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Test Series HMC-8(HP & HR), HMC-9(24-25), HMC-15

MM : 720 **Test - 05** **Time : 3 hrs. 20 min.**

PHYSICS : MOTION IN A STRAIGHT LINE, MOTION IN A PLANE, UNITS, DIMENSIONS & ERRORS
CHEMISTRY : STRUCTURE OF ATOM, CHEMICAL & IONIC EQUILIBRIUM, ENVIRONMETNAL CHEMISTRY
ZOOLOGY : BREATHING & EXCHANGE OF GASES, EXCRETORY PRODUCT & ELIMINATION, BIOMOLECULES
BOTANY : THE LIVING WORLD, BIOLOGICAL CLASSIFICATION (I/C VIRUS), MONERA, PROTISTA, FUNGI

PHYSICS : SECTION-A

All questions are compulsory in section A

1. A car is going with velocity at $(20\hat{i} - 10\hat{j})$ km/h and train is going at $(40\hat{i} + 15\hat{j})$ km/h. Relative velocity of car as seen by a passenger in train is

   (1) $(20\hat{i} + 25\hat{j})$ km/h

   (2) $-(20\hat{i} + 25\hat{j})$ km/h

   (3) $(60\hat{i} + 5\hat{j})$ km/h

   (4) $-(20\hat{i} + 5\hat{j})$ km/h

2. In the formula $F = \frac{A}{\alpha^2\beta} e^{-\alpha t\left(\log\frac{x}{x-\beta}\right)}$. F is force, x distance and t time. What will be dimensional formula of A?

   (1) $[ML^0T^0]$ (2) $[ML^2T^{-2}]$
   (3) $[ML^{-1}T^0]$ (4) $[ML^2T^{-4}]$

3. A body covers one third the total distance with a speed v and remaining two third with a speed 2v. If total distance 50 km was covered in 4hours, then v =

   (1) 12 km/h (2) 8.33 km/h
   (3) 15 km/h (4) 11.67 km/h

4. An object is thrown upwards with a velocity of 30 m/s near the surface of the earth. After two seconds what would be the direction of the displacement, velocity and acceleration?

	displacement	**velocity**	**acceleration**
(1)	up	up	up
(2)	up	up	down
(3)	up	down	down
(4)	up	down	up

5. If force 'F', acceleration 'A' and time 'T' are taken as fundamental quantities, then the dimensions of length will be

   (1) FT^2 (2) $F^{-1}A^2T^{-1}$
   (3) FA^2T (4) AT^2

6. **Assertion** : At the highest point on the trajectory of an oblique projectile, whole of kinetic energy of the projectile gets converted into potential energy.

   Reason : At the highest point of trajectory, the velocity of the projectile becomes 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

7. For an object moving along a straight line, if brakes are applied, then during brakes
   (1) speed increases
   (2) displacement decreases
   (3) distance travelled increases
   (4) acceleration is zero

8. A bullet moving with a velocity of 200 cm/s penetrates a wooden block, retards uniformly and comes to rest after traversing 4 cm inside it. What initial velocity is needed for travelling distance of 9 cm in same block?
   (1) 100 cm/s (2) 136.2 cm/s
   (3) 300 cm/s (4) 250 cm/s

9. If the random error in the arithmetic mean of 100 observations is x, then random error in the arithmetic mean of 300 observations would be
   (1) 3x (2) $\frac{1}{3}x$
   (3) $\frac{1}{9}x$ (4) $\frac{2}{3}x$

10. A particle starts from rest and moves with a constant acceleration for a time 't' and covers a distance S_1. If it covers an additional distance S_2 in next time interval of time '2t', then
   (1) $S_2 = 3S_1$ (2) $S_2 = 4S_1$
   (3) $S_2 = S_1$ (4) $S_2 = 8S_1$

11. If 1 unit of mass = 5 kg; 1 unit of length = 10m and 1 unit of time = 5 sec, then 1 Joule = x units of energy in this system where x =
   (1) 100 (2) 0.01
   (3) 20 (4) 0.05

