MANAS Studies

# MANAS NEET TEST SERIES 2023
Part Test-5

INSTRUCTIONS

1.This test will be a 3 hr 20minTest.

2.This test consists of Physics, Chemistry, Botany and Zoology questions with equal weightage of 180 marks.

3.Each question is of 4 marks.

4.There are four parts in the question paper, consisting Part-I Physics (Q.no.1 to 50), Part-II Chemistry (Q.no.51 to 100), Part-III Botany (Q. no. 101 to 150) and Part-IV Zoology (Q no 151 to 200). Each part is divided into two Sections, Section A consists of 35 multiple choice questions & Section-B contains 15 Multiple choice questions, out of these 15 questions candidates can choose to attempt any 10 questions

5.There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattempted question.

6.Any textual, printed or written material, mobile phones, calculator etc, is not allowed for the student appearing for the test.

7.All calculations/written work should be done in the rough sheet provided,

SYLLABUS

Physics	:	W.E.P., Circular Motion, Centre of Mass, L.M.C. and Collision.
Chemistry	:	The Solid State, Solutions, General Principles and Processes of Isolation of Elements, Environmental Chemistry
Biology	:	Human Physiology Unit.

PHYSICS Section A

1. Which of the diagrams shown in Fig. represents variation of total mechanical energy of a pendulum oscillating in air is function of time?
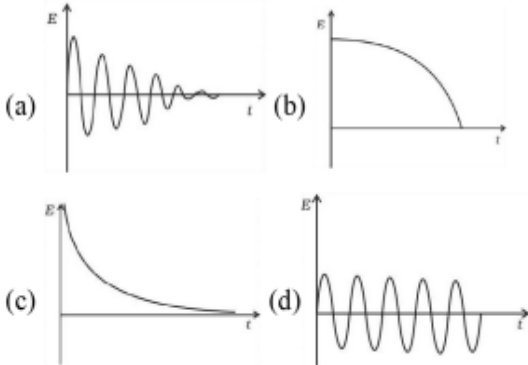
2. A mass of 5 kg is moving along a circular path of radius 1m. If the mass moves with 300 revolutions per minute, its kinetic energy would be
   (a) $250\pi^2$ (b) $100\pi^2$
   (c) $5\pi^2$ (d) 0

3. A 300 g mass has a velocity of $(3i + 4j)m/s$ at a certain instant what is its K.E.?
   (a) 1.35J   (b) 2.4 J
   (c) 3.75 J   (d) 7.35 J

4. A bob of mass m suspended by a light string of length L is whirled into a vertical circle as shown in Fig. What will be the trajectory of the particle if the string is cut at point X?
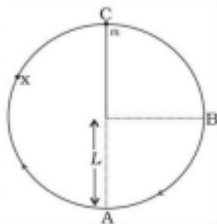

   (a) Parabolic path with vertex higher than C
   (b) Continue on the circular path
   (c) Move on the straight line path vertically upwards from X
   (d) None of thee

5. Suppose the average mass of raindrops is 3.0×10^{-5} kg and their average terminal velocity 9 $m\ s^{-1}$. Calculate the energy transferred by rain to each square metre of the surface at a place which receives 100 cm of rain in a year.
   (a) $4.05 \times 10^4 J$ (b) $2.05 \times 10^4 J$
   (c) $5.05 \times 10^4 J$ (d) $6.05 \times 10^4 J$

6. A force 'F' stops a body of mass 'm' moving with a velocity 'u' in a distance 's'. The force required to stop a body of double the mass moving with double the velocity in the same distance is:
   (a) 2F   (b) 4F
   (c) 6F   (d) 8F

7. A particle of mass m is moving in yz-plane with a uniform velocity v with its trajectory running parallel to $+Ve$ y-axis and intersecting z-axis at z= a(Fig). The change in its angular momentum about the origin as it bounces elastically from a wall at $y = constant$ is:
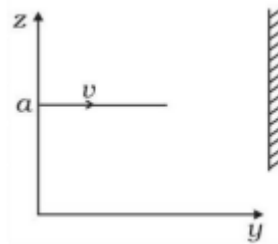
   (a) $mva\ \hat{e}_x$ (b) $2mva\ \hat{e}_x$
   (c) $ymv\ \hat{e}_x$ (d) $2ymv\ \hat{e}_x$

8. The density of a non-uniform rod of length 1m is given by $\rho(x) = a(1 + bx^2)$where a and b are constants and $0 \le x \le 1$. The centre of mass of the rod will be at
   (a) $\frac{3(2+b)}{4(3+b)}$ (b) $\frac{4(2+b)}{3(3+b)}$
   (c) $\frac{3(3+b)}{2(2+b)}$ (d) $\frac{4(3+b)}{3(2+b)}$

9. A particle moves from position $\vec{r}_1 = 3\ \hat{\imath} + 2\ \hat{\jmath} - 6\ \hat{k}$ to position $\vec{r}_2 = 14\ \hat{\imath} + 13\ \hat{\jmath} + 9\ \hat{k}$ under the action of force $4\ \hat{\imath} + \hat{\jmath} + 3\ \hat{k} N$. The work done by this force will be
   (a) 100 J   (b) 50 J
   (c) 200 J   (d) 75 J

11. It is well known that a raindrop falls under the influence of the downward gravitational force and the opposing resistive force. The latter isknown to be proportional to the speed of drop but is otherwise undertermined. Consider a drop of mass 1.00g falling from a height 1.00 kg. It hits the ground with a speed of 50.0 ms^{-1}. What is the work done by the unknown resistive force?
   (a) -2.75 J   (b) -4.75J
   (c) -6.75J   (d) -8.75 J

12. A block of mass m = 1 kg, moving on a horizontal surface with speed $v_i = 2\ ms^{-1}$ enters a rough patch ranging from $x = 0.10\ m\ to\ x = 2.01$ m. The retarding force F_r on the block in this range is inversely proportional to x over this range, $F_r = \frac{-k}{x}$ for $0.1 < x < 2.01m$ $F_r = 0$ for $x < 0.1m$ and $x > 2.01m$ where $k = 0.5j$. What is the final speed v_f of the block as it crosses this patch?
    (a) $1\ ms^{-1}$ (b) $2\ ms^{-1}$
    (c) $3\ ms^{-1}$ (d) $4\ ms^{-1}$

13. To simulate car accidents, auto manufactures study the collisions of moving cars with mounted springs of different spring constants. Consider a typical simulation with a car of mass 1000 kg moving with a speed 18.0 km/h on a smooth road and colliding with a horizontally mounted spring of spring constant $6.25 \times 10^3 Nm^{-1}$. What is the maximum compression of the spring?
    (a) 2.25m   (b) 2.00m
    (c) 1.75 m   (d) 1.50 m

14. An object of mass 5 kg falls from rest through a vertical distance of 20 m and reaches a velocity of 10 m/s. How much work is done by the push of the air on the object? ($g = 10\ m/s^2$)
    (a) 350 J   (b) 750 J
    (c) 200 J   (d) 300J

15. A body is intially at rest. It undergoes one-dimension motion with consant acceleration. The power delivered to it at time t is proportional to
    (a) $t^{1/2}$ (b) t
    (c) $t^{5/2}$ (d) t^2

16. A trolley of mass 300 kg carrying a sandbag of 25kg is moving uniformly with a speed of 27km/h on a frictionless track. After a while, sand starts leaking out of a hole on a floor of the trolley at the rate of $0.05\ kg\ s^{-1}$. What is the speed of the trolley after the entire sand bag is empty?
    (a) $27\ km\ h^{-1}$ (b) $54\ km\ h^{-1}$
    (c) $17\ km\ h^{-1}$ (d) $32\ km\ h^{-1}$

