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Test Series HMC-8 [Option -2]

Test - 01

MM : 720 Time : 3 hrs. 20 min.

Physics	:	Motion in a Straight Line, Motion in a Plane, Units, Dimensions & Errors
Chemistry	:	Structure of atom, Chemical equilibrium, Ionic equilibrium, Environmental chemistry
Zoology	:	Breathing and exchange of gases, Excretory products and Elimination, Biomolecules
Botany	:	The Living world, Biological classification (i/c virus), Monera, Fungi, Protista

PHYSICS : SECTION-A

All questions are compulsory in section A

1. The fundamental unit among the following is
   (1) coulomb (2) tesla
   (3) newton (4) ampere

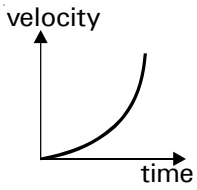
2. A particle has an initial velocity of $(6\hat{i}+7\hat{j})$m/s and a constant acceleration of $(0.3\hat{i}+0.2\hat{j})$m/s^2. The speed of particle after 10 s is
   (1) 10 m/s (2) 9 m/s
   (3) $13\sqrt{2}$ m/s (4) $9\sqrt{2}$ m/s

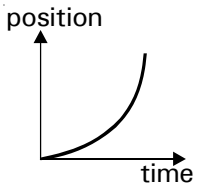
3. A car travels a distance 300 m on a straight road in 4 minutes and then returns to the starting point in the next 6 minutes. Its average speed is
   (1) 4.2 km/h (2) 2.4 km/h
   (3) 3.6 km/h (4) zero

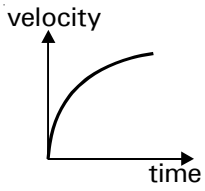
4. Three dimensionally different physical quantities X, Y, Z can generate a meaningful result by the operation?
   a. XYZ b. $XY+Z$
   c. $X(Y-Z)$ d. $XY+Z^2$
   (1) a, b & d (2) both b & d
   (3) a, c & d (4) both a & d

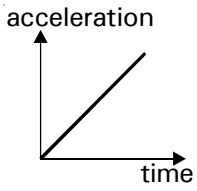
5. Given that $p=\left(\frac{RT}{V-b}\right)e^{-\alpha V/RT}$. The dimensional formula of α is same as that of
   (1) volume V (2) pressure p
   (3) temperature T (4) gas constant R

6. Which of the following graphs may represent a body moving along a straight line with constant acceleration?

(1) 

(2) 

(3) 

(4) 

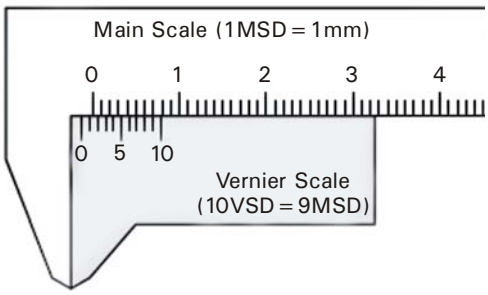
7. The total weight of two bodies A & B is measured to be (10.0 ± 0.1)N and the weight of body A alone is measured to be (8.0 ± 0.1)N. The weight of body B alone is
(1) (2.0 ± 0.0)N (2) (18.0 ± 0.2)N
(3) (2.0 ± 0.2)N (4) (2.0 ± 0.1)N

8. Projectile is fired with initial velocity $\vec{u} = (2\hat{i} + 3\hat{j})$ m/s, where $\hat{i}$ and $\hat{j}$ are unit vectors along horizontal and vertical direction respectively. The horizontal range of projectile is
(1) 2.2 m (2) 3.2 m
(3) 4.2 m (4) 1.2 m

9. An aeroplane flying 1960 m above ground level at 720 km/hr, releases a block. How far on ground will it strike?
(1) 3 km (2) 1 km
(3) 2 km (4) 4 km

10. A ball is rolled off the edge of a horizontal table at a speed of 4 m/s. It hits the ground after 0.4 second. The speed with which the ball hits the ground is
(1) 4 m/s (2) $4\sqrt{2}$ m/s
(3) $2\sqrt{2}$ m/s (4) 8 m/s

11.



The jaws of the vernier calipers shown in figure are in contact with each other. Zero error of this instrument is
(1) 1.8 mm (2) −1.8 mm
(3) 1.2 mm (4) −1.2 mm

12. Two stones are projected with the same speed but making different angles with the horizontal. Their horizontal ranges are same. If the angle of projection of one is $\frac{\pi}{3}$ and its maximum height is y_0, then the maximum height of the other will be
(1) $1.5y_0$ (2) $2y_0$
(3) $0.25y_0$ (4) $0.33y_0$

13. A large number of bullets are fired in all directions with same speed v. What is the maximum area on the ground on which these bullets will spread
(1) $\pi \frac{v^2}{g}$ (2) $\pi \frac{v^4}{g^2}$
(3) $\pi^2 \frac{v^4}{g^2}$ (4) $\pi^2 \frac{v^2}{g^2}$

14. A train is moving with a velocity of 120 km h^{-1} in the North-East direction. If another train is moving with a velocity of 80 km h^{-1} in the South-West direction, then what is the relative velocity of the second train w.r.t. the first train?
(1) 100 km/hr (2) 200 km/hr
(3) 40 km/hr (4) $80\sqrt{2}$ km/hr

15. At the top of the trajectory of an oblique projectile, the angle between its velocity and acceleration is
(1) 0° (2) 45°
(3) 90° (4) 180°

16. **Assertion :** If acceleration of particle is decreasing, then speed of particle will also decrease.
Reason : Acceleration is the rate of change of velocity.
(1) Both Assertion and Reason are true and the reason is correct explanation of assertion.
(2) Both Assertion and Reason are true but reason is not correct explanation of assertion.
(3) Assertion is true but Reason is false.
(4) Assertion is false.

17. Pitch of screw of a screw gauge is

(1) $\frac{\text{distance moved by circular scale on main scale}}{\text{number of rotation of circular scale}}$

(2) $\frac{\text{one circular scale division}}{\text{number of circular scale divisions}}$

(3) $\frac{\text{number of rotations of circular scale}}{\text{number of circular scale divisions}}$

(4) none of these

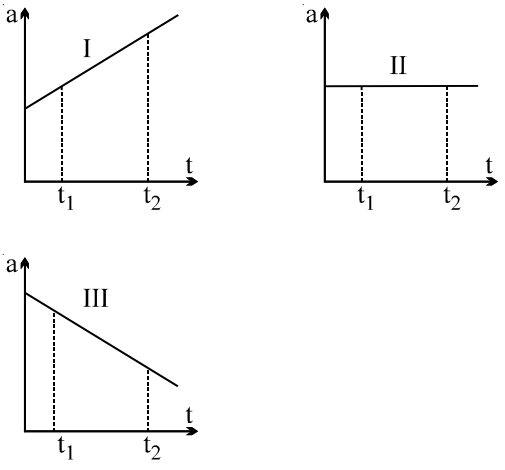
18. Rounding off of 3.6105 upto three decimal places is

(1) 3.600 (2) 3.610
(3) 3.611 (4) 3.620

19. If a ball is projected with a velocity of $(2\hat{i} + 4\hat{j})$ m/s, then its speed of projection is

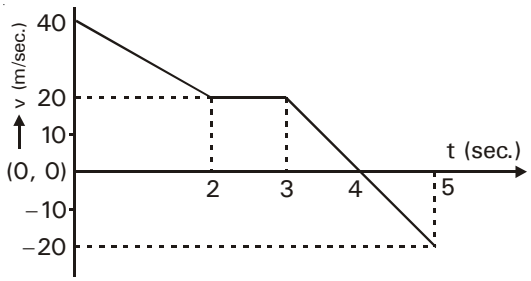
(1) $\sqrt{8}$ m/s (2) $\sqrt{20}$ m/s
(3) $\sqrt{10}$ m/s (4) $\sqrt{6}$ m/s

20. Each of the three graphs represents acceleration versus time for an object that already has a positive velocity at time t_1. Which graphs show an object whose speed is increasing for the entire time interval between t_1 and t_2?



