobic phase.
c) Glucose undergoes partial oxidation to form 2 molecules of pyruvic acid.

d) Glucose is phosphorylated to glucose-6-phosphate by isomerase enzyme.

223. Which one of the following is heterosporous?
a) Adiantum b) Equisetum c) Dryopteris d) Salvinia

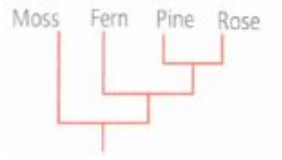
224. Ozone layer of upper atmosphere is being destroyed by:
a) Sulphurdioxide b) Carbondioxide c) Chlorofluorocarbon d) Smog

225. It can be said that some animals in their evolutionary development preferred to be conformers than regulators.
Which of the following can be the best suited reason for it?
a)
The metabolic reactions of these organisms can occur at a very wide range of temperature.
b) Maintaining homeostasis is an energetically expensive process.
c) The enzymes of these organisms are functional at high-temperatures.
d) Both (b) and (c)

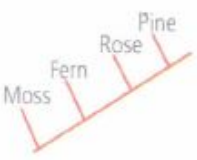
226. Vagus nerve effects
a) voice production b) peristalsis c) respiratory movements d) all of these.

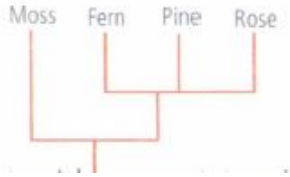
227. Capacitation refers to changes in the _____
a) Orum before fertilisation b) Orum after fertilisation c) Sperm after fertilisation
d) Sperm before ferlilisation

228. A phylogenetic tree or evolutionary tree is a branching diagram showing the inferred evolutionary relationships among various biological species. Which of the following phylogenies is correctly represented?

a) 

b) 

c) 

d) 


229. The statements given below shows some characteristics of a phylum. Identify it.
(i) Tissue absent
(ii) Internal fertilisation
(iii) Development is indirect
(iv) Spongocoelate with ostia (many) and single osculum and canal system
(v) Sexes are hermaphrodite.
a) Cnidaria b) Porifera c) Platyhelminthes d) Ctenophora

230. Read the given statements and select the correct option.
Statement 1: Net primary productivity is less than the gross primary productivity.
Statement 2: Net primary productivity is equal to the gross primary productivity minus the respiration losses.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect.

231. Rhizoids of hepaticopsida and anthoceotopsida are:-

a) Multicellular and branched b) Unicellular and unbranched c) Unicellular and branched
d) Multicellular and unbranched

232. Match column I with column II and select the correct option from the given codes.

| Column I | Column II |
|---|---|
| A. Dihybrid test cross | (i) 9: 3: 3: 1 |
| B. Law of segregation | (ii) Dihybrid cross |
| C. Law of independent assortment | (iii) 1: 1: 1: 1 |
| D. ABO blood group in man | (iv) Purity of gametes |
| | (v) Multiple allelism |

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

233. Synthesis of complex organic substances from simple inorganic raw materials in the presence of sunlight and chlorophyll is called as _____, which is a _____ process.
a) photosynthesis, anabolic b) photosynthesis, catabolic c) respiration, anabolic
d) respiration, catabolic

234. Read the given statements
(i) Outer exine is made up of sporopollenin.
(ii) Inner intine is pecto-cellulosic in nature.
(iii) Generative cell is bigger and contains abundant food reserve.
(iv) Vegetative cell is small and floats in the cytoplasm of the generative cell.
Which of the given statements are not true regarding structure of pollen grain?
a) (i) and (ii) b) (ii) and (iii) c) (iii) and (iv) d) (i) and (iv)

235. In the following question, a statement of assertion is followed by a statement of reason.
Mark the correct choice as :
**Assertion:** Auxin was isolated by F.W.Went from the tips of coleoptiles of wheat seedlings.
**Reason:** Ethylene delays the senescence.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false

236. Dental formula in human beings is
a) $\frac{3223}{3223}$ b) $\frac{2123}{2123}$ c) $\frac{1232}{1232}$ d) $\frac{2233}{2233}$

237. What is the characteristics of tapetum?
a) It stored food b) It is multinucleated c) It is multi layered structure
d) It nourishes the megaspore

238. Assertion : The alternate type of phyllotaxy is the arrangement of leaves in which a single leaf arises at each node in alternate manner
Reason: The alternate type of phyllotaxy is seen in China rose and mustard plant
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

239. Rate limiting material in biogas production is:

a) Methane b) Cellulose c) Starch d) Acetic acid

240. The main difference between gram ⊕ and gram Θ resides in the composition of:-
a) Cilia b) Cell-wall c) Cell-membrance d) Cytoplasm

241. Which of the following options shows the correct measurements of an adult human kidney?

a)

| Length | Width | Thickness | Weight |
|---|---|---|---|
| 10-12 cm | 5-7 cm | 2-3 cm | 120-170 9 |

b)

| Length | Width | Thickness | Weight |
|---|---|---|---|
| 10-20 cm | 10-12 cm | 6-12cm | 40-50 9 |

c)

| Length | Width | Thickness | Weight |
|---|---|---|---|
| 2-6 cm | 8-10 em | 5-10 cm | 60-70 9 |

d)

| Length | Width | Thickness | Weight |
|---|---|---|---|
| 10-12 mm | 5-7 mm | 2-3 mm | 120-170 mg |

242. Mark the pair of substances among the following which is essential for coagulation of blood:
a) Heparin and calcium ions b) Calcium ions and platelet factors c) Oxalates and citrates
d) Platelet factors and heparin

243. Which statement is true for WBC?
a) Non-nucleated b) Its deficiency causes cancer c) Manufactured only in thymus
d) Can squeeze through blood capillaries

244. The mass of living material at a trophic level at a particular time is called _____.
a) Standing state b) Net primary productivity c) Standing crop
d) Gross primary productivity

245. Bacillus thuringiensis (Bt) strains have been used for designing novel
a) biofertilisers b) bio-metallurgical techniques c) bio-mineralisation process
d) bio-insecticidal plants.

