## (B) <br>  <br> IIT-JEE | PMT (NEET)

Maximum Marks: $720(+4,-1)$
FULL TEST-1
Test Time: 3 Hrs.

1. A particle is moving along a straight line $y=3 \mathrm{~m}$ at a velocity $5 \mathrm{~m} / \mathrm{s}$. its angular speed about origin when it is at point $P(4 \mathrm{~m}, 3 \mathrm{~m})$ is
(a) $0.8 \mathrm{rad} / \mathrm{s}$
(b) $0.6 \mathrm{rad} / \mathrm{s}$
(c) $3 \mathrm{rad} / \mathrm{s}$
(d) $5 \mathrm{rad} / \mathrm{s}$
2. How much energy is required to take a hydrogen atom from its ground state to excited state where it subsequently emits radiation of six different wavelength?
(a) 10.2 Ev
(b) 12.1 eV
(c) 12.75 eV
(d) 13.06 eV
3. When $\alpha, \beta$ and $\Upsilon$ radiations pass through a gas, their ionizing powers, in decreasing order, are
(a) $\Upsilon, \alpha, \beta$
(b) $\Upsilon, \beta, \alpha$
(c) $\alpha, \beta, \Upsilon$
(d) $\beta, \Upsilon, \alpha$
4. A body takes $t$ second to slide down in a smooth incline surface of angle of inclination $\theta$. It takes 3 t time to slide down on similar rough surface having coefficient of friction, $\mu=0.4$, then $\theta$ is
(a) $\tan ^{-1}\left(\frac{9}{20}\right)$
(b) $\cos ^{-1}\left(\frac{20}{9}\right)$
(c) $\cot ^{-1}\left(\frac{9}{20}\right)$
(d) $\sin ^{-1}\left(\frac{20}{9}\right)$
5. A ball is dropped from 45 m height after first rebounce from the horizontal surface it attains height of 35 m . the coefficient of restitution is
(a) $e=\frac{2 \sqrt{2}}{3}$
(b) $e=\frac{\sqrt{7}}{3}$
(c) $e=\sqrt{\frac{7}{3}}$
(d) $e=\frac{2}{3}$
6. A capacitor of capacity $C_{1}$ is charged upto potential $V$ volt and then connected in parallel to an uncharged capacitor of capacity $C_{2}$. The final potential difference across each capacitor will be
(a) $\frac{C_{2} V}{C_{1}+C_{2}}$
(b) $\frac{C_{1} V}{C_{1}+C_{2}}$
(c) $\left(1+\frac{C_{2}}{C_{1}}\right) V$
(d) $\left(1-\frac{C_{2}}{C_{1}}\right) V$
7. Dipole moment of the charge distribution shown in figure is

(a) $\sqrt{2} q a$
(b) $\frac{q a}{\sqrt{2}}$
(c) $2 q \mathrm{a}$
(d) Zero
8. A wire of resistance $R$ is stretched till its radius is half of the orrginal value. Then the new resistance is
(a) $2 R$
(b) $4 R$
(c) $8 R$
(d) $16 R$
9. The total current supplied to the circuit by the battery is

(a) 1 A
(b) 2 A
(c) 4 A
(d) 6 A
10. Water is following in streamline motion through a horizontal tube. The pressure at a point in the tube is $P$ where the velocity of flow is $v$. at another point, where the pressure is $P / 2$, the velocity of flow is ( $\rho=$ density of water)
(a) $\sqrt{\mathrm{v}^{2}-\frac{P}{\rho}}$
(b) $\sqrt{\mathrm{V}^{2}+\frac{P}{\rho}}$
(c) $\sqrt{\mathrm{V}^{2}+\frac{2 P}{\rho}}$
(d) $\sqrt{\mathrm{v}^{2}-\frac{2 P}{\rho}}$
11. The position (x) varies with time ( t ) as shown in the given graph. The change in velocity at time $t_{1}$ is

(a) $-2 \cot 2 \theta$
(b) $-2 \operatorname{cosec} 2 \theta$
(c) $-\frac{\sin 2 \theta}{2}$
(d) $-\sec 2 \theta$
12. A certain number of spherical drops of a liquid of radius $r$ coalesce to form a single drop of radius $R$ and volume $V$. If $T$ is the surface tension of the liquid, then
(a) energy $=4 V T\left(\frac{1}{r}-\frac{1}{R}\right)$ is released
(b) energy $=3 V T\left(\frac{1}{r}+\frac{1}{R}\right)$ is absorbed
(c) energy $=3 V T\left(\frac{1}{r}-\frac{1}{R}\right)$ is released
(d) energy is neither released nor absorbed
13. Which of the following is known as universal logic gate?
(a) XOR
(b) OR
(c) NOR
(d) none of these
14. A sample of gas follows process represented by $P V^{2}=$ constant. Bulk modulus for this process is $B$, then which of the following graph is correct?
(a)

(b)

(c)

(d)

15. The $P-V$ diagram of 8 g of Helium gas for a certain process $A \rightarrow B$ is shown in figure. Heat given to the body during process $A \rightarrow B$ is