(1) graph I only (2) graphs I & II only
(3) graphs I & III only (4) graphs I, II & III

21. In the given v - t graph the distance travelled by the body in 5 second will be



(1) 100 m (2) 80 m
(3) 40 m (4) 20 m

22. The velocity of a body moving along a straight line with uniform acceleration reduces by 3/4 of its initial value in time 't'. The total time of motion of the body till its velocity becomes zero is

(1) $\frac{4}{3}t$ (2) $\frac{3}{2}t$
(3) $\frac{5}{3}t$ (4) $\frac{8}{3}t$

23. In a certain system of units, the unit of mass is 4 kg, unit of length is 2 m and that of time is 1 second. Then 32 joules of work in this system will be

(1) 128 units (2) 2 units
(3) 96 units (4) 1 unit

24. Acceleration of a body varies with displacement according to the law $a = 2x$. Given velocity is zero at $x = 1$, the velocity at $x = 5$ is approximately

(1) 6 units (2) 8 units
(3) 5 units (4) 7 units

25. If time of flight of a projectile is 10 seconds, the maximum height attained by it will be

(1) 125 m (2) 50 m
(3) 100 m (4) 150 m

26. Two bodies 1 and 2 are projected from ground with velocities $\vec{v}_1 = a\hat{i} + B\hat{j}$ and $\vec{v}_2 = A\hat{i} + b\hat{j}$, where $A > a$, $B > b$ and x-axis is along horizontal. Which of the following relations is correct? (symbols have usual meanings)

(1) $R_1 < R_2$ (2) $T_1 > T_2$
(3) Both (1) and (2) (4) Neither (1) nor (2)

27. **Assertion** : If two particles are thrown in air simultaneously from same point with different velocities, then their separation increases with time.
Reason : Relative acceleration of two particles thrown in air is always zero.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

28. Position 'x' of a body moving along x-axis is given by $3x = a + 4bt^3$, where a and b are constants and 't' is time in seconds. What is the velocity of the body at the end of 1 second?
(1) 4b (2) a + 4b
(3) a – 4b (4) $\frac{a+4b}{3}$

29. A ball is projected from ground with a speed 30m/s at an angle 60° with horizontal. At what height approximately is its speed 20% more than its minimum speed over its path?
(1) 20 m (2) 25 m
(3) 30 m (4) 32 m

30. A boat with a with a speed 8 km/h crosses a river in shortest time. If the resulting velocity of boat is 10 km/h then the velocity of river water is
(1) 4 km/h (2) 6 km/h
(3) 8 km/h (4) 10 km/h

31. The equation of trajectory of a projectile is $y = \sqrt{3}\,x - 2gx^2$ in SI units. Its time of flight approximately is
(1) 0.1 s (2) 0.4 s
(3) 0.7 s (4) 0.2 s

32. A man standing on a road hold his umbrella at 37° with the vertical to keep the rain away. He throws the umbrella and starts running at 8 km/hr. He finds that raindrops are hitting his head vertically, the speed of raindrops with respect to the road will be
(1) 16 km/hr (2) 12 km/hr
(3) 13.3 km/hr (4) 10 km/hr

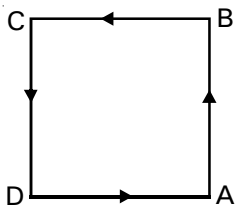
33. A particle is moving along a straight line in xy-plane. If at any instant of time, its coordinates are $x = 3t^2$ and $y = 4t^2$
the speed of the particle is
(1) 12 t (2) 15 t
(3) 10 t (4) 8 t

34. In the motion of a projectile freely under gravity, its
(1) total energy is conserved
(2) momentum is conserved
(3) energy and momentum both are conserved
(4) none is conserved

35. From an elevated point A, a stone is projected vertically upwards. When the stone reaches a distance 'h' below A, its velocity is double of what its was at height 'h' above A. The greatest height attained by the stone is
(1) $\frac{h}{3}$ (2) $\frac{2h}{3}$
(3) $\frac{5h}{4}$ (4) $\frac{5h}{3}$

PHYSICS : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

36. 

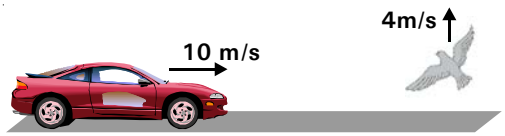
A particle moves along the sides AB, BC, CD & then DA of a square of side 25 m with a constant speed of 5 ms^{-1}. The magnitude of its average velocity is

(1) 1.67 ms^{-1} (2) zero

(3) 7.5 ms^{-1} (4) 5 ms^{-1}

37. **Statement-I** : A body can have constant velocity but variable speed.
Statement-II : At one position we can have two velocities.

(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

38. 

A car is heading due east at a speed of 10 m/s and a bird is flying upward at a speed of 4 m/s as shown. Which one of the following vectors represent the velocity of bird relative to a person in the car?

(1)  (2) 

(3)  (4) 

39. Two trains each of length 100 m are running on parallel tracks. One overtakes the other in 20 s when they are moving in the same direction and crosses the other in 10 s when they move in the opposite directions. The velocities of the two trains are

(1) 15 m/s & 5 m/s (2) 25 m/s & 15 m/s

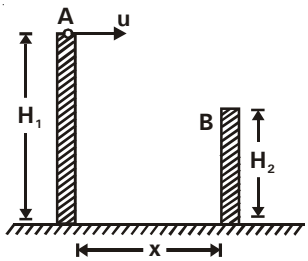
(3) 10 m/s & 10 m/s (4) 30 m/s & 10 m/s

40. In a playground, Ravi kicks a football at an angle of 37° with a speed of 25 m/s which just crosses the goal-post after 2 seconds. The ball will strike the ground beyond the goal-post at a distance of

(1) 20 m (2) 15 m

(3) 25 m (4) 40 m

41. A ball is to be thrown horizontally from point A, at a height $H_1 = 50m$ so that it just crosses a point B at a height $H_2 = 30m$, as shown in the figure. The speed 'u' if horizontal distance between A and B is 10m is



(1) 10 m/s (2) 3.2 m/s

(3) 5 m/s (4) 4 m/s

42. If velocity 'v', acceleration 'a' and force F are chosen as fundamental quantities, then the dimensional formula of angular momentum in terms of v, a and F would be

(1) $[F^2 a^{-1} v^2]$ (2) $[Fv^3 a^{-2}]$

(3) $[Fv^2 a^{-1}]$ (4) $[Fa^{-1} v]$

43. At a metro station, a girl walks up a stationary escalator in time t_1. If she remains stationary on the escalator, then the escalator takes her up in time t_2. The time taken by her to walk up on the escalator moving up will be