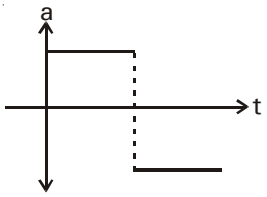
12. A distance of 20 cm is measured using a meter stick having minimum division of 1 mm. The percentage error in measurement is
   (1) 0.5% (2) 0.1%
   (3) 1% (4) 5%

13. Acceleration of a body (in m/s^2) is $a = t^2$ where 't' is time in second. The velocity of the body at $t = 3$ s, if initial velocity was zero, is
   (1) 9 m/s (2) 12 m/s
   (3) 16 m/s (4) 20 m/s

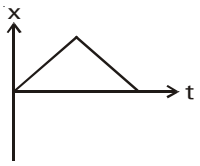
14. Which of the following has no units?
   (1) Mass (2) Angle
   (3) Specific gravity (4) Pressure

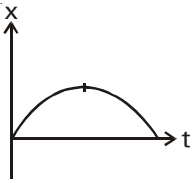
15. A body is thrown downward from top of a tower with a speed 20 m/s such that distance travelled by it in first two seconds is equal to distance travelled by it in last second of its fall. Height of tower is about ($g = 10 m/s^2$)
   (1) 80 m (2) 100 m
   (3) 190 m (4) 160 m

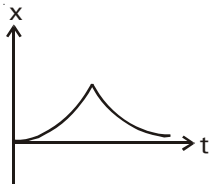
16. A particle is moving on a straight line and its acceleration time graph is as follows

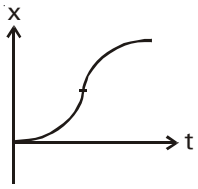


Corresponding distance time graph will be

(1) 

(2) 

(3) 

(4) 

17. The range of a projectile is maximum and its value is R. What is the maximum height in this case?

(1) 2R (2) R

(3) $\frac{R}{2}$ (4) $\frac{R}{4}$

18. The number 23568 when rounded off to three significant figures becomes

(1) 236 (2) 235

(3) 23500 (4) 23600

19. Let the equation of motion of a particle be

$$x = t^2 - t^3$$

Then the particle is moving with

(1) uniform velocity
(2) uniform acceleration
(3) variable acceleration
(4) uniform retardation

20. A ball is thrown horizontally from the top of a tower. Horizontal component of its velocity

(1) increases
(2) decreases
(3) remains unchanged
(4) first decreases and then increases

21. 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

22. The period of oscillation of a simple pendulum is $T = 2\pi\sqrt{\frac{L}{g}}$ where L is effective length of the pendulm and g is acceleration due to gravity. If percentage error in the measurement of T is 2% and in the measurment of L is 1%, then percentage error in measurement of g is

(1) 5% (2) 2%

(3) 3% (4) 1%

23. A man standing on a road hold his umbrella at 30^o with the vertical to keep the rain away. He throws the umbrella and starts running at 10 km/hr. He finds that raindrops are hitting his head vertically, the speed of raindrops with respect to the road will be

(1) 10 km/hr (2) 20 km/hr

(3) 30 km/hr (4) 40 km/hr

24. The X and Y co-ordinates of a particle at any time t are given by $X = 2t + 4t^2$ and $Y = 5t$, where X and Y are in metre and t in second. The acceleration of the particle at $t = 5$ s is

(1) 40 m s^{-2} (2) 20 m s^{-2}

(3) 8 m s^{-2} (4) Zero

25. A particle moves along a semicircle of radius 5m in π seconds. Average speed of the particle is

(1) 2 m/s (2) 3 m/s

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

26. Two cars, separated by distance of 10 km, are moving in same direction with speed of 40 km/hour. Speed of a car moving in opposite direction if it meets two cars at an interval of five minutes is

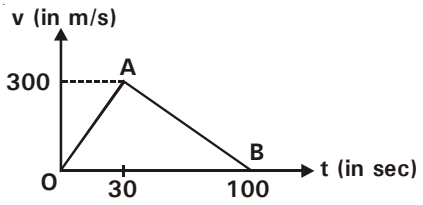
(1) 60 km/hr (2) 100 km/hr

(3) 80 km/hr (4) 120 km/hr

27. Two persons A and B are walking with speed 4 km/h and 5 km/h respectively in the same direction. How far will B be from A after 3 hours?