(a) $12 P_{0} V_{0}$
(b) $6 P_{0} V_{0}$
(c) $4 P_{0} V_{0}$
(d) $15 P_{0} V_{0}$
16. 100 g of ice (latent heat $80 \mathrm{calg}^{-1}$ ) at $0^{\circ} \mathrm{C}$ is mixed with 300 g of water (specific heat 1 cal $g^{-1}{ }^{\circ} \mathrm{C}^{-1}$ ) at $20^{\circ} \mathrm{C}$. the final temperature of the mixture will be
(a) $20^{\circ} \mathrm{C}$
(b) $10^{\circ} \mathrm{C}$
(c) $0^{\circ} \mathrm{C}$
(d) $<0^{\circ} \mathrm{C}$
17. Phase difference between voltage and current in $L C R$ series circuit at resonance is
(a) $0^{\circ}$
(b) $45^{\circ}$
(c) $90^{\circ}$
(d) $180^{\circ}$
18. An A.C. voltage $V=20 \sin (80 \pi \mathrm{t})$ is applied to a circuit. How many times current in circuit becomes zero in 2 second?
(a) 40
(b) 80
(c) 160
(d) 240
19. An unknown thermometer reads 60 at $50^{\circ} \mathrm{C}$ and 10 at $0^{\circ} \mathrm{C}$. The boiling temperature of water in unknown thermometer is
(a) 100
(b) 90
(c) 120
(d) 130
20. A square plate of side 20 cm is kept in yz-plane in a region where magnetic field $\vec{B}=(4 \hat{\imath}+6 \hat{\jmath}+$ $2 \hat{k}) \mathrm{T}$ the magnitude of magnetic flux passing through the loop is
(a) 16 weber
(b) 0.16 weber
(c) $0.4 \sqrt{40}$ weber
(d) 2.4 weber
21. A circular loop and a square loop are entering into a region of uniform magnetic field with constant speed

(a) Induced emf in both are constant
(b) Induced emf in square loop is variable and in circular loop is constant
(c) Induced emf in circular loop is variable and in square loop it is constant
(d) Induced emf in both loops are variable
22. When a metal of atomic number Z is used as the target in a Coolidge tube let $v$ be the frequency of the $\mathrm{K}_{\alpha}$ line. Corresponding values of Z and $v$ are known for a number of metals. Which of the following plots will give a straight line?
(a) vagainst Z
(b) $\frac{1}{v}$ against Z
(c) $\sqrt{v}$ against Z
(d) $v$ against $\sqrt{Z}$
23. Two photons of energy 2.5 eV fall on a metal plate, which was work-function of 4.0 eV . Number of electrons ejected from the metal surface is:
(a) one
(b) two
(c) zero
(d) more than two
24. The ratio of velocity of sound in hydrogen $\left(\Upsilon=\frac{7}{5}\right)$ to that in helium $\left(\Upsilon=\frac{5}{3}\right)$ at the same temperature is
(a) $\sqrt{\frac{5}{42}}$
(b) $\sqrt{\frac{5}{21}}$
(c) $\frac{\sqrt{42}}{5}$
(d) $\frac{\sqrt{21}}{5}$
25. Angle between wave velocity and particle velocity of a transverse wave is
(a) $90^{\circ}$
(b) $60^{\circ}$
(c) $0^{\circ}$
(d) $180^{\circ}$
26. If a concave lens of focal length 20 cm is placed at a distance 26 cm from the convex lens of focal length 30 cm as shown in figure. The distance of final image from concave lens is

(a) 20 cm
(b) 5 cm
(c) 4 cm
(c) 9 cm
27. In Young's double slit experiment the width of one slit is double that of the other, the ratio of intensity of a bright band to that of a dark band in the interference pattern will be:
(a) $2: 1$
(b) $3: 1$
(c) $6: 1$
(d) $9: 1$
28. The radii of two spheres are a and $b$ respectively. They are at equal electric potential. The ratio of their surface charge densities is
(a) $\frac{a^{2}}{b^{2}}$
(b) $\frac{b}{a}$
(c) $\frac{a}{b}$
(d) None of these
29. A body is thrown vertically up which eventually comes down. Taking air drag proportional to speed into consideration. Its velocity-time ( $v-t$ ) graph is best represented by
(a)

(b)

(c)

(d)

30. A stretched wire of length 114 cm is divided into three segments whose fundamental frequencies are in the ratio $1: 3: 4$, the length of the segments must be in the ratio
(a) $18: 24: 72$
(b) $24: 72: 18$
(c) $24: 18: 72$
(d) $72: 24: 18$
31. An observer moves towards a stationary sources of sound with a velocity one-fifth of the velocity of sound. Find the percentage increase in the apparent frequency.
(a) Zero
(b) $0.5 \%$
(c) $5 \%$
(d) $20 \%$
32. The magnifying power of the telescope when it is in normal adjustment is 20 . If the focal length of the objective is 100 cm . find the focal length of eye piece.
(a) 1 cm
(b) 3 cm
(c) 5 cm
(d) 7 cm
33. On a polarizing sheet mixture of plane polarized and un-polarized light falls normally. On rotating the polarized sheet about the direction of the incident beam, the transmitted maximum and minimum intensities vary by a factor 4 . The ratio of the intensities of polarized and unpolarised light is
(a) $\frac{3}{2}$
(b) $\frac{2}{3}$
(c) $\frac{5}{4}$
(d) $\frac{4}{5}$
34. For the given composite arrangement of two different materials at steady state. The ratio of temperature gradient is (symbols have their usual meanings)

