30/04/2019

Code-B

Aakash
Medical | IIT-JEE | Foundations
(Divisions of Aakash Educational Services Limited)

Regd. Office : Aakash Tower, 8, Pusa Road, New Delhi-110005; Ph.: 011-47623456

MM : 720

Mock Test for NEET-2019
Test-12

Time : 3 Hrs.

Complete Syllabus of Class XI & XII

Instructions :

(i) Use Blue/Black ballpoint pen only to darken the appropriate circle.
(ii) Mark should be dark and should completely fill the circle.
(iii) Dark only one circle for each entry.
(iv) Dark the circle in the space provided only.
(v) Rough work must not be done on the Answer sheet and do not use **white-fluid** or any other **rubbing material** on Answer sheet.
(vi) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from total score.

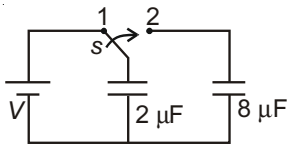
PHYSICS

Choose the correct answer :

1. The dimensional formula of $\frac{1}{\varepsilon_0}\frac{e^2 r}{hc}$ is, (where h is Planck's constant, c is speed of light, e is electronic charge, r is distance between the charges and ε_0 is permittivity of free space)

(1) $[M^0 L^0 T^0 A^0]$ (2) $[M^0 L^0 T^0 A^2]$
(3) $[M^0 L T^0 A]$ (4) $[M^0 L T^0 A^0]$

2. A capacitor of capacitance 2μF is charged to a potential V as shown in figure. The percentage loss in stored energy, when switch is turned to position 2 is

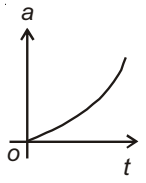


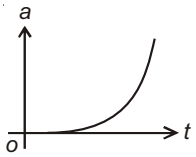
(1) 25% (2) 40%
(3) 75% (4) 80%

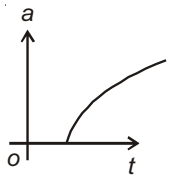
3. A body is projected at an angle of 60° with horizontal, with a speed of 40 m/s. The speed of the body when velocity becomes perpendicular to initial velocity is (g = 10 m/s^2)

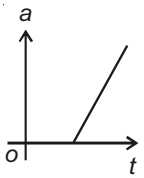
(1) $20\sqrt{3}$ m/s (2) $\frac{40}{\sqrt{3}}$ m/s
(3) 20 m/s (4) 30 m/s

4. A block is placed on a rough horizontal surface. A time dependent force $F = Kt^2$ is applied horizontally on the block. Here K is a positive constant. Then acceleration time graph of block is best represented by

(1) 

(2) 

(3) 

(4) 

5. A body of mass m starts from rest and moves with a velocity $v = a\sqrt{x}$. Then the work done by all the forces on the body in time t is (x is distance travelled)

(1) $\frac{1}{4}ma^2t^2$ (2) $\frac{1}{8}ma^4t^2$
(3) $\frac{1}{4}ma^4t^2$ (4) $\frac{1}{8}ma^2t^2$

6. If the angular momentum of a rotating body about a fixed axis is increased by 10%, then its kinetic energy will be increased by

(1) 11% (2) 21%

(3) 20% (4) 5%

7. A mass m is released from a distance $2R$ from centre on the axis of a fixed ring of mass M and radius R. Speed of mass m at distance R from centre of ring is

(1) $v = \sqrt{\frac{GM\sqrt{2}}{R}\left(1-\sqrt{\frac{2}{5}}\right)}$ (2) $v = \sqrt{\frac{2GM}{R}\left(1-\sqrt{\frac{2}{5}}\right)}$

(3) $v = \sqrt{\frac{GM}{2R}\left(1-\sqrt{\frac{2}{5}}\right)}$ (4) $v = \sqrt{\frac{GM}{R}\left(1-\sqrt{\frac{2}{5}}\right)}$

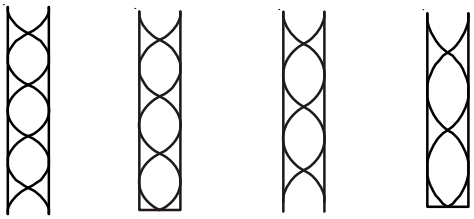
8. Electric potential in a region is given by $V = 6x - 8xy^2 - 8y + 6yz - 4z^2$

The magnitude of electric force acting on a 2C charge placed at origin is (where x, y and z are in meter and V is in volt)

(1) 2 N (2) 20 N

(3) 6 N (4) 8 N

9. Four organ pipes of equal length have their overtones as shown in figure. Respective frequency ratio of sound waves in them is



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

(1) 4 : 3 : 2 : 1

(2) 6 : 5 : 4 : 3

(3) 8 : 7 : 6 : 5

(4) 5 : 3 : 2 : 1

10. An uncharged soap bubble is given some positive charge, then its radius

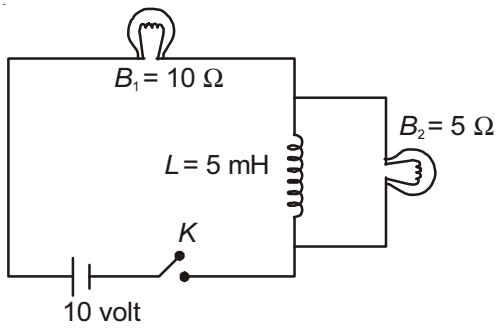
(1) Decreases

(2) Increases

(3) Remains unchanged

(4) May increase or decrease

11. In the circuit shown, the power consumed by the bulb B_1 long time after the key K closed is (inductor is ideal)



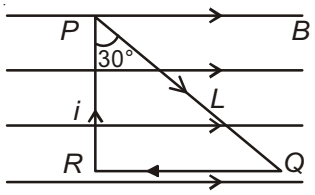
(1) 5 W

(2) 10 W

(3) 20 W

(4) 40 W

12. A triangular loop PQR, carrying current i, is placed in uniform magnetic field B as shown in figure. The length of side PQ is L. Then correct option regarding magnetic force is



(1) The force on side PQ is (iBL) and directed into the page.

(2) The force on side PQ is (iBL) and directed out side the page

(3) The force on side PR is (iBL) and directed into the page.