246. How many chromosome shall be present in a diploid cell at mitotic anaphse if its egg cell has ten chromosome;
a) 10 (ten) b) 20 (twenty) c) 30 (thirty) d) 40 (Forty)

247. The cyanobacteria are also referred to as:-
a) Slime moulds b) Blue green algae c) Protists d) Golden algae

248. Which one of the following microorganisms forms symbiotic association with plants and helps them in their nutrition?
a) Glomus b) Azotobacter c) Klebsiella d) Azospirillum

249. **Assertion:** New names in binomial nomenclature are derived from Latin or are latinised.
**Reason:** Latin is a technical language.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

250. The structural and functional unit of myofibril which contracts to cause movement is called
a) Sarcolemma b) Sarcomere c) Fascia d) Myosin

251. Which of the following is correct regarding jaundice?
a) Skin turns yellow b) Eyesturn yellow c) Liver gets affected d) All of these

252. Which of the following is an occupational respiratory disorder?
a) Botulism b) Silicosis c) Anthracis d) Emphysema

253. Terminalization is related to
a) Diakinesis b) Zygotene c) Leptotene d) Pachytene

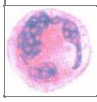
254. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage of male children of this couple will be colour blind?
a) 25 % b) 0% c) 50% d) 75%

255. Which one of the following cell organelles is enclosed by a single membrane?
a) Nucleus b) Mitochondria c) Chloroplasts d) Lysosomes

256. How many quanta are required to reduce one molecule of $CO_2$ and produce one molecule of $O_2$ in green plant photosynthesis?
a) 1 b) 8 c) 16 d) 32

257. Consider the following statements (A-C) each with one or two blanks.
(A) __(i)__are the most abundant cells (60-65 percent) of the total WBCs and ill are the least (0.5-1 percent) among them.
(B) Platelets are cell fragments produced from__(3)__
(C) During clot formation, fibers are formed by the conversion of inactive_(4)_in the plasma by the enzyme _(5)__
Which one of the following options, gives the correct fill ups for the respective blank numbers from (1) to (5) in the statements.
a) (1)-Neutrophils, (2)-basophils, (4)-fibrinogens, (5)-thrombin
b) (3)-mast cells, (4)-thrombokinase, (5)-prothrombin
c) (3)-megakaryocytes, (4)-prothrombin, (5)-thrombin
d) (1)-Basophils, (2)-neutrophils, (3)-reticulocytes

258. Which of the following match is correct?
a)

| Structure | Percentage | Function |
|---|---|---|
|  | 0.3 -0.5 | Phagocytic |

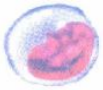
b)

| Structure | Percentage | Function |
|---|---|---|
|  | 0.5 - 1.0 | Secrete histamine and serotonin |

c)

| Structure | Percentage | Function |
|---|---|---|
|  | 30-40 | Defence against parasites |

d)

| Structure | Percentage | Function |
|---|---|---|
|  | 30-40 | Allergic reactions |

259. The most common indicator organism that represents polluted water is _____.
a) E.coli b) P. typhi c) C. vibrio d) Entamoeba

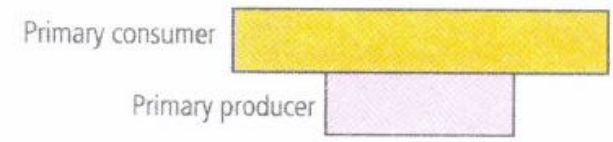
260. Which of the following is the least likely to involved in stabilizing the three-dimensional for most proteins?
a) Hydrophobic interaction b) Ester bonds c) Hydrogen bonds
d) Electrostatic interaction

261. Perisperm is present in
a) Beet b) Black papper c) Both 1 & 2 d) All angiosperms

262. Secondary xylem and phloem in dicot stem are produced by:
a) Phellogen b) Vascular cambium c) Apical meristems d) Axillarymeristems

263. Cauliflower mosaic virus contains _____ .
a) ss RNA b) ds RNA c) ds DNA d) ss DNA

264. Which kind of pyramid is represented by the given figure?




a) Pyramid of numbers in terrestrial ecosystem
b) Pyramid of biomass in terrestrial ecosystem
c) Pyramid of biomass in aquatic ecosystem d) Pyramid of numbers in aquatic ecosystem

265. **Assertion:** Breeding, weeding, feeding and heeding are essential methods for livestock production.
**Reason:** Livestock management deals with processes and systems that increase yield and improve quality of products.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

266. Assertion: Type 'O' blood group individuals are called 'universal donors'.
Reason: RBCs of 'O' blood group have both 'A' and 'B' surface antigens.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertionand reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

267. The "seaweeds" that form the under water forest are:
a) kelps b) Laminaria c) Macrocystis d) all of these.

268. Which pollutant exhibits biomagnfication in food chain -
a) DDT b) $SO_2$ c) CO d) PAN

269. Warm ocean surge of the peru current recurring every 5 to 8 year or so in the East pacific of South America is widely known as _____ .
a) Magnox b) Gull srream c) El Nino d) Aye Aye

270. First biosphere reserve was established in 1986 at
a) Nilgiri b) Nanda Devi c) Rann of Kutch d) Sunderbans.

271. How many copies of DNA sample are produced in PCR technique after 6- cycle:
a) 4 b) 32 c) 6 d) 16

272. Olfactory receptors are present in
a) eye b) nose c) ear d) skin

273. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme?
a) Fungi-Chitinase b) Bacteria-Lysozyme c) Plant cells-Cellulase d) Algae-Methylase