(1) $(t_1 + t_2) / 2$ (2) $t_1 t_2 / (t_2 - t_1)$

(3) $t_1 t_2 / (t_2 + t_1)$ (4) $t_1 - t_2$

44. The width of a river is 24 m and water is flowing with a velocity of 6 m/minute. A boatman on one bank wants to sail the boat to a point at the other bank which is directly opposite to him. In what time will he cross the river, if he can sail the boat at 10 m/minute, relative to the water?
(1) 180 s (2) 360 s
(3) 144 s (4) 160 s

45. A car moving in a straight line under uniform acceleration travels 10 m in first 5 seconds and another 10 m in next 3s. Then initial velocity of car is
(1) 7/6 m/s (2) 5/3 m/s
(3) 3/2 m/s (4) 2 m/s

46. An object starts with initial velocity v_0, with uniform acceleration. When its velocity becomes $5v_0$, only the direction of acceleration gets reversed. The velocity of the body at the starting point will be
(1) $-9\ v_0$ (2) $-7\ v_0$
(3) $-5\ v_0$ (4) $-v_0$

47. Which of the following statements is False?
(1) In javelin throw, athlete throws the javelin at an angle slightly less than 45° because the javelin is thrown from shoulder height, not from ground level.
(2) For a projectile, in the presence of air resistance, time of flight will be less than that in the absence of air resistance.
(3) When the range is maximum, the height attained by the projectile is $4\ R_{maximum}$.
(4) The direction of velocity at any point on the path of an object is tangential to the path at that point.

48. At what angle with the horizontal should a ball be thrown so that its range (R) is related to the time of flight (T) as $R = 5T^2$. (Take $g = 10\ m/s^2$)
(1) 30° (2) 45°
(3) 60° (4) 90°

49. A ball is projected from ground. Which of the following quantities of this ball when plotted against time over its path will yield a straight line graph?
a. Horizontal component of velocity
b. Vertical component of velocity
c. Magnitude of momentum
d. kinetic energy
(1) a and b (2) a, b and c
(3) b, c and d (4) a, b, c and d

50. The number of significant figure in 0.0820370 m is
(1) 6 (2) 3
(3) 7 (4) 4

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Radius of first shell of H-atom is 53 pm then the radius of third shell of Li^{2+} is
(1) 106 pm (2) 159 pm
(3) 79.5 pm (4) 53 pm

52. Buffer solutions resists any change in pH. This is because
(1) Acids and alkalies in these solutions are shielded from attack by other ions.
(2) These give unionised acid or base on reaction with added acid or alkali
(3) These solutions have fixed value of pH
(4) These solutions have large excess of H^+ or OH^- ions

53. Identify the wrong statement in the following
(1) Ozone layer does not permit infrared radiation from the sun to reach the earth.
(2) Acid rain is mostly because of oxides of nitrogen
(3) Chlorofluorocarbons are responsible for ozone layer depletion
(4) Green house effect is responsible for global warming.

54. Suppose the error in measurement of momentum of the electron is $\frac{h}{4\pi} \times 0.05$, then the error in measurement of its position is

(1) $\frac{h}{4\pi} \times 0.05$ (2) $\frac{h}{4\pi}$

(3) 0.05 (4) $\frac{1}{0.05}$

55. Which of the following does not contain electron with azimuthal quantum number equal to 2?

(1) F (2) Ne

(3) Ar (4) All of these

56. **Statement-I** : Within a given principal quantum number, the energy of orbitals increases in the order $s < p < d < f$.

Statement-II : For higher energy levels, these differences are sufficiently pronounced and straggering of orbital energy may result, e.g., $4s < 3d$ and $6s < 5d$.

(1) Both statement-I and statement-II are correct

(2) Both statement-I and statement-II are incorrect

(3) Statement-I is correct but statement-II is incorrect

(4) Statement-I is incorrect but statement-II is correct

57. The gases mainly responsible for greenhouse effect are

(1) Cl_2 and CH_4 (2) CO_2, CH_4, NO_x

(3) CO and Cl_2 (4) $H_2O(g)$, H_2S, CO

58. Ksp of CuI and Ag_2CrO_4 has almost the same value (4×10^{-12}) The ratio of solubilites of the two salts CuI : Ag_2CrO_4 is closest to

(1) 0.01 (2) 0.04

(3) 0.10 (4) 0.02

59. The reaction $C_2H_6(g) \rightleftharpoons C_2H_4(g) + H_2(g)$ is at equilibrium in a closed vessel at 1000 K. ΔH for the reaction is 137.0 kJ/mol. Which of the following actions would shift the equilibrium to the right?

(1) Decreasing the volume of the closed reaction vessel

(2) Decreasing the temperature at which reaction is performed

(3) Increasing the volume of closed reaction vessel

(4) Adding inert gas to the closed reaction vessel

60. What is the relation between K_p and K_c in the following equilibria ?

$$3Fe(s) + 4H_2O(g) \rightleftharpoons Fe_3O_4(s) + 4H_2(g)$$

(1) $K_P = K_c(RT)$ (2) $K_P = K_c(RT)^{-2}$

(3) $K_P = K_c(RT)^2$ (4) $K_P = K_c$

61. How many litres of water must be added to 1L of an aqueous solution of HCl with pH of 1 to create an aqueous solution of pH of 2 ?

(1) 9 L (2) 0.1 L

(3) 0.9 L (4) 2.0 L

62. Match species with corresponding conjugate acid

	Species		**Conjugate acid**
i.	NH_3	a.	H_2CO_3
ii.	HCO_3^-	b.	NH_4^+
iii.	H_2O	c.	H_3O^+
iv.	HSO_4^-	d.	H_2SO_4

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

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

63. The shortest wavelength line in the Paschen series of Li^{2+} ion is

(1) $\frac{R}{9}$ (2) $\frac{9}{R}$

(3) $\frac{1}{R}$ (4) v

64. The pH of 10^{-8} M HCl is
(1) 7 (2) 8
(3) 7.02 (4) 6.98

65. **Assertion** :pH of 1M HF & 1M HCl is equal to 1 .
Reason : They give 1 mole of H^+ ions in aqueous solution .
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

66. Product formation will occur to the maximum extent if the dissociation constant of the reaction is
(1) 10^{-2} (2) 10^{8}
(3) 10^{30} (4) 10

67. Two acids X and Y have pKa 4 and 6 respectively. Then acid X is _____times strong than Y?
(1) 100 times (2) 2 times
(3) 10 times (4) 1.5 times

68. pH of the solution obtained by mixing 100 mL of 0.1M HCl and 200 mL of 0.1M NH_4OH ($K_b = 10^{-4}$) at 25°C is
(1) equal to pK_b of NH_4OH
(2) greater than pK_b of NH_4OH
(3) less than pK_b of NH_4OH
(4) not related to pK_b of NH_4OH

69. On the surface of polar stratospheric clouds, hydrolysis of chlorine nitrate gives A & B while its reaction with HCl produces B and C. Then A, B and C respectively are
(1) HOCl, HNO_3, Cl_2
(2) Cl_2, HNO_3, HOCl
(3) $HClO_2$, HNO_2, HOCl
(4) HOCl, HNO_2, Cl_2O

70. Which is incorrect about classical smog?
(1) it is formed by reaction of particulate and SO_2
(2) it is oxidising in nature
(3) it contains SO_2 and carbon
(4) it may cause respiratory problems

71. When the pH of the rain water drops below _____ it is called acid rain
(1) 3.1 (2) 5.6
(3) 2.5 (4) 1.3

72. If the kinetic energy of a particle is doubled, de-Broglie wavelength becomes
(1) 2 times (2) 4 times
(3) $\sqrt{2}$ times (4) $\frac{1}{\sqrt{2}}$ times