(4) The force on side PR is $\frac{\sqrt{3}}{2}iBL$ and directed into the page

13. Originally the Young's double slit experiment was performed with white light, in which central maxima for all colours in the fringe pattern overlap each other at centre. Assume that wavelength of blue light is 520 nm and that of red light is 780 nm. The value of x for which x^{th} bright red band coincides with $(x + 1)^{th}$ blue band is

(1) 5 (2) 4

(3) 3 (4) 2

14. Assuming Bohr's model of hydrogen atom, the wavelength of α-line of Balmer series is λ. The wavelength of α-line of Lyman series is

(1) $\frac{27}{128}\lambda$ (2) $\frac{5\lambda}{27}$

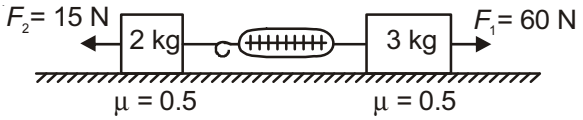
(3) $\frac{27}{32}\lambda$ (4) $\frac{5\lambda}{36}$

15. From a suitable height two projectiles are thrown simultaneously, horizontally in opposite direction with equal speed 20 m/s. Then the displacement between the projectiles, when they are moving perpendicular to each other is (g = 10 m/s^2)

(1) 20 m (2) 80 m

(3) 60 m (4) 40 m

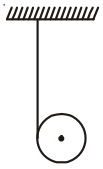
16. In the situation shown, the reading of the spring balance is (g = 10 m/s^2)



(1) 30 N (2) 33 N

(3) 39 N (4) 40 N

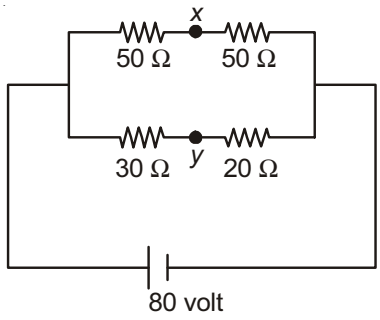
17. A circular disc of mass 2 kg and radius 20 cm is rolling down a string without slipping as shown in figure. If acceleration due to gravity at that place is 10 m/s^2, then the angular acceleration of the disc is (g = 10 m/s^2)



(1) $\frac{100}{3}$ rad/s^2 (2) $\frac{200}{3}$ rad/s^2

(3) 20 rad/s^2 (4) 30 rad/s^2

18. The potential difference between points x and y in the circuit shown in figure is



(1) 8 V (2) 10 V

(3) 20 V (4) 40 V

19. Two inductor coils L_1 = 18 mH and L_2 = 2 mH are perfectly coupled. If a current of 2 A is reversed in first coil within 2 millisecond, then the EMF induced in the second coil will be

(1) 12 V (2) 24 V

(3) 12 mV (4) 24 mV

20. A lift is tied with thick steel wire and its mass is 1000 kg. The minimum diameter of wire required for safe run if the maximum acceleration of lift is 2.76 m/s^2 and maximum safe stress for the steal wire is 1.44 × 10^9 N/m^2 is (g = 9.8 m/s^2)

(1) 1.66 mm (2) 2.66 mm

(3) 8 mm (4) 3.33 mm

21. A hollow cylinder of very small radius and mass m is floating vertically with its length l inside water. Now it is tilted through an angle θ from vertical position and left. The restoring force on cylinder is

(1) mg (2) $mg\sin\theta$

(3) $mg\left(\frac{1}{\cos\theta}-1\right)$ (4) $mg\left(\frac{1}{\sin\theta}-1\right)$

22. A lead sphere of mass m falls in a viscous fluid with a terminal speed v_0. Another lead sphere of mass M falls through the same viscous fluid with terminal speed $9v_0$ the ratio of M/m is

(1) 9 (2) 6

(3) 16 (4) 27

23. A Carnot engine is designed to operate between temperature 480 K and 300 K. If the engine actually produce 1.2 J of mechanical energy per calorie of heat absorbed. Then the ratio of actual efficiency and theoretical efficiency is (1 cal = 4.2 J)

(1) $\frac{16}{21}$ (2) $\frac{12}{21}$

(3) $\frac{3}{4}$ (4) $\frac{3}{8}$

24. The r.m.s speed of gas molecules is given by (where symbols have their usual meanings)

(1) $\sqrt{\frac{2RT}{M}}$ (2) $\sqrt{\frac{RT}{M}}$

(3) $\sqrt{\frac{3RT}{M}}$ (4) $\sqrt{\frac{8}{\pi}\frac{RT}{M}}$

25. The amount of heat required to raise the temperature of 10 g liquid from 0°C to 10°C, if its specific heat $\left(\text{in } \frac{\text{cal}}{\text{g°C}}\right)$ varies with temperature as 0.3 t^2 (where t is temperature in °C) is

(1) 2 kcal (2) 3 kcal

(3) 2.5 kcal (4) 1 kcal

26. A tunnel is made along the diameter of earth of radius R. A body is dropped in the tunnel from a depth h ($h << R$) below earth surface. Then time period of oscillation is

(1) $2\pi\sqrt{\frac{R}{g}+\sqrt{\frac{2h}{g}}}$ (2) $2\pi\sqrt{\frac{R}{g}+4\sqrt{\frac{2h}{g}}}$

(3) $2\pi\sqrt{\frac{R}{g}}$ (4) $2\pi\sqrt{\frac{R}{g}-4\sqrt{\frac{2h}{g}}}$

27. When a ferromagnetic material placed in magnetising field, then intensity of magnetisation is 5000 times the magnetising field intensity. Then relative permeability of material is

(1) 5×10^4 (2) 5×10^5

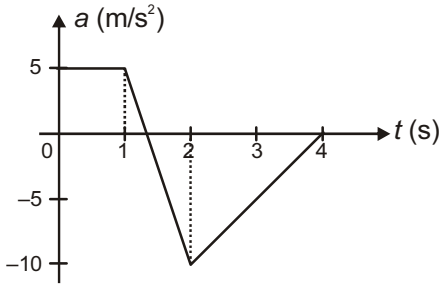
(3) 4999 (4) 5001

28. If binding energy of hypothetical nuclei P, Q, R are 112 MeV, 106 MeV and 230 MeV respectively then energy released in the reaction $P + Q \rightarrow R$ is

(1) 2 MeV (2) 12 MeV

(3) 241 MeV (4) 22 MeV

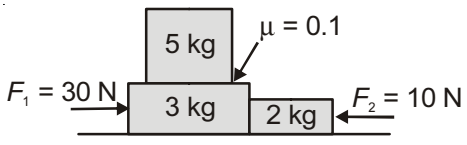
29. A particle moves along +x-axis with initial velocity 5 m/s. If acceleration (a) varies with time (t) as shown in figure, then the velocity of the particle just after 4 second is



