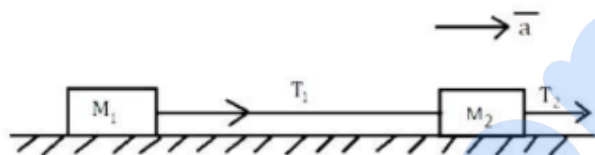


MHT CET 2020 Biology Memory Based Question Paper PDF

Physics

- The period of revolution of communication satellite is 24 hours. The period of satellite in an orbit at a distance three times that of the earth's radius above its surface will be
 - 4 days
 - 16 days
 - 24 hours
 - 8 days
- Two masses M_1 and M_2 are accelerated uniformly on frictionless surface as shown in figure. The ratio of the tensions $\left(\frac{T_1}{T_2}\right)$ is



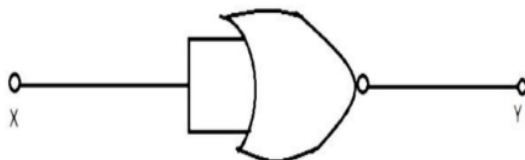
- $\frac{M_2}{M_1}$
 - $\frac{M_1}{M_2}$
 - $\frac{M_1}{(M_1+M_2)}$
 - $\frac{(M_1+M_2)}{M_2}$
- In a transverse progressive wave of amplitude 'a', the maximum particle velocity is six times its wave velocity. The wavelength of wave is
 - $6\pi a$
 - $3\pi a$
 - $\frac{\pi a}{6}$
 - $\frac{\pi a}{3}$
 - When a surface 1 cm thick is illuminated by light of wavelength ' λ ', the stopping potential is ' V_0 '. When the same surface is illuminated by light of wavelength ' 3λ ', the stopping potential is ' $\frac{V_0}{6}$ '. The threshold wavelength for the metallic surface is
 - 5λ
 - 2λ
 - 3λ
 - 4λ
 - A cord is wound round the circumference of a wheel of radius 'r'. The axis of the wheel is horizontal and moment of inertia about it is 'I'. A block of mass 'm' is attached to free end of the cord, initially at rest. When the wheel rotates and the block moves vertically downwards through distance 'h', the angular velocity of the wheel will be (Neglect the mass of cord, g = acceleration due to gravity)

- (a) $\left(\frac{2gh}{I+mr^2}\right)^{\frac{1}{2}}$
- (b) $\left(\frac{2mgh}{I+mr^2}\right)^{\frac{1}{2}}$
- (c) $\left(\frac{2mgh}{I+2m}\right)^{\frac{1}{2}}$
- (d) $(2gh)^{\frac{1}{2}}$
6. Light rays are incident from air on a block of glass (Refractive Index = 1.5). The reflected and refracted rays are perpendicular to each other. The ratio of the wavelengths of the refracted and reflected light is
- (a) 0.66
- (b) 0.11
- (c) 0.44
- (d) 0.22
7. A sonometer wire of length L between the two bridges vibrates in 3rd harmonic. Antinodes are formed at
- (a) $\frac{L}{4}, L, \frac{7L}{4}$
- (b) $\frac{L}{2}, L, \frac{3L}{2}$
- (c) $\frac{L}{3}, \frac{2L}{3}, \frac{5L}{3}$
- (d) $\frac{L}{4}, \frac{3L}{4}, \frac{5L}{4}$
8. A ball at rest falls vertically on ground from a height of 5m. The coefficient of restitution is 0.4. The maximum height of the ball after the first rebound is [$g = 10 \text{ m/s}^2$]
- (a) 0.8 m
- (b) 0.6 m
- (c) 0.2 m
- (d) 0.4 m
9. In parallel plate capacitor, electric field between the plates is 'E'. If the charge on the plates is 'Q', then the force on each plate is
- (a) QE
- (b) $\frac{QE}{2}$
- (c) QE²
- (d) $\frac{QE^2}{2}$
10. Average kinetic energy of H₂ molecule at 300K is 'E'. At the same temperature, average kinetic energy of O₂ molecule will be
- (a) $\frac{E}{2}$
- (b) E
- (c) $\frac{E}{4}$
- (d) $\frac{E}{8}$
11. A wire having a diameter of 3 mm is stretched by an external force to produce a longitudinal strain of 3×10^{-3} . If the Poisson's ratio of the wire is 0.4, the change in its diameter is
- (a) $3.2 \times 10^{-6} \text{ mm}$
- (b) $3.6 \times 10^{-3} \text{ mm}$

- (c) 1.2×10^{-6} mm
(d) 1.2×10^{-3} mm
12. A body situated on earth's surface at its equator becomes weightless when the rotational kinetic energy of the earth reaches a critical value which is given by (M and R be the mass and radius of earth respectively)
- (a) $\frac{MgR}{4}$
(b) $\frac{MgR}{5}$
(c) $\frac{MgR}{2}$
(d) $\frac{MgR}{3}$
13. The product of magnetic susceptibility (χ) and absolute temperature (T) is constant for a
- (a) ferromagnetic material.
(b) diamagnetic and ferromagnetic material.
(c) diamagnetic material.
(d) paramagnetic material.
14. In a semiconductor, the number of holes and number of free electrons are represented as ' n_h ' and ' n_e ' respectively. Which one of the following statements is TRUE for the semiconductor?
- (a) In an intrinsic semiconductor, $n_e = n_h$
(b) In an extrinsic semiconductor, $n_h = n_e$
(c) In an intrinsic semiconductor, $n_e > n_h$
(d) In an intrinsic semiconductor, $n_h > n_e$
15. Let ' R_1 ' and ' R_2 ' be radii of two mercury drops. A big mercury drop is formed from them under isothermal conditions. The radius of the resultant drop is
- (a) $R = \sqrt{R_1^2 - R_2^2}$
(b) $R = (R_1^3 + R_2^3)^{\frac{1}{3}}$
(c) $R = \frac{R_1 + R_2}{2}$
(d) $R = \sqrt{R_1^2 + R_2^2}$
16. Two vectors $\vec{P}$ and $\vec{Q}$ have equal magnitudes. If $|\vec{P} + \vec{Q}| = 5|\vec{P} - \vec{Q}|$, then angle between $\vec{P}$ and $\vec{Q}$ is
- (a) $\cos^{-1} \left(\frac{12}{13} \right)$
(b) $\sin^{-1} \left(\frac{12}{13} \right)$
(c) $\cos^{-1} \left(\frac{3}{5} \right)$
(d) $\sin^{-1} \left(\frac{3}{5} \right)$
17. A thin wire of length 'L' and uniform linear mass density 'm' is bent into a circular loop. The moment of inertia of this loop about the tangential axis and in the plane of the coil is
- (a) $\frac{3mL^3}{16\pi^2}$
(b) $\frac{3mL^3}{4\pi^2}$
(c) $\frac{3mL^3}{8\pi^2}$
(d) $\frac{3mL^3}{2\pi^2}$
18. If v_n and v_p are orbital velocities in n^{th} and p^{th} orbit respectively, then the ratio $v_p : v_n$ is