73. The pH of a 0.1 M sodium acetate solution. (Hydrolysis constant for sodium acetate is 1×10^{-10}) is
(1) 8.5 (2) 6.5
(3) 5.5 (4) 9.5

74. Consider the set of quantum numbers $n = 3, l = 2, m = -1$.
The maximum number of electrons in an atom which can share the above set of quantum numbers is
(1) 2 (2) 1
(3) 5 (4) 10

75. In which of the following solvents AgBr will have the highest solubility?
(1) 10^{-3} M NaBr (2) 10^{-3} M HBr
(3) Pure H_2O (4) 10^{-1} M NH_3

76. $A_2(g) + 3B_2(g) \rightleftharpoons 2AB_3(g)$
The pressure of A_2 and B_2 mixture is 100 atm in a closed vessel and 20% of mixture reacts at equilibrium, then total pressure at equiblibrium is
(1) 100 atm (2) 90 atm
(3) 80 atm (4) 85 atm

77. Which is the correct expression for hydrolysis constant (K_h) of NH_4Cl?

(1) $\sqrt{K_w}$ (2) $\frac{K_w}{K_a}$

(3) $\frac{K_w}{K_a \times K_b}$ (4) $\frac{K_w}{K_b}$

78. $2HI \rightleftharpoons H_2 + I_2$

At a certain temperature, degree of dissociation of HI is 0.25 at equilibrium. The equilibrium constant for the above reaction is

(1) $\frac{1}{36}$ (2) $\frac{1}{9}$

(3) 36 (4) 9

79. The pH of a saturated solution of $B(OH)_3$ is 12 Then Ksp of $B(OH)_3$ is ?

(1) 27×10^{-16} (2) 27×10^{-8}

(3) $\frac{1}{3} \times 10^{-8}$ (4) $\frac{1}{4} \times 10^{-8}$

80. In a suborbit, there are three radial nodes. This suborbit can be

(1) 4s or 5p (2) 4d or 5p

(3) 4s or 4p (4) 3s or 3p

81. $H_2S \rightleftharpoons H^+ + HS^-$

$HS^- \rightleftharpoons H^+ + S^{2-}$

$H_2S \rightleftharpoons 2H^+ + S^{2-}$

K_{a_1}, K_{a_2} and K_{a_3} are the respective ionisation constants for the above reactions. Then

(1) $K_{a3} = K_{a1} \times K_{a2}$ (2) $K_{a3} = K_{a1} + K_{a2}$

(3) $K_{a3} = K_{a1} - K_{a2}$ (4) $K_{a3} = K_{a1} / K_{a2}$

82. Which are natural sinks for ClO radicals in other parts of stratosphere?

(1) SO_2 and NO_2 (2) NO and NO_2

(3) CH_4 and NO_2 (4) Cl_2 and F_2

83. The pH of a solution obtained on mixing equal volumes of 0.1 N KOH and 0.1 N $Ba(OH)_2$ at 25°C is

(1) 11 (2) 12

(3) 13 (4) 14

84. The quantum number which gives information about the spatial orientation of the orbital with respect to standard set of co-ordinate axis is called

(1) principal quantum number

(2) subsidiary quantum number

(3) magnetic quantum number

(4) spin quantum number

85. The correct statement about the chemical equilibrium is

(1) Equilibrium constant is independent of temperature

(2) Equilibrium constant tells us how fast the reaction reaches equilibrium

(3) Equilibrium constant does not depend upon initial concentration

(4) At equilibrium, concentration of reactants and products must become equal

CHEMISTRY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

86. The equilibrium constant K_C for the reaction

$2A \rightleftharpoons B + C$ is 0.5 at 25°C

The reaction will proceed in the backward direction when concentration of [A],[B] and [C] are respectively

(1) 10^{-1}, 10^{-2} and 10^{-3} M

(2) 10^{-3}, 10^{-2} and 10^{-2} M

(3) 10^{-2}, 10^{-2} and 10^{-3} M

(4) 10^{-2}, 10^{-3} and 10^{-3} M

87. In a p_x orbital, the subscript 'x' denotes the

(1) spin of electron (2) size of orbital

(3) shape of orbital (4) none of these

88. Choose the incorrect match

(1) oxide of S – chlorosis
(2) oxide of N – lung irritant
(3) particulate matter – shedding of leaves
(4) oxide of C – asphyxiation

89. Which of the following mixtures can act as a buffer?

(1) $Ba(OH)_2 + (CH_3COO)_2Ba$
(2) $NaOH + Na_2SO_4$
(3) $KNO_3 + HNO_3$
(4) $HCN + KCN$

90. **Assertion** : The solubility of salts of weak acids like phosphates increases at lower pH.
Reason : At lower pH the concentration of the anion decreases due to its protonation.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

91. For the equilibrium

$$A(g) \rightleftharpoons B(g) + C(g)$$

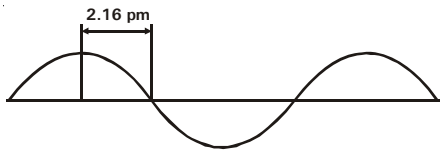
The total pressure at equilibrium is 'P' and partial pressure of A at equilibrium is P/2. Then K_p is

(1) $\frac{P}{4}$ (2) $\frac{P}{8}$
(3) $\frac{P}{2}$ (4) $\frac{P}{16}$

92. **Statement-I** : At high pressure melting of ice is favoured.
Statement-II : Density of ice is more than that of water.

(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

93. A hypothetical electromagnetic wave is shown in figure. The wavelength of the radiation is



(1) 8.64 pm (2) 4.32 pm
(3) 2.16 pm (4) 17.28 pm

94. K_C for $A + 2B \rightleftharpoons C + \frac{5}{2}D$ is 4

The value of K_C for $2C + 5D \rightleftharpoons 2A + 4B$ is

(1) $\frac{1}{4}$ (2) $\frac{1}{16}$
(3) $\frac{1}{32}$ (4) $\frac{1}{64}$

95. When water is completely evaporated from a 100 ml sample of an aq. solution saturated with $CaSO_4$ at 25°C, a deposit of 0.0136g $CaSO_4$ is obtained.then solubility proudct of $CaSO_4$ at 25°C is

(1) 10^{-6} (2) 10^{-4}
(3) 3×10^{-5} (4) 1.7×10^{-2}

96. A particular electromagnetic radiation with wavelength 200 nm
(1) has a higher frequency than radiation with wavelength 400 nm
(2) is in the visible region of the electromagnetic spectrum
(3) has a greater speed in vacuum than does radiation of wavelength 400 nm
(4) has a greater energy content per photon than does radiation with wavelength 100 nm

97. Which of the following sets of quantum numbers is correct for an electron in 6g orbital?
(1) $n=6, \ell=3, m=0, s=+0.5$
(2) $n=6, \ell=4, m=-3, s=+0.5$
(3) $n=5, \ell=4, m=1, s=-0.5$
(4) $n=6, \ell=0, m=0, s=-0.5$

98. Which of the following practices will not come under green chemistry?
(1) Use of CO_2 as solvent instead of Cl_2
(2) Use of H_2O_2 instead of Cl_2 for bleaching
(3) Synthesis of ethanal from ethene in one step
(4) Use of tetrachloroethene as a solvent for dry cleaning

99. Which of the following is the possible arrangement of electrons in ground state of atom?
(1) $1s^2\ 2s^2\ 2px^1$
(2) $1s^2\ 2s^1\ 2px^1\ 2py^1\ 2pz^1$
(3) $1s^2\ 2s^1\ 2px^2\ 2py^1$
(4) $1s^2\ 2s^2\ 3s^2$