(1) –2.5 m/s (2) 10 m/s

(3) 2.5 m/s (4) –5 m/s

30. Three blocks are kept as shown in the figure. The 5 kg block is kept over 3 kg block and the 2 kg block touches 3 kg block. The coefficient of friction μ between 5 kg and 3 kg blocks are $\mu = 0.1$. The 3 kg block is being pushed by force $F_1 = 30$ N and the block 2 kg is being pushed by force $F_2 = 10$ N. The ground is smooth. Then the contact force between 3 kg and 2 kg block will be ($g = 10$ m/s^2)



(1) 5 N (2) 16 N

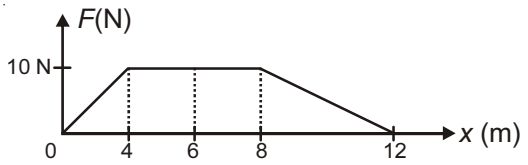
(3) 10 N (4) 12 N

31. A projectile is thrown up with initial speed u at angle θ with the horizontal. It just crosses a tower horizontally. The tower is 100 m high and the foot of the tower is at 200 m from the point of projection. The angle of projection θ is

(1) 30º (2) 45º

(3) 60º (4) 70º

32. A particle of mass 0.1 kg is subjected to force F which varies with distance x as shown in figure. If it starts journey from rest at $x = 0$, then its velocity at $x = 6$ m is



(1) $10\sqrt{2}$ m/s (2) $20\sqrt{2}$ m/s

(3) $20\sqrt{3}$ m/s (4) 40 m/s

33. A source of sound emits a note of frequency 500 Hz. Source is moving with speed of 30 m/s towards a listener and listener is also moving towards the source at a speed of 20 m/s (take speed of sound 330 m/s), then

(1) Frequency heard is 500 Hz

(2) Frequency heard is $\frac{1750}{3}$ Hz

(3) Frequency heard is $\frac{1650}{3}$ Hz

(4) Frequency heard is 1150 Hz

34. Length of wire required to manufacture a solenoid of length l and self-inductance L is

(1) $\sqrt{\frac{2\pi Ll}{\mu_0}}$ (2) $\sqrt{\frac{\mu_0 Ll}{4\pi}}$

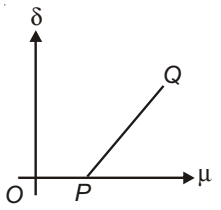
(3) $\sqrt{\frac{4\pi Ll}{\mu_0}}$ (4) $\sqrt{\frac{\mu_0 Ll}{2\pi}}$

35. If an electric current i as a function of time t is given as $i = t^2$ (for $0 < t \leq T$), then RMS value of the current for time 0 to T is

(1) T^2 (2) $\frac{T^2}{\sqrt{2}}$

(3) $\frac{T^2}{2}$ (4) $\frac{T^2}{\sqrt{5}}$

36. For a thin prism of refracting angle A, the variation of minimum deviation δ with refractive index (μ) is shown. Then from graph we can conclude that



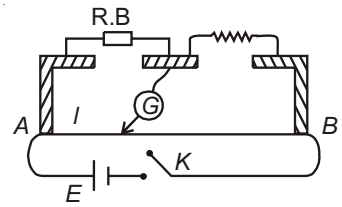
(1) Point P corresponds to $\mu = 1$

(2) Point P corresponds to $\mu = 2$

(3) Slope of straight line is $\frac{A}{2}$

(4) Slope of straight line is $2A$

37. The shown arrangement is an experiment of metre bridge to calculate unknown resistance. The neutral point is obtained at a distance l. The distance of neutral point from A if radius of wire AB is reduced to half of inital value is



(1) $2l$ (2) $4l$

(3) l (4) $\frac{l}{4}$

38. A transistor has a current amplification factor 50 in a common emitter (CE) amplifier circuit, the collector resistance is chosen as 5 kΩ and the input resistance is 1 kΩ. If the input voltage is 0.01 V, then value of output voltage is

(1) 4 V (2) 2.5 V

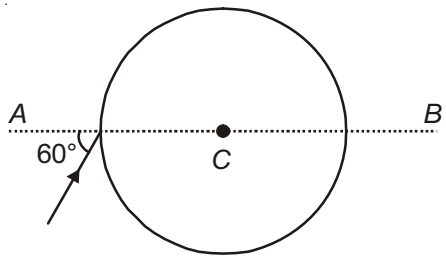
(3) 1 V (4) 5 V

39. A tuning fork of unknown frequency produce 2 beats/s with an open organ pipe at 16°C. If temperature of air in pipe change to 51°C and it again produce 2 beats/s with the same fork. Frequency of fork is

(1) 50 Hz (2) 60 Hz

(3) 65 Hz (4) 70 Hz

40. A ray of light falls on a solid transparent sphere as shown in figure. The ray emerges from the sphere parallel to AB. The refractive index of material of sphere is



(1) $\frac{3}{2}$ (2) $\sqrt{2}$

(3) $\sqrt{3}$ (4) 2

41. The fraction of a radioactive substance decayed in a time interval equal to average life

(1) $\frac{e-1}{e}$ (2) e

(3) $\frac{1}{1-e}$ (4) $\frac{1}{e}$

42. The ground state energy of hydrogen atom is –13.6 eV. The energy required to ionize hydrogen atom from second excited state is

(1) 13.6 eV (2) 3.4 eV

(3) 1.51 eV (4) 0.85 eV

43. If the frequency of incident radiation on metal plate is ν ($\nu > \nu_0$) then speed of emitted photoelectron is v. If frequency of radiation is made twice then the correct option is (ν_0 is threshold frequency of metal plate)

(1) Kinetic energy of emitted photoelectron becomes twice

(2) Kinetic energy of emitted photoelectron becomes greater than twice

(3) Kinetic energy of emitted photoelectron is less than twice

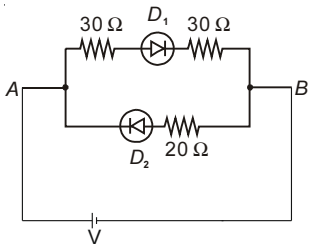
(4) Kinetic energy of emitted photoelectrons remains same

44. Consider an electron in the n^{th} orbit of a hydrogen atom in the Bohr model. The circumference of the orbit can be expressed in terms of de-Broglie wavelength λ of that electron as