- (a) $\frac{p^2}{n^2}$
- (b) $\frac{n}{p}$
- (c) $\frac{n^2}{p^2}$
- (d) $\frac{p}{n}$

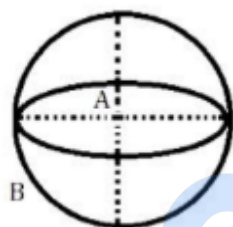
19. The gate represented in the given figure is



- (a) NOT
 - (b) AND
 - (c) OR
 - (d) NOR
20. The energy stored per unit volume is 0.3 J/m^3 when a wire is stretched by 0.125 cm . When it is stretched by 0.75 cm , the increase in potential energy per unit volume stored in the wire is
- (a) 10.3 J/m^3
 - (b) 10.1 J/m^3
 - (c) 10.5 J/m^3
 - (d) 10.8 J/m^3
21. The magnifying power of simple microscope is inversely proportional to its focal length (f) and it is maximum when image is formed at [D = Distance of distinct vision (DDV)].
- (a) a distance greater than DDV.
 - (b) DDV
 - (c) a distance less than DDV.
 - (d) infinity.
22. A vector F_1 is a unit vector along the positive direction of x - axis and F_2 is of magnitude 4. If the vector product of F_1 and F_2 is zero, then F_2 is
- (a) $4\hat{j}$
 - (b) $2\sqrt{3}\hat{i} - 2\hat{j}$
 - (c) $2\hat{i} + 2\sqrt{3}\hat{j}$
 - (d) $-4\hat{i}$
23. The average force applied on the walls of a closed container depends as " T^x ", where 'T' is the temperature of an ideal gas. The value of 'x' is
- (a) 1
 - (b) zero
 - (c) 2
 - (d) 3

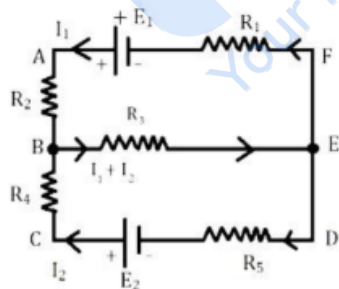
24. A given metal wire has length 1m, linear density 0.6 kg/m and uniform cross-sectional area 10^{-7} m^2 is fixed at both ends. The temperature of wire is decreased by 40°C . The fundamental frequency of the transverse wave is $[Y = 2 \times 10^{11} \text{ N/m}^2, \text{ coefficient of linear expansion of metal is } = 1.2 \times 10^{-5}/^\circ\text{C}]$
- 0.5 Hz
 - 2 Hz
 - 1 Hz
 - 2.5 Hz
25. For a photocell, the work function is ' ϕ ' and the stopping potential is ' V_s '. The wavelength of the incident radiation can be expressed as
- $\frac{hc}{e\phi + V_s}$
 - $\frac{hc}{\phi + eV_s}$
 - $\frac{hc}{\phi - eV_s}$
 - $\frac{hc}{\phi}$
26. If the length and diameter of a wire are decreased, then for the same tension the natural frequency of stretched wire will
- decrease.
 - not change.
 - become zero.
 - increase.
27. When a capillary is dipped vertically in water, rise of water in capillary is 'h'. The angle of contact is zero. Now the tube is depressed so that its length above the water surface is $h/2$. The new apparent angle of contact is $[\cos 0^\circ = 1]$
- $\sin^{-1}(0.5)$
 - $\sin^{-1}(0.7)$
 - $\cos^{-1}(0.5)$
 - $\cos^{-1}(0.7)$
28. The vertical and horizontal components of earth's magnetic field at a place are $2 \times 10^{-5} \text{ T}$ and $2\sqrt{3} \times 10^{-5} \text{ T}$ respectively. The angle of dip and resultant earth's magnetic field is
- $\tan^{-1}(\sqrt{3}), 2 \times 10^{-10} \text{ T}$
 - $\tan^{-1}(\sqrt{3}), 2 \times 10^{-5} \text{ T}$
 - $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right), 4 \times 10^{-10} \text{ T}$
 - $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right), 4 \times 10^{-5} \text{ T}$
29. The frequency of a particle performing linear S.H.M. is $\frac{7}{2\pi} \text{ Hz}$. The differential equation of S.H.M. is
- $\frac{d^2x}{dt^2} + 14x = 0$
 - $\frac{d^2x}{dt^2} + 64x = 0$
 - $\frac{d^2x}{dt^2} + 49x = 0$
 - $\frac{d^2x}{dt^2} + 25x = 0$

30. A motor cycle racer takes a round with speed 20 m/s on a curved road of radius 40 m. The leaning angle of motor cycle with vertical for safe turn is ($g = 10 \text{ m/s}^2$, $\tan 45^\circ = 1$)
- 75°
 - 45°
 - 60°
 - 30°
31. Two parallel long wires 'A' and 'B' carry currents ' i_1 ' and ' i_2 ' ($i_2 < i_1$). When ' i_1 ' and ' i_2 ' are in the same direction, the magnetic field at a point midway between the wires is $10\mu T$. If ' i_2 ' is reversed, then the field becomes $30\mu T$. The ratio of $\frac{i_1}{i_2}$ is [$\frac{\mu_0}{4\pi} = 10^{-7} \text{ Wb/Am}$]
- 1
 - 2
 - 3
 - 4
32. Two coils of wire A and B are placed mutually perpendicular as shown. When current is changed in any one coil,



- no current will be induced in another coil.
 - magnetic field will be perpendicular to plane of another coil.
 - magnetic flux linked with another coil is maximum.
 - current induced in another coil is maximum.
33. A thin prism 'P' of angle 4° made up of glass of refractive index 1.48 is combined with another prism 'Q' made up of glass of refractive index 1.64 to produce dispersion without deviation. The angle of prism 'Q' is
- 5°
 - 3°
 - 6°
 - 4°
34. The magnetic moment of a circular coil carrying current (I), having radius (r) and number of turns (n) is proportional to
- r
 - $\frac{1}{r}$
 - r^2
 - $\frac{1}{r^2}$
35. A galvanometer of resistance 20Ω gives a full scale deflection when a current of 0.04 A is passed through it. To convert it into an ammeter of range 20A, the resistance that must be connected in series with the coil of the galvanometer is (Galvanometer is shunted by 0.05Ω)