100. Cu^{2+} ions reacts with Fe^{2+} ions according to the reaction
$Cu^{+2} + 2Fe^{2+} \rightleftharpoons Cu(s) + 2Fe^{3+}$
At equilibrium, the concentration of Cu^{2+} ions is not changed by addition of
(1) Cu^{2+} (2) Fe^{2+}
(3) Cu (4) Fe^{3+}

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Formation of proteins from amino acids and breakdown of starch to form glucose are catalysed by enzymes of class _____and _____ respectively
(1) III, VI (2) I, IV
(3) II, III (4) VI, III

102. How many of the following statements are correct
a. Arachidonic acid has 20 carbon atom including carboxy carbon
b. Gingely oil has low melting point
c. Lecithin is a phospholipid present in cell membranes
d. Lipids are generally insoluble inn water
e. Palmitic acid is 16 carbon unsaturated fatty acid
(1) Two (2) Three
(3) Four (4) Five

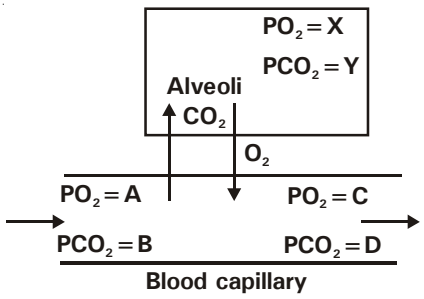
103. How many statements are correct w.r.t. following reaction?
$$CO_2 + H_2O \rightleftharpoons H_2CO_3$$
a. If it is uncatalysed 200 molecules of carbonic acid are formed per second
b. In the body above reaction is catalysed by carbonic anhydrase enzyme
c. K_{cat} for above reaction in body is 36 million/min
d. If catalysed about 6,00,000 molecules of carbonic acid are formed per minute.
(1) four (2) three
(3) two (4) one

104. Angiotensin causes_____that results in_____
(1) Vasoconstriction; $Na+$ reabsorption in PCT
(2) Vasodilation; K^+ secretion in PCT
(3) Secretion of ADH; reabsorption of H_2O
(4) Release of aldosterone; Na^+ reabsorption in DCT

105. Respiratory process is regulated by certain specialised centres in the brain. One of the following listed centres can reduce the inspiraotry duration upon stimulation
(1) Medullary inspiratory centre
(2) Pneumotaxic centre
(3) Apneustic centre
(4) Chemosensitive centre

106. Which of the following group of animals excrete uric acid in the form of pellet or paste with minimum loss of water?
(1) Reptiles, birds, land snails, mammals
(2) Reptiles, birds, insects, mammals
(3) Reptiles, birds, insects, land snails
(4) Amphibians, birds, insects, land snails

107.



Find out the values of pressure X,Y, A, B, C and D in mm Hg respectively
(1) X–104, Y–40, A–95, B–40, C–40, D–45
(2) X–95, Y–40, A–104, B–40, C–40, D–45
(3) X–104, Y–40, A–40, B–45, C–95, D–40
(4) X–95, Y–40, A–104, B–40, C–45, D–40

108. **Assertion** : Starch gives blue colour with iodine
Reason : Starch forms secondary helical structure that can hold I_2 molecules in the helical portion
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

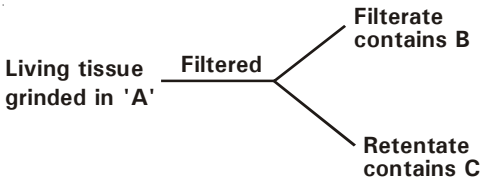
109. Which of the following is an incorrect statement?
(1) Living state and metabolism are synonyms
(2) Living state is a non equilibrium steady state
(3) Metabolic pathways are linear or circular
(4) There is no definite rate of flow of metabolites through metabolic pathway

110. Inhibition of succinate dehydrogenase by malonate will result in
(1) increase in Vmax; decrease in K_m value
(2) same Vmax; same K_m value
(3) same Vmax; increase in K_m value
(4) decrease in Vmax; increase in K_m value

111. Organic cofactors of enzymes include
a. Prosthetic group
b. Co-enzymes
c. Metal ions
(1) a and b (2) b and c
(3) a and c (4) a, b and c

112. Which one of the following is correct match?
(1) Toxic secondary metabolite – Concanavalin-A
(2) Polymer of Fructose – Amylose
(3) Protein which functions like intercellular ground substance – Collagen
(4) Nitrogen containing polysaccharide – Glycogen

113. Study the following process to analyse organic components of a living tissue



A, B and C respectively are
(1) glycerol, lipids, amino acids
(2) trichloroacetic acid, lipids, amino acids
(3) trichloroacetic acid, amino acids, proteins
(4) glycerol, amino acids, lipids

114. How many of the following organism exchange O_2 & CO_2 directly from entire body surface?
Aquatic arthropods, Fishes, Frog, Aquatic molluscs, Coelenterates, Flatworms, Sponges
(1) Two (2) Three
(3) Four (4) Five

115. Which of the following would help in increasing the osmolarity of the interstitial fluid?
i. The exchange of NaCl between descending limb of henle's loop and ascending limb of vasa recta
ii. The entry of NaCl into the interstitium by the ascending limb of vasa recta
iii. The entry of water from the interstitium into the descending limb of Henle's loop
iv. The transport of urea from the collecting tubule back into interstitium
(1) i & ii (2) i, ii, iii & iv
(3) ii & iv (4) iii, iv

116. Match the column

	Respiratory disorder		**Symptoms**
a.	Asthma	i.	Proliferation of fibrous tissue
b.	Emphysema	ii.	Breathing causing wheezing
c.	Occupational respiratory disorders	iii.	Alveolar walls damaged

(1) a–ii, b–iii, c–i (2) a–i, b–ii, c–iii
(3) a–iii, b–ii, c–i (4) a–iii, b–i, c–ii

117. **Statement-I** : Tertiary structure is absolutely necessary for many biological activities of proteins

Statement-II : In tertiary structure when a long protein chain is folded upon itself it loses its primary structure

(1) Both statement-I and statement- II are correct

(2) Both statement-I and statement-II are incorrect

(3) Statement-I is correct but statement-II is incorrect

(4) Statement-I is incorrect but statement- II is correct

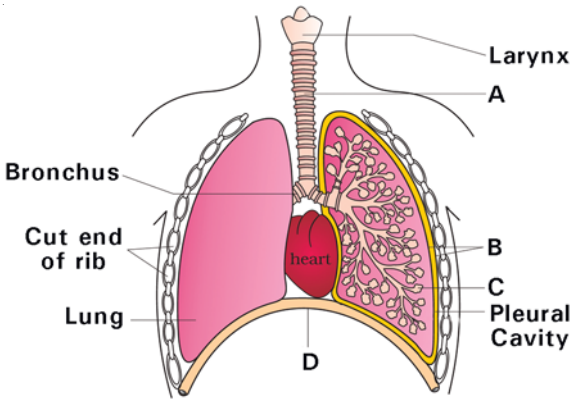
118. How many of the following enzymes control metabolism within our body cells?

Trypsin, Rennin, Ptyalin, Cytochrome oxidase, Carboxypeptidase

(1) one (2) three

(3) five (4) two

119. The figure shows a diagrammatic view of human respiratory system with labels A, B, C and D. Select the option which gives correct identification and main functions and/or characteristic.