(1) $0.529\,n\lambda$ (2) $n\lambda$

(3) $13.6\,n\lambda$ (4) $\sqrt{n\lambda}$

45. In the circuit shown in figure diodes D_1 and D_2 are ideal. The effective resistance between A and B is



(1) 60 Ω

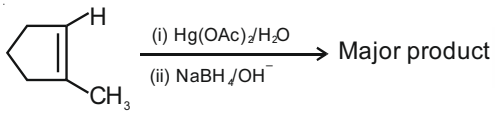
(2) 80 Ω

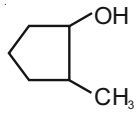
(3) 120 Ω

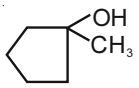
(4) 30 Ω

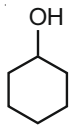
CHEMISTRY

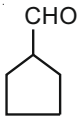
46. Major product in the given reaction is



(1) 

(2) 

(3) 

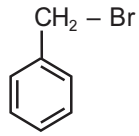
(4) 

47. The change in the optical rotation of freshly prepared solution of glucose in known as

(1) Tautomerism (2) Racemisation

(3) Mutarotation (4) Epimerisation

48. $CH_2 = CH - Br$ (I) $CH_2 = CH - CH_2 - Br$ (II)



(III)

$CH_3 - CH_2 - Br$ (IV)

Correct order of S_N1 reactivity of above compounds is

(1) (III) > (II) > (IV) > (I) (2) (II) > (III) > (IV) > (I)

(3) (I) > (II) > (III) > (IV) (4) (III) > (IV) > (II) > (I)

49. The synthesis of alkyl fluorides is best accomplished by

(1) Sandmeyer's reaction

(2) Swarts reaction

(3) Wurtz reaction

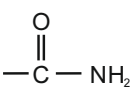
(4) Rosenmund reaction

50. An organic compound A upon heating with NH_3 gives B. B in presence of KOH reacts with Br_2 to give Ph-NH_2. Compound A is

(1) Ph — OH

(2) Ph — COOH

(3) Ph — CH_2 — COOH

(4) 

51. Kolbe's electrolytic method can be used to produce

(1) An alkane (2) An alkene

(3) An alkyne (4) All of these

52. Both lithium and magnesium display several similar properties due to diagonal relationship, however, the one which is incorrect, is

(1) Both form nitrides

(2) Nitrates of both yield NO_2 and O_2 on thermal decomposition

(3) Both give crimson red colour to the flame test

(4) Both form soluble bicarbonates

53. Number of electrons present in 10 g of D_2O is

(1) 10 N_A (2) N_A

(3) 5 N_A (4) 20 N_A

54. The ratio of orbital angular momentum of electrons having l = 2 and l = 3 respectively will be

(1) 2 : 1 (2) 1 : 2

(3) $\sqrt{2}:1$ (4) $1:\sqrt{2}$

55. How many mole of $K_2Cr_2O_7$ is required to oxidise one mole of ferrous sulphate in acidic medium?

(1) $\frac{1}{7}$ (2) $\frac{1}{3}$

(3) $\frac{1}{6}$ (4) $\frac{1}{2}$

56. If molality of a solute in its aqueous solution is 5.55 then mole fraction of solute will be

(1) $\frac{10}{11}$ (2) $\frac{1}{11}$

(3) $\frac{1}{5}$ (4) $\frac{1}{18}$

57. If x is the initial amount of reactant in a first order reaction A $\rightarrow$ B, then the amount of reactant converted to product in three half lives will be

(1) $\frac{15x}{16}$ (2) $\frac{3x}{4}$

(3) $\frac{7x}{8}$ (4) $\frac{x}{32}$

58. The activation energy for the forward reaction, P $\rightarrow$ Q is 20 kJ mol^{-1} and the enthalpy change, ΔH of the reaction is +10 kJ mol^{-1}. The activation energy (in kJ mol^{-1}) for the backward reaction will be

(1) 30 (2) 50

(3) 20 (4) 10

59. At low pressure Van der Waals equation reduces to

(1) PV = nRT

(2) $\left(P+\frac{an^2}{V^2}\right)(V-nb)=nRT$

(3) P(V – nb) = nRT

(4) $\left(P+\frac{an^2}{V^2}\right)V=nRT$

60. If N is the number of atoms in the closely packed unit cell then the number of octahedral voids in that unit cell is equal to

(1) N (2) 2N

(3) N/2 (4) N/4

61. The polymer used for making electrical switches is

(1) Neoprene (2) Teflon

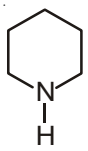
(3) Bakelite (4) Melamine

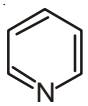
62. Five moles of an ideal gas are expanded isothermally and reversibly at 300 K from 1 L to 2 L. ΔE for the process is

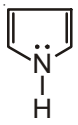
(1) Zero (2) 180.6 cal

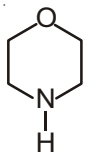
(3) 300 cal (4) –180.6 cal

63. Least basic compound among the following is

(1) 

(2) 

(3) 

(4) 

64. Partial charge on each oxygen atom in MnO_4^- is

(1) $-\frac{1}{4}$ (2) –1

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

65. If $H^+ + OH^- \longrightarrow H_2O$, ΔH_1 = –56 kJ/mole

$2H + \frac{1}{2}O_2 \longrightarrow H_2O$, ΔH_2 = –66 kJ/mole

$2H + O \longrightarrow H_2O$, ΔH_3 = –46 kJ/mole

and $H_2 + \frac{1}{2}O_2 \longrightarrow H_2O$, ΔH_4 = –36 kJ/mole

Using above data the heat liberated for formation of 1 g water is

(1) 36 kJ (2) 2 kJ

(3) 18 kJ (4) 1 kJ

66. K_C of a reaction $A+B \rightleftharpoons 2C$ is 0.5 at T(K). If concentration of all A, B and C have been taken intially as $2\left(\frac{mol}{L}\right)$, then the direction of reaction will be

(1) The forward direction

(2) The backward direction

(3) Remain at equilibrium

(4) Equilibrium can never be achieved

67. If at T°C $K_w = 10^{-12}$ then an aqueous solution of pH of 7 will be

(1) Acidic (2) Basic

(3) Neutral (4) Can't be predicted

68. Which of the following group is ortho/para directing when attached with benzene ring?

(1) – CHO (2) $-\overset{\overset{O}{\|}}{C}-CH_3$

(3) $-NHCOCH_3$ (4) $-NO_2$

69. E°_{SRP} values of metals are given as

$E^\circ_{A^+/A}$ = –2.54 volt $E^\circ_{B^+/B}$ = –3.0 volt

$E^\circ_{M^+/M}$ = 1.25 volt $E^\circ_{N^+/N}$ = 0.76 volt

Metal with strongest reducing nature is

(1) A (2) B

(3) M (4) N

70. A 5% solution of sucrose (M.W. = 342) is isotonic with 1% of a solution having an unknown non-electrolytic/non-associating solute. The molar mass of unknown solute (in g/mol) is