- (a) 5.94Ω
 (b) 4.95Ω
 (c) 12.62Ω
 (d) 9.45Ω
36. A parallel monochromatic beam of light is incident normally on a narrow slit. A diffraction pattern is formed on a screen placed perpendicular to the direction of incident beam. At the first maximum of the diffraction pattern, the phase difference between the rays coming from the edges of the slit is
- (a) $\frac{\pi}{4}$ rad.
 (b) 2π rad.
 (c) $\frac{\pi}{2}$ rad.
 (d) π rad.
37. The pressure at the bottom of a tank containing liquid does not depend upon the
- (a) area of bottom surface.
 (b) acceleration due to gravity.
 (c) density of liquid.
 (d) height of liquid column.
38. Which of the following molecules is a polar molecule?
- (a) Oxygen (O_2)
 (b) Hydrogen (H_2)
 (c) Carbon dioxide (CO_2)
 (d) Hydrogen Chloride (HCl)
39. In the given electrical network, the correct equation for the loop 'ABEFA' is



- (a) $E_1 - I_1(R_1 + R_2 + R_3) - I_2R_3 = 0$
 (b) $E_1 - I_1(R_1 - R_2 + R_3) + I_2R_3 = 0$
 (c) $E_1 - I_1(R_1 + R_2 + R_3) + I_2R_3 = 0$
 (d) $-E_1 + I_1(R_1 + R_2 + R_3) - I_2R_3 = 0$
40. A charged particle carrying a charge 'q' and moving with velocity 'v', enters into a solenoid carrying a current 'I', along its axis. If 'B' is the magnetic induction along the axis of solenoid, then the force 'F' acting on the charged particle will be
- (a) $F = 0$

- (b) $F = qvB$
 (c) $F < qvB$
 (d) $F > qvB$
41. A cube of mass 'M' and side 'L' is fixed on the horizontal surface. Modulus of rigidity of the material of cube is ' η '. A force is applied perpendicular to one of the side faces. When the force is removed, cube executes small oscillations. The time period is
- (a) $\frac{2\pi\eta L}{M}$
 (b) $\frac{M}{2\pi\eta L}$
 (c) $2\pi\sqrt{\frac{M}{\eta L}}$
 (d) $2\pi\sqrt{\frac{\eta L}{M}}$
42. A body attached to a spring oscillates in horizontal plane with frequency 'n'. Its total energy is 'E'. If the velocity in the mean position is 'v', then the spring constant is
- (a) $\frac{E\pi^2 n^2}{v^2}$
 (b) $\frac{4E\pi^2 n^2}{v^2}$
 (c) $\frac{8E\pi^2 n^2}{v^2}$
 (d) $\frac{2E\pi^2 n^2}{v^2}$
43. Two waves given as $y_1 = 10 \sin \omega t$ cm and $y_2 = 10 \sin(\omega t + \frac{\pi}{3})$ cm are superimposed. What is the amplitude of the resultant wave? [$\cos \frac{\pi}{3} = \frac{1}{2}$]
- (a) $10\sqrt{2}$ cm
 (b) $5\sqrt{3}$ cm
 (c) $10\sqrt{3}$ cm
 (d) 10 cm
44. In the equation $P = \frac{(C+S)}{D}$, P and S represent pressure and distance respectively. The dimensions of $(\frac{D}{C})$ are
- (a) $[L^1 M^1 T^2]$
 (b) $[L^1 M^{-1} T^2]$
 (c) $[L^1 M^0 T^{-1}]$
 (d) $[L^0 M^1 T^1]$
45. In meter bridge experiment, null point was obtained at a distance ' ℓ ' from left end. The values of resistances in the left and right gaps are doubled and then interchanged. The new position of null point is
- (a) $(100 - \ell)$
 (b) $(100 - \frac{\ell}{4})$
 (c) $(100 - \frac{\ell}{2})$
 (d) $(100 - 2\ell)$
46. A sample of radioactive element contains 8×10^{16} active nuclei. The half-life of the element is 15 days. The number of nuclei decayed after 60 days is
- (a) 0.5×10^{16}
 (b) 2×10^{16}

(c) 7.5×10^{16}

(d) 4×10^{16}

47. At any instant, the magnitude of the centripetal force on a particle of mass 'm' performing circular motion is given by (ω = angular velocity and v = linear velocity of the particle)

(a) $\frac{m^2\omega^2}{v}$

(b) $\frac{m\omega^2}{v}$

(c) $\frac{mv^2}{\omega}$

(d) $m\omega v$

48. A flywheel of mass 2 kg has radius of gyration 0.5m. If it makes 10 r.p.s. then its rotational kinetic energy will be

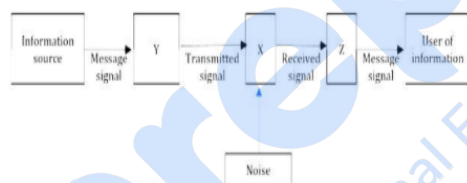
(a) $100\pi^2$ J

(b) $50\pi^2$ J

(c) $100\pi^2$ erg

(d) $50\pi^2$ erg

49. In the block diagram of generalised communication system, the element labelled as 'x' is



(a) Receiver

(b) Transmitter

(c) Channel

(d) Amplifier

50. The coefficient of mutual induction is 2 H and induced e.m.f. across secondary is 2 kV. Current in the primary is reduced from 6 A to 3 A. The time required for the change of current is

(a) 6×10^{-3} s

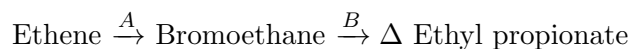
(b) 5×10^{-3} s

(c) 3×10^{-3} s

(d) 4×10^{-3} s

Chemistry

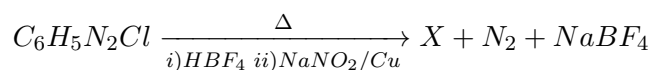
1. Identify A and B respectively in the following conversion



- (a) $Br_2/AlBr_3$, C_2H_5ONa
(b) $Br_2/AlBr_3$, C_2H_5COOAg
(c) HBr , C_2H_5ONa
(d) HBr , C_2H_5COOAg
2. The most basic hydride of group 15 elements is
- (a) NH_3
(b) PH_3
(c) SbH_3
(d) AsH_3
3. IUPAC name of pinacol is
- (a) 2,3-dimethyl butane-1,4-diol
(b) 2,2-dimethyl butane-1,3-diol
(c) 2,3-dimethyl butane-2,3-diol
(d) 2,3-dimethyl butane-1,3-diol
4. When 46 g of ethyl alcohol is dissolved in 162 g of water, the mole fraction of ethyl alcohol and water respectively is
- (a) 0.9 , 0.1
(b) 0.78 , 0.22
(c) 0.1 , 0.9
(d) 0.22 , 0.78
5. What is the position of an element in long form of periodic table if the expected electronic configuration is $[Kr]4d^95s^2$?
- (a) Group - 6, period - 5
(b) Group - 9, period - 5
(c) Group - 5, period - 6
(d) Group - 11, period - 5
6. The compound used in Holme's signals is
- (a) Ne
(b) PH_3
(c) H_2Se
(d) P_4O_{10}