(1) C - Alveoli - thin walled, vascular, bag-like structure for exchange of gases

(2) D - Lower end of lungs - diaphragm pulls it down during inspiration

(3) A - trachea - long tube supported by complete cartilaginous rings for conducting inspired air

(4) B - pleural membranes - surround ribs on both sides to provide cushion against rubbing

120. The oxygen - haemoglobin dissociation curve will show a right shift in case of

(1) High pCO_2

(2) High pO_2

(3) Low pCO_2

(4) Less H^+ concentration

121. For the formation of a nucleoside, the carbon at position _____ of sugar join to nitrogen at position _____ in purine through a _____ bond. The blanks are respectively

(1) 1,1, glycosidic (2) 5, 1, hydrogen

(3) 1, 9, glycosidic (4) 1,9, phosphodiester

122. When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?

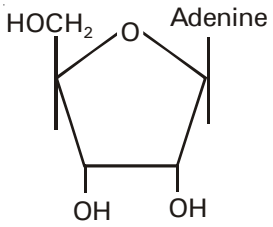
(1) Falling CO_2 concentration

(2) Falling O_2 concentration

(3) Rising CO_2 concentration

(4) Rising CO_2 and falling O_2 concentration

123. Identify the given structure



(1) Nucleic acid

(2) Nitrogeneous base

(3) Nucleotide

(4) Nucleoside

124. It is known that exposure to carbon monoxide is harmful to animals because

(1) It reduces CO_2 transport

(2) It reduces O_2 transport

(3) It increases CO_2 transport

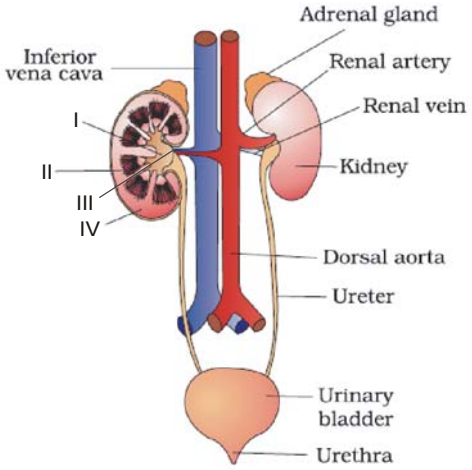
(4) It increases O_2 transport

125. Match the excretory products with the organ/ secretion that helps in their removal.

a.	Small amount of nitro-genous waste	i. Sebaceous glands
b.	NaCl, small amount of urea, lactic acid	ii. Saliva
c.	Sterols, waxes, hydro-carbons	iii. Sweat glands

(1) a-ii, b-i, c-iii (2) a-iii, b-i, c-ii

(3) a-ii, b-iii, c-i (4) a-i, b-ii, c-iii

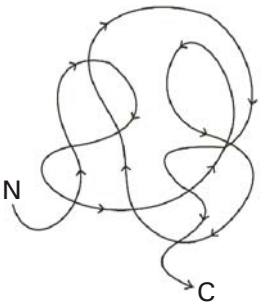
126. 

In the given figure identify the part through which ureter, blood vessels, nerves enter

(1) I– Pelvis (2) II– Medulla
(3) III– Hilum (4) IV– Cortex

127. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because

(1) there is a positive intrapleural pressure
(2) there is a negative pressure in the lungs
(3) pressure in the lungs is higher than the atmospheric pressure
(4) there is negative intrapleural pressure pulling the lungs wall

128. 

Which structural form of protein is shown above?

(1) Primary (2) Secondary
(3) Tertiary (4) None of the above

129. Choose the correct pair

	Structure/function of kidney	Characteristic	Exception
(1)	Bowman's capsule, PCT, HL, CT	Lie in cortex	PCT
(2)	HL, vasa recta, CT	Help in urine concentration	vasa recta
(3)	PCT, DCT, CT	Absorption of H_2O under effect of ADH	PCT
(4)	Column of Bertini, renal calyces, renal pelvis	Lie in inner medulla	renal pelvis

130. Find out the incorrect statement

(1) FAD and FMN are coenzymes which contain vitamin riboflavin.
(2) Zn^{2+} acts like coefactor for enzyme carbonic anhydrase
(3) Enzymes are highly specific inorganic catalysts
(4) Ribozymes is a nucleic acid enzyme

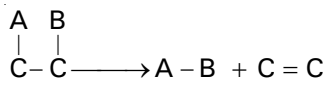
131. Which of the following option is incorrect?

(1) Collagen – Most abundant protein in the animal world
(2) GLUT–4– Enables glucose transport into cells
(3) Receptor proteins – Homopolymers
(4) Rubisco – Most abundant protein in whole of biosphere

132. Which of the following statement is correct regarding kidney?

(1) Narrow ends of renal pyramids project into calyces
(2) Narrow funnel like portion called pelvis leads into the ureter
(3) Hilus in kidney is located on convex surface
(4) All of these are incorrect

133. Identify the class of enzyme catalyzing following reactions



$A-X + A' \longrightarrow A + A'-X$

(1) Hydrolases, oxidoreductase
(2) Lyases, transferases
(3) Ligases, isomerases
(4) Lyases, hydrolases

134. Which of the following is correct statement?

(1) Volume of air inspired and expired in one breath is tidal volume
(2) Maximum volume of air a person can breathe in after forceful inspiration is vital capacity
(3) Additional volume of air a person can inspire forcibly after normal inspiration is inspiratory capacity
(4) Volume of air present in lungs after forceful expiration is residual volume

135. If RV = 1200 mL
EC = 1600 mL
TV = 500 mL
What would be the value of FRC?
(1) 2800 mL (2) 1600 mL
(3) 2300 mL (4) 350 mL

ZOOLOGY : SECTION-B

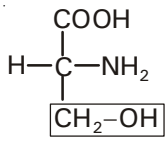
This section has 15 questions, attempt any 10 questions of them.

136. Haemo dialysis is a technique used to remove nitrogenous waste from the blood of uremic patients. Only nitrogenous wastes move out across the cellophane tube of haemodialysis unit because
(1) Cellophane tube is impermeable to all solutes except the nitrogenous wastes
(2) Nitrogenous wastes are absent in dialysing fluid
(3) Blood is drained into cellophane tube from renal vein which already lackes nitrogenous wastes
(4) Concentration of all other solutes except nitrogenous wastes is higher in the dialysing fluid than blood plasma

137. **Statement-I** : Juxtamedullary nephrons have well developed vasa recta.
Statement-II : Longer loop of Henle helps in concentration of urine.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

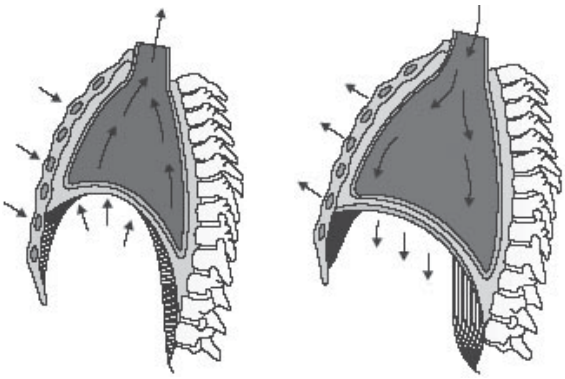
138. Renal plasma flow per minute is
(1) 1/5th of cardiac output –1100 to 1200 mL
(2) 1/5th of renal blood flow–650 to 700 mL
(3) 55% of renal blood flow–125 mL
(4) 55% of renal blood flow–650–700 mL