(1) 34.2 (2) 136.2

(3) 171.2 (4) 68.4

71. Reactions with order greater than three are rare due to

(1) Non-spherical nature of molecules

(2) Increase in entropy and activation energy

(3) Very less probability of simultaneous collision of more than three reacting species at a time

(4) Increase in non elastic collisions

72. If all the ions along an axis passing through two opposite face centred are removed then effective number of Cl^- ions left in a unit cell of NaCl is

(1) 2 (2) 3

(3) 3.5 (4) 2.5

73. Which of the given sets of quantum numbers is impossible?

(1) n = 3, l = 2, m = –3, s = +1/2

(2) n = 4, l = 3, m = +1, s = +1/2

(3) n = 2, l = 1, m = 0, s = –1/2

(4) n = 4, l = 3, m = +2, s = +1/2

74. The percentage strength of H_2O_2 solution obtained by mixing equal volumes of two H_2O_2 solutions of "10 volume" and "20 volume" strength is

(1) 0.45 (2) 4.55

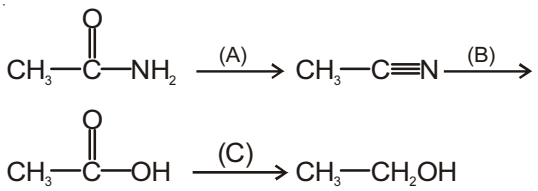
(3) 15 (4) 9

75. The degree of dissociation of 0.1 M CH_3COOH in 0.1 M HCl will be [$K_a(CH_3COOH) = 10^{-5}$]

(1) 10^{-3} (2) 10^{-5}

(3) 10^{-4} (4) 10^{-6}

76. A, B and C in the following reaction sequence respectively are



(1) $LiAlH_4$, H_3O^+, P_2O_5

(2) $LiAlH_4$, P_2O_5, H_3O^+

(3) H_3O^+, HI/Red P, $LiAlH_4$

(4) P_2O_5, H_3O^+, $LiAlH_4$

77. Which among the following is an antifertility drug?

(1) Veronal (2) Dimetapp

(3) Novestrol (4) Alitame

78. Which of the following is an example of negative charged sol?

(1) Silver sol (2) Methylene blue sol

(3) TiO_2 sol (4) $Al_2O_3 \cdot xH_2O$ sol

79. Leaching is done for the concentration of

(1) Al_2O_3 (2) Ag_2S

(3) Au (4) All of these

80. Which of the following can have maximum number of isomers?

(1) $[Pt(NH_3)_2Cl_2]$

(2) $[Pt(en)_2Cl_2]$

(3) $[Co(ox)_3]^{3-}$

(4) $[Ni(CN)_2(NH_3)_4]Cl_2$

81. Carbylamine reaction and Reimer-Tiemann reaction have same

(1) Reactants (2) Products

(3) Intermediate (4) Nucleophile

82. Chain growth polymer out of the following is

(1) Terylene (2) Buna-S

(3) Nylon-6 (4) Nylon-6, 6

83. Linear species in the following is

(1) H_3O^+ (2) $\overset{+}{N}H_4$

(3) I_3^- (4) I_3^+

84. Alkali metals at very high concentration are dissolved in liquid NH_3 and gives the following colour.

(1) Red (2) Blue

(3) Bronze (4) Yellow

85. Which of the following element has least melting point?

(1) Sc (2) Au

(3) Ag (4) Hg

86. The value of CFSE for d^5 system in an octahedral complex in presence of a weak ligand is

(1) $-\frac{12}{5}\Delta_0$ (2) $\frac{-6}{5}\Delta_0$

(3) $-\frac{3}{5}\Delta_0$ (4) Zero

87. Which among the following is the most reactive?

(1) Cl_2 (2) O_2

(3) N_2 (4) ICl

88. Phenol and formaldehyde on polymerisation forms

(1) Melamine (2) Bakelite

(3) Glyptal (4) Dacron

89. DNA does not contain

(1) Adenine (2) Guanine

(3) Cytosine (4) Uracil

90. Mischmetal mainly consists of

(1) Alkaline earth metals

(2) Transition metals

(3) Lanthanoids

(4) Actinoids

BOTANY

91. Which of the following cell organelle help in osmoregulation in some protists?
(1) Golgi apparatus
(2) Contractile vacuoles
(3) Mitochondrion
(4) Sap vacuoles

92. What will be the amount of DNA in meiosis-II products if the meiocyte contains 40 pg DNA in G_1-phase?
(1) 20 pg (2) 40 pg
(3) 10 pg (4) 30 pg

93. In six kingdom classification, Monera was divided into two separate kingdoms on the basis of
(a) Cell wall composition
(b) Lipid nature in plasma membrane
(c) Absence of sexual reproduction
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) All (a), (b) and (c)

94. Select the **incorrectly** matched pair
(1) *Aspergillus* – Conidia
(2) *Rhizopus* – Dikaryophase
(3) *Mucor* – Coenocytic mycelium
(4) *Penicillium* – Ascocarp

95. Stem tendrils occur in
(a) Watermelon
(b) Cucumber
(c) Pumpkin
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) All (a), (b) and (c)

96. Keel is the characteristic feature of the flower of
(1) Lily (2) *Trifolium*
(3) Potato (4) Chilli

97. Which of the following component of phloem is made up of sclerenchymatous cells?
(1) Companion cells (2) Bast fiber
(3) Sieve tubes (4) Xylem fiber

98. The prime source of taxonomic studies of various species of plants, animals and other organisms is
(1) Collection of actual specimens
(2) Identification
(3) Description
(4) Nomenclature

99. Find out the **incorrect** match
(1) Epiphyllous – Stamens are attached to the petals
(2) Polyadelphous – Stamens united in more than two bundles
(3) Staminode – Sterile stamen
(4) Staminate flower – Male flower

100. Select **incorrect** matching

(1)	Linnaeus's Kingdom System of classification	Includes Plantae and Animalia
(2)	Whittaker's system of Classification	Brought together *Chlamydomonas, Chlorella* with *Paramoecium* and *Amoeba* in protista
(3)	Recycling of nutrients	Chemosynthetic bacteria
(4)	Thermoacidophiles	Autotrophic obligate anaerobes

101. Ribophorins are found on the membrane of
(1) Mitochondria
(2) Secondary lysosomes
(3) SER
(4) RER

102. Endogenously formed thin-walled, non-motile asexual spores are characteristic of fungal group related with
i. Septate mycelium
ii. Chitinous cell wall
iii. Aseptate and coenocytic mycelium
iv. An intervening dikaryotic stage
v. Absence of fruiting bodies
(1) ii, iii & v
(2) i, iv & v
(3) ii & iv
(4) iii & iv

103. Select the **correct** statement w.r.t pollen grain
(1) Exine is rich in pectocellulose
(2) Viability of pollen grains of wheat and rice is of many years
(3) Pollen kit is present in pollen grains of entomophilous plants
(4) Vegetative cell floats in the cytoplasm of generative cell.