274. Which part of the coconut produces coir?
a) Seed coat b) Mesocarp c) Epicarp d) Pericarp

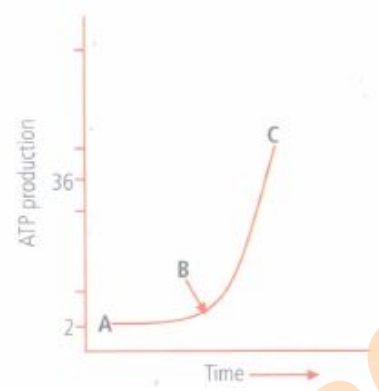
275. Yeast is used in the production of:-
a) Bread and beer b) Cheese and butter c) Citric acid and lactic acid
d) Lipase and pectinase

276. Vexillary aestivation is characteristic of the family _____ .
a) Fabaceae b) Asteraoeae c) Solanaceae d) Brassicaceae

277. The sympathetic nerves, in mammals arise from _____
a) sacral neryes b) cervical nerves c) thoraco-lumbar nerves
d) III, VII, IX and X cranial nerves

278. Which of the following statements is not correct regarding the Class Ascomycetes?
a) Conidia are the asexual spores produced endogenously on conidiophores.
b) Ascospores are the sexual spores produced endogenously in asci.
c) Aspergillus, Neurospora and Claviceps are Ascomycetes fungi.
d) Mycelium is generally branched and septate in Ascomycetes.

279. Animal cells are suspended in a culture medium that contains excess glucose. The graph below shows glucose utilisation under different growth conditions. (A), (B), and (C) in the graph indicate.




A - Anaerobic respiration
B - Introduction of $O_2$ to culture medium
a) C - Aerobic respiration

A - Aerobic respiration
B - Introduction of $CO_2$ to culture medium
b) C - Anaerobic respiration

A - Aerobic respiration
B - Supply of organic triphosphate
c) C - Aerobic respiration

A - Aerobic respiration
B - Introduction of CO to culture medium
d) C - Anaerobic respiration

280. Following is a list of the events (in a random order) that lead to the formation of an auditory impulse.
(i) Vibration is transferred from the malleus to the incus to the stapes.
(ii) Basilar membrane moves up and down.
(iii) Nerve impulse is transmitted in cochlear nerve to auditory cortex of brain for impulse analysis and recognitions.
(iv) Sound waves pass through ear canal.
(v) Stereocilia of hair cells of organ of Corti rub against tectorial membrane.
(vi) Sound waves cause ear drum to vibrate.
(vii) Nerve impulse is generated.

(viii) Vibrations move from fluid of vestibular canal to the fluid of tympanic canal.
(ix) Membrane at oval window vibrates.
Which of the following options represents these events in a correct order?
a) (iv). (vi), (i), (ix), (viii), (ii), (v). (vii), (iii) b) (i), (ii), (iii), (iv), (v). (vi), (vii), (viii), (ix)
c) (ix), (viii), (vii), (vi), (v). (iv), (iii), (ii), (i) d) (iv), (vi), (i), (viii), (ix), (ii), (v). (vii), (iii)

281. Select the correct match.
a) Matthew Meselson and F. Stahl : pisum satirum
b) Alfred Hershey TMV and Martha Chase c) Alec Jefffeys : Streptococcus pneumoniae
d) Francois Jacob and Jacques Monod : Lac operon.

282. Due to discovery of which of the following in 1980 the evolution was termed as RNA world?
a) mRNA, tRNA, rRNA synthesise proteins b) In some virus RNA is genetic material
c) RNA have enzymatic Property d) RNA is not found in all cells

283. Which of the following is not found in birds?
a) Hind limb b) Pectoral girdle c) Pelvic girdle d) Fore limb

284. Select one of the following pairs of important features distinguishing Gnetum from Cycas and Pinus and showing affinities with angiosperms:-
a) Perianth and two integuments b) Embryo development and apical meristem
c) Absence of resin duct and leaf venation
d) Presence of vessel elements and absence of archegonia

285. Select the incorrect pair
a) 2-carbon compound - Aspartic acid b) 3-carbon compound - PGA
c) 4-carbon compound - Malic acid d) 5-carbon compound - RuBP

286. Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition?
a) Glomus b) Trichoderma c) Azotobacter d) Aspergillus

287. What would happen if you forget to add cytokinin to the culture medium?
a) Callus will not develop shoot buds b) Callus will not develop root buds
c) Callus will stop differentiating d) Both (a) and (b)

288. Ribosomes are the centre for _____ .
a) Respiration b) Photosynthesis c) Protein synthesis d) Fat synthesis

289. Location and secretion of Leydig's cells are _____ .
a) liver - cholesterol b) ovary - estrogen c) testis - testosterone d) pancreas - glucagon

290. Meristematic tissues are composed of
a) mature cells b) fully differentiated cells c) cells that cannot divide
d) immature cells with power to divide.

291. Read the following statements.
(i) In Limnophila heterophylla, the lamina of submerged leaves is very much dissected while the lamina of aerial leaves is entire. This variation in the form of lamina is referred to as _____
(ii) Potato tubers, when exposed to light, turn green due to the increased production of a glycoalkaloid named _____
(iii) In_____,ovary arises from the bottom of the cup-shaped thalamus and

androperianth arises from the rim of the cup-shaped thalamus

(iv) Underground stems can be differentiated from roots by_____of axillary buds on the nodes. Select the correct fill-ups out of the following for the above statements

a)

| (i) | (ii) | (iii) | (iv) |
|---|---|---|---|
| developmental heterophylly | solanine | Rosa | presence |

b)

| (i) | (ii) | (iii) | (iv) |
|---|---|---|---|
| environmental heterophylly | solanine | Prunus | presence |

c)

| (i) | (ii) | (iii) | (iv) |
|---|---|---|---|
| environmental heterophylly | chlorophyll | Prunus | absence |

d)

| (i) | (ii) | (iii) | (iv) |
|---|---|---|---|
| adaptive heterophylly | lycopene | Cucurbita | absence |