17. A body of mass 0.5 kg travels in a straight line with velocity $v = ax^{3/2}$ where $a = 5\ m^{-1/2}s^{-1}$. What is the work done by the net force during its displacement from $x = 0\ to\ x = 2\ m$?
    (a) 75 J   (b) 50J
    (c) 100 J   (d) 25 J

18. A uniform chain is held on a frictionless table with one-fifth of its length hanging over the edge. If the chain has a length ℓ and a mass m, how much work is required to pull the hanging part back on the table?
    (a) $mg\ \ell/10$ (b) $mg\ \ell/5$
    (c) $mg\ \ell/50$ (d) $mg\ \ell/2$

19. A particle of mass 4 m which is at rest explodes into three fragments, two of the fragments each of mass m are found to moves each with a speed v making an angle of 90° with each other. The total energy relased in this explosion is-
    (a) $\frac{1}{2}m\ v^2$ (b) $m\ v^2$
    (c) $\frac{3}{2}m\ v^2$ (d) $2\ m\ v^2$

20. A bicyclist comes to a skidding stop in 10 m. During this process, the force on the bicycle due to the road is 200 N and is directly opposed to the motion. The work done by the cycle on the road is
    (a) + 2000 J   (b) – 200 J
    (c) zero   (d) – 20,000J

21. A block is released from a rest a height $h = 5m$. After travelling through the smooth curved surface it moves on the rough horizontal surface through a length $l = 8m$ and climbs onto the other smooth curved surface through a height $'h'$. If $\mu = 0.5$, find h'.
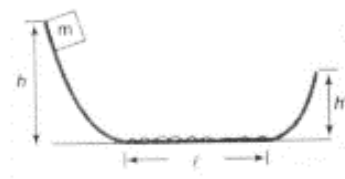
    (a) 2m   (b) 3m
    (c) 1m   (d) zero

22. Four identical spheres each of mass m are placed at the corners of square of side 2 metre. Taking the point of intersection of the diagonals as the origin, the co-ordinates of the centre of mass are
    (a) (0,0)   (b) (1,1)
   (c) (-1, 1)   (d) (1, -1)

23. A ring of mass m can slide over a smooth vertical rod as shown in figure. The ring is connected to a spring of force constant $k = 4$ mg/R, where 2R is the natural length of the spring. The other end of spring is fixed to the ground at a horizontal distance 2R from the base of the rod. If the mass is released at a height 1.5 R, then the velocity of the ring as it reaches the ground is
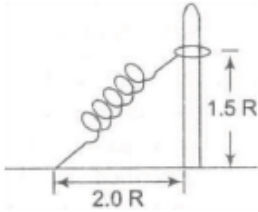
(a) $\sqrt{gR}$ (b) $2\sqrt{gR}$

(c) $\sqrt{2gR}$ (d) $\sqrt{3gR}$

24. If the water falls from a dam into a turbine wheel 19.6 m below, then the velocity of water at the turbine is (g = 9.8 m/s^2)

(a) 9.8 m/s   (b) 19.6 m/s

(c) 39.2 m/s   (d) 98.0 m/s

25. The sphere A of mass m_1 moves with velocity V on a frictionless horizontal surface and strikes elastically with sphere B of mass m_2 at rest. The sphre A comes back with speed $V/10$. Choose the correct option.
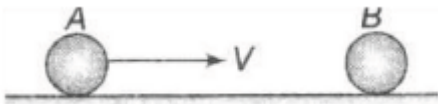
(a) $m_1 > m_2$ (b) $m_1 = m_2$

(c) $m_1 < m_2$ (d) None of these

26. A car moves at a constant speed on a road as shown in figure. The normal force by the road on the car is N and N when is at the points A and B re

(a) $N_A = N_B$ (b) $N_A > N_B$

(c) $N_A < N_B$ (d) insufficient

27. A long horizontal rod has a bead which can slide along its length andis initially placed at a distance L from one end A of the rod. The rod is set in angular motion about A with a constant angular acceleration, α . If the coefficient of friction between the rod and the bead is μ, and gravity is

neglected, then the time after which the bead starts slipping is-

(a) $\sqrt{\dfrac{\mu}{\alpha}}$ (b) $\dfrac{\mu}{\sqrt{\alpha}}$

(c) $\dfrac{1}{\sqrt{\mu\alpha}}$ (d) Infinitesimal

28. A particle of mass m is moving with constant velocity $\vec{v}$ on smooth horizontal surface. A constant force $\vec{F}$ starts acting on particle perpendicular to velocity v. Radius of curvature after force F start acting is:

(a) $\dfrac{mv^2}{F}$

(b) $\dfrac{mv^2}{F\cos\theta}$

(c) $\dfrac{mv^2}{F\sin\theta}$

(d) None of these

29. A block is moved from rest through a distance of 4m along a straight line path. The mass of the blocks is 5kg. and the force acting on it is 20N. If the kinetic energy acquired by the block be 40J, at what angle to the path the force is acting

(a) 30°   (b) 60°

(c) 45°   (d) none of the above

30. A force $\vec{F} = 2\,\hat{\imath} - 3\,\hat{\jmath} + 7\,\hat{k}(N)$ acts on a particle which undergoes a displacement $\vec{r} = 7\,\hat{\imath} + 3\,\hat{\jmath} - 2\,\hat{k}(m)$. Calculate the work done by the force.

(a) 37J   (b) $-$ 9J

(c) 49J   (d) 14J

31. A motorcycle is going on an overbridge of radius R. The driver maintains a constant speed. As the motorcycle is ascending on the overbridge, the normal force on it:

(a) increase

(b) decrease

(c) remains constant

(d) first increases then decreases

32. The maximum velocity at the lowest point, so that the string just slack at the highest point in a vertical circle of radius l

(a) $\sqrt{gl}$ (b) $\sqrt{3gl}$

(c) $\sqrt{5gl}$ (d) $\sqrt{7gl}$

33. Radius of the curved road on national highway is R. Width of the road is b. The outer edge of the road is raised by h with respect to inner edge so that a car with velocity v can pass safe over it. The value of h is
    (a) $\frac{v^2 b}{Rg}$
    (b) $\frac{v}{Rgb}$
    (c) $\frac{v^2}{g}$
    (d) $\frac{v^2 b}{R}$

34. Two cars of masses m_1 and m_2 are moving in circles of radii r_1 and r_2, respectively. Their speeds are such that they make complete circles in the same time t. The ration of their centripetal acceleration is:
    (a) $m_1 r_1 : m_2 r_2$
    (b) $m_1 : m_2$
    (c) $r_1 : r_2$
    (d) $1 : 1$

35. A uniform solid cone of height 40 cm is shown in figure. The distance of centre of mass of the cone from point B (centre of the bas) is:

    (a) 20 cm
    (b) 10/3 cm
    (c) 20/3 cm
    (d) 10 cm

Section B

36. A system of particles has its centre of mass at the origin. The x-coordinates of all the particles
    (a) may be positive
    (b) may be negative
    (c) may be non-negative
    (d) may be positive for some cases and negative in other cases

37. Two particles of equal mass have initial velocities $2\,\hat{i}\,ms^{-1}$ and $2\,\hat{j}\,ms^{-1}$. First particle has a constant acceleration $(\hat{i}+\hat{j})ms^{-2}$ while the acceleration of the second particle is always zero. The centre of mass of the two particles moves in
    (a) Circle
    (b) Parabola
    (c) Ellipse
    (d) Straight line

38. Internal forces in a system can change
    (a) Linear momentum only
    (b) Kinetic energy only
    (c) Both kinetic energy and linear momentum
    (d) Neither the linear momentum nor the kinetic energy of the system

39. A particle of mass 4m which is at rest explodes into three fragments. Two of the fragments each of mass m are found to move with a speed 'v' each in mutually perpendicular directions. The minimum energy released in the process of explosion is:
    (a) (2/3) mv^2
    (b) (3/2) mv^2
    (c) (4/3) mv^2
    (d) (3/4) mv^2

