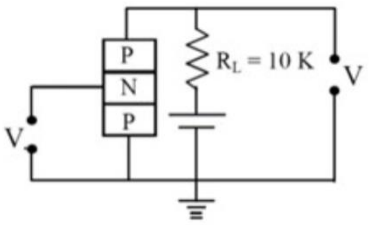
SECTION -A

1. An P – N – P transistor circuit is arranged as shown. It is a



(a) Common base amplifier circuit (b) Common – emitter amplifier circuit
(c) Common –collector circuit (d) None

2. A cylinder rolls up an inclined plane, reaches some height, and then rolls down (without slipping throughout these motions). The directions of the frictional force acting on the cylinder are
(a) Up the inclined while ascending and down the incline while descending
(b) Up the incline while ascending as well as descending
(c) Down the incline while ascending and up the incline while descending
(d) Down the incline while ascending as well as descending

3. Photons of energy 6 eV are incident on a metal surface whose work function is 4 eV. The minimum kinetic energy of the emitted photoelectrons will be
(a) 10 eV (b) 1 eV (c) 2 eV (d) Zero

4. A disc of mass 4 kg and of radius 1 m rolls on a horizontal surface without slipping such that the velocity of its centre of mass is 10 cm $\sec^{-1}$. Its rotational kinetic energy is
(a) 0.005 J (b) 0.02 J (c) 0.03 J (d) 0.01 J

5. A telescope of objective lens diameter 2 m uses light of wavelength 5000 $\overset{0}{A}$ for viewing stars. The minimum angular separation between two stars whose image is just resolved by the telescope is
(a) $4\times10^{-4}\ rad$ (b) $0.25\times10^{-6}\ rad$ (c) $0.31\times10^{-6}\ rad$ (d) $5\times10^{-3}\ rad$

6. 1000 small water drops each of radius r and charge q coalesce together to form one spherical drop. The potential of the bigger drop is larger than that of the smaller one by a factor
(a) 1000 (b) 100 (c) 10 (d) 1

7. Two waves represented by the following equations are travelling in the same medium

$y_1 = 5\sin 2\pi(75t - 0.25x)$

$y_2 = 10\sin 2\pi(150t - 0.50x)$

The intensity ratio $\frac{I_1}{I_2}$ of the two waves is
(a) 1 : 2 (b) 1 : 4 (c) 1 : 8 (d) 1 : 16

8. A charged particle enters a uniform magnetic field with a velocity vector at an angle of 45^0 with the magnetic field. The pitch of the helical path followed by the particle is p. The radius of the helix will be

Space for rough work

(a) $\frac{p}{\sqrt{2\pi}}$ (b) $\sqrt{2}p$ (c) $\frac{p}{2\pi}$ (d) $\frac{\sqrt{2}p}{\pi}$

9. In a coil of area 10 cm^2 and 10 turns, magnetic field is directed perpendicular to the plane and is changing at a rate of $10^4\ T\,s^{-1}$. The resistance of the coil is 20 Ω. The current in the coil will be

(a) 0.5 A (b) 5 A (c) 50 A (d) $5\times10^8\ A$

10. 22 g of CO_2 at $27\ ^0C$ is mixed with 16 g of O_2 at $37\ ^0C$. If both gases are considered as ideal then the temperature of the mixture is (ignore vibrational degree of freedom)

(a) $30\ ^0C$ (b) $30.5\ ^0C$ (c) $31.5\ ^0C$ (d) $32\ ^0C$

11. A compass needle placed at a distance r from a short magnet in tanA position shows a deflection of 60^0. If the distance is increased to r((c)$^{1/3}$, then the deflection of the compass needle is -

(a) 30^0 (b) $60^0 \times ((c)^{1/3}$ (c) $60^0 \times ((c)^{2/3}$ (d) $60^0 \times ((c)^{3/3}$

12. In the mean life of a radioactive sample

(a) About $\frac{1}{3}$ of substance disintegrates (b) About $\frac{2}{3}$ of the substance disintegrates

(c) About 90% of the substance disintegrates (d) Almost all the substance disintegrates

13. The distance of a planet from the sun is 5 times the distance between the earth and the sun. The Time period of the planet is

(a) $5^{3/2}$ *years* (b) $5^{2/3}$ *years* (c) $5^{1/3}$ *years* (d) $5^{1/2}$ *years*

14. A atomic power reactor furnace can deliver 300 MW. The energy released due to fission of each of uranium atom U^{238} is 170 MeV. The number of uranium atoms fissioned per hour will be

(a) 5×10^{15} (b) 10×10^{20} (c) 40×10^{21} (d) 30×10^{25}

15. A billiard ball moving at a speed of $6.6\ m\,s^{-1}$ strikes an identical stationary ball elastically. After the collision, one ball is found to be moving at a speed of 3.3 $m\,s^{-1}$ in a direction making an angle of 60^0 with the original line of motion. The velocity of the other ball is

(a) 4.4 $m\,s^{-1}$ (b) 6.6 $m\,s^{-1}$ (c) 3.3 $m\,s^{-1}$ (d) 5.7 $m\,s^{-1}$

16. The voltage E and the current I in an instrument are represented by the equations $E = 2\cos\omega t\,V$ $I = 2\sin\omega t\,A$. The average power dissipated in the instrument will be

(a) Zero (b) 1.0 W (c) 4 W (d) 2.0 W

17. If input of a full - wave rectifier is e = 50 sin (314 t) volt, diode resistance is 100 Ω and load resistance is 1kΩ then, pulse frequency of output voltage is

(a) 50 Hz (b) 100 Hz (c) 150 Hz (d) 200 Hz

18. A horizontal plane supports a fixed vertical cylinder of radius R and a particle is attached to the cylinder by a horizontal thread AB as shown in figure. The horizontal velocity v_0 is imparted to the particle normal to the thread, then during subsequent motion which of the following statements is true?

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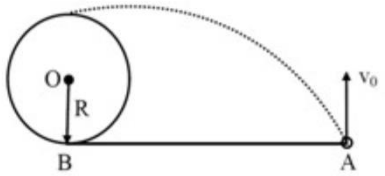


(a) Angular momentum of particle about O remains constant
(b) Angular momentum about B remains constant
(c) Momentum and kinetic energy both remain constant
(d) Kinetic energy alone remains constant

19. The potential energy of a particle varies with position x according to the relation $U(x) = 2x^4 - 27x$. The point $x = \frac{3}{2}$ is point of

(a)Unstable equilibrium (b) Stable equilibrium (c) Neutral equilibrium (d) None of these

20. When the resistance wire is passed through a die the cross – section area decreases by 1% , what change in resistance of the wire is

(a) 1% decrease (b) 1% increase (c) 2% decrease (d) 2% increase

21. The average translational Kinetic Energy. In one milliliter volume of oxygen at NTP is

(a) 0.15 J (b) 0.036 J (c) 0.56 J (d) 152 J

22. If on transition to the ground state a He^+ ion emits two photons in succession, having wavelengths 1026. $7\overset{0}{A}$ and 304 $7\overset{0}{A}$, then the quantum number n corresponding to the exiting state of He^+ ion is $\left[R = 1.096 \times 10^7\ m^{-1}\right]$