104. Cells of which of the following regions of root, undergo rapid enlargement and are responsible for the growth of root in length?
(1) Maturation region (2) Elongation region
(3) Root cap (4) Meristematic region

105. In Mendel's dihybrid cross for seed shape and seed colour the F_2 progeny produced with genotype RrYy : rrYy : Rryy : rryy are respectively
(1) 4 : 2 : 2 : 1 (2) 2 : 4 : 2 : 1
(3) 2 : 2 : 4 : 1 (4) 1 : 2 : 2 : 4

106. The main axis terminates in a flower and other flowers are borne in a basipetal order in
(1) Mustard family (2) Potato family
(3) Pea family (4) Cereals family

107. Which one of the following is **not** a greenhouse gas?
(1) CFCs (2) CH_4
(3) NO_2 (4) CO_2

108. T.S. of dicot root shows
(1) Starch sheath
(2) Well developed pith
(3) Parenchymatous pericycle
(4) Polyarch xylem bundles

109. Which of the given are **correct** for Ascomycetes?
(a) Hyphae is aseptate
(b) Motile stage do not occur in life cycle
(c) Asexual reproduction mostly by conidia
(d) Ascospores are formed exogenously
(1) a and b (2) b and c
(3) c and d (4) a and d

110. Strobilus is found in
(a) *Pinus*
(b) *Equisetum*
(c) *Polytrichum*
(d) *Pteris*
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) (c) and (d) only

111. In which of the following all three are micronutrients?
(1) P, Zn, B (2) S, Cu, Mo
(3) Mn, Zn, Fe (4) N, Mg, Zn

112. The CO_2 acceptor in photosynthesis of rice plants is
(1) PGA (2) PEP
(3) RuBP (4) OAA

113. The end products of fermentation is
(a) CO_2 (b) Ethanol
(c) Oxygen (d) Acetaldehyde
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) (c) and (d) only

114. Abscisic acid is responsible for
(a) Closure of stomata (b) Triple response
(c) Inducing cell division (d) Bolting
(1) (a) only (2) (a) and (b) only
(3) (c) and (d) only (4) (a) and (d) only

115. Which of the following plant groups show(s) external fertilization?
(a) Algae (b) Bryophytes
(c) Pteridophytes (d) Gymnosperms
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) (c) and (d) only

116. The ploidy level of integument and antipodal cell of plant, respectively is
(1) n, n (2) n, 2n
(3) 2n, n (4) 2n, 2n

117. Which of the following is **incorrectly** matched?
(1) Dedifferentiated medullary cells – Interfascicular cambium
(2) Heart wood – Highly lignified walls and nonconductive
(3) Vascular cambium in dicot root – Partly primary in origin
(4) Lenticels – Lens shaped openings for gaseous exchange

118. Pyrenoids contain
(1) Protein only (2) Starch only
(3) Protein and starch (4) Oil droplets only

119. The bacterial structure which helps in respiration and DNA replication is
(1) Glycocalyx (2) Slime layer
(3) Lomasomes (4) Mesosome

120. *Equisetum* shows which one of the following set of features/conditions?
A. Motile male gametes
B. Rhizome
C. Prothallus
D. Homospory
(1) A & B only (2) A, B & C only
(3) B, C & D only (4) A, B, C & D

121. In which of the following phase of cell cycle, most of the organelle duplication occurs?
(1) G_1-phase (2) S-phase
(3) G_2-phase (4) M-phase

122. Nitrogen content in amides is
(1) Equal to amino acids
(2) More than amino acids
(3) Less than amino acids
(4) Absent

123. If a meiocyte has 24 chromosomes with 10 pg DNA (at G_1 phase) then what will be the total number of bivalents, chromatids and amount of DNA in meiosis-I products?

	Bivalents	Chromatids	DNA(pg)
(1)	12	48	10
(2)	12	24	5
(3)	6	24	10
(4)	12	24	20

124. Select the **correct** statement
(1) NAA is a synthetic auxin
(2) Auxins promote fruit and leaf drop at early stage
(3) Auxins prevent the abscission of older mature leaves and fruits
(4) 2,4 -D is an insecticide

125. Read the given statements and select the option with **correct** ones
A. The more the solute molecules the lower is the Ψ_S.
B. Most of the water flow in the roots occurs via the symplast.
C. Phloem sap is mainly water and sucrose.
D. Elements most readily mobilised are Ca, Fe and P.
E. DPD = OP in a flaccid cell.
(1) A, C & E (2) B, C & E
(3) A, B & E (4) C, D & E

126. Flocs are formed during secondary treatment of sewage. They are made up of
(1) Aerobic bacteria and fungal filaments
(2) Anaerobic bacteria and aerobic bacteria
(3) Anaerobic bacteria and fungal filaments
(4) Bacteria only

127. Plants produced through tissue culture are genetically identical to the original plant from which they were grown and they are called
(1) Somatic hybrids (2) Somaclones
(3) Hybrid protoplasts (4) Explants

128. Which one is **not** a hot spot of India?
(1) Western Ghats
(2) Aravalli Hills
(3) Indo-Burma
(4) Himalaya

129. Select the **correct** one(s) w.r.t. polygenic inheritance
(a) Also called quantitative inheritance
(b) Intermediate phenotypes are more frequent
(c) Dominant alleles show cumulative effect
(d) Bell shaped curve is obtained
(1) (a) only
(2) (b) and (c) only
(3) (c) and (d) only
(4) All (a), (b), (c) and (d)