40. Two particles approach each other with different velocities. After collision, one of the particles has a momentum $\vec{p}$ in their centre of mass frame. In the same frame, the momentum of the other particle is
    (a) 0
    (b) $-\vec{p}$
    (c) $-\vec{p}/2$
    (d) $-2\vec{p}$

41. A position dependent force F = $7 - 2x + 3x^2$ newton acts on a small body of mass 2 kg and displaces it from $x = 0\ to\ x = 5m$. The work done in Joules is
    (a) 70
    (b) 270
    (c) 35
    (d) 135

42. A particle of mass m at rest is acted upon by a force F for a time t. Its kinetic energy after an interval t is:
    (a) $\frac{F^2 t^2}{m}$
    (b) $\frac{F^2 t^2}{2m}$
    (c) $\frac{F^2 t^2}{3m}$
    (d) $\frac{Ft}{2m}$

43. Where will be the centre of mass on combining two masses m and M (M>m)
    (a) Towards m
    (b) Towards M
    (c) Between $m\ and\ M$
    (d) Anywhere

44. An electric motor creates a tension of 4500 N in a hoisting cable and reels it in at the rate of $2\ ms^{-1}$. What is the power of the electric motor?
    (a) 15 kW
    (b) 9 kW
    (c) 225 kW
    (d) 9000 HP

45. An athlete in the Olympic Games covers a distance of 100 m in 10 s. His kinetic energy can be estimated to be in the range (mass of athlete may vary from 40 kg to 100 kg)
    (a) $2 \times 10^5 J - 3 \times 10^5 J$
    (b) $20,000J - 50,000J$
    (c) $2,000J - 5,000J$
    (d) $200\ J - 500\ J$

46. When a rubber – band is stretched by an distance x, it exerts a restoring force of magnitude $F = ax + bx^2$ where a and b are constants. The work done in stretching the unsretched rubber-band by L is:

(a) $aL^2 + bL^2$ (b) $\frac{1}{2}(aL^2 + bL^3)$

(c) $\frac{aL^2}{2} + \frac{bL^3}{3}$ (d) $\frac{1}{2}\left(\frac{aL^3}{2} + \frac{bL^3}{3}\right)$

47. A system consists of 3 particles each of mass m and located at (1,1) (2,2) (3,3). The co-ordinate of the centre of mass are

(a) (6,6)   (b) (3, 3)

(c) (2, 2)   (d) (1, 1)

48. The average acceleration vector for a particle having a uniform circular motion is

(a) A constant vector of magnitude $\frac{v^2}{1}$

(b) A vector of magnitude $\frac{v^2}{r}$ directed normal to the plane of the given uniform circular motion.

(c) Equal to the instantaneous acceleration vector at the start of the motion

(d) A null vector

49. Let a_r and a_t represent radial and tangential acceleration. The motion of a partical may be circular if:

(a) $a_r = 0, a_t = 0$ (b) $a_r = 0, a_t \neq 0$

(c) $a_r \neq 0, a_t = 0$ (d) none of these

50. Read the following statements carefully

(i) A body can have momentum without having energy

(ii) When a particle moves in a circle with uniform speed, its velocity and acceleration bothy changes.

(iii) The centripetal acceleration in circular motion is dependent on angular velocity of the body.

(iv) When a vehicle takes a tune on the road, it travels along a nearly circular path because in circular motion, velocity of vehicle remains same.

(v) Whenever there is a change in momentum of onebody, the same change occurs in the momentum of the second body of the same system but in the opposite direction.

(vi) Linear momentum of a body changes even when it is moving uniformly in a circle.

(vii) In an elastic collision of two billiards balls, the kinetic energy is conserved during the short interval of time of collision between the balls.

(viii) Energy spent against friction does not follow the law of conservation of energy

(ix) The centre of mass of a body may lie where there is no mass

(x) The centre of mass of a proton and an electron, released from their respective positions remains at rest because the centre of mass remain at rest, if no external force is applied

(xi) A quick collision between two bodies is more violent than a slow collision, even when the initial and the final velocities are identical

Choose the correct statements from the above statements.

(a) ii, iii, v, vii, viii, ix, x

(b) i, ii, iv, v, vi, x, xi

(c) ii, iii, v, vi, ix, x, xi

(d) i, iii, iv, vi, ix, x, xi

CHEMISTRY Section A

51. The principal ores of silver are argentite, horn silver and pyrargyrite. Their formula respectively are

(a) $Ag_2S, AgCl$ and $AgSbS_2$

(b) $AgCl, AgSbS_2$ and Ag_2S

(c) $AgSbS_2, Ag_2S$ and $AgCl$

(d) $AgCl, Ag_2S$ and $AgSbS_2$

52. In order to refine "blister copper" it is melted in a furnace and is stirred with green logs of wood. The purpose is

(a) To expel the dissolved gases in blister copper

(b) To bring the impurities to surface and oxidize them

(c) To increase the carbon content of copper

(d) To reduce the metallic oxide impurities with hydrocarbon gases liberated from the wood.

53. Van Arkel method of purification of metals involves converting the metal to a

(a) Volatile stable compound

(b) Volatile unstable compound

(c) Non volatile stable compound

(d) None of the above

54. In electrolytic refining, the impure metal is made is used to make

(a) Cathode   (b) Anode

(c) Electrolytic bath   (d) None of these

55. Which of the following has maximum number of molecules.
(a) $16 gm\ of\ O_2$ (b) $16 gm\ of\ NO_2$
(c) $7 gm\ of\ N_2$ (d) $2 gm\ of\ H_2$

56. Which of the following modes of expressing concentrations is independent of temperature
(a) Molarity   (b) Molality
(c) Formality   (d) Normality

57. A molal solution is one of that contains one mole of a solute in
(a) 1000 gm of the solvent
(b) One litre of the solvent
(c) One litre of the solution
(d) 22.4 litres of the solution

58. Calculate molarity of KI if the density of 20% (mass/mass) aqueous KI is 1.202 g mL^{-1}.
(a) 1.0 Mole/lt   (b) 1.45 Mole/lt
(c) 2.0 Mole/lt   (d) 0.5 Mole/lt

59. A solution is obtained by mixing 300g of 25% solution and 400 g of 40% solution by mass. Calculate the mass percentage of the resulting solution.
(a) 17.5 %   (b) 11.5 %
(c) 22.5 %   (d) 33.5 %

60. An azeotropic solution of two liquids has boiling point lower than either when it
(a) Shows negative deviation from Raoult's law
(b) Shows no deviation from Raoult's law
(c) Shows positive deviation from Raoult's law
(d) Is saturated

61. The correct statement in the following is
(a) The ionic crystal of AgBr has impurity defect
(b) The unit cell having crystal parameters, $a = b \neq c, \alpha = \beta = 90°, \gamma = 120°$ is hexagonal
(c) In ionic compounds having Frenkel defect the ratio $\frac{\gamma^+}{\gamma^-}$ is high
(d) The coordination number of Na^+ ion in $NaCl$ is 8

62. In a face – centered cubic lattice, a unit cell is shared equally by how many unit cells
(a) 8   (b) 4
(c) 2   (d) 6

63. For tetrahedral coordinatin number, the radius ratio $\frac{r_{c+}}{r_{a-}}$ is
(a) $0.732 - 1.000$ (b) $0.414 - 0.732$
(b) $0.225 - 0.414$ (d) $0.155 - 0.225$

64. An ionic compound has a unit cell consisting of A ions at the corners of a cube and B ions on the centres of the faces of the cube. The empirical formula for this compound would be
(a) AB (b) A_2B
(c) AB_3 (d) A_3B