(a) 5
(b) 2
(c) $\frac{7}{6}$
(d) 1
35. The root mean square speed of hydrogen molecule is $v_{1}$ at temperature $T \mathrm{~K}$. the most probable speed of oxygen molecule is $\mathrm{V}_{2}$ at same temperature. Then $\frac{v_{1}}{v_{2}}$ is equal to
(a) $2 \sqrt{6}$
(b) 4
(c) $3 \sqrt{6}$
(d) 2
36. In the two positions of the lens keeping distance between object and screen fixed, lateral size of the image is 4 cm and 9 cm . the size of the object is
(a) 5 cm
(b) 13 cm
(c) 6 cm
(d) $\frac{9}{2} \mathrm{~cm}$
37. A coil of one turn is made of a wire of certain length and then from the same length a coil of two turns is made. If the same current is passed in both the cases, then the ratio of the magnetic induction at their centres will be
(a) $2: 1$
(b) $1: 4$
(c) $4: 1$
(d) $1: 2$
38. When a changed particle of charge $q$ and mass $m$ is moving perpendicularly in a magnetic field (B) in a circle of radius $r$. its de-Broglie wavelength $\lambda$ is
(a) $\frac{2 h}{q B r}$
(b) $\frac{h}{2 q B r}$
(c) $\frac{h}{q B r}$
(d) $\frac{2 h}{\sqrt{2} q B r}$
39. After 200 days, the activity of a radioactive sample is 5000 dps . The activity reduces to 2500 dps after another 100 days. The initial activity of the sample in dps is
(a) 20000 dps
(b) 10000 dps
(c) 5000 dps
(d) 15000 dps
40. Escape velocity from the surface of earth is $\mathrm{v}_{e}$. The escape velocity from the surface of a planet whose mass and radius both are half of that of earth, is
(a) $\mathrm{v}_{e}$
(b) $\frac{v_{e}}{\sqrt{2}}$
(c) $\sqrt{2} \mathrm{v}_{e}$
(d) $2 \mathrm{v}_{e}$
41. If the area enclosed by earth's orbit in one year $\left(3.5 \times 10^{7} \mathrm{~s}\right)$ is $7 \times 10^{22} \mathrm{~m}^{2}$, then find the ratio of earth's orbital angular momentum to its mass.
(a) $4 \times 10^{15} \mathrm{~m}^{2} / \mathrm{s}$
(b) $3 \times 10^{15} \mathrm{~m}^{2} / \mathrm{s}$
(c) $10^{15} \mathrm{~m}^{2} / \mathrm{s}$
(d) $2 \times 10^{15} \mathrm{~m}^{2} / \mathrm{s}$
42. In n-p-n transistor $10^{10}$ electrons enters in emitter region in $10^{-6}$ s. if $4 \%$ electrons are lost in base regin then current amplification factor $(\beta)$ is
(a) 48
(b) 36
(c) 24
(d) 12
43. If $A=4.321 \mathrm{~cm}$ and $B=2.1 \mathrm{~cm}$, then $(A+B)$ is equal to
(a) 6.421 cm
(b) 6.42 cm
(c) 6.4 cm
(d) 6 cm
44. A ball rolls off the top of stair way with a horizontal velocity of magnitude $2 \mathrm{~m} / \mathrm{s}$. the steps are 10 cm high and 20 cm wide. If $g=10 \mathrm{~m} / \mathrm{s}^{2}$, then the ball hits first edge of
(a) First step
(b) Second step
(c) Third step
(d) Fourth step
45. Rain is falling at $6 \mathrm{~km} / \mathrm{h}$ making angle $30^{\circ}$ with the vertical towards east. A man is walking on horizontal road towards east at $5 \mathrm{~km} / \mathrm{h}$. the speed with which the rain hits the man is approximately
(a) $\sqrt{72} \mathrm{~km} / \mathrm{h}$
(b) $\sqrt{91} \mathrm{~km} / \mathrm{h}$
(b) $\sqrt{31} \mathrm{~km} / \mathrm{h}$
(d) $\sqrt{82} \mathrm{~km} / \mathrm{h}$
46. Chargaff's rule states that in an organism
(a) amount of all bases are equal
(b) amount of adenine (A) is equal to that of thymine ( T ) and the amount of guanine ( G ) is equal to that of cytosine (C)
(c) amount of adenine (A) is equal to that of guanine ( G ) and the amount of thymine ( T ) is equal to that of cytosine (C).
(d) amount of adenine (A) is equal to that of cytosine $(\mathrm{C})$ and the amount of thymine ( T ) is equal to that of guanine (G).
47. A binary liquid solution is prepared by mixing $n$ heptane and ethanol. Which one of the following statements is correct regarding the behaviour of the solution?
(a) The solution formed is an ideal solution.
(b)The solution is non-ideal showing +ve deviation from Raoult's law.
(c)The solution is non-ideal, showing -ve deviation from Raoult's law.
(d) $n$-heptane shows +ve deviation while ethanol shows - ve deviation from Raoult's law.
48. The vapour pressure of water at $20^{\circ} \mathrm{C}$ is 17.5 mm of Hg . If 18 g of glucose $\left(\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6}\right)$ is added to 178.2 g of water at $20^{\circ} \mathrm{C}$, the vapour pressure of the resulting solution will be
(a) 17.325 mm of Hg
(b) 16.675 mm of Hg
(c) 15.750 mm of Hg
(d) 16.5 mm of Hg
49. On the basis of the following thermochemical data $\left(\Delta G^{\circ}, \mathrm{H}^{+}(a q)=0\right)$
$\mathrm{H}_{2} \mathrm{O}(l) \rightarrow \mathrm{H}^{+}(a q)+\mathrm{OH}^{-}(a q) ; \quad \Delta H=57.32 \mathrm{~kJ}$
$\mathrm{H}_{2}(\mathrm{~g})+\frac{1}{2} \mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{H}_{2} \mathrm{O}(\mathrm{l}) ; \quad \Delta \mathrm{H}=-286.20 \mathrm{~kJ}$ the value of enthalpy of formation of $\mathrm{OH}^{-}$ion at $25^{\circ} \mathrm{C}$ is
(a) -22.88 kJ
(b) -228.88 kJ
(c) +228.88 kJ
(d) -343.52 kJ
50. Which of the following is not a concentration cell?
(a) $\mathrm{Zn} \mid \mathrm{Zn}^{2+}$
( 0.1 M ) \| $\mid \mathrm{Zn}^{2+}$
$(0.01 \mathrm{M}) \mid \mathrm{Zn}$
(b) $\mathrm{Pt}_{2}(\mathrm{~g})+\mathrm{H}^{+}$
$\mathrm{H}^{+}(1 \mathrm{M}) \| \mathrm{H}^{+}(1 \mathrm{M}) \mid \operatorname{Pt~H}_{2}(\mathrm{~g})$
1 atm
2 atm
(c) $\mathrm{Ag}\left|\mathrm{AgCl}, \mathrm{KCl}(0.1 \mathrm{M}) \| \mathrm{AgNO}_{3}(0.2 \mathrm{M})\right| \mathrm{Ag}(\mathrm{s})$
(d) None of the above