130. Which of the following is **not** a pyrimidine?
(1) Cytosine (2) Uracil
(3) Guanine (4) Thymine

131. Which of the following is/are considered as source of SCP?
(a) Mushrooms
(b) *Spirulina*
(c) *Methylophilus methylotrophus*
(d) *Fusarium graminearum*
(1) (a) only
(2) (b) and (c) only
(3) (c) and (d) only
(4) All (a), (b), (c) and (d)

132. Which of the following is **not** used mainly as biocontrol agent?
(1) *Trichoderma* (2) Baculoviruses
(3) Dragonflies (4) *Anabaena*

133. Succession stages that occur in an aquatic habitat are called
(1) Xerosere (2) Halosere
(3) Hydrosere (4) Lithosere

134. Which of the following shares maximum diversity of species in global biodiversity of plants?
(1) Lichens (2) Ferns
(3) Angiosperms (4) Algae

135. Which of the following is one of the most problematic aquatic weed of India?
(1) *Parthenium* (2) *Azolla*
(3) *Eichhornia* (4) *Rauwolfia*

ZOOLOGY

136. Disturbance in Hardy-Weinberg equilibrium would be interpreted as
(1) Resulting in stable population
(2) Resulting in no natural selection
(3) Resulting in evolution
(4) Evolution cannot be interpreted

137. Which one of the following diseases **cannot** be cured using antibiotics?
(1) Pneumonia (2) Cholera
(3) Common cold (4) Typhoid

138. Cells present in the interstitial spaces of testes secrete which hormone?
(1) Androgens
(2) Progesterone
(3) FSH
(4) LH

139. Diseases that severely affected the population during Bangladesh war and Ethiopian drought of mid-eighties is
(1) Acquired Immuno Deficiency Syndrome (AIDS)
(2) Malaria
(3) Protein Energy Malnutrition (PEM)
(4) Plague

140. Select the **incorrect** statement w.r.t. blood vessels
(1) Arteries have no valves.
(2) Veins are collapsible because they have thin walls.
(3) Tunica interna of artery has simple, elastic membrane with elongated endothelial cells.
(4) Arteries are not collapsible as they have thick walls.

141. Juxtaglomerular apparatus (JGA) is a special sensitive region formed by cellular modification of
(1) Proximal convoluted tubule and afferent arteriole
(2) Distal convoluted tubule and afferent arteriole
(3) Proximal convoluted tubule and efferent arteriole
(4) Distal convoluted tubule and efferent arteriole

142. Gametocytes of *Plasmodium* are unable to develop further in man because of
(1) pH of the blood
(2) High temperature of humans
(3) Presence of haemoglobin
(4) Low temperature of humans

143. Basmati rice is distinct for it unique aroma and flavours. How many documented varities of basmati rice are grown in India?
(1) 15 (2) 27
(3) 45 (4) 35

144. Choose the **odd** one w.r.t. chordates
(1) A post anal tail is present
(2) Pharynx perforated by gill slits.
(3) Central nervous system is ventral, solid and double
(4) Heart is ventral.

145. Choose the **odd** one w.r.t. Urochordates
(1) *Ascidia*
(2) *Salpa*
(3) *Branchiostoma*
(4) *Doliolum*

146. The substance secreted by virus infected cells
(1) Cyclosporin-A
(2) Cytotoxic killer cells
(3) Interferons
(4) Natural killer cells

147. Genetically modified plants
(1) Are less tolerant to abiotic stresses
(2) Show reduced reliance on chemical pesticides
(3) Exhibit decreased efficiency of mineral usage
(4) Have diminished nutritional content

148. Choose the amino-acid derivative hormone
(1) Hypothalamic hormone
(2) Pituitary hormone
(3) Epinephrine
(4) Thyroid hormone

149. Drug cocaine is obtained from the extract of
(1) *Cannabis sativa*
(2) *Papaver somniferum*
(3) *Erythroxylum coca*
(4) *Atropa belladona*

150. *Toxoplasma*, a parasite responsible for causing opportunistic infection in AIDS, is a
(1) Bacterium
(2) Fungus
(3) Virus
(4) Protozoan

151. Respiratory structure book lungs are present in

(1) Scorpion (2) *Limulus*

(3) *Prawn* (4) Locust

152. Select the animal whose body is cylindrical and is composed of an anterior proboscis, a collar and a long trunk

(1) *Balanoglossus*

(2) *Echinus*

(3) *Chaetopleura*

(4) *Loligo*

153. Match the column I and column II.

	Column I		Column II
a.	Muscular dystrophy	(i)	Wild contractions in muscles due to low Ca^{2+} in body fluid
b.	Myasthenia gravis	(ii)	Caused due to accumulation of uric acid crystals
c.	Gout	(iii)	Degeneration of skeletal muscles
d.	Tetany	(iv)	Affecting neuromuscular junctions and finally paralysis of skeletal muscles

Choose the **correct** option.

(1) a(i), b(ii), c(iii), d(iv) (2) a(iii), b(iv), c(ii), d(i)

(3) a(ii), b(iii), c(iv), d(i) (4) a(iv), b(i), c(iii), d(ii)

154. When ready-made antibodies are directly given to protect the body against foreign agents is called

(1) Artificial passive immunity

(2) Natural passive immunity

(3) Artificial active immunity

(4) Natural active immunity

155. Cells that secrete histamine, serotonin and heparin, are

(1) Neutrophils

(2) Basophils

(3) Monocytes

(4) Eosinophils

156. Which one of the following formed elements of blood are **not** true cells?

(1) RBCs only

(2) RBCs and platelets

(3) Platelets only

(4) All formed elements are cells

157. Choose the **incorrect** statement w.r.t. an electrical impulse?

(1) Transmission is similar to impulse conduction along a single axon

(2) Two-way transmission can occur across an electrical synapse

(3) Electrical synapse are abundant in our body

(4) Impulse transmission across an electrical synapse is always faster than a chemical synapse

158. After childbirth a woman is not able to release milk to feed her child. Which hormone could help in milk ejection?

(1) Prolactin

(2) Pitocin

(3) Estrogen

(4) Progesterone

159. Saddle joint is present between

(1) Humerus and pectoral girdle

(2) Atlas and axis

(3) Between carpal and metacarpal

(4) Between the carpals

160. Choose the **correct** statement w.r.t. ECG

(1) QRS complex represents the depolarisation of atria

(2) The enlarged Q and R waves indicate myocardial infarction.