7. A 5 % solution of cane sugar (molar mass 342) is isotonic with 1 % solution of non electrolyte substance X, the molar mass of substance X is
- (a) 34.2 g mol^{-1}
 - (b) 171.2 g mol^{-1}
 - (c) 136.8 g mol^{-1}
 - (d) 68.4 g mol^{-1}
8. 0.4 g of an organic compound in Dumas method gives 22.4 mL of nitrogen collected at S. T. P. What is the percentage of nitrogen in the compound?
- (a) 13.67 %
 - (b) 7.0 %
 - (c) 8.5 %
 - (d) 10.0 %
9. According to radius ratio rule if 'R' is radius of anion and 'r' is the radius of cation then for an atom to occupy octahedral hole, the possible relation between R and r is
- (a) $r = 2.25R$
 - (b) $r = 0.514R$
 - (c) $r = 0.225R$
 - (d) $r = 0.314R$
10. Molecular formula C_2H_7N represents
- (a) only 2° amine
 - (b) 1° amine and 2° amine
 - (c) only 1° amine
 - (d) 2° amine and 3° amine
11. Which of the following is obtained on dry distillation of equimolar mixture of calcium acetate and calcium propionate?
- (a) Ethyl propyl ketone
 - (b) Propionaldehyde
 - (c) Acetaldehyde
 - (d) Ethyl methyl ketone
12. Which of the following solution is called as Lucas reagent?
- (a) Concentrated carboic acid with zinc chloride.
 - (b) Concentrated hydrochloric acid with zinc chloride.
 - (c) Concentrated sulphuric acid with zinc sulphate.
 - (d) Concentrated nitric acid with zinc nitrate.
13. Which among the following substituent groups increases the acidic strength of aromatic carboxylic acids?
- (a) $-OH$
 - (b) $-CH_3$
 - (c) $-NH_2$
 - (d) $-NO_2$

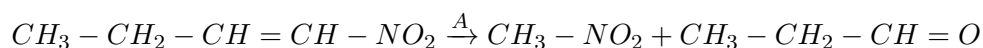
14. During electrolysis of aqueous NaCl, the product obtained at cathode is
- (a) $O_2(g)$
 - (b) $Cl_2(g)$
 - (c) $H_2O(g)$
 - (d) $H_2(g)$
15. For zero order reaction, when $[A]_t$ is plotted against time (t), the slope of the straight line obtained is equal to
- (a) $-k$
 - (b) k
 - (c) $[A]_0$
 - (d) $-kt$
16. How many moles of fructose and galactose respectively are obtained on hydrolysis of 1 mole stachyose?
- (a) 1 , 1
 - (b) 2 , 2
 - (c) 3 , 1
 - (d) 1 , 2
17. In colloidal dispersion of starch maximum possible size of starch particle is
- (a) 0.1 nm
 - (b) 1 nm
 - (c) greater than 10^3 nm
 - (d) 10^3 nm
18. Which among the following is NOT paramagnetic in nature?
- (a) Benzene
 - (b) Oxygen
 - (c) Fe^{3+}
 - (d) Cu^{2+}
19. What is the product X obtained in the following reaction?



- (a) $C_6H_5NH_2$
 - (b) $C_6H_5NO_2$
 - (c) C_6H_5Cl
 - (d) C_6H_5F
20. The electronic configuration of Be_2 molecule according MOT is

- (a) $(\sigma 1s^2)(\sigma^* 1s)^2, \sigma 2s^2, \sigma^* 2s^0$
- (b) $(\sigma 1s)^2(\sigma^* 1s)^2, \sigma 2s^2, \sigma^* 2s^2$
- (c) $(\sigma 1s^2)(\sigma^* 1s)^2, \sigma 2s^1, \sigma^* 2s^2$
- (d) $(\sigma 1s^2)(\sigma^* 1s)^1, \sigma 2s^2, \sigma^* 2s^2$

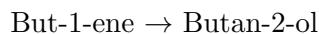
21. Which among the following pairs of percentage of carbon and the property of cast iron is true?
- (a) 0.2 to 2.0 % C , forms steel alloy
 - (b) 0.2 to 2.0 % C , very soft
 - (c) 4.0 % C , hard and brittle
 - (d) Less than 0.2 % C , very soft
22. Which of the following is an intensive property?
- (a) Mass
 - (b) Melting point
 - (c) Internal energy
 - (d) Volume
23. Alkyl chloride when treated with sodium iodide in presence of dry acetone forms alkyl iodide. What is the name of this reaction?
- (a) Swarts reaction
 - (b) Wurtz reaction
 - (c) Wurtz - Fittig reaction
 - (d) Finkelstein reaction
24. At constant temperature and pressure when 8 volumes of dihydrogen gas react with 4 volumes of dioxygen, the mass of water vapour produced is
- (a) 36 g
 - (b) 72 g
 - (c) 162 g
 - (d) 144 g
25. Identify 'A' in the following reaction.



- (a) $K_2Cr_2O_7$
 - (b) $KMnO_4$
 - (c) H_3O^+
 - (d) $LiAlH_4$
26. A first order reaction is 50 % completed in 16 minutes. The percentage of reactant that will react in 32 minutes is
- (a) 100 %

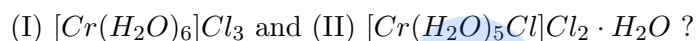
- (b) 12.5 %
- (c) 25 %
- (d) 75 %

27. Which of the following reagents can bring about following conversion?



- (a) H_2O_2
- (b) KOH aqueous
- (c) (i) cold Conc. H_2SO_4 , (ii) H_2O
- (d) B_2H_6

28. What type of isomerism is present between



- (a) Ionisation
- (b) Coordination
- (c) Hydrate
- (d) Linkage

29. Identify the correct statement from the following.

- (a) Vapour pressure of a solution containing a non volatile solute is always less than vapour pressure of pure solvent.
- (b) Liquids having greater intermolecular forces have lower boiling points.
- (c) Boiling point of pure solvent is always greater than boiling point of its solution containing a non volatile solute.
- (d) Vapour pressure of a solution containing a non volatile solute is always greater than vapour pressure of pure solvent.

30. Which among the following polymers is used to obtain bullet proof vests and helmets?

- (a) Dynel
- (b) Glyptal
- (c) Nomex
- (d) Kevlar

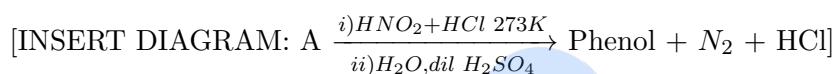
31. Which metal from following has highest tendency to undergo oxidation?