292. When a plant have two alleles of contrasting characters it is called

a) Homazygous b) Dioecious c) Heterozygous d) Monoecious

293. During photorespiration, the oxygen consuming reaction(s) occur in_____

a) stroma of chloroplasts and peroxisomes b) grana of chloroplasts and peroxisomes

c) stroma of chloroplasts d) stroma of chloroplasts and mitochondria

294. Crypts of Lieberkuhn are present in

a) pancreas and secrete pancreatic juice b) small intestine and secrete digestive enzymes

c) stomach and secrete dilute HCl d) stomach and secrete trypsin

295. The Nobel Laureate, who developed semi-dwarf wheat varieties in Mexico was

a) Norman E. Borlaug b) Herbert Boyer c) William Harvey d) Typhoid Mary

296. Ecology is basically concerned with how many levels of biological organisation?

a) Three b) Four c) Two d) Five

297. In Bougainvillea, weak stems rise up a support by clinging to it with the help of curved thorns, such plants are called as

a) tendrils b) hooks c) offsets d) scramblers.

298. Which one of following does not follow the central dogma of molecular bilogy?

a) Chlamydomonas b) HIV c) Pea d) Mucor

299. Bundle of His is a part of which one of the following organs in human?

a) Brain b) Heart c) Kidney d) Pancreas

300. Which of the following is the primary absorptive process in the large intestine?

a) Active transport of Na+ from the lumen to the blood

b) Absorption of amino acids and fructose

c) Active transport of potassium from the lumen to the blood

d) Active absorption of $HCO_3^-$ into the blood

301. Wastewater treatment generates a large quantity of sludge, which can be treated by

a) anaerobic digesters b) floc c) chemicals d) oxidation pond

302. Which one from those given below is the period for Mendel's hybridisation experiments?
a) 1856-1863 b) 1840-1850 c) 1857-1869 d) 1870-1877

303. Which one is a wrong statement?
a) Brown algae have chlorophyll a and c, and fucoxanthin
b) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms
c) Mucor has biflagellate zoospores
d) Haploid endosperm is typical feature of gymnosperms

304. Bt toxins are
a) intracellular lipids b) intracellular crystalline proteins c) extracellular crystalline proteins
d) intracellular polysaccharides

305. Translocation of carbohydrate nutrients usually occurs in the form of_____
a) glucose b) maltose c) starch d) sucrose

306. Assertion: Green revolution was comparatively less effective in developing world where farmers were dependent on conventional breeding.
Reason: In developing world, inability to buy expensive agro-chemicals forced farmers to rely on conventional breeding.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

307. pulvinus lef base is the feature of
a) Mimosa b) glorisa c) Solanum d) Banana

308. Inducible operon system usually occurs in_____(i)_____pathways. Nutrient molecules serve as_____(ii)_____to stimulate production of the enzymes necessary for their breakdown. Genes for inducible operon are usually switched_____(iii)_____and the repressor is synthesised in an_____(iv)_____form.

a)

| **(i)** | **(ii)** | **(iii)** | **(iv)** |
|---|---|---|---|
| anabolic | corepressor | on | inactive |

b)

| **(i)** | **(ii)** | **(iii)** | **(iv)** |
|---|---|---|---|
| anabolic | inducer | off | active |

c)

| **(i)** | **(ii)** | **(iii)** | **(iv)** |
|---|---|---|---|
| catabolic | inducer | off | active |

d)

| **(i)** | **(ii)** | **(iii)** | **(iv)** |
|---|---|---|---|
| catabolic | corepressor | on | inactive |

309. **Assertion:** Coenzyme nicotinamide adenine dinucleotide (NAD) and NADP contain a vitamin.
**Reason:** The association of co-enzyme with apoenzyme is enduring.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

310. Study the following statements regarding the preparation of herbarium sheets.
(i) Plant should be collected in flowering stage.
(ii) Every detail regarding the plant such as locality, ecological conditions, vegetative and floral characters, etc. should be noted.
(iii) Plants are evenly pressed by unfolding all the plant parts between blotting papers (or newspapers) with the help of plant pressers.

(iv) Blotting papers need not be changed until the plant gets dried.
(v) After drying, the plant specimen is carefully mounted! pasted on the herbarium sheets.
(vi) The herbarium sheet is labelled on the lower right hand corner representing the number of plant specimen, date of collection, etc.
Which of the above statements is/are not correct?
a) (i) only b) (iv) only c) (i) and (iv) d) (iii) and (iv)

311. Tumor including plasmid transforms
a) Nematodes b) Bacteria c) Fungi d) Several dicot plants

312. Placentation of mustard plant is
a) Parietal b) Axial c) Basal d) Marginal

313. Select the wrong statement.
a) Bacterial cell wall is made up of peptidoglycan.
b) Pili and fimbriae are mainly involved in motility of bacterial cells.
c) Cyanobacteria lack flagellated cells. d) Mycoplasma is a wall-less micro-organism.

314. Haldane effect plays more important role in promoting carbon dioxide transport than that of the Bohr's effect in promoting oxygen transport because
a)
oxyhaemoglobin is a stronger acid which donates hydrogen ion ($H^+$) which in turn displace carbon dioxide from blood
b)
carbaminohaemoglobin is a stronger acid which splits into hydrogen ion ($H^+$) and bicarbonate ($HCO^-_3$)
c) carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue
d) carbon dioxide is less soluble in venous blood than in arterial blood.