51. Given, $\mathrm{E}_{\mathrm{Cr}^{3+} / \mathrm{Cr}}=-0.72 \mathrm{~V} ; \mathrm{E}_{\mathrm{Fe}^{2+} / \mathrm{Fe}}=-0.42 \mathrm{~V}$, the potential for the cell
$\mathrm{Cr}\left|\mathrm{Cr}^{3+}(0.1 \mathrm{M}) \| \mathrm{Fe}^{2+}(0.01 \mathrm{M})\right| \mathrm{Fe}$ is
(a) -0.26 V
(b) 0.26 V
(c) 0.339 V
(d) -0.339 V
52. Which one of the following pairs of species have the same bond order?
(a) $\mathrm{NO}^{+}, \mathrm{CN}^{+}$
(b) $\mathrm{CN}^{-}, \mathrm{NO}^{+}$
(c) $\mathrm{CN}^{-}, \mathrm{CN}^{+}$
(d) $\mathrm{O}_{2}^{-}, \mathrm{CN}^{-}$
53. Which of the following has zero electron density in $x y$ plane?
(a) $d_{y z}$
(b) $d_{x^{2}-y^{2}}$
(c) $p_{z}$
(d) $d_{\mathrm{xy}}$
54. The weight of $\mathrm{Na}_{2} \mathrm{CO}_{3}$ required to completely neutralize 45.6 mL to $0.235 \mathrm{~N} \mathrm{H}_{2} \mathrm{SO}_{4}$ will be
(a) 0.47 g
(b) 0.57 g
(c) 0.67 g
(d) 0.77 g
55. The ionic radius of $\mathrm{Rb}^{+}$and $\mathrm{I}^{-}$are 1.46 A and 2.16 A. The most probable type of structure exhibited by it is
(a) CsCl type
(b) NaCl type
(c) ZnS type
(d) $\mathrm{CaF}_{2}$ type
56. In a compound, atoms of element Y form ccp lattice and those of element $X$ occupy $2 / 3$ rd of tetrahedral voids. The formula of the compound will be
(a) $X_{3} Y_{4}$
(b) $X_{4} Y_{3}$
(c) $X_{2} Y_{3}$
(d) $X_{2} Y$
57. The half-life period of a first order chemical reaction is 6.93 min . The time required for the completion of $99 \%$ of the chemical reaction will be
(a) 230.3 min
(b) 23.03 min
(c) 46.06 min
(d) 460.6 min
58. Gold number of protective colloids A, B, C and D are $0.5,0.01,0.1$ and 0.5 respectively.
The correct order of their protective powers is
(a) B $<$ D $<$ A $<$ C
(b) D $<$ A $<$ C $<$ B
(c) C $<$ B $<$ D $<$ A
(d) A $<$ C $<$ B $<$ D
59. Among the following substituting silanes the one which will give rise to cross linked silicon polymer on hydrolysis is
(a) $\mathrm{R}_{3} \mathrm{SiCl}$
(b) $\mathrm{R}_{4} \mathrm{Si}$
(c) $\mathrm{R} \mathrm{SiCl}_{3}$
(d) $\mathrm{R}_{2} \mathrm{SiCl}_{2}$
60. Which among the following is paramagnetic?
(a) $\mathrm{Cl}_{2} \mathrm{O}$
(b) $\mathrm{ClO}_{2}$
(c) $\mathrm{Cl}_{2} \mathrm{O}_{7}$
(d) $\mathrm{Cl}_{2} \mathrm{O}_{6}$
61. Which of the following oxyacids has the maximum number of hydrogens directly attached to P?
(a) $\mathrm{H}_{4} \mathrm{P}_{2} \mathrm{O}_{7}$
(b) $\mathrm{H}_{3} \mathrm{PO}_{2}$
(c) $\mathrm{H}_{3} \mathrm{PO}_{3}$
(d) $\mathrm{H}_{3} \mathrm{PO}_{4}$
62. Which can act as a buffer?
(a) $\mathrm{NH}_{4} \mathrm{Cl}+\mathrm{NH}_{4} \mathrm{OH}$
(b) $\mathrm{CH}_{3} \mathrm{COOH}+\mathrm{CH}_{3} \mathrm{COONa}$
(c) 40 mL of $0.1 \mathrm{M} \mathrm{NaCN}+20 \mathrm{~mL}$ of 0.1 M HCl
(d) All of these
63. The rate of reaction is double for every $10^{\circ} \mathrm{C}$ rise in temperature. The increase in reaction rate as a result of temperature rise from $10^{\circ} \mathrm{C}$ to $100^{\circ} \mathrm{C}$ is
(a) 112
(b) 512
(c) 400
(d) 614
64. Which one of the following arrangements does not truly represent the property indicated against it ?
(a) $\mathrm{Br}_{2}<\mathrm{Cl}_{2}<\mathrm{Fe}_{2}$ : Electronegativity
(b) $\mathrm{Br}_{2}<\mathrm{Fe}_{2}<\mathrm{Cl}_{2}$ : Electron affinity
(c) $\mathrm{Br}_{2}<\mathrm{Cl}_{2}<\mathrm{F}_{2}$ : Bond energy
(d) $\mathrm{Br}_{2}<\mathrm{Cl}_{2}<\mathrm{F}_{2}$ : Oxidising power
65. General electronic configuration of lanthanides is
(a) $(n-2) f^{1-14}(n-1) s^{2} p^{6} d^{0-1} n s^{2}$
(b) $(n-2) f^{10-14}(n-1) d^{0-1} n s^{2}$
(c) $(n-2) f^{0-14}(n-1) d^{10} n s^{2}$
(d) $(n-2) d^{0-1}(n-1) f^{1-14} n s^{2}$
66. $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ on heating with aqueous NaOH gives
(a) $\mathrm{CrO}_{4}^{2-}$
(b) $\mathrm{Cr}(\mathrm{OH})_{3}$
(c) $\mathrm{Cr}_{2} \mathrm{O}_{7}^{2-}$
(d) $\mathrm{Cr}(\mathrm{OH})_{2}$
67. Which one of the following complexes is not expected to exhibit isomerism?
(a) $\left[\mathrm{Ni}(\mathrm{en})_{3}\right]^{2+}$
(b) $\left[\mathrm{Ni}\left(\mathrm{NH}_{3}\right)_{4}\left(\mathrm{H}_{2} \mathrm{O}\right)_{2}\right]^{2+}$
(c) $\left[\mathrm{Pt}\left(\mathrm{NH}_{3}\right)_{2} \mathrm{Cl}_{2}\right]$
(d) $\left[\mathrm{Ni}(\mathrm{CO})_{4}\right]$
68. Which one of the following will exhibit maximum paramagnetic behaviour?
(a) $\left[\mathrm{Mn}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{2+}$
(b) $\left[\mathrm{Fe}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{2+}$
(c) $\left[\mathrm{Co}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{2+}$
(d) $\left[\mathrm{Cr}\left(\mathrm{H}_{2} \mathrm{O}\right)_{6}\right]^{2+}$
69. The compound A on heating gives a colourless gas and a residue that is dissolved in water to obtain B . Excess of $\mathrm{CO}_{2}$ is bubbled through aqueous solution of $B, C$ is formed which is recovered in the solid form. Solid $C$ on gentle heating gives back A. The compound is
(a) $\mathrm{CaSO}_{4} \cdot 2 \mathrm{H}_{2} \mathrm{O}$
(b) $\mathrm{CaCO}_{3}$
(c) $\mathrm{Na}_{2} \mathrm{CO}_{3}$
(d) $\mathrm{K}_{2} \mathrm{CO}_{3}$
70. Which one of the following does not exhibit the phenomenon of mutarotation?
(a) (+) - sucrose
(b) (+) - lactose
(c) (+) - maltose
(d) (-) - fructose
71. Aniline when diazotised in cold and then treated with dimethyl aniline gives a coloured compound. The product is
(a)