- (a) Mg
- (b) Ag
- (c) Al
- (d) Fe

32. Which among the following elements has highest ionisation enthalpy and bears a diagonal relationship with aluminium?

- (a) Magnesium

- (b) Beryllium
 - (c) Calcium
 - (d) Lithium
33. Which of the following is cationic detergent?
- (a) n-hexadecyl trimethyl ammonium chloride
 - (b) Pentaerythrityl stearate
 - (c) n-dodecyl benzene sulphonic acid
 - (d) Sodium lauryl sulphate
34. Identify compound 'A' in the following reaction.



- (a) Benzene
 - (b) Chlorobenzene
 - (c) Aniline
 - (d) Cumene
35. Strength of 20 volume solution of hydrogen peroxide is
- (a) 60.71 g/L
 - (b) 6.8 g/L
 - (c) 68 g/L
 - (d) 6.071 g/L
36. What type of geometry and magnetic behaviour is found in compound $[NiCl_4]^{2-}$? (Atomic no. Ni = 28)
- (a) Square planar and Paramagnetic
 - (b) Tetrahedral and paramagnetic
 - (c) Pyramidal and diamagnetic
 - (d) Square planar and paramagnetic
37. Identify the compound having highest boiling point from following?
- (a) Propanal
 - (b) Methoxy ethane
 - (c) Propane
 - (d) Propan-1-ol
38. Which among the following catalysts is used in manufacture of sulphuric acid by contact process?
- (a) Ni

- (b) Fe with Mo
- (c) V_2O_5
- (d) MnO_2

39. A balloon contains 2.27 L air and has a pressure of $1.013 \times 10^5 \text{ Nm}^{-2}$. The balloon rises to a certain height and expands to volume of 4540 mL. What is the final pressure of air in balloon?

- (a) $2.026 \times 10^2 \text{ Nm}^{-2}$
- (b) $4.540 \times 10^4 \text{ Nm}^{-2}$
- (c) $5.065 \times 10^{-4} \text{ Nm}^{-2}$
- (d) $5.065 \times 10^4 \text{ Nm}^{-2}$

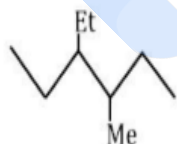
40. Heat of combustion of liquid benzene to carbon dioxide and water is $-3266 \text{ kJ mol}^{-1}$. What is the amount of heat liberated when 780 mg of benzene is fully oxidised? (At mass of C = 12, H = 1)

- (a) 32.66 kJ
- (b) 326.6 kJ
- (c) 65.32 kJ
- (d) 16.33 kJ

41. Total number of lone pairs of electron on oxygen atoms in carbondioxide are

- (a) 2
- (b) 3
- (c) 4
- (d) 1

42. What is the molar mass of a compound represented below?



- (a) 128 g mol^{-1}
- (b) 108 g mol^{-1}
- (c) 120 g mol^{-1}
- (d) 126 g mol^{-1}

43. Which among the following polymers is a heteropolymer?

- (a) Nylon-6
- (b) Polythene
- (c) Buna-N
- (d) Polystyrene

44. Which of the following formulae is used to find edge length of bcc unit cell?

- (a) $\frac{\sqrt{3}}{4r}$
- (b) $\sqrt{8} r$
- (c) $\frac{4r}{\sqrt{3}}$
- (d) $\sqrt{\frac{4r}{3}}$

45. What is the molecular formula of nitrogen sesquioxide?

- (a) N_2O
- (b) N_2O_3
- (c) N_2O_5
- (d) N_2O_4

46. Prolonged heating of glucose with HI to form n-Hexane, confirms

- (a) Presence of carbonyl group
- (b) Presence of all six carbon atoms in a straight chain
- (c) Presence of primary alcoholic group
- (d) Presence of aldehydic carbonyl group

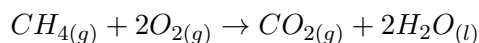
47. When will be change in Gibb's free energy always negative?

- (a) ΔH = positive, ΔS = negative at all temperatures.
- (b) ΔH and ΔS both positive at low temperature.
- (c) ΔH = negative, ΔS = positive, at all temperatures.
- (d) ΔH and ΔS both negative at high temperature.

48. The conductivity of NaI solution is $6.0 \times 10^{-4} \Omega^{-1} \text{cm}^{-1}$ and molar conductivity is $120 \Omega^{-1} \text{cm}^2 \text{mol}^{-1}$. Calculate the concentration of NaI solution

- (a) 0.05 M
- (b) 2×10^{-2} M
- (c) 0.005 M
- (d) 7.2×10^{-3} M

49. Identify the oxidising agent in following reaction.



- (a) $CH_{4(g)}$
- (b) $O_{2(g)}$
- (c) $CO_{2(g)}$
- (d) $H_2O_{(l)}$

50. Which of the following is NOT an antiseptic?

- (a) Bithional
- (b) Penicillin
- (c) Chloroxylonol
- (d) Iodine

Biology

1. How many among the sixteen offsprings produced in the F_2 generation will have parental combinations of two genes controlling wheat kernel colour?
 - (a) Three
 - (b) Four
 - (c) One
 - (d) Two
2. In herbivorous animals, appendix helps in digestion of _____.
 - (a) cellulose
 - (b) glycogen
 - (c) polypeptides
 - (d) lactose
3. One of the following cell organelles is involved in synthesis and storage of fat.
 - (a) Glyoxysome
 - (b) Peroxisome
 - (c) Sphaerosome
 - (d) Ribosome
4. Eustachian valve guards the opening of _____.
 - (a) coronary sinus
 - (b) coronary artery
 - (c) inferior venacava
 - (d) superior venacava
5. The gene transfer between unrelated plants is brought about by _____.
 - (a) cloning
 - (b) genetic engineering
 - (c) asexual reproduction
 - (d) sexual reproduction
6. The applications of DNA finger printing technique are following EXCEPT _____.
 - (a) to establish parentage in disputed cases.
 - (b) to study chromosomal types.
 - (c) to settle insurance claims.
 - (d) to study phylogeny of organisms.
7. The process of tubular secretion adds following substances to the renal fluid EXCEPT _____.
 - (a) hydrogen ions
 - (b) creatinine
 - (c) potassium ions
 - (d) sodium ions
8. The sites of nitrogen fixation in blue green algae are _____.