139. The structure given below represents which amino acid ?



(1) Serine (2) Glycine
(3) Methionine (4) Alanine

140. The mechanism of breathing is depicted in following diagram A and B. What type of condition mentioned is not correct during stage A and B



(A) **(B)**

	Condition	A	B
(1)	Intrapulmonary pressure	More	Less
(2)	Diaphragm	Contracted	Relaxed
(3)	Position of diaphragm	Dome shaped	Flat
(4)	Volume of thorax	decreases	Increases

141. Juxta glomerular apparatus is a special sensitive region formed by cellular modifications in
(1) PCT and afferent arteriole
(2) PCT and efferent arteriole
(3) DCT and afferent arteriole
(4) DCT and efferent arteriole

142. If A = primary bronchi,m B = alveolar duct, C = alveoli , D = secondary bronchi, E = terminal bronchiole, then starting from trachea (T), the branching sequence of respiratory three is
(1) $T \rightarrow A \rightarrow E \rightarrow D \rightarrow C \rightarrow B$
(2) $T \rightarrow A \rightarrow D \rightarrow E \rightarrow B \rightarrow C$
(3) $T \rightarrow A \rightarrow D \rightarrow E \rightarrow C \rightarrow B$
(4) $T \rightarrow E \rightarrow A \rightarrow D \rightarrow B \rightarrow C$

143. **Assertion** : Lungs are situated in anatomicaly air tight thoracic chamber.
Reason : Change in volume of thoracic cavity results in no change in the volume of pulmonary cavity .
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

144. Which of the following is incorrect match
(1) Malphighian tubules – Insects
(2) Green glands – Crustaceans
(3) Nephridia – Annelids
(4) Flame cells – Coelenterates

145. If 100 ml of blood transports 4 ml of CO_2 then CO_2 transported in dissolved form in plasma by 1 litre of blood is approximately
(1) 3 ml (2) 30 ml
(3) 25ml (4) 1 ml

146. Match the pulmonary volumes and capacities given in column-I with their respective values given in column-II

Column-I	Column-II
a. Inspiratory reserve volume	i. 1000-1100 ml
b. Total lung capacity	ii. 5100-5800 ml
c. Expiratory reserve volume	iii. 4000-4600 ml
d. Vital capacity	iv. 2500-3000 ml

(1) a-iii, b-iv, c-ii, d-i (2) a-iv, b-ii, c-iii, d-i
(3) a-iv, b-ii, c-i, d-iii (4) a-iv, b-iii, c-i, d-ii

147. Which of the following statements is correct?
(1) Enzyme & substrate form a temporary complex
(2) Enzymes catalyse irreversible reactions only
(3) Change in tertiary structure of enzymes has no effect on enzyme activity
(4) Enzymes work efficiently at all pH

148. The diffusion membrane is made up of which of the following layers?
(1) Thin squamous epithelium of alveoli
(2) Endothelium of alveolar capillaries
(3) Basement membrane
(4) all the above

149. Gas 'A' will diffuse faster than Gas 'B' if
(1) B has more solubility in water than A
(2) Partial pressure gradient of 'A' across respiratory membrane is higher
(3) Thickness of diffusion surface decreases
(4) Both (2) and (3)

150. The reaction catalyzed by carbonic anhydrase in RBC
(1) is irreversible reaction
(2) is oxygenation reaction
(3) results in formation of bicarbonate ions
(4) results in formation of carbamino haemoglobin

BOTANY : SECTION-A

All questions are compulsory in section A

151. Which of the following is not a viral disease?
(1) Cholera (2) Mumps
(3) Measles (4) AIDS

152. Choose the correct match
(1) Muscidae – Class –Housefly
(2) Polymoniales – Order – Mango
(3) Felidae –Family – Dog
(4) Poaceae – Family – Wheat

153. Class of imperfect fungi is _____ that reproduce only by _____ asexual spores and once perfect stage of members of this class is discovered, they were often move to _____.
(1) Basidiomycetes, Sporangiospores Ascomycetes
(2) Deuteromycetes, Conidia, Ascomycetes
(3) Deuteromycetes, Zoospores, Basidiomycetes
(4) Ascomycetes, Conidia, Zygomycetes

154. Most plant viruses such as tobacco mosaic virus (TMV) have _____ as genetic material but cauliflower mosaic virus (CaMV) is an exceptional plant virus in having
(1) ssRNA, ssDNA (2) dsRNA, dsDNA
(3) ssRNA, dsDNA (4) ssRNA, dsRNA

155. The two families placed together in order Polymoniales are
(1) Solanaceae, Convolvulaceae
(2) Solanaceae, Poaceae
(3) Convolvulaceae, Poaceae
(4) Convolvulaceae, Anacardiaceae

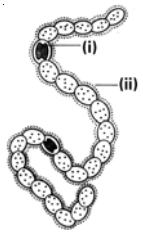
156. Bacterial flagellum is composed of
(1) pili and fimbriae
(2) filament,hook and basal body
(3) flagellin protein and 9 + 2 organisation
(4) tubulin protein and 9 + 0 organisation

157. **Assertion** : Several ribosomes may attach to a single mRNA form a chain called polysome
Reason : The ribosomes of a polysome translate the mRNA into proteins
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

158. Organisms showing loose tissue level of organisation with non cellulosic cell wall are placed In which of the following Kingdom ?
(1) Protista (2) Fungi
(3) Plantae (4) Animalia

159. Which of the following statements is incorrect?
(1) In binomial nomenclature, word genus starts with a capital letter.
(2) Herbarium is a quick referral system.
(3) Two or more related orders are placed in same family
(4) Growth is not a defining feature of an living organisms

160. Identify the diagram and label (i) and (ii) respectively



(1) *Nostoc,* heterocyst, mucilagenous sheath
(2) *Rhizobium,* nodule, cell wall
(3) *Frankia*, nodule, mucilagenous sheath
(4) Virus, collar, head

161. Corona viruses contain
(1) RNA (2) RNA or DNA
(3) DNA (4) Protein only

162. In *Agaricus,* Karyogamy and meiosis occur in
(1) Ascus (2) Basidium
(3) Ascocarp (4) Sporangium

163. Identify the correct sequence of taxonomical categories?
(1) Species → Order → Phylum → Kingdom
(2) Genus → Species → Order → Kingdom
(3) Species → Genus → Order → Phylum
(4) Order → Species → Phylum → Kingdom

164. In case two or more scientific names are given to the same organism
(1) the older name is the valid name and other names become synonyms
(2) the new name will replace the older name
(3) older name & new name both will be invalid
(4) older name will become synonym while the new name will be valid

165. Which of the following will have organisms with more characters in common?
(1) Species (2) Class
(3) Kingdom (4) Family

166. In five kingdom classification of Whittaker, eukaryotes were assigned to
(1) 3 out of 5 kingdoms (2) 2 out of 5 kingdoms
(3) 4 out of 5 kingdoms (4) all the 5 kingdoms

167. Which of the following statement is incorrect?
(1) Viroids lack a protein coat
(2) Viruses are obligate parasites
(3) Infective constituent in viruses is the protein coat
(4) D.J. Ivanowsky is credited with discovery of virus

168. Choose the correct statement
(1) bacteria show true sexual reproduction
(2) diploid zygote is produced as a result of syngamy in all bacteria
(3) genetic recombination can occur in bacteria involving transfer of DNA from one cell to the other
(4) Yeast is filamentous and multicellular