(b)

(c)

(d)

72. Which one of the following would afford a secondary alcohol?
(a)

(b) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{COCH}_{3}$

(c)

(d)

73. 2-pentanone and 3-pentanone can be distinguished by one of the following test
(a) Tollen's reagent
(b) Fehling's solution
(c) Schiff's test
(d) Iodoform test
74. Which acid gives red wine colour with neutral $\mathrm{FeCl}_{3}$ ?
(a) Propanoic acid
(b) Acetic acid
(c) Formic acid
(d) None of these
75. Which alkene on ozonolysis gives $\mathrm{CH}_{3}-\mathrm{CH}_{2}-\mathrm{CHO}$ and
(a)

(b)

(c)

(d)

76. Reaction of HBr with propene in the presence of peroxide gives
(a) isopropyl bromide
(b) 3-bromopropanal
(c) allyl bromide
(d) n-propyl bromide
77. In a $\mathrm{S}_{\mathrm{N}} 2$ substitution reaction of the type $\mathrm{R}-\mathrm{Br}+\mathrm{Cl}^{\Theta} \xrightarrow{\text { DMF }} \mathrm{R}-\mathrm{Cl}+\mathrm{Br}^{\Theta}$, which one of the following has the highest relative rate?
(a) $\mathrm{CH}_{3}-\mathrm{CH}_{2}-\mathrm{CH}_{2}-\mathrm{Br}$
(c)

(b)

(d) $\mathrm{CH}_{3}-\mathrm{CH}_{2}-\mathrm{Br}$
78. Which one is the most reactive towards $\mathrm{S}_{\mathrm{N}} 1$ reaction?
(a) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}\left(\mathrm{C}_{6} \mathrm{H}_{5}\right) \mathrm{Br}$
(b) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}\left(\mathrm{CH}_{3}\right) \mathrm{Br}$
(c) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{C}\left(\mathrm{CH}_{3}\right)\left(\mathrm{C}_{6} \mathrm{H}_{5}\right) \mathrm{Br}$
(d) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CH}_{2} \mathrm{Br}$
79. The major organic product in the reaction,
$\mathrm{CH}_{3}-\mathrm{O}-\mathrm{CH}\left(\mathrm{CH}_{3}\right)_{2}+\mathrm{HI} \longrightarrow$ Product is
(a) $1-\mathrm{CH}_{2}-\mathrm{O}-\mathrm{CH}\left(\mathrm{CH}_{3}\right)_{2}$
(b)


$$
l
$$

(c) $\mathrm{CH}_{3}-1+\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CHOH}$
(d) $\mathrm{CH}_{3} \mathrm{OH}+\left(\mathrm{CH}_{3}\right)_{2} \mathrm{CHl}$
80. Among the following four compounds
(i) phenol
(ii) methyl phenol
(iii) meta-nitrophenol
(iv) para-nitrophenol the acidity order is
(a) ii $>$ i $>$ iii $>$ iv
(b) iv $>$ iii $>$ i $>$ ii
(c) iii $>$ iv $>$ i $>$ ii
(d) i > iv > iii > ii
81. Which one of the following compounds will undergo self aldol condensation in the presence of cold dilute alkali?
(a) $\mathrm{CH}_{2}=\mathrm{CH}-\mathrm{CHO}$
(b) $\mathrm{CCl}_{3}-\mathrm{CHO}$
(c) $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CHO}$
(d) $\mathrm{C}_{6} \mathrm{H}_{5}-\mathrm{CH}_{2}-\mathrm{CHO}$
82.
$\xrightarrow{\mathrm{CO}_{2}} P$ The product $P$ is
(a)
(c)


(b)

(d)

83. Aspirin is an acetylation product by
(a) $o$-hydroxy benzoic acid
(b) o-dihydroxy benzoic acid
(c) $m$-hydroxy benzoic acid
(d) $p$-dihydroxy benzene
84. Nitrogen (1) oxide is produced by
(a) thermal decomposition of ammonium nitrate
(b) disproportionation of $\mathrm{N}_{2} \mathrm{O}_{4}$
(c) thermal decomposition of ammonium nitrite
(d) None of the above
85. Buna-S is a polymer of
(a) butadiene
(b) butadiene and nitrile
(c) butadiene and styrene
(d) butadiene and isoprene
86. The chemical system that is anti-aromatic is
(a)