(a) 4 (b) 6 (c) 2 (d) 1

23. For proper ventilation of building windows must be open near the bottom and top of the walls so as to let pass

(a) More air in (b) Cool in near the bottom and hot air out near the roof
(c) Hot air in near the roof and cool air out near the bottom (d) Hot air out near the roof

24. The angle of dip at a place is 60°. A magnetic needle oscillates in a horizontal plane at this place with period T. The same needle will oscillate in a vertical plane coinciding with the magnetic meridian with a period

(a) T (b) 2T (c) $\frac{T}{2}$ (d) $\frac{T}{\sqrt{2}}$

25. A fish looking up through the water sea the outside world contained in circular horizon. If the refractive index of water is $\frac{4}{3}$ and the fish is 12 cm below the surface, the radius of this circle (in cm) is

(a) $36\sqrt{7}$ (b) $\frac{36}{\sqrt{7}}$ (c) $36\sqrt{5}$ (d) $4\sqrt{5}$

26. A second's pendulum clock having steel wire is calibrated at $20\ ^0C$. When the temperature is increased to $30\ ^0C$, how much times does the clock lose or gain in the week? $\left[\alpha_{steel} = 1.2 \times 10^{-5}\ ^0C^{-1}\right]$

(a) 0.3628 s (b) 3.626 s (c) 362.8 s (d) 36.28 s

27. A concave lens of glass of refractive index 1.5, has both surfaces of the same radius of curvature R. On immersion in a medium of refractive index 1.75, it will behave as a

(a) Convergent lens of focal length 3.5 R (b) Convergent lens of focal length 3.0 R
(c) Divergent lens of focal length 3.5 R (d) Divergent lens of focal length 3.0 R

28. The electric field associated with a light wave is $E = E_0 \sin\left[1.57 \times 10^7 (x - ct)\right]$ where x is in metre and t is in second. If this light is used to produce photoelectric emission from the surface of a metal of work function 1.9 eV, then the stopping potential will be

Space for rough work

(a) 1.2 V (b) 1.5 V (c) 1.75 V (d) 1.9 V

29. Two spheres of radii 2 cm and 3 cm are charged to same potential. If σ_1 *and* σ_2 be respectively the values of surface charge density on the conductors, then the ratio $\frac{\sigma_1}{\sigma_2}$ will be

(a) $\frac{4}{9}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $\frac{9}{4}$

30. One end of a spring of force constant k is fixed to a vertical wall and the other to a body of mass m resting on a smooth horizontal surface. There is another wall at a distance x_0 from the body. The spring is then compressed by 2 x_0 and released. The time taken to strike the wall first time is

(a) $\frac{\pi}{6}\sqrt{\frac{m}{k}}$ (b) $\sqrt{\frac{m}{k}}$ (c) $\frac{2\pi}{3}\sqrt{\frac{m}{k}}$ (d) $\frac{\pi}{4}\sqrt{\frac{m}{k}}$

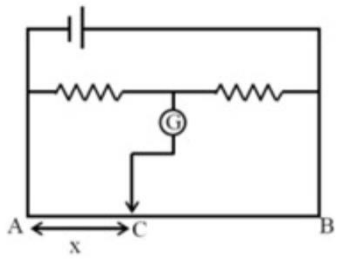
31. There is a magnetic material of coercivity $2\times10^3\ Am^{-1}$. What current should flow through a solenoid of length 15 cm having 150 turns to demagnetize the substance completely?

(a) 4 A (b) 2.5 A (c) 2 A (c) 3.5 A

32. A stone of mass 500 g is dropped from the top of a tower of 100 m height and simultaneously other stone of mass 1 kg is thrown horizontally with a speed of 10 m/s from same point. The height of the centre of mass of the above two stone system after 3 s is ($g = 10\ m/s^2$)

(a) 45 m (b) 35 m (c) 55 m (d) None of these

33. In this given circuit, no current is passing through the galvanometer. If the cross – sectional diameter of the wire AB is doubled, then for null point of galvanometer the value of AC would



(a) $\frac{4}{x}$ (b) $4x$
(c) $2x$ (d) x

34. When a free neutron decays to form a proton and an electron, then choose the incorrect statement

(a) The relation may be expressed as ${}_0n^1 \rightarrow {}_1p^1 + {}_{-1}e^0 + \bar{\nu}$
(b) Every electron comes out with the same energy
(c) The electron shares the major part of the energy released
(d) All the above

35. A particle is thrown over a triangle from the end of a horizontal base and after grazing the vertex falls on the other end of the base. If 30^0 *and* 60^0 be the base angles and θ the angle of projection then $\tan\theta$ is

(a) $\frac{2}{\sqrt{3}}$ (b) $\frac{4}{\sqrt{3}}$ (c) $\frac{1}{3}$ (d) 3

Space for rough work

Section -B

36. A block of mass 2 kg is kept at origin at t = 0 and is having velocity $4\sqrt{5}\,m/s$ in positive x – direction. The only force on it is a conservative and its potential energy is defined as $U = -x^3 + 6x^2 + 15$ (SI units). Its velocity when the force acting on it is minimum (after the time t = 0) is

(a) $8\,m/s$ (b) $4m/s$ (c) $10\sqrt{24}\,m/s$ (d) None of these

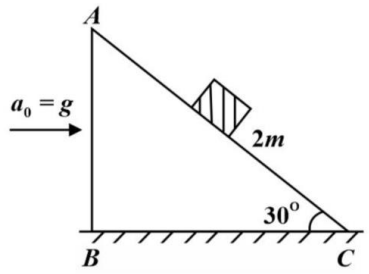
37. A sphere of density d, specific heat capacity c and radius r is hung by a thermally insulating thread in an enclosure which is kept at a lower temperature than the sphere. The temperature of the sphere starts to drop at a rate which depends upon the temperature difference between the sphere and the enclosure. If the temperature difference is ΔT and surrounding temperature is T_0, then rate of fall in temperature will be [Given that $\Delta T << T_0$]

(a) $\frac{12\sigma T_0^2 \Delta T}{rdc}$ (b) $\frac{12\sigma T_0^3 \Delta T}{rdc}$ (c) $\frac{12\sigma T_0^4 \Delta T}{rdc}$ (d) $\frac{12\sigma \Delta T}{rdcT_0^3}$

38. A rod of mass M kg and length L metre is bent in the form of an equilateral triangle. The moment of inertia of triangle about a vertical axis to perpendicular to the plane of triangle and passing through the centre (in units of $kg\,m^2$) is

(a) $\frac{ML^2}{12}$ (b) $\frac{ML^2}{54}$ (c) $\frac{ML^2}{162}$ (d) $\frac{ML^2}{108}$

39. A block is placed on an inclined plane moving towards right horizontally with an acceleration $a_0 = g$. The length of the plane AC = 1 m. Friction is absent everywhere. The time taken by the block to reach from C to A is (g = 10 m/ s^2)



(a) 1.2 s
(b) 0.74 s
(c) 2.56 s
(d) 0.42 s

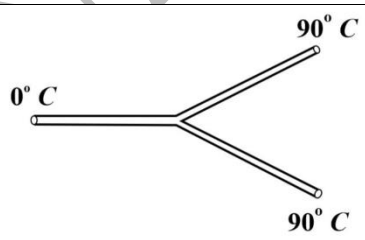
40. Weight of a body of mass *m* decreases by 1% when it is raised to height *h* above the earth's surface. If the body is taken to a depth h in a mine, change in its weight is