315. Which is not correctly matched:
a) Agrobacterium ⇒ Ti- plasmid b) Cosmid ⇒ Vector DNA
c) Rhizobium ⇒ Asymbiotic $N_2$- fixer d) Albinism ⇒ Autosomal recessive gene

316. Refer to the given reaction.
$2H_2O \rightarrow 4H^+ + O_2 + 4e^-$
Where does this reaction take place in the chloroplasts of plants?
a) Outer surface of thylakoid membrane b) Inner surface of thylakoid membrane
c) In the matrix (stroma) d) Intermembrane space

317. Which statement is correct for muscle contraction?
a) Length of two Z-lines increase b) Length of H-line decreases
c) Length of A-band remains constant d) Length of I-band increases

318. The Broca's area and Wernicke's centre are the association areas situated in cerebrum. These are associated with
a) breathing b) blind spot c) memory d) none of these

319. Hormone responsible for growth of the root in micropropagation is
a) auxin b) gibberellin c) cytokinin d) abscisic acid.

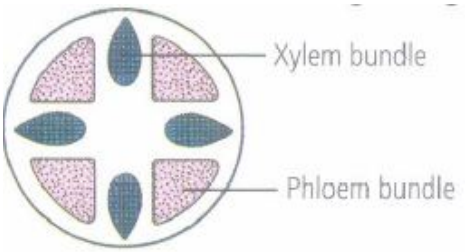
320. Functionwise, just as there are nephridia in an earthworm, so are _____ .

a) parotid glands in toad b) statocysts in prawn c) flame cells in liver fluke
d) myotomes in fish

321. Sheet or broad band of fibrous connective tissue that is deep is deep to the skin an surrounds entire muscles and other organs of body are
a) Epimysium b) Fasicule c) Endosperm d) Fa scia

322. Leaves become modified into spines in :
a) Silk cotton b) Opuntia c) Pea d) Onion

323. Identify the type of vascular bundle as shown in the figure and select the incorrect statement regarding it.




a)
Figure represents radial vascular bundles in which xylem and phloem occur in the form of separate bundles.
b) Xylem bundles and phloem bundles occur on different radii.
c) These are the characteristic of monocot and dicot leaves. d) None of these

324. Which of the following statements are correct with respect to a bioreactor?
(i) It can process large volumes of culture.
(ii) It provides optimum temperature and pH.
(iii) It is a completely automated tool.
(iv) It is a compact thermal cycler
a) (i) and (ii) b) (i), (ii) and (iii) c) (iii) and (iv) d) (ii) and (iii)

325. Read the following four statement (A-D) about certain mistakes in two of them.
(A) The first transgenic buffalo, Rosie produced milk which was human alpha- lactabumin enriched.
(B) Restriction enzymes are used in isolation of DNA form other macro molecules.
(C) Downstream processing is one of steps of R-DNA technology.
(D) Disarmed pathogen vectors are also used in transfer of R-DNA into the host.
Which are the two statement having mistakes?
a) Statement (A) and (B) b) Statement (B) and (C) c) Statement (C) and (D)
d) Statement (A) and (C)

326. One of the major difficulties in the biological control of insect pests is the _____.
a) practical difficulty of introducing the predator to specific areas
b) method is less effective as compared with ihe use of insecticides
c) predator does not always survive when transferred to a new environment
d) the predator develops a preference to other diets and may itself become a pest

327. Which of the following is a full proof method of contraception?
a) Implantation b) Lactational amenorrhea c) Condoms d) Sterilisation

328. Beewax is the secretion of abdominal glands of

a) drones b) worker bees c) queen bees d) worker and queen bees

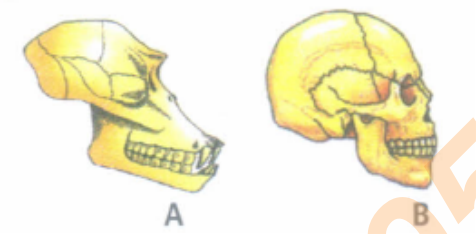
329. Which one of the following is wrong in relation to photorespiration ?
a) It is a characteristic of $C_3$ plants. b) It occurs in chloroplasts.
c) It occurs in daytime only d) It is a characteristic of $C_4$ plants

330. Cells formed in bone marrow include_____
a) RBC b) RBC and leucocytes c) Leucocytes d) Lymphocytes

331. Cloaca is a small, median chamber that is used to pass
a) faecal matter b) urine c) sperms d) all of these.

332. From the following relationships between respiratory volumes and capacities, mark the correct option.
(i) Inspiratory Capacity (IC) = Tidal Volume + Residual Volume
(ii) Vital Capacity (VC) =Tidal Volume (TV)+ Inspiratory ReserveVolume (IRV) + Expiratory ReserveVolume (ERV)
(iii) Residual Volume (RV) = Vital Capacity (VC) - Inspiratory ReserveVolume (IRV)
(iv) Tidal Volume (TV) = Inspiratory Capacity (IC) - Inspiratory ReserveVolume (IRV)
a) (i) Incorrect, (ii) Incorrect, (iii) Incorrect, (iv) Correct
b) (i) Incorrect, (ii) Correct, (iii) Incorrect, (iv) Correct
c) (i) Correct, (ii) Correct, (iii) Incorrect, (iv) Correct
d) (i) Correct, (ii) Incorrect, (iii) Correct, (iv) Incorrect

333. The diagram given here shows the skulls of two different mammals.




Which of the following accurately describes the differences between these skulls?
a) Skull A has more teeth than skull B. b) Skull A has more brain capacity than skull B.
c) Skull A is of a human and skull B is of an ape
d) Skull A is of an ape and skull B is of human

334. Which of the following statements is correct?
a) Goblet cells secrete pepsinogen b) Parietal cells secrete hydrochloric acid
c) Argentaffin cells secrete mucus. d) Chief cells secrete gastrin

335. An antibody consists of
a) two light peptide chains and two heavy peptide chains
b) two light peptide chains and one heavy peptide chain
c) one light peptide chain and one heavy peptide chain
d) one light peptide chain and two heavy peptide chains

336. Which of the following statements is correct regarding Genetic Engineering Approval committe (GEAC)?

a) It makes decision regarding the validity of GM research

b) It ensures the safety of introducing GM-organisms for public services

c)
Genetic modification of organisms can have unpredictable results when such organisms are introduced into the ecosystem. Therefore, the Indian government has set up organisation such as GEAC

d) All of these

337. **Assertion:** The $C_4$ plants have a special type of leaf anatomy called kranz anatomy.
**Reason:** Chloroplasts of bundle sheath cells have well-developed grana and starch grains.
a) If both assertion and reason are true and reason is the correct explanation of assertion.