(b)

(c)

(d)

87. Consider the following reaction,
$\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{NO}_{2} \xrightarrow[\mathrm{HCl}]{\mathrm{Sn}^{2}} X \xrightarrow{\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{COCl}} Y+\mathrm{HCl}$ What is $Y$ ?
(a) Acetanilide
(b) Benzanilide
(c) Azobenzene
(d) Hydrabenzene
88. Which statement is false?
(a) Some disinfectants can be used as antiseptics at low concentration
(b) Sulphadiazine is a synthetic antibacterial
(c) Ampicillin is a natural antibiotic
(d) Aspirin is analgesic and antipyretic both
89. The two anomers of glucose differ in stereochemistry at
(a) $\mathrm{C}_{1}$
(b) $\mathrm{C}_{2}$
(c) $\mathrm{C}_{3}$
(d) $\mathrm{C}_{6}$
90. Which of the following conditions favour the reduction of metal oxide to metal?
(a) $\Delta H=+\mathrm{ve}, \mathrm{T} \Delta \mathrm{S}=+\mathrm{ve}$ at low temperature
(b) $\Delta H=+\mathrm{ve} ; \mathrm{T} \Delta \mathrm{S}=-\mathrm{ve}$ at any temperature
(c) $\Delta H=-\mathrm{ve} ; \mathrm{T} \Delta \mathrm{S}=-\mathrm{ve}$ at high temperature
(d) $\Delta H=-\mathrm{ve} ; \mathrm{T} \Delta \mathrm{S}=+\mathrm{ve}$ at any temperature
91. Lateral roots are arise from
(a) pericycle
(b) cortex
(c) endodermis
(d) stele
92. Cytochrome oxidase contain
(a) Fe
(b) Mg
(c) Zn
(d) Cu
93. Restriction endonuclease cuts
(a) One strand of DNA at specific site
(b) Both strand of DNA
(c) Both strand of DNA at any site
(d) Single strand of RNA
94. Diameter of DNA is constant due to
(a) Hydrogen bonds between base
(b) Phosphodiester bond
(c) Disulphide bond
(d) Covalent bonds
95. Photosynthesis products translocated in the form of
(a) glucose
(b) sucrose
(c) maltose
(d) starch
96. Maximum percentage of which occur in plant ash?
(a) Mg
(b) Zn
(c) K
(d) Ca
97. Submerged hydrophytes shows:
(a) Stomata
(b) Abundant air sacs
(c) Developed mechanical tissue
(d) Secondary growth
98. Number of meiosis for formation of 64 zygote in angiosperm in 80 but in gymnosperms, number of meiosis for formation of 64 zygotes will
(a) 40
(b) 80
(c) 160
(d) 20
99. Catalytic converter in vehicle is used for controlling
(a) Air pollution
(b) Water pollution
(c) Radioactive pollution
(d) Soil pollution
100. Spore of Funaria on germination gives rise to
(a) protonema
(b) sporophyte
(c) prothallus
(d) capsule
101. Maximum numbers of vascular bundles are present in
(a) monocot
(b) monocot root
(c) dicot stem
(d) dicot root
102. Difference between rough and smooth endoplasmic reticulum
(a) Rough has ribosomes
(b) Smooth has ribosomes
(c) Smooth takes part in protein synthesis
(d) Both has $F_{1}$ particles
103. Which is not related with $\mathrm{N}_{2}$ - fixation?
(a) Anabaena
(b) Rhizobium
(c) Pseudomonas
(d) Nostoc
104. Vascular bundle in which two patchs of phloem are present on both side of xylem?
(a) Collateral
(b) Bicollateral
(c) Concentric
(d) Radial
105. Which is a sex linked disease?
(a) Sickle cell anaemia
(b) Haemophilia
(c) Phenyl ketonuria
(d) Albinism
106. Cell membrane controls:
(a) Exocytosis
(b) Endocytosis
(c) Both Exocytosis and Endocytosis
(d) Not controls movement of substances
107. In photosynthesis $\mathrm{NADPH}_{2}$ is formed but in respiration its forms during
(a) HMP
(b) ETS
(c) Krebs cycle
(d) None of these
108. Last electron acceptor during ETC
(a) $\mathrm{O}_{2}$
(b) Cytochrome $a_{3}$
(c) Cytochrome $a$
(d) Cytochrome $a_{2}$
109. Net gain of ATP during Glycolysis are
(a) 2
(b) 4
(c) 8
(d) 10
110. Term 'New Systematic' was given by
(a) Julian Huxley
(b) Bateson
(c) Linnaeus
(d) Darwin
111. Presence of persistant calyx is a feature of family
(a) Solanaceae
(b) Gramineae
(c) Malvaceae
(d) Compositae
112. Zygotic meiosis takes place in
(a) Chlamydomonas
(b) Bryophyte
(c) Pinus
(d) Dryopteris
113. In which cell orgenelles a lipoprotein covering is absent?
(a) Ribosomes
(b) lysosomes
(c) Mitochondria
(d) Peroxisome
114. Most diverse organism of an ecosystem is
(a) Producer
(b) Consumer
(c) Decomposer
(d) Carnivores
115. Which is correct
(a) RNA is genetic material of bacteria
(b) RNA is genetic material of all virus
(c) DNA is genetic material of some organism
(d) Some yirus has RNA as genetic material
116. Which is correct to saprophytic angiosperm?
(a) They secreates enzyme outside the body and absorbes
(b) They have mycorrhiza with fungi
(c) They takes food and then digested it
(d) They are photosynthetic
117. Parasitic algae is
(a) Cephaleuros
(b) Spirogyra
(c) Chlorella
(d) Anabaena
118. Which is incorrect for Mendelism?
(a) Works on garden pea
(b) Law of segration proved by mono hydride cross
(c) Discovered linkage
(d) All of the above
119. Auxin causes
(a) Growth of apical bud
(b) Growth of lateral bud
(c) Seed dormancy
(d) Fall of leaf
120. In a double stranded DNA, the sequence of base pairs in one starand are AGCTAAGC. What is the complementary sequence on the other strand?
(a) TCGATTCG
(b) VCGAUUCG
(c) ACGTAAGC
(d) CAUTAUCG
121. On Selfing RrTt we produce 400 plans, find out number of plants with genotype RrTt.
(a) 100
(b) 225
(c) 50
(d) 300
122. Gene regulation in bacteria is shown by
(a) Jacob and Monod
(b) Beadle and Tatum
(c) Temin and Baltimore
(d) Kornberg
123. Who proves plant absorbs $\mathrm{CO}_{2}$ and release $\mathrm{O}_{2}$ ?
(a) Mayer
(b) Von Niel
(c) Priestley
(d) Ingen house
124. Which is not correct for ancient plants?
(a) They have photosynthetic pigment
(b) They are primitive algae like
(c) They use $\mathrm{H}_{2} \mathrm{~S}$ as hydrogen source
(d) They release $\mathrm{O}_{2}$ as by product