(a) 2% decrease (b) 0.5% decrease (c) 1% increase (d) 0.5% increase

41. The time period of oscillation of a magnet is 2 sec. When it is magnetized so that its pole strength is 4 times. Its period will be

(a) 1 sec (b) 2 sec (c) 4 sec (d) 8 sec

42. Three rods made of the same material and having the same cross – section have been joined as shown in the figure. Each rod is of the same length. The left and right ends are kept at $0\ ^0C$ *and* $90\ ^0C$ respectively. The temperature of the junction of the three rods will be



(a) $45\ ^0C$
(b) $60\ ^0C$
(c) $30\ ^0C$
(d) $20\ ^0C$

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43. When 24.8 keV x – rays strike a material, the photoelectrons emitted from K shell are observed to move in a circle of radius 23 mm in a magnetic field of $2\times10^{-2}\,T$. The binding energy of K shell electron is

(a) 6.2 keV (b) 5.4 keV (c) 7.4 keV (d) 8.4 keV

44. An ideal gas is expanded so that the amount of heat given is equal to the decrease in internal energy of the gas. The gas undergoes the process $PV^{\frac{6}{5}} = \text{constant}$. The gas may be

(a) He (b) O_2 (c) Ar (d) All of the above

45. At any point $(x,0,0)$ the electric potential V is $\left(\frac{1000}{x}+\frac{1500}{x^2}+\frac{500}{x^3}\right)$, volt, then electric field intensity at x = 1 m is

(a) $5500\left(j+k\right)V\ m^{-1}$ (b) $5500\,\hat{i}\,V\ m^{-1}$ (c) $\frac{5500}{\sqrt{2}}\left(j+k\right)V\ m^{-1}$ (d) $\frac{5500}{\sqrt{2}}\left(\hat{i}+k\right)V\ m^{-1}$

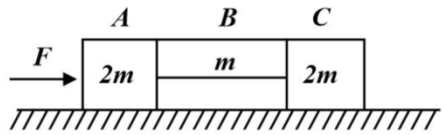
46. An observer moves towards a stationary source of sound, with a velocity one – fifth of the velocity of sound. What is the percentage increase in the apparent frequency?

(a) 5% (b) 20% (c) Zero (d) 0.5%

47. A slit of width α is illuminated by white light. The first minimum for red light $\left(\lambda = 6500\,\overset{0}{A}\right)$ will fall at $\theta = 30^0$, when α is

(a) 3250 $\overset{0}{A}$ (b) $6.5\times10^{-4}\ cm$ (c) 1.3 μm (d) $2.6\times10^{-4}\ cm$

48. The system is pushed by a force F as shown in the figure. All surfaces are smooth except between B and C. Friction coefficient between B and C is μ. Minimum value of F to prevent block B from downward slipping is



(a) $\left(\frac{3}{2\mu}\right)mg$ (b) $\left(\frac{5}{2\mu}\right)mg$

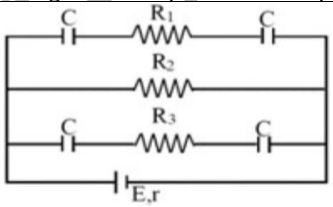
(c) $\left(\frac{5}{2}\right)\mu mg$ (d) $\left(\frac{3}{2}\right)\mu mg$

49. The equation of a wave travelling on a string is $y = 4\sin\frac{\pi}{2}\left(8t-\frac{x}{8}\right)$. If x and y are in cm, then velocity of wave is

(a) $64\ cm\ s^{-1}\ in -x$ direction (b) $32\ cm\ s^{-1}\ in -x$ direction

(c) $32\ cm\ s^{-1}\ in +x$ direction (d) $64\ cm\ s^{-1}\ in +x$ direction

50. In the adjoining circuit diagram, $E = 5\ V,\ r = 1\Omega,\ R_2 = 4\Omega,\ R_1 = R_3 = 1\Omega\ and\ C = 3$ mF. Then the numerical value of the charge on each plate of the capacitor is



(a) 24 μC
(b) 12 μC
(c) 6 μC
(d) 3 μC

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1. The molal lowering of vapour pressure for water at 100^0C, is

(a) 760 mm (b) 750 mm (c) 13.43 mm (d) 0.760 mm

2. A crystal is made of particles X, Y and Z. X forms FCC packing, Y occupies all octahedral voids of X and Z occupies all tetrahedral voids of X. If all the particles along one body diagonal are removed, then the formula of crystal would be

(a) XYZ_2 (b) X_2YZ_2 (c) $X_8Y_4Z_5$ (d) $X_5Y_4Z_8$

3. The volume percentage of Cl_2 at equilibrium in the dissociation of PCl_5 under a total pressure of 1.5 atm is $\left(K_P = 0.202\right)$

(a) 74.5 (b) 36.5 (c) 63.5 (d) 26.6

4. Which of the following metal is expected to have the highest third ionization enthalpy.

(a) $Cr\left(Z = 24\right)$ (b) $V\left(Z = 23\right)$ (c) $Mn\left(Z = 25\right)$ (d) $Fe\left(Z = 26\right)$

5. Bond angle in PH_3 is closer to 90^0 while that in NH_3 is 104.5^0. Which of the following best explains this structural feature?

(a) Due to larger size of the lone pair electron cloud, there is larger lone pair – bond pair repulsion in PH_3 compared to NH_3.

(b) Higher electronegativity of nitrogen concentrates the bond pair electron cloud near the central atom which increases the bond pair – bond pair repulsion which in turn decreases the bond angle in NH_3.

(c) Energy difference between 3s and 3p orbitals is quite high and hence the lone pair on phosphorous prefers to occupy unhybridized s – orbital rather than hybridized sp^3 hybridized orbital which causes its s – orbital energy to increase.

(d) Phosphorous forms $p\pi - d\pi$ bonds while nitrogen does not.

6. In a reaction carried out at 400 K, 0.01% of the total number of collisions is effective. The energy of activation of the reaction is

(a) 13.3 kJ/mol (b) 23.5 kJ/mol (c) 3.2 kJ/mol (d) 30.6 kJ/mol

7. Sodium thiosulphate, $Na_2S_2O_3.5H_2O$ is used in photography to:

(a) reduce the silver bromide grains to metallic silver

(b) convert the metallic silver to silver salt

(c) remove undecomposed $AgBr$ as soluble silver thiosulphate complex

(d) remove reduced silver

8. On of the processes used for concentration of ores is Froth floatation process. This process is generally used for concentration of sulphide ores. Sometimes in this process we add NaCN as a depressant. NaCN is generally added in case of ZnS and PbS minerals. What is the purpose of addition of NaCN during the process of Forth floatation?

(a) NaCN causes reduction by precipitation

(b) A soluble complex is formed by reaction between NaCN and ZnS while PbS forms froth

(c) A soluble complex is formed by reaction between NaCN and PbS while ZnS forms froth

(d) A precipitate of $Pb\left(CN\right)_2$ is produced while ZnS remain unaffected.