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

c) If assertion is true but reason is false. d) If both assertion and reason are false.

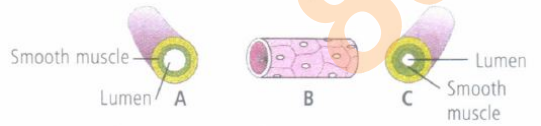
338. Which one of the following is an example of carrying out biological control of pests/ diseases using microbes?
a) Trichodenna sp. against certain plant pathogens
b) Nucleopolyhedrovirus against white rust in Brassica
c) Bt - cotton to increase cotton yield d) Ladybird beetle against aphids in mustard

339. Coenocytic mycelium is
a) uninucleate, septate b) multinucleate, septate c) multinucleate, septate
d) both (b) and (c).

340. Bryophytes differ from thallophytes in having:-
a) Embryo b) Rhizoids c) Sterile jacket around sex organs d) All the above

341. Embryo with more than 16 blastomeres formed due to in vitro fertilisation is transferred into:
a) Uterus b) Fallopian tube c) Fimbriae d) Cervix

342. Given below are the figures of blood vessels. Identify them and select the correct option.




a)

| A | B | C |
|---|---|---|
| Capillary | Vein | Artery |

b)

| A | B | C |
|---|---|---|
| Artery | Capillary | Vein |

c)

| A | B | C |
|---|---|---|
| Vein | Capillary | Artery |

d)

| A | B | C |
|---|---|---|
| Vein | Artery | Capillary |

343. Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis, and addition of groups to double bonds, are called
a) ligases b) lyases c) hydrolases d) dehydrogenases.

344. DNA as an acidic substance present in nucleus was first identified by in _____1869; he named it as __.
a) Meischer, nuclein b) Watson and Crick, DNA c) Chargaff, nuclein
d) Wilkins and Franklin, double helix

345. Archaebacterial cell lacks:-
a) Peptidoglycan b) DNA c) Ribosomes d) Branched Chain Lipids

346. The world's highly prized wool yielding 'Pashmina' breed is _____.
a) goat b) sheep c) goat - sheep cross d) Kashmir sheep-Afghan sheep cross

347. Adaptive radiation refers to_____
a) evolution of different species from a common ancestor
b) migration of members of a species to different geographical areas
c) power of adaptation in an individual to a variety of environments
d) adaptations due to geographical isolation

348. If you chew on a piece of bread long enough, it will begin to taste sweet because
a) maltase is breaking down maltose b) lipases are forming fatty acids
c) amylase is breaking down starches to disaccharides
d) disaccharides are forming glucose

349. Selaginella and Salvinia are considered to represent a significant step toward evolution of seed habit because:
a) Megaspores possess endosperm and embryo surrounded by seed coat
b) Embryo develops in female gametophyte which is retained on parent sporophyte
c) Female gametophyte is free and gets dispersed like seeds
d) Female gametophyte lacks archegonia

350. Which one of the following does not constitute a part of single uriniferous tubule?
a) Distal convoluted tubule b) Collecting duct c) Bowman's capsule d) Loop of Henle

351. Which of the following secondary metabolites are used as drugs?
a) Abrin and ricin b) Vinblastin and curcumin c) Anthocyanins d) Gums and cellulose

352. Which of the following statements is incorrect about gene therapy in ADA deficiency?
a) Lymphocytes from patient's blood are taken out and cultured
b) A functional ADA-cDNA is introduced into these lymphocytes
c) Lymphocytes are then introduced in the body of patient
d) Patient does not require periodic infusion of genetically engineered lymphocyte

353. Which part of the sperm plays an important role in penetrating the egg membrane?
a) Allosome b) Tail c) Autosome d) Acrosome

354. End product of citric acid/Krebs' cycle is_____
a) citric acid b) lactic acid c) pyruvic acid d) $CO_2+H_2O$

355. Select the mismatched pair of organism and its mode of multiplication.

a)

| Organism | Mode of multiplication |
|---|---|
| Agave, Oxalis | Bulbils |

b)

| Organism | Mode of multiplication |
|---|---|
| Amoeba, Paramecium | Binary fission |

c)

| Organism | Mode of multiplication |
|---|---|
| Chlamydomonas, Ulothrix | Sporangiospores |

d)

| Organism | Mode of multiplication |
|---|---|
| Adiantum caudatum | Adventitious buds present at leaf tips |

356. The term biodiversity is popularised by

a) Odum b) Paul Ehrlich c) Edward Wilson d) Tilman

357. Assisted reproductive technologies (ART)

a)
include social awareness programmes to educate people about reproductive health and diseases

b)
include research organisation working to produce new and more effective contraceptives for birth control

c) include a number of special techniques which assist infertile couples to have children

d) both (b) and (c).