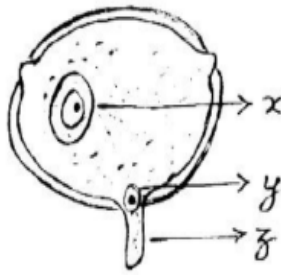
- (a) vegetative cells
(b) apical cells
(c) heterocysts
(d) basal cells
9. On sensitization, activated B-lymphocytes multiply to form clone of specific A which in turn produce B.
- (a) A-cytotoxic T-cells, B-perforins
(b) A-plasma cells, B-antibodies
(c) A-plasma cells, B-antigens
(d) A-memory T-cells, B-lymphokines
10. Pusa Shubhra a variety of cauliflower is produced to prevent _____.
- (a) black rot
(b) leaf curl
(c) stripe rust
(d) Hill bunt
11. The toxic substances released from *Bacillus thuringiensis* affects _____ of insect larva.
- (a) brain
(b) gut
(c) Malpighian tubules
(d) trachea
12. Which one of the following is NOT needed to construct solenoid fibre?
- (a) Nucleosome
(b) DNA molecule
(c) RNA molecule
(d) Basic proteins histones
13. In Column - I there are names of viral diseases while in Column-II there are names of viruses.
- | | Column - I | Column - II |
|--|-----------------|------------------|
| | 1) Yellow fever | – Flavi virus |
| | 2) Swine flu | – H_1N_1 virus |
| | 3) Small pox | – Morbilli virus |
| | 4) AIDS | – Retro virus |
- Find out INCORRECT pair.
14. Highest taxonomic category is _____.
- (a) species
(b) division
(c) genus
(d) kingdom
15. At how many places, Co-A is used in aerobic respiration after glycolysis?
- (a) Three
(b) Four

- (c) One
(d) Two
16. A gap present in upper jaw, between incisor and canine of ape is _____.
(a) diastema
(b) diapedesis
(c) diaphysis
(d) diarthrosis
17. Increased blood pressure and heart rate, deposition of fats in eye sockets and weight loss are found in _____.
(a) Addison's disease
(b) Grave's disease
(c) bleeder's disease
(d) Cushing's disease
18. What proportion of photosynthetically fixed CO_2 goes back to atmosphere, in C_3 plants by photorespiration?
(a) $1/6$
(b) $2/3$
(c) $1/4$
(d) $5/6$
19. Cranial capacity of Java man is _____.
(a) 1600 c.c.
(b) 1450 c.c.
(c) 1200 c.c.
(d) 940 c.c.
20. How many of the following statements is/are true?
i) Alleles are located on different loci.
ii) An allele individually controls a trait.
iii) An allelic pair controls two traits.
iv) An allelic pair controls a single trait.
(a) Two
(b) One
(c) Four
(d) Three
21. Branching tree like processes of white matter called A are located in B of CNS.
(a) A - funiculi, B - spinal cord
(b) A - folia, B - medulla oblongata
(c) A - corpora striata, B - cerebrum
(d) A - arbor vitae, B - cerebellum
22. Exudation of water from the cut end of basal part of stem is due to _____.

- (a) osmotic pressure
 - (b) transpiration
 - (c) root pressure
 - (d) low temperature
23. In *Kalanchoe*, vegetative reproduction takes place by _____.
- (a) root tuber
 - (b) stem tuber
 - (c) floral buds
 - (d) epiphyllous buds
24. Which one of the following is NOT a characteristic of genetic code?
- (a) It is commaless.
 - (b) It is in triplets.
 - (c) It is degenerate.
 - (d) It is ambiguous.
25. A pea plant with genotype YyRr is crossed with another pea plant with genotype yyrr. The expected phenotypic ratio of individuals formed will be _____.
- (a) 2:1:1
 - (b) 1:2:1
 - (c) 1:1:2
 - (d) 1:1:1:1
26. Generally lower pulse rate is observed in _____.
- (a) males
 - (b) excitement
 - (c) standing position
 - (d) children
27. Which one of the following is NOT an example of C_4 plant?
- (a) Sugarcane
 - (b) Gram
 - (c) Amaranthus
 - (d) Maize
28. A protein is a sequence of amino acids. The end of polypeptide chain of $-NH_2$ end and at $-COOH$ end are respectively called _____.
- (a) α -terminal and β -terminal
 - (b) N-terminal and C-terminal
 - (c) C-terminal and N-terminal
 - (d) β -terminal and α -terminal
29. Usually at which pH, the human sperms become motile?
- (a) 4.5 to 5.0
 - (b) 6.0 to 6.5

- (c) 7.5 to 8.5
- (d) 4.0 to 4.5

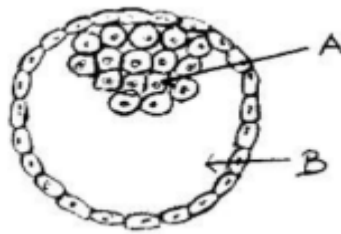
30. Choose the correct set of labellings in the given diagram.



- (a) x-generative cell, y-pollen tube, z-tube nucleus
 - (b) x-generative cell, y-tube nucleus, z-pollen tube
 - (c) x-pollen tube, y-tube nucleus, z-generative cell
 - (d) x-tube nucleus, y-generative cell, z-pollen tube
31. *Psilotum nudum* is a/an _____ species.
- (a) endangered
 - (b) rare
 - (c) extinct
 - (d) exotic
32. The endocrine nature of kidney is indicated by secretion of _____.
- (a) calcitriol
 - (b) aldosterone
 - (c) glucagon
 - (d) vasopressin
33. The law of dominance is not universally applicable because in some organisms few characters are _____.
- (a) completely dominant.
 - (b) both, dominant and recessive
 - (c) completely recessive.
 - (d) incompletely dominant.
34. A single layer of cells that composes epicardium is called _____.
- (a) endothelium
 - (b) mesothelium
 - (c) ependyma
 - (d) epidermis
35. The pO_2 of alveolar blood is _____ mmHg.
- (a) 90
 - (b) 50
 - (c) 104

- (d) 40
36. The correct group of ureotelic animals is _____.
- (a) frog, shark, *Labeo*
 - (b) land snail, toad, *Labeo*
 - (c) dog, *Labeo*, snake
 - (d) frog, turtle, rat
37. Lymph contains all of the following components EXCEPT _____.
- (a) platelets
 - (b) lymphocytes
 - (c) antibodies
 - (d) CO_2
38. Smallest bacterial genome is seen in _____.
- (a) *Methanococcus jannaschii*
 - (b) *Mycobacterium genitalium*
 - (c) *Haemophilus influenzae*
 - (d) *Saccharomyces cerevisiae*
39. Which of the following steps involved in Calvin cycle is in sequential manner?
- 1) Carboxylation - reduction - regeneration - synthesis
 - 2) Carboxylation - reduction - synthesis - regeneration
 - 3) Reduction - carboxylation - synthesis - regeneration
 - 4) Carboxylation - synthesis - regeneration - reduction
- (a) 2
 - (b) 4
 - (c) 1
 - (d) 3
40. c DNA library is mostly constructed for organisms like _____.
- (a) yeast
 - (b) cyanobacteria
 - (c) virus
 - (d) bacteria
41. In genetic engineering, _____ serve as agents for gene transfer.
- (a) plasmids
 - (b) ribosomes
 - (c) lysosomes
 - (d) microbodies
42. Neurotransmitter, at a synapse, is stored temporarily in _____.
- (a) synaptic vesicles.
 - (b) synaptic cleft