65. CsBr crystal has bcc structure. It has an edge length of 4.3 Å .The shortest interionic distance between Cs^+ and Br^- ions is
(a) 1.86Å   (b) 3.72 Å
(c) 4.3 Å   (d) 7.44 Å

66. The number of atoms/molecules contained in one face centred cubic unit cell of a monoatomic substance is
(a) 1   (b) 2
(c) 4   (d) 6

67. In face centred cubic unit cell edge length is
(a) $\frac{4}{\sqrt{3}}r$ (b) $\frac{4}{\sqrt{2}}r$
(c) $2r$ (d) $\frac{\sqrt{3}}{2}r$

68. Schottky defect in crystals is observed when
(a) Density of crystal is increased
(b) Unequal number of cations and anions are missing from the lattice
(c) An ion leaves its normal site and occupies an interstitial site
(d) Equal number of cations and anions are missing from the lattice

69. The edge length of face centred unit cubic cell is 508 pm if the radius of cation is 110 pm the radius of the anion is
(a) 285 pm   (b) 398 pm
(c) 144 pm   (d) 618 pm

70. The pyknometric density of sodium chloride crystal is $2.165 \times 10^3 kg\ m^{-3}$ while its $X-rays$ density is 2.178×10^{-3} kg m^3 . The fraction of unoccupied sites in sodium chloride crystal is
(a) 5.96×10^{-3} (b) 5.96×10^{-4}
(c) 5.96×10^{-2} (d) 5.96×10^{-1}

71. A solid compound XY has $NaCl$ structure. If the radius of the cation is 100 pm, the radius of the anion (Y^-) will be
(a) 165.7 pm
(b) 275.1 pm
(c) 322.5 pm
(d) 241.5 pm

72. Which is the incorrect statement?
(a) Density decreases in case of crystals with Schottky defect.
(b) $NaCl$(s) is insulator, silicon is semiconductor, silver is conductor, quartz is piezoelectric crystal
(c) Frenkel defect is favoured in those ionic compounds in which sizes of cation and anions are almost equal
(d) $FeO_{0.98}$ has non-stoichiometric metal deficiency defect

73. The density of an ionic compound ($Mw = 58.5$) is 2.165 kg m^{-3} and the edge length of unit cell is 562 pm, then the closest distance between A^+B^- is
(a) 281 pm
(b) 562 pm
(c) 218 pm
(d) 526 pm

74. On the basis of ellingham diagram which of the following is not correct.
(a) Entropy change for all metal oxides is roughly same.
(b) Below the boiling point, $'T\Delta S'$ factor is same irrespective of metal.
(c) Above $\Delta G = 0$ $line$, oxide decomposes into metal & oxygen
(d) If randomness increases the slope increases

75. The method of zone refining of metals is based on the principle of
(a) greater mobility of the pure metal than that of impurity
(b) higher melting point of impurity than that of the pure metal
(c) greater noble character of the solid metal than that of the impurity
(d) greater solubility of the impurity in the molten state than in the solid

76. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below:

$$BrO_4^- \xrightarrow{1.82V} BrO_3^- \xrightarrow{1.5V} HBrO$$
$$\downarrow$$
$$Br^- \xleftarrow{1.0652V} Br_2 \xleftarrow{1.595V}$$
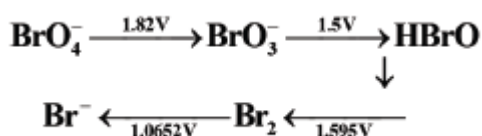
Then the species undergoing disproportionation is:
(a) BrO_3^-
(b) BrO_4^-
(c) Br_2
(d) $HBrO$

77. The correct statement regarding defects in crystalline solids is
(a) Frenkel defects decrease the density of crystalline solids
(b) Frenkel defect is a dislocation defect
(c) Frenkel defect is found in halides of alkaline metals
(d) Schottky defects have no effect on the density of crystalline solids

78. Molarity of H_2SO_4 (density 1.8 g/mL) is 18M. The molality of this H_2SO_4 is
(a) 36
(b) 200
(c) 500
(d) 18

79. Considering Ellingham diagram, which of the following metals can be used to reduce alumina
(a) Fe
(b) Zn
(c) Mg
(d) Cu

80. Cryolite is:
(a) Na_3AlF_6 and is used in the electrolysis of alumina for decreasing electrical conductivity.
(b) Na_3AlF_6 and is used in the electrolysis of alumina for lowering the melting point of alumina
(c) Na_3AlF_6 and is used in the electrolytic purification of alumina
(d) Na_3AlF_6 and is used in the electrolysis of aluminia for increasing the melting point and electrical conductivity

81. Which metal is extracted using a hydrometallurgical process involving complexation?
(a) Mg
(b) Ag
(c) Cu
(d) Zn

82. In the leaching of Ag_2S with $NaCN$, a stream of air is also passed. It is because of
(a) reversible nature of reaction between Ag_2S and NaCN
(b) to oxidise Na_2S formed into Na_2SO_4 and Sulphur
(c) both (a) and (b)
(d) None of the above

83. Poling process:
    (a) reduces SnO_2 to Sn
    (b) Oxidises impurities like iron and removes are scum
    (c) uses green poles
    (d) all of the above are correct

84. Which mineral has been named incorrectly?
    (a) Bauxite: $Al_2O_3.2H_2O$
    (b) Corundum: Al_2O_3
    (c) Cryolite: $3NaF.AlF_3$
    (d) Feldspar: $Be_3Al_2Si_6O_{18}$

85. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law?
    (a) Methanol and acetone
    (b) Chloroform and acetone
    (c) Nitric acid and water
    (d) Phenol and aniline

Section B

86. Colligative properties depends on.
    (a) the nature of the solute particles dissolved in solution.
    (b) the number of solute particles in solution.
    (c) the physical properties of the solute particles dissolved in solution.
    (d) the nature of solvent particles.

87. An element has body centred cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is
    (a) $\frac{\sqrt{2}}{4} \times 288 \, pm$ (b) $\frac{4}{\sqrt{3}} \times 288 \, pm$
    (c) $\frac{4}{\sqrt{2}} \times 288 \, pm$ (d) $\frac{\sqrt{3}}{4} \times 288 \, pm$

88. Which of the following statements is false?
    (a) Two different solutions of sucrose of same molality prepared in different solvents will have the same depression in freezing point.
    (b) The osmotic pressure of a solution is given by the equation $\pi = CRT$ (Where C is the molarity of the solution)
    (c) Decreasing order of osmotic pressure for 0.01 M aqueous solutions of barium chloride, potassium chloride, acetic acid and sucrose is $BaCl_2 > KCl > CH_3COOH >$ sucrose.
    (d) According to Raoult's law, the vapour pressure exerted by a volatile component of a solution is directly proportional to its mole fraction in the solution.