358. Which of the following options give the correct sequence of events during mitosis?

a)
condensation > nuclear membrane disassembly > crossing over > segregation > telophase

b)
condensation > nuclear membrane disassembly > arrangement at equator > centromere division > segregation > telophase

c)
condensation > crossing over > nuclear membrane disassembly > segregation > telophase

d) condensation > arrangement at equator > centromere division > segregation > telophase

359. For transformation, micro-particles coated with DNA to be bombarded with gene gun are made up of _____.

a) Silver or Platinum b) Platinum or Zinc c) Silicon or Platinum d) Gold or Tungsten

360. Lysine and tryptophan are

a) proteins b) non-essential amino acids c) essential amino acids

d) aromatic amino acids

361. The main organelle involved in modification and routing of newly synthesised proteins to their destinations is _____ .

a) Chloroplast b) Mitochondria c) Lysosome d) Endoplasmic reticulum

362. A chemical believed to be involved in flowering is_____

a) gibberellin b) kinetin c) florigen d) IBA

363. Which of the following is the correct sequence of processes involved in urine formation?

a) Secretion, Reabsorption, Filtration b) Filtration, Reabsorption, Secretion

c) Reabsorption, Filtration, Secretion d) Reabsorption, Secretion, Filtration

364. The ornamental leguminous plant is

a) Tulip b) Petunia c) Sesbania d) Lupin

365. Which of the following hormones is not a secretory product of human placenta?

a) Human chorionic gonadotropin b) Prolactin c) Estrogen d) Progesterone

366. A collection of all the alleles of all the genes of a crop plant is called

a) germ plasm collection b) protoplasm collection c) herbarium d) somaclonal collection

367. Male cockroach differs from female cockroach in having

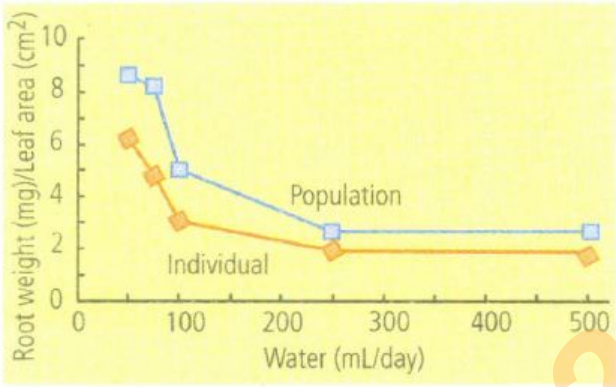
a) antennae b) labrum c) maxillae d) anal styles.

368. Which of the following type of water is most abundantly found in protoplasm?
a) Free form b) Bound form c) Crystal form d) Ice

369. Photorespiration is favoured by_____
a) high $O_2$ and low $CO_2$ b) low light and high $O_2$ c) low temperature and high $O_2$
d) low $O_2$ and high $CO_2$

370. An acid soluble compound formed by phosphorylation of nucleoside is called
a) nitrogen base b) adenine c) sugar phosphate d) nucleotide

371. To determine the effect of intra-specific competition on the growth of saplings of Eucalyptus dives, an experiment was designed in which two sets of pots were used. In the first set only 1 sapling was planted per pot and in the other set 16 saplings were planted per pot. To check for the effect of intra-specific competition on allocation of resources, a decreasing amount of water was added to each set. The results have been graphically indicated below. Which of the following conclusions can be best drawn from the study?




a) More resources are allocated to the root during low water conditions
b)
Competition for water among individuals of a population causes more root growth as compared to individuals who are growing alone.
c) Lesser leaves are formed under low water conditions
d)
Root growth is higher in individuals grown singly as compared to individuals in populations.

372. Which statement is wrong for Kreb's cycle?
a) There are three point in the cycle where NAD+ is reduced to NADH + H+
b) There is one point in the cycle where FAD+ is reduced to FADH2
c) During conversion of succinyl CoA to succine acid, a molecule of GTP is synthesised
d)
The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid

373. Single-celled eukaryotes are included in:-
a) Monera b) Protista c) Fungi d) Archaea

374. **Assertion:** In MOET, hormones with progesterone-like activity are given to the cow for inducing superovulation.
**Reason:** After mating, the embryos at 4 - 6 celled stage are recovered and transferred to surrogate mothers.

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

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

c) If assertion is true but reason is false.  d) If both assertion and reason are false.

375. Passive immunity is provided through
a) Exogenous supply of antigens  b) Exogenous supply of antibodies
c) Endogenous supply of antigens  d) Endogenous supply of antigens

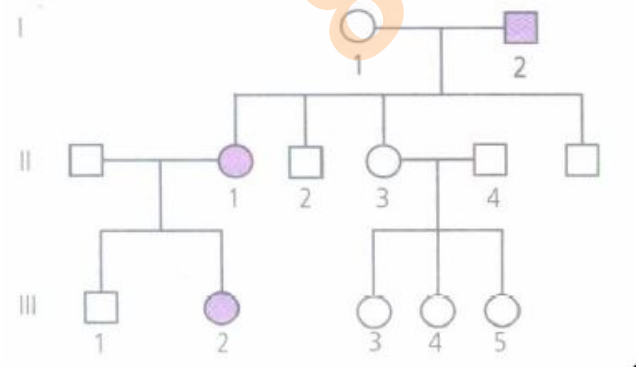
376. The correct order of steps in Polymerase Chain Reaction (PCR) is :
a) Denaturation, Extension, Annealing  b) Annealing, Extension, Denaturation
c) Extension, Denaturation, Annealing  d) Denaturation, Annealing, Extension

377. Which of the following cranial nerves of man is both sensory and motor?
a) Olfactory  b) Optic  c) Vagus  d) Oculomotor

378. **Assertion:** Archaebacteria are able to survive in harsh habitats.
**Reason:** Presence of peptidoglycan in cell wall help archaebacteria to survive in extreme conditions.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.  d) If both assertion and reason are false.

379. Which one of the following is not true about antibiotics:
a) First, antibiotic was discovered by Alexander Fleming.
b) The term 'antibiotic' was coined by S.Waksman in 1942.
c) Each antibiotic is effective only against one particular kind of germ .
d) Some persons can be only against one particular kind of germ.