Space for rough work

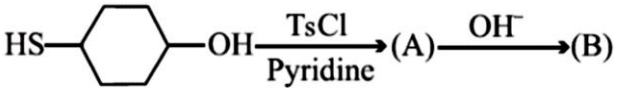
9. The ΔH_f^0 for $CO_2(g)$, $CO(g)$ and $H_2O(g)$ are – 393.5, - 110.5 and – 241.8 kJmol^{-1} respectively. The standard enthalpy changes (inkJ) for the reaction $CO_2(g)+H_2(g)\rightarrow CO(g)+H_2O(g)$ is

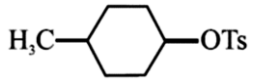
(a) 524.1 (b) 41.2 (c) – 262.5 (d) – 41.2

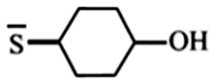
10. Which of the following drugs is an alagesic?

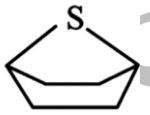
(a) Sulpha guanidine (b) Paludrin (c) Analgin (d) All of these

11. In the given reaction, what is [B]?



(a) 

(b) 

(c) 

(d) 

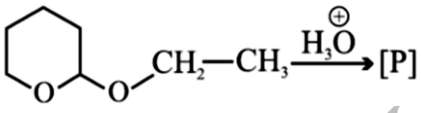
12. Copper pyrite ore is concentrated by:

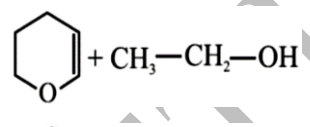
(a) electromagnetic method (b) gravity method (c) froth floatation process (d) all the above

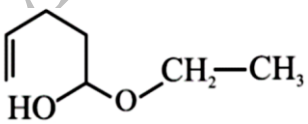
13. Which of the following is magnetite?

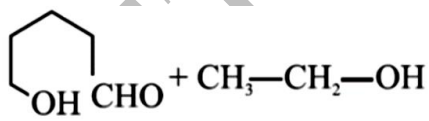
(a) Fe_2CO_3 (b) Fe_2O_3 (c) Fe_3O_4 (d) $Fe_2O_3.3H_2O$

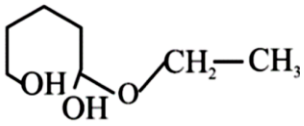
14. The major product [P] formed in the following reaction is



(a) 

(b) 

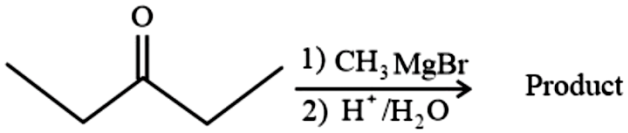
(c) 

(d) 

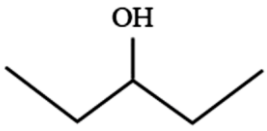
15. The strength of 10^{-2} M Na_2CO_3 solution in terms of molality will be (density of the solution = 1.10 gml$^{-(a)}$ (M. wt Na_2CO_3 = 106)

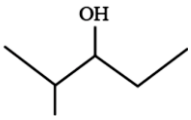
(a) 9×10^{-3} (b) 1.15×10^{-2} (c) 5.1×10^{-3} (d) I

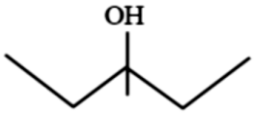
Space for rough work

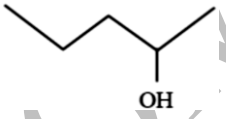
16. 

Product is

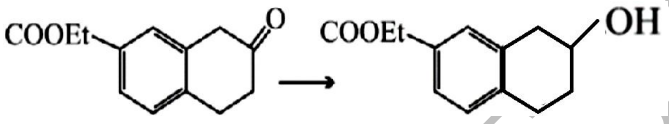
(a) 

(b) 

(c) 

(d) 

17. The conversion: Can be effected by



(a) $LiAlH_4$ reduction (b) Clemmensen's reduction

(c) $NaBH_4$ reduction (d) H_2 / Ni reduction

18. Non – polar molecule among the following is

(a) SF_4 (b) $BF_3.NH_3$ (c) PF_3Cl_2 (d) XeF_4

19. If the temperature of an ideal gas in a sealed, rigid container is increased to 1.5 times the initial value (in K), the density of gas

(a) becomes 1.5 times the initial value (b) becomes 1/1.5 times the initial value

(c) becomes 2.25 times the initial value (d) remains same

20. The anomeric carbon in $D(+)$ glucose is

(a) C – 1 carbon(b) C – 2 carbon (c) C – 5 carbon(d) C – 6 carbon

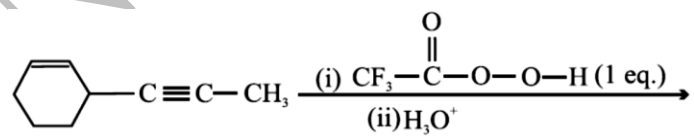
21. By which of the following method, H_2O_2 cannot be synthesized?

(a) Addition of H_2SO_4 on BaO_2 (b) Addition of H_2SO_4 on PbO_2

(c) Aerial oxidation of 2 – ethyl anthraquinol (d) Electrolysis of $(NH_4)_2SO_4$ at a high current density

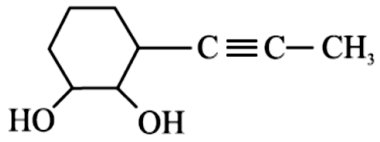
22. Orthoboric acid when heated to red hot gives:

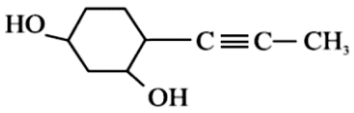
(a) metaboric acid (b) pyroboric acid (c) boron and water (d) diboron trioxide

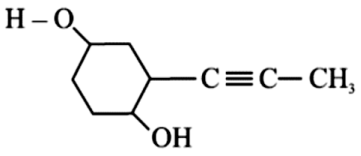
23. 

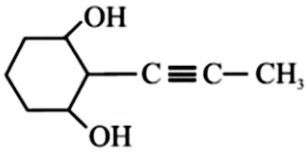
Identify the product

Space for rough work

(a) 

(b) 

(c) 

(d) 

24. Reduction of CH_3CH_2NC with hydrogen in presence of Ni or Pt as catalyst gives.

(a) $CH_3CH_2NH_2$ (b) $CH_3CH_2NHCH_3$

(c) $CH_3CH_2NHCH_2CH_3$ (d) $(CH_3)_3N$

25. Identify the option which represents the correct products of the following reaction,

$$PhCHO + CH_3CHO \xrightarrow{OH^-} (Aldols)$$

I) $Ph-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-CHO$

II) $PhCH_2-COPh$

III) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2CHO$

IV) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-\overset{\displaystyle O}{\overset{||}{C}}-Ph$

(a) I, II (b) I, III (c) II, III (d) I, III, IV

26. A chloride dissolves appreciable in cold water. When placed on platinum wire in Bunsen flame, no distinctive colour is noticed. Then the cation is

(a) Mg^{2+} (b) Ba^{2+} (c) Ag^{+} (d) Ca^{2+}

27. Which of the following chemical equation represents the formation of colloidal solution?

(a) $Cu + CuCl_2 \rightarrow Cu_2Cl_2$ (b) $2Mg + CO_2 \rightarrow 2MgO + C$

(c) $2HNO_3 + 3H_2S \rightarrow 3S + 4H_2O + 2NO$ (d) Both 2 & 3

28. An organic compound (A) contains 20% C, 46.66% N and 6.66% H. It gave NH_3 gas on heating with NaOH. The organic compound (A) could be