(3) T-wave is flat when heart muscle receive sufficient oxygen

(4) Enlargement of P-wave indicates enlargement of ventricles

161. How is the digestion and absorption of fats different from that of proteins and carbohydrates?

(1) Digestion of fats occurs in the small intestine and the digestion of proteins and carbohydrates in the stomach

(2) Fats are absorbed into the cell as fatty acids and monoglycerides but are then modified for absorption into blood; amino acids and glucose are not modified for absorption

(3) Fats enter the hepatic portal circulation, but proteins and carbohydrates enter the lymphatic system

(4) Fats are absorbed in large intestine and proteins and carbohydrates are absorbed in the small intestine

162. Nearly all of the essential nutrients, and 70-80% of electrolytes and water are reabsorbed by
(1) Collecting duct (2) DCT
(3) Henle's loop (4) PCT

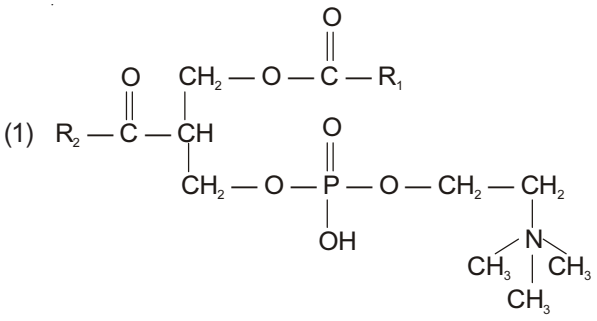
163. When the doctor taps the patella with the rubber headed hammer, simple knee jerk reflex occurs. Which of the following is **not** involved in this reflex?
(1) Stretching of the quadriceps muscles
(2) Motor neuron
(3) Interneuron
(4) Muscle spindle

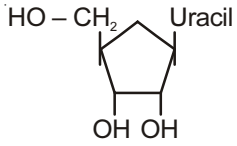
164. The most widely distributed connective tissue in the body of animals is
(1) Areolar (2) Adipose
(3) Cartilage (4) Dense irregular

165. The members of class chondrichthyes have
(1) Gill slits are separate and without operculum
(2) External fertilization
(3) Sexes are not separate
(4) Teeth are modified cycloid scales

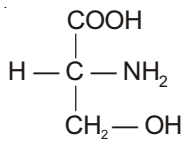
166. Enzymes catalyse biochemical reactions by
(1) Lowering activation energy
(2) Increasing activation energy
(3) Establishing stable bonds with substrate
(4) Increasing temperature

167. Which of the following is **correct** match?

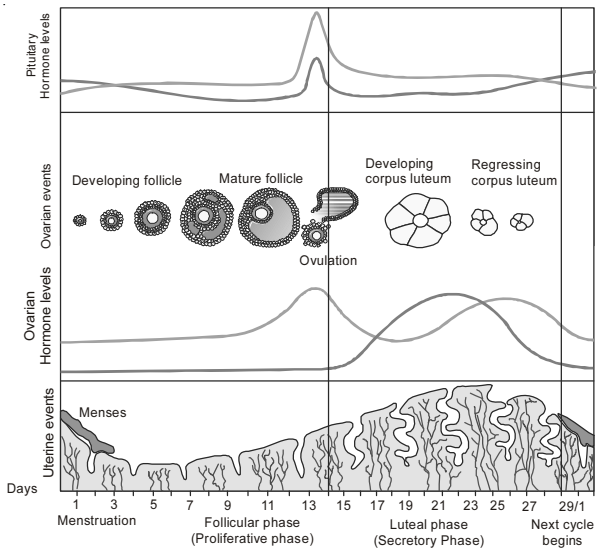
(1)  : Lecithin

(2)  : Uridylic acid

(3) NAD : Coenzyme nicotinamide adenine mononucleotide

(4)  : Serine

168. Following is a graphic representation of ovarian and menstrual cycle. Study the graph and choose the option which is **correct** interpretation of graph.



(1) In the midcycle positive feedback effect of progesterone on pituitary increases LH secretion
(2) In follicular phase estrogen regenerates the endometrium of uterus through proliferation
(3) Ovarian cycle is initiated by hormones produced by corpus luteum
(4) hCG stimulates the formation of corpus luteum and also stimulates it to release progesterone and estrogen in the cycle

169. All are key evolutionary advances of flatworms, **except**
(1) Bilateral symmetry
(2) Organ level body organization
(3) Cephalisation
(4) One way digestive tract

170. Excretory product of *Periplaneta*, is
(1) Urea
(2) Ammonia
(3) Uric acid
(4) Guanines

171. The exaggerated response of the immune system to certain antigens present in the environment is called
(1) AIDS
(2) Allergy
(3) Autoimmune disease
(4) SCID

172. Which of the following is **true** w.r.t. DNA fragments during gel electrophoresis?
(1) Larger the fragment size, the farther it moves
(2) Osmium chloride can be used for visualization during gel electrophoresis
(3) DNA fragments migrate towards the anode
(4) Bees wax can be used as matrix

173. Inhibition of succinate dehydrogenase by malonate which closely resembles the substrate succinate in structure, would
(1) Increase V_{max} without affecting K_m
(2) Decrease K_m without affecting V_{max}
(3) Increase K_m without affecting V_{max}
(4) Decrease both V_{max} and K_m

174. How much blood will transport 10 ml of O_2 to tissues under normal physiological conditions?
(1) 100 ml
(2) 200 ml
(3) 1000 ml
(4) 2000 ml

175. Neoplastic transformation may occur as a result of
(1) Non-ionizing radiation like X-rays
(2) Ionizing radiation like UV-rays
(3) Non-ionizing gamma rays
(4) Both ionizing and non-ionizing radiations

176. Volume of air that remains in lungs after a normal expiration is termed as
(1) Residual volume
(2) Tidal volume
(3) Functional residual capacity
(4) Expiratory capacity

177. Sunita, a 23 year old female, suffers from internal bleeding, muscular pain, fever, anaemia and blockage of intestinal passage. Which of the following is her most likely diagnosis?
(1) Amoebiasis (2) Filariasis
(3) Ascariasis (4) Ringworm

178. Which one of the following drugs changes a person's behaviour, thoughts, feelings and perceptions without any actual sensory stimulus?
(1) Lysergic acid diethyl amide.
(2) Benzodiazepines
(3) Heroin
(4) Amphetamines

179. Which of the following is **not** included in the respiratory membrane?
(1) Thin squamous epithelium of Alveoli
(2) Endothelium of alveolar capillaries
(3) Alveolar cavity
(4) Basement membrane

180. Which blood group acts as an universal recepient?
(1) A^- (2) O^-
(3) O^+ (4) AB^+

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