380. Fused ear lobes appear in the progeny due to an autosomal recessive gene. Work out the genotypes of members in the given pedigree.




a)

| I-2 | II-3 | III-1 |
|---|---|---|
| aa | Aa | Aa |

b)

| I-2 | II-3 | III-1 |
|---|---|---|
| aa | AA | AA |

c)

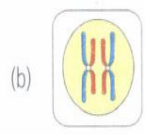
| I-2 | II-3 | III-1 |
|---|---|---|
| Aa | Aa | Aa |

d)

| I-2 | II-3 | III-1 |
|---|---|---|
| aa | Aa | AA |

381. Which of the following correctly shows a pair of homologous chromosomes at the start of meiosis?

a) 

b) 

c) 

d) 

382. Match column I with column II and select the correct option from the given codes.

| | Column I | | Column II |
|---|---|---|---|
| A. | Labeo rohita | (i) | Red junglefowl |
| B. | Gallus gallus | (ii) | Rohu |
| C. | Bos indicus | (iii) | Tussar silkmoth |
| D. | Antheraea mylitta | (iv) | Cattle |

a) A-(ii), 8-(iii), C-(i), D-(iv) b) A-(iii), 8-(i), C-(iv), D-(ii) c) A-(ii), 8-(i), C-Iiv), D-(iii)
d) A-(ii), 8-(i), C-(iii), D-(iv)

383. In which of the following biogeochemical cycles, atmospheric phase is absent/negligible?
a) Nitrogen b) Oxygen c) Phosphorus d) Water

384. Sucrose is composed of-
a) Glucose & Fructose b) Glucose & Glycogen c) Two molecules of Glucose
d) Glycogen & Fructose

385. Which of the following stains is not used for staining chromosomes?
a) Basic Fuchsin b) Safranin c) Methylene green d) Carmine

386. In eukaryotes, RNAPIII catalyses the synthesis of
a) All rRNA and tRNA b) mRNA, HnRNA and SnRNA c) 5S rRNA, tRNA and ScRNA
d) 288,18S and 5S rRNA

387. Agar-agar is commercially obtained from
a) green algae b) blue-green algae c) brown algae d) red algae.

388. Which of the following is required to perform polymerase chain reaction?
a) Primers, dNTPs and DNA polymerase b) DNA, $CaCl_2$ and nuclease c) $Mg^{+2}$, DNA
d) Both (a) and (c)

389. Match column I with column II and select the correct option from the given codes

| | Column-I | | Column-II |
|---|---|---|---|
| A | Marginal | (i) | Sunflower, marigold |
| B | Parietal | (ii) | Pea |
| C | Axile | (iii) | Mustard, Argemone |
| D | Free central | (iv) | Hibiscus, tomato, lemon |
| E | Basal | (v) | Dianthus, Primrose |

a) A-(ii), B-(iii), C-(iv), D-(v). E-(i) b) A-(i), B-(iii), C-(ii), D-(v), E-(iv)
c) A-(i), B-(ii), C-Ilil). D-(iv), E-(v) d) A-(iii), B-(ii), C-(iv), D-(v). E-(i)

390. Consider the following three statements and select the correct option stating which ones are true (T) and which ones are false (F).
(i) Hybridisation is crossing of two or more types of plants for bringing their traits together in progeny.
(ii) Semi-dwarf rice varieties were derived from IR-8 and Taichung Native -1.
(iii) Hybrid breeding have led to the development of several high yielding varieties resistant to water stress.

a)

| (i) | (ii) | (iii) |
|---|---|---|
| F | T | T |

b)

| (i) | (ii) | (iii) |
|---|---|---|
| T | T | F |

c)

| (i) | (ii) | (iii) |
|---|---|---|
| F | T | F |

d)

| (i) | (ii) | (iii) |
|---|---|---|
| T | T | T |

391. In Meselson and Stahl's experiment, heavy isotope $^{15}N$ was used In the form of
a) $Na^{15}NO_3$ b) $^{15}NH_4Cl$ c) $K^{15}NO_3$ d) $NH_4{}^{15}NO_3$

392. In the process of apical dominance, lateral buds are unable to grow in the presence of apical bud. This is due to:
a) less amount of auxin in apical bud b) more amount of auxin in apical bud
c) less amount of cytokinins in lateral buds d) more amount of cytokinins in lateral buds.

393. 'Key' is a taxonomical aid used for the identification of organisms. Each statement in key is called a_____.
a) couplet b) lead c) both (a) and (b) d) none of these

394. There is no natural death in single celled organisms like Amoeba and bacteria because
a) they cannot reproduce sexually b) they reproduce by binary fission
c) parental body is distributed among the offspring d) they are microscopic

395. Imbalances of certain hormones, deficiencies of calcium and vitamin D are the major causative factors of
a) rheumatoid arthritis b) osteoporosis c) osteoarthritis d) gouty arthritis

396. Which of the following statements is correct?
a) The contraction of internal intercostal muscles lifts up the ribs and sternum.
b) The RBCs transport oxygen only.
c) The thoracic cavity is anatomically an air tight chamber.
d) Healthy man can inspire approximately 500 mL of air per minute.

397. Match the column I with column II

| | Column -I | | Column-II |
|---|---|---|---|
| (i) | Chlorophyceae | (a) | Ectocarpus |
| (ii) | Hemichordata | (b) | Chara |
| (iii) | Phaseophyceae | (c) | Selaginella |
| (iv) | Liverwort | (d) | Marchantia |

a) i-b, ii-c, iii-a, iv-d b) i-b, ii-d, iii-a, iv-c c) i-a, ii-d, iii-c, iv-b d) i-c, ii-a, iii-b, iv-d

398. What are the chances of this couple's fifth child being an albino?
a) 1 in 1 b) 1 in 2 c) 1 in 3 d) 1 in 4

399. Read the given statements and select the correct option.
**Statement 1:** In photosynthesis, during ATP synthesis, protons accumulate in the lumen of thylakoid.
**Statement 2:** In respiration, during ATP synthesis, protons accumulate in the intermembranal space of mitochondria.
a) Both statements 1 and 2 are correct.
b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct.
d) Both statements 1 and 2 are incorrect

400. **Assertion:** The joint between the atlas and axis is an example of gliding joint.
**Reason:** Gliding joint allows movement primarily in one plane.

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

b)

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

c) If assertion is true but reason is false.  d) If both assertion and reason are false.