(a) CH_3CONH_2 (b) $C_6H_5CONH_2$ (c) NH_2CONH_2 (d) $CH_3NHCONH_2$

29. The optical rotation of the $\alpha-$form of a pyranose is +150.70, that of the $\beta-$form is +52.80. In solution an equilibrium mixture of the anomer has an optical roation of +80.20. The percentage of the $\alpha-$form at equilibrium is

(a) 28% (b) 32% (c) 68% (d) 72%

Space for rough work

30. In the chemical reaction $CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow (A)$, the $+(B) + 3H_2O$

Compound (A) and (B) are respectively

(a) C_2H_5NC and K_2CO_3 (b) $CH_3CH_2CONH_2$ and $3KCl$

(c) C_2H_5CN and $3KCl$ (d) C_2H_5NC and $3KCl$

31. The molar ratio of Fe^{++} to Fe^{+++} in a mixture of $FeSO_4$ and $Fe_2(SO_4)_3$ having equal number of sulphate ion in both ferrous and ferric sulphate is

(a) 1 : 2 (b) 3 : 2 (c) 2 : 3 (d) can't be determined

32. Which of the following is not an actinoid?

(a) Curium (Z=96) (b) Californium (Z=98)

(c) Uranium (Z=9(b) (d) Terbium (Z=65)

33. For a certain atom, there are energy levels A, B,C corresponds to energy values $E_A < E_B < E_C$. Choose the correct option if $\lambda_1, \lambda_2, \lambda_3$ are the wavelength of radiations corresponding to the transition from C to B, B to A and C to A respectively.

(a) $\lambda_3 = \lambda_1 + \lambda_2$ (b) $\lambda_3 = \dfrac{\lambda_1\lambda_2}{\lambda_1 + \lambda_2}$ (c) $\lambda_1 + \lambda_2 + \lambda_3 = 0$ (d) $3\lambda_2 = \lambda_3 + 2\lambda_2$

34. The change in entropy when the pressure of perfect gas is changed isothermally from P_1 to P_2 is

(a) $\Delta S = nR\ln(P_1 + P_2)$ (b) $\Delta S = nR\ln(P_2 / P_1)$

(c) $\Delta S = nR\ln(P_1 / P_2)$ (d) $\Delta S = nR\ln\left(\dfrac{P_1 + P_2}{P_2}\right)$

35. The unit cell cube length for $LiCl$ ($NaCl$ type structure) is $5.14A^0$. Assuming anion cation contact, calculate the ionic radius for chloride ion.

(a) 1.815 (b) 3.63 (c) 2.75 (d) 5.14

36. In hydrogen atom, an electron in its ground state absorbs two times of the energy as if requires escaping (13.6 eV) from the atom. The wavelength of the emitted electron will be

(a) $1.34\times10^{-10}\,m$ (b) $2.34\times10^{-10}\,m$ (c) $3.34\times10^{-10}\,m$ (d) $4.44\times10^{-10}\,m$

37. Electrode potential data given below

$Cl_2 + 2H_2O \rightarrow 2ClO^- + 4H^+ + 2e^-; E^0 = -1.61\,volt$

$ClO^- + 2H_2O \rightarrow ClO_3^- + 4H^+ + 4e^-; E^0 = -0.50\,volt$

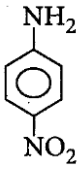
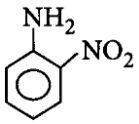
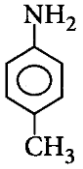
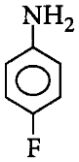
Based on these data which is the spontaneous reaction.

(a) $Cl_2 + ClO^- + ClO_3^-$ (b) $ClO^- \rightarrow Cl_2 + ClO_3^-$

(c) $ClO_3^- \rightarrow Cl_2 + ClO^-$ (d) $ClO^- + Cl_2 \rightarrow ClO_3^-$

Space for rough work

38. The most basic amine among the following is.

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

39. Correct sequence for reactivity of acid derivative is

I) $(RCO)_2O$ II) $RCOCl$ III) $RCOOR$ IV) $RCONH_2$

(a) II > I > III > IV (b) I > II > III > IV (c) II > I > IV > III (d) I > III > II > IV

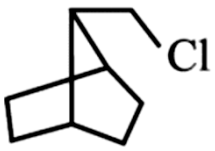
40. A 0.001 molal aqueous solution of a complex $[MA_8]$ has the freezing point of – 0.0054^0C. If the primary valency of the salt undergoes 100% ionization and K_f for water = 1.8 Kmolal^{-1} the correct representation of complex is

(a) $[MA_8]$ (b) $[MA_6]A_2$ (c) $[MA_4]A_4$ (d) $[MA_5]A_3$

41. Specific conductive of 0.1M HA is $3.75\times10^{-4}ohm^{-1}cm^{-1}$. If λ^∞ of HA is 250 ohm^{-1}cm^{2}mol^{-1}, then dissociation constant K_a of HA is

(a) 1×10^{-5} (b) 2.25×10^{-4} (c) 2.25×10^{-5} (d) 2.25×10^{-13}

42. Which of the following is inert towards S_N1 reaction?

(a) Ethyl chloride (b) Isopropyl chloride (c)  (d) 

43. Which of the following esters cannot undergo Claisen self – condensation

(a) $CH_3CH_2CH_2CH_2COOC_2H_5$ (b) $C_6H_5COOC_2H_5$

(c) $C_6H_{11}CH_2COOC_2H_5$ (d) $C_6H_5CH_2COOC_2H_5$

44. Some type of gel like gelatin loose water slowly, the process is known as

(a) synerisis (b) thixotropy (c) peptisation (d) limbitition

45. Which of the following oxide of Nitrogen is neutral?

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

Space for rough work

46. Primary amines react with benzyol chloride to give
(a) Benzamides (b) Ethanamides
(c) Imides (d) Imines

47. Consider the following statement:

(I) $CH_3O\overset{\oplus}{C}H_2$ is more stable than $CH_3\overset{\oplus}{C}H_2$

(II) $Me_3\overset{\oplus}{C}$ is more stable than $CH_3CH_2\overset{\oplus}{C}H_2$

(III) $CH_2=CH-\overset{\oplus}{C}H_2$ is more stable than $CH_2=CH-\overset{\oplus}{C}H_2$

(IV) $CH_2=\overset{\oplus}{C}H$ is more stable than $CH_3\overset{\oplus}{C}H_2$

Of these statement:
(a) I and II are correct (b) III and IV are correct
(c) I, II and III are correct (d) II, III and IV are correct

48. In blast furnace iron oxide is reduced by
(a) Silica (b) Carbon monoxide
(c) Carbon (d) Lime stone

49. pH of a 10^{-10} M NaOH is nearest to

(a) 10 (b) 7 (c) 4 (d) 10.9

50. One mole of a non – ideal gas undergoes a change of state (2.0 atom, 3.0L, 95 K) → (4atm, 5L, 245K) with a change internal energy, $\Delta E = 30.0L\,atm$. The change in enthalpy, ΔH, of the process in L atom is

(a) 40.0 (b) 42.3
(c) 44.0 (d) not defined, because pressure is not constant

Space for rough work

Section - A

01. Which mineral is required in larger amount in comparison to other micronutrients?
(a) Mo (b) B (c) Fe (d) Zn

02. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that is rrtt :-
(a) All the offsprings will be tall with red fruit (b) 25% will be tall with red fruit
(c) 50% will be tall with red fruit (d) 75% will be tall with red fruit

03. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct ?
(a) Yeast - statins (b) Acetobacter aceti - Acetic acid
(c) Clostridium butyricum - lactic acid (d) Aspergillus niger - citric acid

04. In sugarcane plant 14CO2 is fixed in malic acid, in which the enzyme that fixes CO2 is
(a) Ribulose biphosphate carboxylase (b)Phosphoenol pyruvic acid carboxylase (PEP-case)
(c) Ribulose phosphate kinase (d) Fructose phosphatase

05. The product of hybridization is known as
(a) Clone (b) Homozygous (c) Hybrid (d) Heterozygous

06. Due to eutrophication _____
(a) Water gets less harmful (b) BOD decreases (c) Algae are destroyed (d) BOD increases

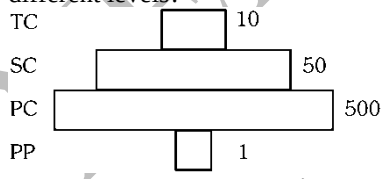
07. Waste water treatment generates a large quantity of sludge, which can be treated by.
(a) Floc (b) Anaerobic digesters (c) Chemicals (d) Oxidation pond

08. Photoperiodism was first characterised in :
(a) Tobacco (b) Potato (c) Tomato (d) Cotton

09. Microbial biomass that is used as a food suppliment of human and animals is called-
(a) Detritus (b) Duff (c) SCP (d) Humus

10. Who is popularly known as the "Father of Phycology"
(a) Fritsch (b) Papenfus (c) Smith (d) Morris

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



(a) Level one PP is *Reject*' Pipal trees" and the level SC is "sheep"
(b) Level PC is ' rats" and level SC is "cats'
(c) Level PC is '*Reject*insects' and level SC is *Reject*'small insectivorous birds
(d) Level PP is "Phytoplanktons" in sea and "Whale' on top level TC.

Space for rough work

12. Apart from high yield, other main objective of plant breeding is
(a) Improvement of quality (b) Development of resistance
(c) Establishment of change in duration (d) All the above

13. ATPase has
(a) channel that allows H^+ diffusion (b) channel that allows electron diffusion
(c) channel that allows O_2 molecule diffusion (d) channel that allows CO_2 molecule diffusion

14. What is called Warburg's effect on photosynthesis
(a) Low rate of the process due to O_2 supply (b) Low rate of the process due to CO_2 supply
(c) Both (a) and (b) (d) None of the above

15. Which one of the following processes duringdecomposition is correctly described?
(a) Leaching– Water soluble inorganic nutrients rise to the top layers of soil
(b) Fragmentation - Carried out by organisms such as earthworm
(c) Humification– Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate
(d) Catabolism– Last step in the decomposition under fully anaerobic condition

16. Which one of the following is being tried in India as a biofuel substitute for fossil fuels?
(a) Jatropha (b) Musa (c) Aegilops (d)Azadirachta

17. Meristem present at lamina margin is :
(a) Apical meristem (b) Intercalary meristem (c) Mass meristem (d) Marginal meristem

18. Lignin is a component of the secondary cell walls of
(a) Epidermis (b) collenchyma (c) sclerenchyma (d) Parenchyma

19. *Saccharomycescerevissaeis* used in the formation of: -
(a) Ethanol (b) Methanol (c) Acetic acid (d) Antibiotics

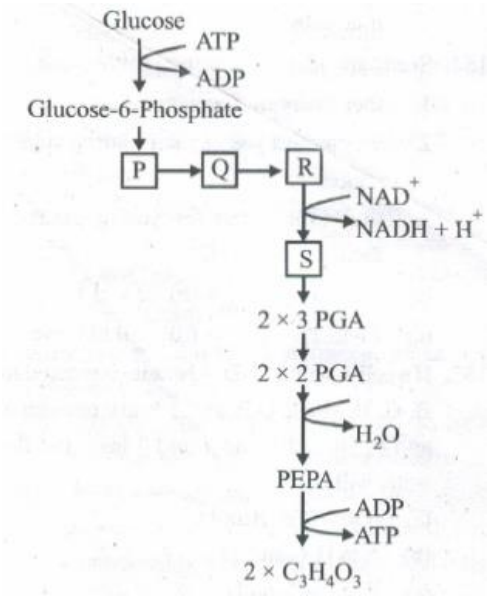
20. A long day plant flowers only when it is exposed to
(a) Red light (b) Light more than critical day length
(c) Light equal to critical day length (d) Light less than critical day length.

21. Annual or growth rings consist of -
(a) Alternate rings of heart and early wood (b) Alternate rings of sapwood and heart wood
(c) Alternate rings of early and late wood (d) Alternate rings of porous and non-porous wood

22. Selection is the method of
(a) Plant physiology (b) Plant breeding (c) Genetics (d) Cytology

Space for rough work

23. Refer the figure and answer the question



	P	Q	R	S
(a)	1,3 di PGA	3 PGALD	Fr. 1,6 di P	Fr. 6 P
(b)	3 PGALD	1,3 di PGA	Fr. 1,6 di P	Fr. 6 P
(c)	Fr. 1,6 di P	Fr. 6 P	3 PGALD	1,3 di PGA
(d)	Fr. 6 P	Fr. 1,6 di P	3 PGALD	1,3 di PGA

24. Greatest genetic diversity of plants is found in
(a) Central America (b) Homelands (c) South America (d) India

25. dB is a standard abbreviation used for the quantitative expression of
(a) A particular pollutant (b) The dominant Bacillus in a culture
(c) Certain pesticides (d) The density of bacteria in a medium

26. Excess of Mn causes deficiency of –
(a) Fe (b) Mg (c) Ca (d) All

27. Annual rings are seen in temperate zone trees because
(a) Xylem cell size varies with season (b) Heart wood cells alternate with sap wood cells
(c) Xylem activity varies with season (d) Resin is deposited in the rings in the stem

Space for rough work

28. Which one is not true?
(a) The symplast is a meshwork consisting of (connected) living cells
(b) The casparian strips prevent water from moving between endodermal cells
(c) Water can move freely in the apoplast from cortical area to xylem of root
(d) All

29. Life cycle of *Chlamydomonas* / *Spirogyra* / *Ulothrix* is
(a) Haplontic (b) Haplobiontic (c) Diplontic (d) Diplobiontic

30. Which one of the following methods is commonly used to maintain the genetic traits of a given plant
(a) By propagating through seed germination (b) By propagating through vegetative multiplication
(c) By generating hybrids through intergeneric pollination (d) By treating the seeds with gamma radiation

31. Zygotic meiosis is characteristic of
(a) *Marchantia* (b) *Fucus* (c) *Funaria* (d) *Chlamydomonas*

32. When a plant cell is placed in a hypotonic solution, which of the following occurs?
(a) The cell takes up water and eventually bursts
(b) The cell takes up water until the osmotic potential equals the pressure potential of the cell
(c) Plasmolysis occurs
(d) Nothing occurs

33. Green house effect is due to
(a) X-rays (b) UV rays (c) Green rays (d) Infra-red rays

34. First discovered Enzyme was
(a) Isomerase (b) Transaminase (c) Zymase (d) Transferase

35. R.Q. of tripalmitin :-
(a) 0.7 (b) 1.0 (c) 1.3 (d) 1.4

Section B

36. Which of the following sets of diseases is caused by bacteria?
(a) Herpes and influenza (b) Cholera and tetanus (c) Typhoid and smallpox (d) Tetanus and mumps