89. Value of Henry constant K_H
    (a) increases with increases in temperature
    (b) decreases with increases in temperature
    (c) remains consant
    (d) first increases then decreases

90. On the basis of information given below mark the correct option.
    (A) In bromoethane and chloroethane mixture intermolecular interactions of A-A and B-B type are nearly same as A-B type interactions
    (B) In ethanol and acetone mixture   A – A or B – B type intermolecular interactions are stronger than A – B type interactions
    (c) In chloroform and acetone mixture A – A or B – B type intermolecular interactions are weaker than A – B type interactins
    (a) Solution (B) and (C) will follow Raoult's law.
    (b) Solution (A) will follow Raoult's law
    (c) Solution (B) will show negative deviation
    (d) Solution (C) will show positive deviation from Raoult's law

91. Which of the following aqueous solutions produce the same osmotic pressure
    (a) 0.1 M glucose solution
    (b) 0.6 g urea in 100 ml solution
    (c) 1.0 g of a non-electrolyte solute (X) in 50 ml solution (Molar mass of X = 200)
    (d) All are correct

92. Drawback of DDT as pesticide is:
    (a) It is less effective than others
    (b) It is not easily/rapidly degraded in nature
    (c) Its high cost
    (d) It becomes ineffective after some time

93. At $25 \, °C$, the highest osmotic pressure is exhibited by 0.1 M solution of
    (a) $CaCl_2$ (b) KCl
    (c) Glucose   (d) Urea

94. Acid rain occurs in areas where
    (a) There are big industries and the atmosphere is polluted with SO_2
    (b) There are large plantation of prime plants
    (c) Citrus plants are grown
    (d) There are large plantation of eucalyptus

95. BOD is:
    (a) Biological oxygen demand
    (b) Biological oxygen deficit
    (c) Biosphere oxygen demand
    (d) None of the above

96. Match the lists I and II pick the correct matching form the codes given below:

List I	List II
(a) Peroxy acetyl nitrate	1.Minamata Disease
(b) Ploycyclic Aromatic Hydrocarbons	2.Global warming
(c) Hg compounds	3.Photochemical smog
(d) IR active Molecules	4. Carcinogens

    (a) a – 1, b-2, c-3, d-4   (b) a-3, b-4, c-3, d-3
    (c) a -3, b-4, c- 1, d-2   (d) a-2, b-3, c-5, d-4

97. A crystal is made up of particles X, Y and Z. X forms fcc packing. Y occupies all octahedral of X and Z occupies all tetrahedral voids of X. If all the particles along one body diagonal are removed, then the formula of the crystal would be
    (a) XYZ_2 (b) X_2YZ_2
    (c) $X_8Y_4Z_5$ (d) $X_5Y_4Z_8$

98. Blister copper is:
    (a)impure copper
    (b)obtained in self reduction process during bessemerisation
    (c)both (a) and (b) are correct
    (d)none is correct

99. In the closet packing of atoms
    (a) The size of TV is greater than that OV
    (b) The size of TV is smaller than that of OV
    (c) The size of TV is equal to that of OV
    (d) The size of TV may be greater or small or equal to that of OV depending upon the size of atoms

100. Mark the given statements True (T) or False (F)
    (i) In Hall and Heroult's process, Al is extracted by electrolysis of a fused mixture of alumina, cryolite and fluorspar
    (ii) Addition of cryolite and fluorspar lowers the fusion temperature and increases the conductivity of the electrolyte
    (iii) Lead, tin and bismuth are purified by liquation method.
    (iv) Lead, tin and bismuth have high m.p. as compared to impurities.
    (v) Gold is recovered from its solution containing aurocynaide complex by adding zinc dust
    (vi) Zinc is more electronegative than gold.
    (vii) In close packing of spheres, a tetrahedral void is surrounded by four spheres whereas an octahedral void is surrounded by six spheres.
    (viii)A tetrahedral void has a tetrahedral shape whereas anoctahedral void has an octahedral shape
    (ix) Elevation in boiling point and depression in freezing point are colligative properties.
    (x) All colligative properties are used for the calculation of molecular masses.

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
(a)F	F	T	T	T	T	T	F	T	T
(b)T	T	T	F	T	F	T	F	T	T
(c) F	T	T	T	T	T	T	F	T	T
(d) F	F	T	T	T	T	T	T	F	T

Biology
Section A

101. ECG depicts the depolarization and repolarisation process during the cardiac cycle. In the ECG of a normal healty individual one of the following waves is not represented.
    a. Depolarisation of atria
    b. Repolarisation of atria
    c. Depolarisation of ventricles
    d. Repolarisation of ventricles

102. Potential difference across resting membrane is negatively charged. This is due to differential distribution of the following ions
    a. $Na^+ \ and \ K^+$ ions
    b. $Co^{+3} and \ \mathrm{Cl}^-$ ions
    c. $Ca^{++} \ and \ Mg^{++}$ ions
    d. $Ca^{++} \ and \ \mathrm{Cl}^-$ ions

103. The function of our visceral oragans is controlled is
    a. Sympathetic and somatic neural system
    b. Sympathetic and para sympathetic neural system
    c. Central and somatic neural system
    d. None of these

104. Thymosin is responsible for
    a. Raising the blood sugar level
    b. Raising the blood calcium level
    c. Differentiation of T lymphocytes
    d. Decrease in blood RBC.

105. Match the following structures with their respective location organs.

(a) Crypts of Lieberkuhn   (i) Pancreas
(b) Glisson's   (ii) Duodenum
(c) Islets of   (iii) Small intestine
Langerhans
(d) Bruanner's Glands   (iv) Liver

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

106. The least abundant of total WBC's are:
(a) Monocytes   (b) Basophils
(c) Eosinophils   (d) Neutrophils

107. The partial pressure of oxygen in the alveoli of the lungs is
a. Equal to that in blood
b. More than that in the blood
c. Less than that in the blood
d. Less than that of carbon dioxide

108. Serum differs from blood in
a. Lacking globulins
b. Lacking albumins
c. Lacking clotting factors
d. Lacking antibodies

109. The diagram given here is the standard ECG of a normal person. The P – wave represents the
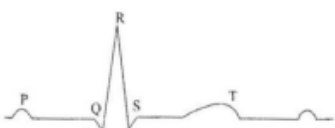
a. Beginning of the systole in both atria and ventricle
b. End of systole
c. Contraction of both the atria
d. Initiation of the ventricular contraction

110. Tunica intima is:
a. An inner layer of artery
b. An inner layer of vein
c. An inner layer of both artery and vein
d. An inner layer of meninges

111. **Assertion:** At fovea the visual acuity is the greatest
Reason: The fovea is a thick area of the retina where both rods and cones are present
a. Both assertion and reason are true and reason is the correct explanation of assertion
b. Both assertion and reason are true but reason is not the correct explanatioin of assertion
c. Assertion is true but reason is false
d. Both assertion and reason are false

112. **Assertion:** The PNS comprises of all the nerves of the body associated with CNS
Reason: PNS is the site of information processing and control
a. Both assertion and reason are true and reason is the correct explanation of assertion
b. Both assertion and reason are true but reason is not the correct explanation of assertion
c. Assertion is true but reason is false
d. Both assertion and reason are false

113. **Assertion:** Atrial Natriuretic Factor (ANF) mechanism, acts as a check on the reninangiotensin mechanism.
Reason: ANF can cause vasodilation and thereby decrease the blood pressure
a. Assertion and reason both are true and the reason is correct explanation of assertion.
b. Assertion and reason both are true but reason is not correct explanation of assertion.
c. Assertion is true but reason is wrong
d. Assertion and reason both are wrong

114. The sequence of events of micturition is given below in an unorderly manner
(i) Stretch receptors on the wall of urinary bladder send signal to CNS
(ii) Bladder fills with urine and becomes distended
(iii) Micturition
(iv) CNS passes a motor message to initiate the contraction of smoth muscles of bladder and simultaneous relaxation of urethral sphincter
The correct sequence of steps for urination is
a. I → II → III → IV
b. IV → III → II → I
c. II → I → IV → III
d. III → II → I → IV

115. Match the terms given in column – I with their physiological processes given in column – II and choose the correct answer:

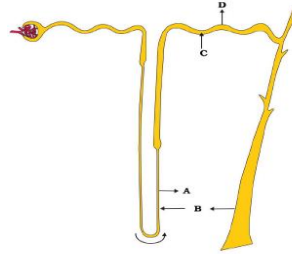| Column – I	Column – II
A. Proximal Convoluted tubule	(i) Formation of Concenterated Urine
B. Distal convoluted Tubule	(ii) Filtration of blood
C. Henle's loop	(iii) Reabsorption of 70-80% of Electrolytes
D. Counter-current	(iv) Ionic balance mechanism
E. Renal corpuscle	(v) maintenance of concentration gradient in medulla