- (c) pre synaptic membrane
(d) post synaptic membrane
43. Lysozyme present in tears brings about lysis of _____.
(a) bacteria
(b) fungi
(c) protists
(d) viruses
44. At the end of gestation period, the foetal hormones, which cause decrease in progesterone level in mother's blood are _____.
(a) adrenaline and nor-adrenaline
(b) parathyroid hormones
(c) thyroid hormones
(d) corticosteroids
45. Total number of complete spirals occurring in a segment of DNA having 100 nucleotides will be _____.
(a) 5
(b) 6
(c) 3
(d) 4
46. Protozoan disease of poultry is _____.
(a) Favus
(b) Pullorum
(c) Ranikhet
(d) Coccidiosis
47. One of the human embryonic developmental stages has been shown in the diagram. What do the A and B indicate?



- (a) A-Inner mass of cells; B- Blastocoel
(b) A- Inner mass of cells; B- Antrum
(c) A-Trophoblasts; B-Yolk sac
(d) A- Ectoderm; B- Amniotic cavity
48. Which one of the following is the correct structural organization of any animal?
(a) Tissues → Organs → Systems → Cells

- (b) Cells → Tissues → Organs → Systems
 - (c) Cells → Organs → Systems → Tissues
 - (d) Systems → Organs → Cells → Tissues
49. How many ATP molecules would be produced from complete aerobic breakdown of one molecule of acetyl Co-A?
- (a) 38
 - (b) 15
 - (c) 36
 - (d) 12
50. The figure below is showing two chambers A and B having different concentration of solutions separated by a semi-permeable membrane. Identify the correct statement.

[INSERT DIAGRAM: Two chambers A and B separated by semi-permeable membrane. Dots representing solute.]

- (a) Movement of solute molecules takes place from chamber 'B' to chamber 'A' till equilibrium.
 - (b) There is no movement of solvent between chamber 'A' and 'B'.
 - (c) Movement of solvent molecules takes place from chamber 'A' to chamber 'B' till equilibrium.
 - (d) Movement of solvent molecules takes place from chamber 'B' to chamber 'A' till equilibrium.
51. The source of oxygen evolved during photosynthesis is _____.
- (a) light
 - (b) chlorophyll
 - (c) CO_2
 - (d) water
52. The initial acceptor of electrons among the cytochromes in respiratory chain is
- (a) cytochrome - a_3
 - (b) cytochrome - a
 - (c) cytochrome - c
 - (d) cytochrome - $b - c_1$
53. During _____, variations are created.
- (a) sexual reproduction
 - (b) vegetative propagation
 - (c) cloning
 - (d) asexual reproduction
54. If a person experiences difficulty in movements of pharynx, neck and shoulders, _____ cranial nerve may be injured.

- (a) abducens
(b) hypoglossal
(c) spinal accessory
(d) vagus
55. During glycolysis, ATP generation -II step occurs between which of the two intermediates?
- (a) 2- PGA and PEPA
(b) PEPA and pyruvate
(c) 3- PGA and 2 -PGA
(d) 1,3-diPGA and 3 -PGA
56. Which auxin should be used to eradicate dicotyledonous weeds from a monocotyledonous crop field?
- (a) 2, 4 -D
(b) IBA
(c) IAA
(d) NAA
57. A test cross is a back cross but back cross is not necessarily a test cross. Because a test cross is always between_____.
- (a) F_1 hybrid with another F_1 hybrid
(b) F_1 hybrid and recessive parent.
(c) F_1 hybrid and dominant parent.
(d) F_1 hybrid and F_2 hybrid
58. In human beings, which of the following is NOT the function of vagina?
- (a) It acts as a passage for urine.
(b) It receives penis during copulation.
(c) It serves as the birth canal.
(d) It allows passage of menstrual flow.
59. During gametogenesis, unequal cytoplasmic divisions take place in _____.
- (a) multiplication phase of oogenesis.
(b) maturation phase of spermatogenesis.
(c) multiplication phase of spermatogenesis.
(d) maturation phase of oogenesis.
60. Match Column - I with Column -II considering mode of asexual reproduction.
- | Column - I | Column - II |
|-------------------|------------------------|
| a) Binary fission | i) <i>Spirogyra</i> |
| b) Conidia | ii) Yeast |
| c) Budding | iii) <i>Amoeba</i> |
| d) Fragmentation | iv) <i>Penicillium</i> |
- (a) a-iii, b-iv, c-ii, d-i
(b) a-iv, b-iii, c-ii, d-i

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

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

61. Select the correct statement.

(a) Striated muscles fibres are spindle shaped and show cross striations.

(b) Cardiac muscles show presence of intercalated disc.

(c) Smooth muscles show presence of large number of peripheral nuclei.

(d) Pace maker consists of nerve fibres in human beings.

62. Smooth leaved and nectarless cotton varieties are NOT affected by _____.

(a) bollworms

(b) jassids

(c) fruit borers

(d) stem borers

63. Which of the following prevents entry of food particles into the respiratory passage?

(a) Tongue

(b) Epiglottis

(c) Pharynx

(d) Glottis

64. Select the correct match from Column-I with Column-II

Column-I

a) Fibrous pericardium

b) Lymphocyte

c) Bundle of His

d) Erythrocyte

Column-II

i) Mesothelium

ii) Scavenger

iii) Circular with kidney shaped nucleus

iv) Connection with AV node

v) Interventricular septum

(a) a - v

(b) c - iv

(c) d - ii

(d) b - iii

65. The relation between herbivore and carnivore is an example of _____.

(a) commensalism

(b) predation

(c) parasitism

(d) mutualism

66. Match Column-I with Column-II and select the correct option.

Column-I

a) *Seymouria*

b) *Ichthyostegia*

c) *Archaeopteryx*

d) *Australopithecus*

Column-II

i) fish and amphibian

ii) reptiles and birds

iii) ape and man

iv) amphibians and reptiles

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

67. The correct group of Indian breeds of buffalo is _____.

- (a) Murrah, Nagpuri, Nili
- (b) Nili, Surati, Sindhi
- (c) Sahiwal, Jersey, Brown swiss
- (d) Sindhi, Gir, Holstein

68. Runners are slender wire like structures which develop from _____.

- (a) underground part of stem.
- (b) internodes of the stem.
- (c) subaerial axillary buds of the stem.
- (d) apical meristem.