37. In somatic hybridization technique, the material generally used is
(a) IAA (b) 2, 4–D (c) Polyethylene glycol (d) Starch

38. Vessels are found in
(a) All angiosperms
(b) Most angiosperms few gymnosperms and few pteridophytes
(c) All angiosperms and few gymnosperms
(d) Most angiosperms and few gymnosperms

39. Lactic acid bacteria(LAB) grow in milk and convert it to curd and also improve its nutritional quality by increasing : -
(a) Vitamin A (b) Vitamin B_{12} (c) Vitamin B_6 (d) Vitamin C and A

40. The bond in molecular nitrogen (N_2) is difficult to break, because it is a –
(a) Twisted configuration (b) Quadruple hydrogen bond (c) Triple covalent bond (d) Triple ionic bond

Space for rough work

41. Which of the following statements is correct regarding microbes in human welfare?
(a)*Saccharomycescereviceae* is useful in industries for production of citric acid
(b)*Trichodermapolysporum* is used as blood cholesterol lowering agent
(c)*Aspergillusniger* used to obtain acetic acid
(d) In sewage treatment CO_2, H_2 and CH_4 gases are produced from activated sludge by bacteria such as *Methanobacterium*

42. Plant growth substances generally -
(a) Have a single role
(b) Are species-specific
(c) Are produced in many parts of plant
(d) Affect mainly the cells that produce them

43. A plant biochemist received a specimen from a fellow scientist who noticed that the plant's stomata are closed during the day. The biochemist observed that radioactive carbon supplied in the form of carbon dioxide fed to the plant at night was first found in organic acids that accumulated in the vacuole. During the day; the label moved to sugars being manufactured in the chloroplast. What was the conclusion of the biochemist? **(NSEB 2010-2011)**
(a) It is a CAM plant
(b) It is a C_4 plant
(c) It is a C_3 plant
(d) It is a plant showing pentose phosphate pathway

44. Tunica corpus theory is related with
(a) Root apex
(b) Lateral meristems
(c) Root cap
(d) Shoot apex (apical meristem)

45. Presence of sheathing leaf base and ligule are characteristic of
(a) Cycas leaf
(b) Fern leaf
(c) Banana leaf
(d) Grass leaf

46. Light energy performs following function in PS- II
(a) Photolysis of water
(b) Excitation of chlorophyll
(c) Formation of ATP
(d) Formation of $NADPH_2$

47. Attraction of water molecules to polar surface is known as :
(a) Cohesion
(b) Adhesion
(c) Capillarity
(d) Tencile strength

48. ABA acts as antagonistic to
(a) ethylene
(b) cytokinin
(c) gibberellic acid
(d) IAA

49. How many molecules of water are needed by a green plant to produce one molecule of hexose/reduce 6 molecules of CO2
(a) 6
(b) 12
(c) 24
(d) Only one

50. Which of the following begins the Calvin cycle and is the commitment step that results the entire pathway being carried out?
(a) 3PGA 3PG ATP, NADPH 2$\longrightarrow$ Ald
(b) The regeneration of RuBP
(c) CO RuBP 3PGA 2 + $\longrightarrow$
(d) It can start from anywhere

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Section A

01. In which of the following methods zygote upto 32 blastomere is transferred into the uterus ?
(a) IUT (b) ZIFT (c) GIFT (d) ICSI

02. Semiautonomous cell organelle is : -
(a) Mitochondria (b) Ribosome (c) Plasma membrane (d)Peroxysome

03. Which of the following statements about the mechanism of ventilation / breathing is false?
(a) As the diaphragm relaxes, air is expelled from the respiratory system
(b) During inspiration the lungs act as suction pump
(c) Inspiration is a passive and expiration is an active process
(d) For quiet breathing external intercostals muscles and diaphragm play an important role

04. Which one of the following is exotic Indian fish
(a) Clarias (b) Labeo (c) Cypris (d) Dephnia

05. Presence of Pneumatophore roots & vivipary are special features of
(a) Hydrophytes (b) Halophytes
(c) Xerophytes (d) Mesopohytes

06. A taxonomic key used to identify organisms is labeled:
(a) Phylogenetic key (b) Evergreen key
(c) Dichotomous key (d) None of the above

07. Which of the following is viviparous ?
(a) Reptiles (b) Frog
(c) All mammals (d) Majority of mammals

08. Choose the incorrect one:
(a) Nucleosomes in chromatin are seen as "beads on string structure".
(b) Nucleosome in a histone octamer.
(c) Nucleosome is present in both prokaryotic & eukaryotic DNA.
(d) A typical nucleosome contains 200 bp. of DNA helix.

09. Number of plasmids per bacteria is usually between:
(a) 1-5 (b) 15-100 (c) 130-200 (d) 300-400

10. Functional aspect of a species with reference to its place of occurrence is
(a) Ecology (b) Ecological niche
(c) Species (d) Environment

11. An animal with unsegmented coelom, superficial radial symmetry and bilateral symmetrical larva belongs to
(a) Arthropoda (b) Mollusca
(c) Echinodermata (d) Annelida

12. Which of the following set is not involved in microbes?
(a) Bacteria, Fungi

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(b) Bacteria, Protozoa
(c) Viroids, Prions
(d) All of these are considered as microbes

13. Mucus and bicarbonates in gastric juice-
(a) Lubricate the food
(b) Protect mucosal epithelium from HCI
(c) Active pepsinogen
(d) Both a and b

14. Which of the following symptoms is not due to Mn-toxicity in plants?
(a) Ca-translocation in shoot apex is inhibited
(b) Appearance or brown spot surrounded by chlorotic veins
(c) Deficiency of both Fe and N is induced
(d) None

15. Which of the following statements is correct?
(a) Amides and ureides are the transported forms of nitrogen as they have more nitrogen
(b) Legumes of tropical origin (e.g. soyabean) transport ureides
(c) The host plant produces globin part and bacterial symbiont produces haem part of leghaemoglobin (N_2-fixing pigment)
(d) All

16. After the centromeres separate during mitosis the chromatids now called _____ move toward opposite poles of the spindle
(a) Centrosomes (b) Kinetochores
(c) Half spindles (d) Daughter chromosomes

17. Cardiac / heart muscles are-
(a) Striated and involuntary (b) Branched
(c) Not fatigued (d) All

18. When a skeletal muscle shortens during contraction which of these statements is false?
(a) The I-band shortens (b) The A-band shortens
(c) The H-zone becomes narrow (d) The sarcomeres shorten

19. Amniocentesis is used for determining :-
(a) Heart diseases
(b) Brain disease
(c) Hereditary disease of embryo
(d) All the above

20. What is the primary controlled variable from which scientists benefit in a hydrophonic experiment?
(a) Sunlight (b) Insects
(c) Size of the plant (d) Nutrient uptake

21. In human being digestion of starch starts form-
(a) Mouth` (b) Stomach (c) Duodenum (d) Oesophagus

22. Cyanobacteria / Blue green algae are -
(a) Unicellular only (b) Colonial only
(c) Filamentous only (d) Unicellular, Colonial or filamentous