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

116. Podocytes are the cells present on
    a. In Malpighian body
    b. Inner wall of Bowman's capsule
    c. Neck of Nephron
    d. Wall of glomerular capillary

117. During muscle contraction ____A____. Release acetylcholin and ____B____ release Ca^{+2} ions. A and B respectively?
    a. $A \rightarrow Sarcolemma$, $B \rightarrow Sarcoplasm$
    b. $A \rightarrow Motor$ neuron, $B \rightarrow Sarcolemma$
    c. $A \rightarrow Motor$ neuron, $B \rightarrow Sarcoplasmic\ reticulum$
    d. $A \rightarrow$ Motor neuron, $B \rightarrow$ Troponin protein

118. Read the following statements carefully
    (A) Bone and cartilage constitute our skeletal system
    (B) Skull, Vertebral column, ribs and sternum constitute appendicular skeleton
    (C) Synovial joints allow considerable movements.
    (D) Joints are essential for all type of movements involving bony parts of the body
    How many statements are not incorrect?
    (a) Four   (b) Three
    (c) Two   (d) One

119. Reabsorption and secretion of major substances at different parts of the nephron are shown in the given figure. In this figure A, B, C and D are respectively?

    a. HCO_3^- Nutrients, Urea, Nacl
    b. $NaCl, Urea, K^+, HCO_3^-$
    c. $NaCl, Urea, HCO_3^-, Ammonia$
    d. H_2O, Urea, NaCl, HCO_3^-

120. Match column I with Column II

A. Skeletal muscle	(i) Myoglobin
B. Troponin	(ii) Thin Filament
C. Red Muscle	(iii) Suture
D. Skull	(iv) Voluntary

    a. $A \rightarrow ii, B \rightarrow i, C \rightarrow iv, D \rightarrow iii$
    b. $A \rightarrow iv, B \rightarrow ii, C \rightarrow i, D \rightarrow iii$
    c. $A \rightarrow iv, B \rightarrow iii, C \rightarrow ii, D \rightarrow i$
    d. $A \rightarrow ii, B \rightarrow iv, C \rightarrow i, D \rightarrow iii$

121. The proximity between the Henle's loop and vasa recta, as well as the counter current in them help in maintining an increasing osmolarity towards the inner medullary interstitiun, i.e. from 300 mOsmol/L in the cortex to about 1200 mOsmol/L in the inner medulla this gradient in mainly casued by _____ and _____
    (a) NaCl, ammonia   (b) NaCl, Urea
    (c) KCl, Uric acid   (d) All of these

122. **Statement I:** Left atrium has the thickest muscles.
    Statement II: Left atrium receives blood frm the lungs.
    a. Both statemetns are correct
    b. Statement I is correct & II is incorrect
    c. Statement I is incorrect & II is correct
    d. Both statements are incorrect

123. What is the thickness of diffusion members or respiratory membrane?
    a. Equals to 1 mm
    b. More than 1 mm
    c. Less than 1 mm
    d. More than 1 cm

124. Time of cardiac cycle is:
(a) 0.1 sec   (b) 0.8 sec
(c) 0.6 sec   (d) 1 sec

125. The average amount of urea excreated in urine by man per day is
(a) 1 – 5 gm   (b) 25 gm
(c) 25 mg   (d) 2.5 gm

126. Find out correctly matched pair:
a. Crypts of Lieberkuhn → Between the base of villi in small intestine
b. Lacteal → Large blood vessel
c. Bile duct → Sphincter of oddi
d. Salivary amylase → pH – 7.8

127. **Statement I:** A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the pO_2
 Statement II: Every 100 mL of oxygenated blood can deliver around 5 mL of O_2 to the tissures under normal physiological conditions
a. Both statements are correct
b. Statement I is correct & II is incorrect
c. Statement I is incorrect & II is correct
d. Both statements are incorrect

128. Brunner's gland are found in which of the following layers?
a. Submucosa of stomach
b. Mucosa of Ileum
c. Submucosa of Duodenum
d. Mucosa of Oesophagus

129. According to scientific definition hormones are:
a. Trace elements
b. Non nutrient chemical
c. Intercellular messenger
d. All of these

130. Which of the following is not a-neurotransmitter?
(a) Norepinephrine   (b) Acetylcholine
(c) Dopamine   (d) ADH

131. (a) Small projections present on upper surface of tongue are called ___A___
(b) Tongue is attached to the floor of the oral cavity by ___B___
(c) Human has 4 different type of teeth such teeth are called ___C___
Identify A, B and C

	A	B	C
(a)	Scales	Frenulum	Diphyodont
(b)	Papillae	Frenulum	Heterodont
(c)	Frenulum	Papillae	Heterodont
(d)	Papillae	Frenulum	Diphyodont

132. Following reaction is catalyzed by which enzyme?
$$CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow HCO_3^- + H^+$$
a. Catalase
b. Carbonic anhydrase
c. Carboxylase
d. Aldolase

133. The _____ of the brain is the centre of controlling respiration and gastric secretions:
(a) Medulla   (b) Thalamus
(c) Hypothalamus   (d) Midbrain

134. The regulatory protein of skeletal muscles whose filaments run close to the 'F' Actin through out is:
(a) Myosin   (b) Meromyosin
(c) Troponin   (d) Tropomyosin

135. The partial pressure of O_2 in deoxygenated blood is
(a) 104 mm Hg   (b) 45 mm Hg
(c) 40 mm Hg   (d) 95 mm Hg

Section B

136. Jaundice is caused when:
a. Spleen is affected
b. Kidney is affected
c. Circulation is affected
d. Liver is affected

137. WBCs that resist infections and are also associated with allergic reactions are:
(a) Eosinophils   (b) Monocyte
(c) Neutrophills   (d) Lymphocyte

138. Choose incorrect match:
a. Platelet count – 1.5 – 3.5 lakh/mm^3
b. Lymphocyte – 6% of TLC
c. Leucocyte count – 6000-8000/mm^3
d. Neutrophil – 60 – 65% of TLC

139. **Statement I:** The role of oxygen in the regulation of respiratory rhythm is quite insignificant
     Statement II: Increased pCO_2 and H^+ concentration inputs from chemoreceptors can activate respiratory rhythm centre to make necessary adjustments
     a. Both statements are correct
     b. Statement I is correct and II is incorrect
     c. Statement I is incorrect and II is correct
   d. Both Statements are incorrect

140. **Statement I:** Alveoli are the primary sites for exchange of gases
     Statement II: All factors in our body are favourable for diffusion of O_2 from alveoli to tissues.
     a. Both statements are correct
     b. Statement I is correct and II is incorrect
     c. Statement I is incorrect and II is correct
     d. Both statements are incorrect

141. Match the following regarding ABCDE.

Column I	Column II
A. Reflex action	1. Meninges
B. Multipolar neuron	2. Cerebral cortex
C. Na^+ and K^+ Pump	3 Parasympathetic nervous system
D. Increase secretion of saliva and digestive juices	4. Involuntary action
E. Piameter	5. Active transport

     The correct pairing sequence is

	A	B	C	D	E
(a)	4	2	5	3	1
(b)	1	4	3	5	2
(c)	2	4	3	5	1
(d)	2	3	5	1	4

142. Identify the correct and incorrect match about respiratory volumes and capcities and mark the correct answer.
     A. Inspiratory capacity (IC) = TV + RV
     B. Vital Capcity (V.C.) = TV + IRV + ERV
     C. Residual Volume (R.V.) = VC – IRV
     D. Tidal Volume (TV) = IC- IRV
     Options:
     a. A, B, C are incorrect and D correct
     b. A, C incorrect and B and D correct
     c. A, B, D correct and C incorrect
     d. A, C correct and B, D incorrect