69. During lytic cycle the enzyme endolysin causes break down of _____.

- (a) bacteriophage DNA
- (b) host cell wall
- (c) host DNA
- (d) virions

70. Match Column-I with Column-II and select the correct option.

Column-I	Column-II
a) Sunflower	i) Protogyny
b) Castor	ii) Self incompatibility
c) <i>Michelia</i>	iii) Protandry
d) Orchid	iv) Unisexuality

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

71. Presence of whole sets of chromosomes in an organism are indicated by the following EXCEPT _____.

- (a) diploidy
- (b) aneuploidy
- (c) triploidy
- (d) polyploidy

72. The initial development of male gametophyte from the pollen grain in angiosperms is _____.

- (a) in vitro
- (b) ex situ
- (c) in situ

(d) ex partite

73. Normal value of serum bilirubin is usually _____ μ mol/L.

- (a) 19 to 29
- (b) 3 to 13
- (c) 15 to 25
- (d) 33 to 37

74. Select vestigial organs from the following.

- (a) Vermiform appendix, wings of bat and coccyx of man.
- (b) Vermiform appendix, nictitating membrane and coccyx of man.
- (c) Forelimbs of whale, lizard and bat.
- (d) Wings of bat, nictitating membrane and wings of insects.

75. Out of the 56 % of sunlight reaching the earth's atmosphere, _____ is used for photosynthesis.

- (a) 0.05 %
- (b) 0.02 %
- (c) 10 %
- (d) 0.2 %

76. In human beings, if the spermatozoa are not ejaculated, then _____.

- (a) they are inactivated within the seminal vesicles.
- (b) they are permanently stored in cauda epididymis.
- (c) they are permanently stored in caput epididymis.
- (d) they are re-absorbed in the vas deferens.

77. Detritus food chain always begins with _____.

- (a) lichens
- (b) dead organic matter
- (c) phytoplanktons
- (d) trees

78. Telomere has a unique property of _____.

- (a) condensation of chromatin network.
- (b) prevention of ends of the chromosomes from sticking together.
- (c) attaching to spindle fibres.
- (d) regulation of protein synthesis.

79. Which of the following is affected by injury to Broca's area of cerebrum?

- (a) Vision
- (b) Speech
- (c) Hearing
- (d) Smell

80. Which of the following is NOT a unique feature of acquired immunity?

- (a) Discrimination between self and non-self
 - (b) Non- specificity
 - (c) Memory
 - (d) Diversity
81. How many of the nitrogen containing bases are common among both DNA and RNA?
- (a) Four
 - (b) Two
 - (c) Three
 - (d) One
82. The white adipose tissue appears opaque due to _____.
- (a) large amount of intra-cellular protein.
 - (b) large amount of extra-cellular fat.
 - (c) large number of adipocytes.
 - (d) more number of white fibres.
83. Neeta is assigned a project of integrated organic farming in village. Which ideal sustainable method will she use for this?
- (a) include the activities of bee-keeping, dairy management, water harvesting, composting along with agriculture in the village.
 - (b) educate the rural women for establishment of self help groups to encourage cottage industry.
 - (c) form groups of youths to do street plays to educate the villagers for reduction and recycling of wastes.
 - (d) guide the villagers to design and build an effluent treatment and biogas plant.
84. One of the following is an example of incomplete sex linkage _____.
- (a) Red green colour blindness
 - (b) Myopia
 - (c) Retinitis pigmentosa
 - (d) Haemophilia
85. Binomial system of nomenclature was introduced by _____.
- (a) R. H. Whittaker
 - (b) H. J. Lam
 - (c) Carl Woese
 - (d) Carl Linnaeus
86. The photosynthetic pigments present only in red algae are _____.
- (a) xanthophyll
 - (b) carotene
 - (c) phycobilins
 - (d) anthocyanin
87. Mark the mismatch pair.
- (a) Mixing of chromosomes of male and female pronuclei – Karyogamy

- (b) Morphogenetic movements so as to form germinal layers – Gastrulation.
 - (c) Discharge of semen in vagina during copulation – Fertilization
 - (d) A series of rapid mitotic divisions in zygote – Cleavage
88. During germination of seed, water absorption takes place by _____.
- (a) endosmosis
 - (b) osmotic pressure
 - (c) exosmosis
 - (d) imbibition
89. What are the sediments in the settling tanks of tertiary treatment in STP called?
- (a) Activated Sludge
 - (b) Contaminants
 - (c) Effluents
 - (d) Sewage
90. Wobble hypothesis explains _____.
- (a) polarity of DNA molecule.
 - (b) synthesis of protein.
 - (c) degeneracy of genetic code.
 - (d) triplets of nucleotides.
91. The step followed during DNA profiling in which DNA sample is subjected to restriction endonuclease is _____.
- (a) Hybridization
 - (b) DNA isolation
 - (c) DNA amplification
 - (d) DNA fragmentation
92. Bacteria possess following appendages EXCEPT _____.
- (a) flagella
 - (b) fimbriae
 - (c) cilia
 - (d) pili
93. Generally callus produced during tissue culture is a mass of _____ cells.
- (a) sclerenchyma
 - (b) collenchyma
 - (c) parenchyma
 - (d) chlorenchyma
94. Which of the following intermediates of Krebs cycle undergoes both oxidation and decarboxylation reactions?
- (a) Oxalo acetate
 - (b) Oxalo succinate
 - (c) α - ketoglutarate

- (d) Succinyl Co-A
95. Cell walls become brittle due to lack of _____ elements.
- (a) Calcium
 - (b) Potassium
 - (c) Boron
 - (d) Copper
96. Which one of the following is NOT an example of mutualism?
- (a) *Plasmodium* and Man
 - (b) Ruminants and bacteria
 - (c) Mycorrhiza
 - (d) Lichen
97. The narrow passage, which connects the abdominal cavity with the scrotal sacs, is _____.
- (a) inguinal canal
 - (b) iter
 - (c) gubernaculum
 - (d) ejaculatory duct
98. After completing his civil engineering degree, Ramesh was appointed as trainee in the R and D city development office, he was to work on the project of laying water repellent roads in the city, which one of the following method will he decide to implement for sustainability?
- (a) Mixing 'Polyblend' in bitumen to be used.
 - (b) Adding plastic powder in the cement to be used.
 - (c) Mixing wax in the cement to be used.
 - (d) Adding cement in the mixture to be used.
99. During the development of male gametes in angiosperms, the microspore mother cell undergoes _____ meiosis and _____ mitosis respectively.
- (a) two and two
 - (b) two and one
 - (c) one and two
 - (d) one and three
100. Corona in passion flower helps the plant in achieving _____ pollination.
- (a) bat
 - (b) bird
 - (c) wind
 - (d) insect