23. Artificial immunity can be acquired from a

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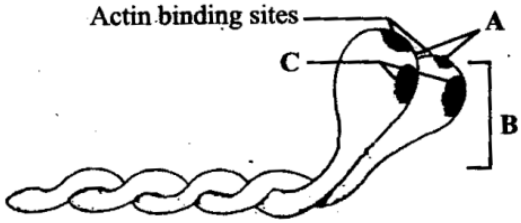
(a) Serious illness
(b) Vaccination
(c) Repeated exposure to the same microbe
(d) Treatment with penicillin

24. The given figure is related with myosin monomer (meromyosin). Identify the parts labeled from A to C and select the correct option



	A	B	C
(a)	Head	Cross arm	ATP binding sites
(b)	Head	Cross arm	GTP binding sites
(c)	Cross arm	Head	Ca^{+2} binding sites
(d)	Cross arm	Head	ATP binding sites

25. Mark the incorrect statement concerning life
(a) It is a self-regulated thermodynamic system
(b) It is capable of catalyzing the metabolic reactions
(c) It is capable of self perpetuation from generation to generation without DNA duplication
(d) It is simply impossible without energy

26. Which one of the following hormones does not play any role in the menstruation?
(a) GH (b) FSH (c) LH (d) All of these

27. What conclusion is drawn about stratification of a fossil?
(a) Upper strata are recent and lower are older
(b) Reverse of (a)
(c) No stratification takes place
(d) None of the above

28. Weismann cut off tails of mice generation after generation but tails neither disappeared nor shortened showing that:
(a) Darwin was correct
(b) Mutation theory is wrong
(c) Tail is an essential organ
(d) Lamarckism was wrong in inheritance of acquired Characters

29. If male is impotent and female is normal then which of the following technique can be used?
(a) ICSI (b) ZIFT (c) GIFT (d) A.I.

30. Nitrogen fixation is –
(a) Parasitic (b) Symbiotic (c) Mutualistic (d) Carnivorous

31. The given diagram represents that T.S. of gut. Identify A,B, C and D.

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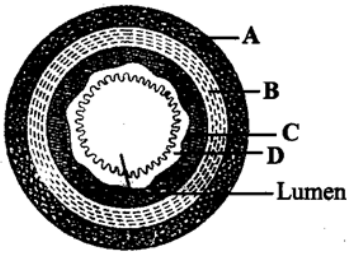

	A	B	C	D
(a)	Serosa	Muscularis	Submucosa	Mucosa
(b)	Muscularis	Serosa	Submucosa	Mucosa
(c)	Serosa	Muscularis	Mucosa	Submucosa
(d)	Serosa	Submucosa	Muscularis	Mucosa

32. Distance between the genes and percentage of recombination shows.
(a) An inverse relationship (b) A direct relationship
(c)A parallel relationship (d) No relationship

33. Which of the following in mammals produce/s alkaline mucous for lubrication?

(a) Pineal body (b) Prostate gland
(c) Cowper's glands (d) Testis

34. Which of the following has the smallest diameter?
(a) Trachea (b) Terminal bronchiole
(c) Tertiary bronchus (d) Secondary bronchus

35. In the inguinal canal lies
(a) Posterior mesentric artery (b) Spermatic artery
(c) Internal carotid artery (d) Dorsal aorta

SECTION B

36. In earthworm, the common prostate and spermatic duct / vasa deferentia open to the _____ by a pair of _____ genital pore on the ventro-lateral side of the _____ segment.
(a) Exterior, male, 16^{th} (b) Exterior female, 16^{th}
(c) Exterior, male, 18^{th} (d) Exterior, female, 18^{th}

37. Nucleolar organizer is a : -
(a) Primary constnction (b) Secondary constnction
(c) Tertiary constriction (d) Centriole

38. During anaphase - I of meiosis
(a) Non- homologous chromosomes separate (b) Sister chromatids chromosomes separate
(c) Non-Sister chromatids chromosomes separate (d) Homologous chromosomes separate

39. A reduction step during meiosis is important because
(a) It returns the chromosomes number to normal before fertilization
(b) There is a mechanism for this
(c) Only one copy of each chromosome in necessary

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(d) Otherwise chromosome copies would double each fertilization

40. A frog lives in water or near water because
(a) It can get its food easily in water
(b) Its hindlimbs are webbed and help in swimming
(c) It can see through its transparent eyelids while swimming
(d) It respires through the skin

41. Branch connected with nomenclature, identification and classification is -
(a) Ecology (b) Taxonomy (c) Morphology (d) Physiology

42. Offspring formed be sexual reproduction exhibit more variation than those formed by asexual reproduction because.
(a) Sexual reproduction is a lengthy process.
(b) Genetic material comes from parents to two different species.
(c) Greater amount of DNA is involved in sexual reproduction.
(d) Gametes of parents have qualitatively different genetic composition

43. Given below are a few statements related to external fertilization. Choose the correct statements.
(i) The male and female gametes are formed and released simultaneously.
(ii) Only a few gametes are released into the medium.
(iii) Water is the medium in a majority of organisms exhibiting external fertilization.
(iv) Offspring formed as a result of external fertilization have better chance of survival than those formed inside an organism.
(a) (i) and (iii) (b) (iii) and (iv)
(c) (ii) and (iv) (d) (i) and (iv)

44. The head of cockroach consists of fusion of _____ segments
(a) 6 (b) 10 (c) 14 (d) 18

45. Menstrual cycle is reported in -
(a) Only humans (b) Only apes (c) Only monkey (d) Primates like humans, apes and monkey

46. The beating of heart of man is heared on the left side because
(a) The left ventricle is towards the left side (b) Both the ventricles are towards the left side
(c) Entire heart is on the left side (d) The aorta is on the left side

47. Myasthenia is an _____ disorder affecting neuromuscular junction leading to fatigue, weakening and paralysis of skeletal muscles-
(a) Arthritic (b) Autoimmune
(c) Agnosic (d) Amnesic

48. Which one of the following is the correct matching of the site of action on the given substrate, the enzyme acting upon it and the end product ?
(a) Small intestine : Proteins $\xrightarrow{\text{Pepsin}}$ Amino acids
(b) Stomach : Fats $\xrightarrow{\text{Lipase}}$ Micelles
(c) Small intestine : Starch $\xrightarrow{\alpha-\text{Amylase}}$ Disaccharide (maltose)
(d) Duodenum : Triglycerides $\xrightarrow{\text{Trypsin}}$ Monoglycerides

49. Brown heart rot of beets is due to deficiency of-

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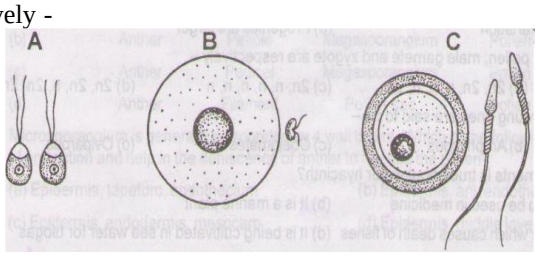
(a) B (b) P (c) Mg (d) Mo

50. Identify gametes (A, B and C) respectively -



(a) Heterogametes, isogametes, Homogametes
(b) Isogametes, homogametes, Heterogametes
(c) Homogametes, isogametes, Heterogametes
(d) Home / Isogametes, heterogametes, heterogametes

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