143. In the given figure curve shows percentage saturation of haemoglobin with O_2 is plotted against pO_2 . This curve is highly useful in studying the effect of which factors on binding of O_2 with haemoglobin?
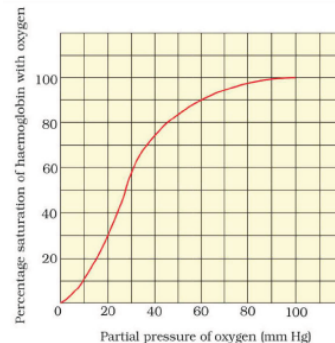

     a. Carbonic anhydrase
     b. pCO_2
     c. H^+ concentration
     d. Both (b) and (c)

144. Which is not correctly matched?
     a. Malpighian tubules – cockroach
     b. Antennal glands – planaria
     c. Nepridia – earthworm
     d. Protonephredia – Amphioxus

145. In the given list how many hormones are include in peptide, polypetide and protein hormones.
     Estrodiol, insulin, cortisol, glucagon, progesterone, testosterone.
     (a) 6   (b) 4
     (c) 1   (d) 2

146. Large area neither sensory nor motor located in cerebrum called
     a. Sensory area
     b. Association area
     c. Motor area
     d. Cerebral cortex

147. **Assertion:** Pancreas is a heterocrine gland.
     Reason: Endocrine part secretes insulin and glucagon and exocrine part secretes a pancreatic juice containing enzymes.
     a. Both assertion and reason are true and reason is the correct explanation of assertion.
     b. Both assertion and reason are true but reason is not the correct explanation of assertion.
     c. Assertion is true but reason is false
     d. Both assertion and reason are false

148. The wall of alimentary canal from stomach to rectum posses four layers. The sequence of these layers is (From outside to inside is)
    a. *Serosa → Mucosa → Submucosa → Muscularis*
    b. *Muscularia → Serosa → Mucosa → Submucosa*
    c. *Serosa → Muscularis → Submucosa → Mucosa*
    d. *Serosa → Muscularis → Mucosa → Submucosa*

149. Which part doesn't include in limbic system?
    a. Limbic lobe
    b. Corpora quadrigemina
    c. *Amygdala*
    d. *Hippocampus*

150. Insoluble mass of crystablised (oxalates etc) salts formed with in the kidney is called
    (a) Uremia   (b) Renal calculi
    (c) Renal failure   (d) Glomerulonephritis

Section A

151. Cavity of aqueous humor is
    a. In front of lens
    b. Behind the lens
    c. Between choroid and retina
    d. Between lens and retina

152. Read the following statements:
    A. High H^+ concentration and higher temperature are favourable for dissociation of oxygen from oxyhaemoglobin
    B. Partial pressure of oxygen in alveoli is higher than in tissue
    C. The maximum volume of air a person can breathe in, after a forced expirtion is vital capacity
    D. In alveoli low pCO_2 and high pO_2 are favourable for dissociation of CO_2
    Have many statement are correct
    (a) One   (b) Two
    (c) Three   (d) Four

153. Which of the following is correct labelling for the given figure.
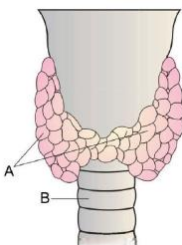
a. A – Parathyroid,   B - Trachea
b. A – Larynx,   B – Trachea
c. A – Thyroid,   B- Trachea
d. A – Parathyroid,   B – Thyroid
e.

154. **Assertion:** Glucose, Na^+ and amino acids are absorbed actively.
    Reason: Na^+, glucose and amino acids move against the concentration gradient and hence required energy.
    a. Both assertion and reason are true and reason is the correct explanation of assertion.
    b. Both assertion and reason are true but reason is not the correct explanation of assertion
    c. Assertion is true but reason is false
    d. Both assertion and reason are false

155. **Statement I:** Electrical synapses are rare in our system.
    Statement II: The Eustachian tube helps in equalizing the pressure on either sides of the ear drum.
    a. Both statements are correct
    b. Statement I is correct & II is incorrect
    c. Statement I is incorrect & II is correct
    d. Both statements are incorrect

156. Which one of the following option is correctly matched with its category?

Group	Type of Circlulation	Blood is oxygenated by
(a) Fish	Single circulation	Skin
(b) Amphibia	Dobule circulation	Gills
(c)Reptiles	Incomplete double Circulation	Lungs
(d) Birds	incomplete double Circulation	Lungs

157. Arrange the correct sequence of enzymes which act on food in different regions of alimentary canal:
    (A)Pepsin, (B) Ptyalin, (C) Carboxypeptidase
    Option:
    (a) A, C, B   (b) B, A, C
    (c) B, C, A   (d) A, B, C

158. **Statement I:** Caecum is a small blind sac which hosts some symbiotic micro-organisms.
Statement II: Chemical synapses are common in our system:
    a. Both statements are correct.
    b. Statement I is correct and II is incorrect
    c. Statement I is incorrect and II is correct
    d. Both statement are incorrect

159. **Statement I:** RBCs are devoid of nucleus in most of the mammals.
Statement II: Entire cytoplasm of RBCs is filled with red coloured, iron containing complex protein called haemoglobin.
    a. Both statements are correct
    b. Statement I is correct and II is incorrect
    c. Statement I is incorrect and II is correct
    d. Both statements are incorrect.

160. In human female (adult) oxytocin
    a. Stimulates pituitary to secrete vasopression
    b. Stimulates growth of mammary gland
    c. In secreted by antherior pituitary
    d. Casues strong uterine contraction during parturition

161. Which of the following glands is realated to circadean rhythm?
    (a) Thymus gland   (b) Pituitary gland
    (c) Pineal gland   (d) Pancreas
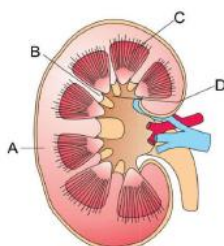
162. The type of joint present in elbow and knee are:
    a. Saddle joint
    b. Ball and socket joint
    c. Cystic duct
    d. Common hepato-pancreatic duct

163. Sphinctor of Oddi guards:
    a. Common bile duct
    b. Pancreatic duct
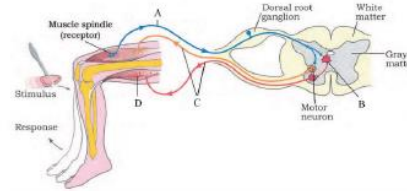   c. Cystic duct
    d. Common hepato-pancretic duct

164. See the diagram given below carefully:

Which structure given in diagram have malpighian corpuscles?

(a) A   (b) B
(c) C   (d) D

165. Given below is a diagrammatic presentation of knee jerk reflex, select the option with correct identification of the structures labelled as A, B, C and D in the same:

    a. A – Afferent fibre, B – Interneuron, C- Sensory fibre
    b. B – Interneuron, C – Efferent fire, D – Recepor
    c. A – Sensory fibre, C – Afferent fiber, D- Motor end plate (effector)
    d. A – Afferent fibre, B- Interneuron, D –Motor end plate (Effector)

166. Addision's disease results from:
    a. Hypertrophy of gland
    b. Hypo-secretion of adrenal cortex hormones
    c. Hyperactivity of cells of leydig
    d. None of the above

167. Decreased level of estrogen is associated with which of the following disorder?
    a. Rheumatoid arthritis
    b. Osteoporosis
    c. Gout
    d. Muscular dystrophy

168. Glomerular filteration rate per day is:
    (a) 125 ml   (b) 180 lit.
    (c) 1.5 lit.   (d) 5 lit.

169. Read following structure given below:
    A. Vasa recta   B. Long Henle loop
   C. Collecting duct   D. PCT
    Juxta medullary nephron differs from cortical nephron due to presence of:
    (a) A and B   (b) A and C
    (c) A, B and C   (d) A, B, C and D