125 . Which is correct for bacteria?
(a) They have both cyclic and non - cyclic photo phosphorylation
(b) The absorb light $>900 \mathrm{~nm}$ of wavelength
(c) They release $\mathrm{O}_{2}$ during photosynthesis
(d) They use $\mathrm{H}_{2} \mathrm{O}$ during photosynthesis
126. Modification of an organism to its external environment is example of
(a) Analogy
(b) Homology
(c) Adaptation
(d) Speciation
127. Kyoto protocol is related with
(a) Ozone layer depletion
(b) Green - house effect
(c) Water pollution
(d) Conservation wild life
128. Genetic diversity is related to
(a) Gene based diversity
(b) Types of communities in a area
(c) Diversity and evolution of species with a genus
(d) Types of species within a community
129. A pollutant can be best defined as it
(a) Has natural geochemical cycles
(b) Changes homeostasis of a place
(c) Disturb natural flora of a place
(d) Become stabilized in ecosystem forever 130. Larger nucleus in a pollen grain is
(a) Tube nucleus
(b) Sperm nucleus
(c) Generative nucleus
(d) None of these
131. $\mathrm{C}_{4}$ pathway for $\mathrm{CO}_{2}$ fixation was proposed by
(a) Benson and associates
(b) Arnon and associates
(c) Rouhani et. al
(d) Hatch et. al
132. Which of the following is exhaustible but limited source of energy?
(a) Nuclear fuels
(b) Water energy
(c) Fossil fuels
(d) Solar energy
133. Trophic level of food chain having greatest amount of energy
(a) carnivores
(b) herbivores
(c) autotrophs
(d) omnivores
134. Pollination occurring from one flower to another of same plant is
(a) autogamy
(b) allogamy
(c) geitonogamy
(d) none of these
135. Core of chlorophyll is formed by
(a) Fe
(b) Mn
(c) $\mathrm{CH}_{3}$
(d) Mg
136. By anaerobic process, the cow dung is used to produce
(a) methane
(b) butane
(c) ethane
(d) propane
137. Fruits are formed in
(a) Brassica
(b) Fern
(c) Cycas
(d) Funaria
138. $\mathrm{CO}_{2}$ in CAM plants is in
(a) mesophyll cells
(b) bundle sheath
(c) both (a) and (b)
(d) none of these
139. If centromere is in the middle the chromosome is called
(a) Sub-metacentric
(b) Meta-centhic
(c) Acenthic
(d) Telocenthic
140. Which hormone is responsible for mobilization of storage food during seed germination
(a) Auxin
(b) Gibberellin
(c) cytokinin
(d) ethylene
141. P -proteins belong to
(a) Xylem parenchyma
(b) Trichomes
(c) Siece tube elements
(d) Tracheids and vessels
142. The organelles, those take part in photorespiration are
(a) Chloroplast and mitochondria
(b) Chloroplast, mitochondria and Peroxisome
(c) Mitochondria and perxisome
(d) Mitochondria only
143. Coding sequences of DNA in split genes are
(a) exon
(b) intron
(c) rhizoids
(d) cistron
144. Mark the correct sequence of layers found in root anatomy
(a) Epiblema, cortex, endodermis, pericycle
(b) Cortex, epiblema, pericycle, endodermis
(c) Epiblema, pericycle, endodermis
(d) Cortex, epiblema, endodermis, epidermis
145. Which pigment involves in photoperiodic change in plants?
(a) Phytochrome
(b) Cytochrome
(c) Chlorophyll
(d) Anthocyanin
146. A fruit in which seed coat and fruit wall is fused known as caryopsis present in
(a) wheat
(b) sunflower
(c) mango
(d) tomato
147. A wastage process is
(a) respiration
(b) photosynthesis
(c) photorespiration
(d) movement
148. Which is absent in a leaf:
(a) Lenticel
(b) Stomata
(c) Mesophyll
(d) Chloroplast
149. Pneumatophores are present in
(a) mangroves
(b) xerophyte
(c) hydrophyte
(d) lithophyte
150. The wall of bacteria consists of
(a) N -acetyl glucosamine
(b) $\mathrm{N}-\mathrm{n}$ acetyl muramic acid
(c) Both (a) and (b)
(d) Cellulose
151. Which of the following is not used for disifection of drinking water?
(a) Phenyl
(b) chloramine
(c) Chlorine
(d) Ozone
152. Chemiosmotic theory of ATP synthesis is the chloroplasts and mitochondria is based on:
(a) Portion gradient
(b) Accumulation of K ions
(c) Accumulation of Na ions
(d) Membrane potential
153. Parkinson's disease (characterized by tremors and progressive rigidity of limbs) is caused by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter:
(a) Acetylcholine
(b) Norepinephrine
(c) Dopamine
(d) GABA
154. An acromian process is characteristically found in the :
(a) Pelvic girdle of mammals
(b) Skull of frog
(c) Pectoral girdle of mammals
(d) Sperm of mammals
155. In a type of apomixes know as adventives embryony, embryos develop directly from the:
(a) Nucellus or integuments
(b) Synergids or antipodals in an embryo sac
(c) Accessory embryo sacs in the ovule
(d) Zygote
156. Through which cell of the embryo sac, does the pollen tube enter the embryo sac?
(a) Egg cell
(b) Central cell
(c) Persistant synergid
(d) Degenerated synergid
157. Epithelial cells of the intestine involved in food absorption have on their surface:
(a) Pinocytic vesicles
(b) Phagocytic vesicles
(c) Zymogen granules
(d) Micro-villi
158. A patient is generally advise to specially, consume more meat, lentils, milk and eggs in diet only when he suffers from:
(a) Kwashiorkor
(b) Rickest
(c) Anaemia
(d) Scurvy
159. Which one of the following pairs is mismatched?
(a) Savanna