169. One of the main reasons to include cyanophyceae (cyanobacteria) in prokaryote is
(1) presence of mucilage sheath
(2) presence of nucleoid
(3) absence of sexuality
(4) absence of flagellation

170. **Statement- I** : The organisation of the prokaryotic cell is fundamentally similar even though prokaryote exhibit a wide variety of shapes and functions
Statement- II : All prokaryotes have a cell wall surrounding the cell membrane except in mycoplasma
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

171. Which of the following statements is incorrect?
(1) Prusiner discovered prions
(2) Prions consist of abnormally folded proteins
(3) Prions cause neurological diseases in animals such as BSE, the analogous variant of this is CJD in humans
(4) Prions have DNA as genetic material

172. Which of the following taxonomical aid is analytical in nature?
(1) Herbarium (2) Key
(3) Museum (4) Zoo

173. Which of the following statements is incorrect?
(1) The capsid of a virus is made up of capsomeres and is protective
(2) Some animal viruses such as HIV have an envelope made up of peplomeres
(3) Viroids were discovered by T.O. Diener in 1971
(4) The genetic material of Coliphage T_4 is dsRNA

174. According to five kingdom system of classification organisms with non-cellulosic cell wall were placed in the kingdom
a. Monera b. Protista
c. Fungi d. Plantae
e. Animalia
(1) a, b and c (2) a and c
(3) c only (4) d only

175. Identify the incorrect match
(1) Bacillus – Circular
(2) Coccus – Spherical
(3) Vibrio – Comma shape
(4) Spirillum – Spiral shape

176. The branch of study which deals with diversity of organisms and their evolutionary relationships is called
(1) taxonomy (2) nomenclature
(3) systematics (4) classification

177. Haploid, sexual spores produced endogenously in sacs arranged in different types of fruiting bodies are
(1) Sporangiospores
(2) Ascospores
(3) Condia
(4) Basidiospores

178. Choose the incorrect statement
(1) Families are characterised on the basis of both vegetative as well as reproductive features in plants
(2) *Petunia* and *Datura* belong to different families
(3) Cats and dogs belong to different families but a common order
(4) Increase in mass and number of individuals are twin characteristics of growth

179. Mycoplasma is
(1) eukaryotic unicellular
(2) eukaryotic multicellular
(3) prokaryotic unicellular
(4) prokaryotic multicellular

180. Which of the following is a bacterial plant disease?
(1) Citrus canker (2) Botulism
(3) Anthrax (4) Tobacco mosaic

181. Which is not a criteria used by Whittaker in 5 kingdom system?
(1) Mode of nutrition
(2) Body organisation
(3) Phylogeny
(4) Chemical composition of cell membrane .

182. Late blight of potato is due to
(1) *Albugo candida* (2) *Pythium*
(3) *Phytopthora* (4) *Colletotrichum*

183. Which is incorrect about Slime Moulds?
(1) They are saprophytic protists
(2) Their body moves along decaying twigs and leaves engulfing organic material
(3) In suitable conditions, they form plasmodium which may grow & spread over several feet
(4) They show presence of two flagellas, one long and one short

184. Unlike other algae, diatoms do not readily decay due to
(1) mucilagenous wall (2) non-living cell wall
(3) silicified cell wall (4) suberised cell wall

185. Which of the following is not true for a species?
(1) Species of two genera can interbreed freely
(2) Members of a species can interbreed
(3) Group of individual organisms with fundamental similarities is considered as species
(4) One species is morphologically distinct from other species.

BOTANY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

186. Dinoflagellates
a. are mostly marine and photosynthetic
b. appear yellow, green, brown, blue or red depending on the main pigments
c. Have silica rich cell wall
(1) a, b & c (2) both a & b
(3) a only (4) both b & c

187. How many of the following statements is incorrect?
a. Character which unified all members in Plantae in the two kingdom system was presence of cell wall
b. Kingdom Mycota includes unicellular prokaryotes.
c. The 3 Domain system had 4 kingdoms in domain Eukarya.
d. Producers belong to three kingdoms in Whittaker's 5 kingdom classification.
(1) Two (2) One
(3) Four (4) Three

188. Select the incorrect statement
(1) A group represents a category and category further denotes a rank
(2) Binomial system of nomenclature was proposed by Linnaeus in the book 'Pinax'
(3) Species is the lowest category in taxonomic hierarchy
(4) For classification the basic requirement is the knowledge of characters of an individual or group of organisms

189. Identify the incorrect match
(1) Fungi – Multicellular decomposers tissue body organisation
(2) Protista – Most abundant microorganisms
(3) Slime moulds – Saprophytic protist
(4) Methanogens – Obligate anaerobes

190. Reproduction is
(1) a characteristic of all living organisms
(2) an all inclusive defining characteristic of living organisms
(3) synonymous with growth in unicellular organisms
(4) a method of multiplication seen in living organsims under *in vitro* conditions only

191. How many statements are true?
a. Classes comprising animals like fishes, amphibians, reptiles, birds alongwith mammals constitute the next higher category called Phylum
b. The numbers of species that are known and described range between 1.7–1.8 million
c. In multicellular organisms, growth and reproduction are exclusive events
d. Boulders show intrinsic growth
(1) 4 (2) 3
(3) 2 (4) 1

192. **Assertion** : Viruses are not placed in any of the five kingdoms in Whittaker's system of classification.
Reason : Viruses are acellular entities.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

193. How many organism out of the following show oxygenic photosynthesis?
Nostoc, *E-coli*, *Rhizobium*, *Azotobacter*, *Anabaena*, *Cylindrospermum*, *Bacillus,* Diatoms, Dinoflagellates
(1) 3 (2) 4
(3) 2 (4) 5

194. Which of the following statements is false?
(1) Phycobiont is autotrophic and mycobiont is heterotrophic partner of lichen
(2) Morels and truffles are edible ascocarps
(3) A zoospore is formed by fusion of two gametes
(4) White spots on mustard leaves are due to parasitic fungus–*Albugo*

195. Identify the incorrect statement
(1) chemosynthetic autotrophs are most abundant in nature
(2) many heterotrophic bacteria have a significant impact on human affairs
(3) The colonies of photosynthetic cynaobacteria are generally surrounded by gelatinous sheath
(4) There are thousands of different eubacteria or true bacteria

196. Which of the following is not the all inclusive defining feature of living organisms?
a. Metabolism b. Cellular organisation
c. Consciousness d. Reproduction
(1) a, b & d (2) a, b, c & d
(3) a, b & c (4) d only

197. *Chlamydomonas* and *Chlorella* along with *Amoeba* and *Paramecium* are kept in
(1) Plantae in 2 kingdom system
(2) Protista in 5 kingdom system.
(3) Fungi in 5 kingdom system
(4) Both 1 & 2

198. Mycoplasmas are characterized by all except
(1) most of them are parasitic
(2) fried egg like colonies in culture medium
(3) cannot grow on culture medium
(4) gram negative cells

199. **Statement- I** : In the five kingdom system,all prokaryotes have been kept in kingdom Monera.
Statement- II : In the 3 domain system prokaryotes are kept in only one domain i.e Archaea.
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

200. Arrange the different layers of cell envelope from outside toward inside of bacteria
(1) Glycocalyx $\rightarrow$ Cell membrane $\rightarrow$ Cell wall
(2) Capsule $\rightarrow$ Cell wall $\rightarrow$ Cell membrane
(3) Cell membrane $\rightarrow$ Cell wall $\rightarrow$ Slime layer
(4) Cell wall $\rightarrow$ Glycocalyx $\rightarrow$ Cell membrane