170. **Assertion:** The Henle's loop and vasa recta play a significant role in producing a concentrated urine.
   Reason: The counter current arrangement of Henle's loop and vasa recta helps in this
   a. Both assertion and reason are true and reason is the correct explanation of assertion
   b. Both assertion and reason are true but reason is not the correct explanation of assertion
   c. Assertion is true but reason is false
   d. Both assertion and reason are false

171. See the reactions given below carefully:
   A: $CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow HCO_3^- + H^+$
   B: $HCO_3^- + H^+ \rightarrow H_2CO_3 \rightarrow CO_2 + H_2O$
   Reaction A and B respectively occurs in blood
   a. At tissue level and in RBCs
   b. At tissue level and at alveoli level
   c. At alveoli level and at tissue level
   d. Both reaction are occur in plasma

172. During muscle contraction length of all the following reduces, except:
   (a) I-band   (b) A-band
   (c) H-zone   (d) Sarcomere

173. **Assertion:** Antidiuretic hormone (ADH) controls the amount of water in the urine.
   Reason: ADH deficiency cause diabetes mellitus
   a. Both assertion and reason are true and reason is the correct explanation of assertion.
   b. Both assertion and reason are true but reason is not the correct explanation of assertion.
   c. Assertion is true but reason is false
   d. Both assertion and reason are false

174. Progresterone is secreted by
   a. Corpus luteum
   b. Corpus albicans
   c. Corpus callosum
   d. Corpus striatum

175. The globular head of the myosin filament has active site for binding to?
   (i) ATP
   (ii) Active site on actin filament
   (iii) Calcium
   (iv)Tropomyosin
   (a) i only   (b) i and ii only
   (c) i, ii, iii only   (d) i, ii, iii and iv all

176. Choose the correct match:

Column-A	Column-B
(a) Unipolar neuron	(i) Embryonic stage
(b) Bipolar neuron	(ii) Retina of eye
(c) Multipolar neuron	(iii) Cerebral cortex

	A	b	c
(a)	i	ii	iii
(b)	i	iii	ii
(c)	iii	ii	i
(d)	iii	i	ii

177. Given below is diagram showing parts of an eye. Which of them is/are incorrectly described?
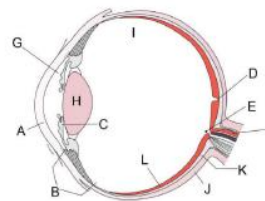
   a. A – cornea, B – Ciliary body, C – iris
   b. D – fovea, E-blind spot, F – optic nerve
   c. G – aqueous chamber, H – Lens, I- vitreous chamber.
   d. J – retina, K – sclera, L – choroid.

178. One of the following is not a common disorder associated with digestive system.
   (a) Tetanus   (b) Diarrhoea
   (c) Jaundice   (d) Dysentery

179. Match the enzymes with their respective substrates and choose the right one among options given:

Column – I	Column – II
A. Lipase	(i) Dipeptides
B. Nuclease	(ii) Fats
C. Carboxypeptidase	(iv) Fats
D. Dipeptidases	(v) Proteins, peptones and proteoses

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

180. Respiratory process in regulated by certain specialized centres in the brain. One of the following listed centres can reduce the inspiratory duration upon stimulation
    a. Medullary inspiratory centre
    b. Pneumotaxic centre
    c. Apneustic centre
    d. Chemosensitive centre

181. Correctly match column – I with column – II

Column – I	Column – II
A. Myasthenia gravis	(i) A oxygen storing pigment
B. Muscular dystrophy	(ii) Rapid spasm in muscles
C. Myoglobin	(iii) Progresive degeneration of skeletal muscle
D. Tetany	(iv) Autoimmune disorder

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

182. Which of the following option is incorrect.
    a. Hinge joint- between humerus and pectoral girdle.
    b. Pivot joint- between atlas and axis
    c. Saddle joint- between carpal and metacarpals of thumb
    d. Gliding joint – between carpal

183. Hypothalamus does not control.
    a. Thermoregulation
    b. Urge of eating and drinking
    c. Produces hormones that regulate the synthesis and secretion of pituitary hormone
    d. Creative think and consciousness

184. Which type of joint is shown by the flat skull bones?
    (a) Saddle joint   (b) Fibrous joint
    (c) Synovial joint   (d) Cartilageneous joint

185. Receptor sites for neurotransmitters are present on:
    a. Pre – synaptic membrane
    b. Tips of axons
    c. Post – synaptic membrane
    d. Membrane of synaptic vesicles.

Section B

186. All of the following enzymes are found in succus entericus except
    a. Dipeptidase
    b. Sucrase
    c. Nucleosidase
    d. Carboxypeptidase

187. During joint diastole:
    a. All the four chambers of heart are in a relaxed state
    b. The tricuspid and bicuspid valves are open
    c. The semilunar valves are closed

    Which of the above stages are correct:
    (a) Only a and b   (b) Only b and C
    (c) Only a and c   (d) a, b and c

188. Which of the following hormone have membrane receptor?
    a. Testosteron
    b. Follicle Stimulating Hormone (FSH)
    c. Progesteron
    d. Estrogen

189. Which muscles are mainly related for changes in body posture
    a. Cardiac muscle
    b. Unstripped muscle
    c. Smooth muscle
    d. Skeleton muscle

190. The hormone synthesized by hypothalamus is transported to neurohypoplysis by?
    a. Hypophyseal portal circulation
    b. Axonal transport
    c. Through blood
    d. Through lymph

191. Eustachian tube in the connecting link in between?
    a. Larynx and internal ear
    b. Phayrynx and middle ear
    c. Pharynx and external ear
    d. Larynx and middle ear

192. Blood clotting factor prothrombin is found in:
    (a) Serum   (b) Blood platelets
    (c) Blood plasma   (d) Blood corpuscles

193. 70-80% of electrolyte and water reabsorbed in which part of nephron:
    (a) PCT   (b) DCT
    (c) Henle's loop (d) Collecting duct

194. The balancing receptor of ear is:
     a. Cochlea and sacculus
     b. Crista and macula
     c. Semicircular canal and otolith
     d. Otolith and organ of corti

195. Which of the following wave of ECG represent repolarization of ventricle?
     (a) P – wave   (b) QRS – wave
     (c) T – wave   (d) Both P & T wave

196. GFR is increased by which hormone?
     (a) ADH   (b) ANF
     (c) Renin   (d) Both (a) and (c)

197. Which endocrine hormone influences metabolism, pigmentation and our defence capability?
     (a) Calcitonin   (b) Parathyroid
     (c) Melatonin   (d) Thymosins

198. At resting stage charge of inner surface due to presence of:
     a. More Na^+ ion and negatively charge protein molecule
     b. More PO_4^{-2} and Na^+ ion
     c. More K^+ ion and negatively charge protein molecule
     d. More Cl^- and PO_4^{-2}

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

200. Mark the given statements True (T) or False (F)
     (i)Fibrins and formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin
     (ii)Plasma without fibrinogen and blood corpuscles is called serum
     (iii)Sino – atrial node (SAN) is called the pacemaker.
     (iv)Closed circulatory system is less efficient than open circulatory system

(v) About 70 percent of the starch is hydrolyzed in oral cavity by salivary amylase
(vi)Bile helps in emulsification of fat
(vii) Bile is not a true digestive juice.
(viii) Pneumotaxic centre, located in the medulla region of the brain, moderates the respiratory rhythm centre.
(ix) The lungs are situated in thoracic chamber which is anatomically an air-tight chamber
(x) Vasa recta is absent or highly reduced in cortical nephrons.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
a.	F	F	T	T	T	T	T	F	T	T
b.	T	F	T	F	F	T	T	F	T	T
c.	T	T	T	T	T	T	T	F	T	F
d.	F	T	T	T	T	T	F	T	T	F