- Acacia trees
(b) Prairie
- Epiphytes
(c) Tundra $\quad$ Permafrost
(d) Coniferous forest - Evergreen trees

160. All of the following statements concerning the actinomycetous filamentous soil bacterium Frankia are correct except the Frankia:
(a) Can induce root nodules on many plant species
(b) Can fix nitrogen in the free-living state
(c) Like Rhizobium, it usually infects it host plant through root hair deformation and stimulates cell proliferation in the host's cortex
(d) Forms specialized vesicles in which the nitrogenase is protected from oxygen by a chemical barriers involving triterpene hopanoids
161. Which of the following is the relatively most accurate method for dating of fossils?
(a) Potassium -argon method
(b) Uranium -lead method
(c) Electron-spin resonance method
(d) Radio - carbon method
162. Which one of the following represents an ovule, where the embryo sac becomes horse-shoe shaped and the funiculus and micropyle are close to each other?
(a) Circinotropous
(b) Anatropous
(c) Amphitropous
(d) Atropous
163. Potometer worked on the principle of:
(a) Amount of water absorbed equals the amount transpired
(b) Osmotic pressure
(c) Root pressure
(d) Potential difference between the tip of the tube and that of the plant
164. De Vries gave his mutation theory on organic evolution while working on:
(a) Althea rosea
(b) Drosophila melanogaster
(c) Oenothera lamarckiana
(d) Pisum sativum
165. One of the examples of the action of the autonomous nervous system is:
(a) Knee - jerk response
(b) Papillary reflex
(c) Swallowing of food
(d) Peristalsis of the intestines
166. In contrast to annelids the Platyhelminthes show:
(a) Radial symmetry
(b) Presence of pseudocoel
(c) Bilateral symmetry
(d) Absence of body cavity
167. Which of the following statements regarding enzyme inhibition is correct?
(a) Non- competitive inhibition of an enzyme can be overcome by adding large amount of substrate
(b) Competitive inhibition is seen when a substrate competes with an enzyme for binding to an inhibition protein
(c) Competitive inhibition is seen when the substrates and the inhibitor compete
(d) Non- competitive inhibition often bind to the enzyme irreversibly
168. The catalytic efficiency of two different enzymes can be compared by the:
(a) The $K_{m}$ value
(b) The pH optimum value
(c) Formation of the product
(d) Molecular size of the enzyme
169. Using imprints from a plate with complete medium and carrying bacterial colonies, you can select streptomycin resistant mutants and prove that such mutations do not originate as adaption. These imprints need to be used :
(a) Only on plates with streptomycin
(b) On plates with minimal medium
(c) Only on plates without streptomycin
(d) On plates with and without streptomycin
170. Which of the following pairs is correctly matched?
(a) Cartilaginous - Skull bones joint
(b) Hinge joint - Between vertebrae
(c) Fibrous joint - Between phalanges
(d) Gliding joint - Between zygapophyses of the successive vertebrae
171. Which one of the following makes use of RNA as a template to synthesize DNA?
(a) Reverse transcriptase
(b) DNA dependant RNA polymerase
(c) DNA polymerase
(d) RNA polymerase
172. Which of the following is generally used for induced mutagenesis in crop plants?
(a) Alpha particle
(b) X-rays
(c) UV $(260 \mathrm{~nm})$
(d) Gamma rays (from cobalt 60)
173. Haemophilia is more commonly seen in human males than in human females because:
(a) This disease is due to an X -linked dominant mutation
(b) A greater proportion of girls die in infancy
(c) This disease is due to an X-linked recessive mutation
(d) This disease is due to a Y-linked recessive mutation
174. A woman with 47 chromosomes due to three copies of chromosome 21 is characterize by :
(a) Down syndrome
(b) Triploidy
(c) Turner syndrome
(d) Super femaleness
175. Four healthy people in their twenties got involved in injuries resulting in damage and death of a few cells of the following. Which of the cells are least likely to be replaced by new cells?
(a) Osteocytes
(b) Malpighian layer of the skin
(c) Liver cells
(d) Neurons
176. Secretin and Cholecystokinin are digestive hormones. They are secreted in:
(a) Oesophagus
(b) ileum
(c) Duodenum
(d) pyloric stomach
177. Which of the following unicellular organism has micro-nucleus for trophic function and one or more micro - nuclei for reproduction?
(a) Euglena
(b) Amoeba
(c) Paramecium
(d) Trypansoma
178. AIDS is caused by HIV that principally infects:
(a) all lymphocytes
(b) activator B cells
(c) $T_{4}$ lymphocytes
(d) Cytotoxic T cells
179. Which one of the following depresses brain activity and produces feelings of calmness, relaxation and drowsiness?
(a) Valium
(b) Morphine
(c) Hashish
(d) Amphetamines
180. In a woody dicotyledonous tree, which of the following parts will mainly cannot of primary tissues?
(a) Stem and root
(b) All parts
(c) Shoot tips and root tips
(d) Flowers, fruits and leaves