(1) 2 km (2) 1 km
(3) 4 km (4) 3 km

28. The following figure shows the velocity-time graph for a rocket which is fired vertically. If air friction is negligible, then the maximum height reached by the rocket is



(1) 12 km (2) 15 km
(3) 24 km (4) 18 km

29. The equation of trajectory of a projectile is $y = x - gx^2$. The horizontal range of projectile is

(1) 0.1 m (2) 0.2 m
(3) 0.01 m (4) 0.02 m

30. 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

31. A body is released from a great height and falls freely towards the earth. Another body is released from the same height exactly one second later. The separation between the two bodies, two seconds after the release of the second body is

(1) 4.9 m (2) 24.5 m
(3) 9.8 m (4) 14.7 m

32. A body is projected such that its kinetic energy at the top is $\frac{3}{4}$th of its initial kinetic energy. What is the initial angle of projection of the projectile with the horizontal?

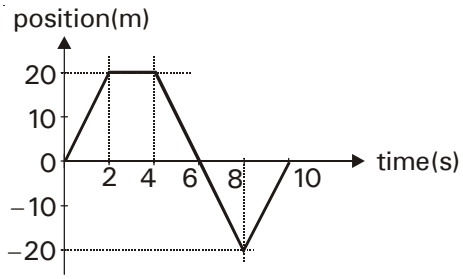
(1) 60° (2) 37°
(3) 30° (4) 45°

33. $\frac{1}{\mu_0 c^2}$ should be multiplied by square of which quantity to get the units of J/m^3.(c = speed of light, μ_0 = magnetic permeability of vacuum)

(1) magnetic field (2) electric field
(3) dipole moment (4) inductance

34. A ball thrown vertically upwards with a speed of 20 m/s from the top of a tower returns to the foot of the tower in 6 s. The height of tower is

(1) 20 m (2) 30 m
(3) 40 m (4) 60 m

35. 

The figure shows the position-time graph of a particle moving in a straight line. Its average speed and average velocity for first 10 seconds are respectively

(1) 8 m/s ; zero (2) zero ; zero
(3) 6 m/s ; zero (4) 8 m/s ; 8 m/s

PHYSICS : SECTION-B

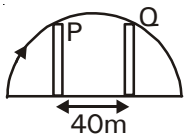
This section has 15 questions, attempt any 10 questions of them.

36. When 97.52 is divided by 2.54, correct result is
(1) 38.3937 (2) 38.394
(3) 38.39 (4) 38.4

37. A car accelerates from rest at constant rate of 4 m/s^2 for sometime. Then, it retards at constant rate of 6 m/s^2 and comes to rest. If the total time for which it remains in motion be 5 s, what is total distance travelled?
(1) 20 m (2) 30 m
(3) 40 m (4) 15 m

38. The maximum range of a projectile is 3 km. Its range when launched at an angle of 15° with the horizontal with same speed is
(1) 3 km (2) 1.5 km
(3) 1 km (4) 0.5 km

39. A man can swim with a speed of 4 km/h in still water. River of width 1 km flows steadily at 3km/h and he makes his strokes normal to the river current. How far down the river does he go when he reaches the other bank?
(1) 250 m (2) 500 m
(3) 750 m (4) 1000 m

40. 

A projectile fired from ground just grazes past two points P and Q at same height, 40m apart, at an interval of 5 second. If time taken to reach point P was 2 second, range of the projectile is
(1) 72 m (2) 66 m
(3) 84 m (4) 96 m

41. A stone is thrown horizontally with a speed $\sqrt{2gh}$ from the top of a wall of height h. It strikes the level ground through the foot of the wall at a distance x from the wall. The value of x is
(1) h (2) 0.5 h
(3) 2 h (4) 4 h

42. The number of significant figure in 0.003070 m is
(1) 6 (2) 3
(3) 7 (4) 4

43. Body P is projected with on speed 30 m/s at 37° with horizontal towards east. Another body Q is projected at 53° with horizontal from same point at same time such that P sees Q always moving horizontally towards west. ($g = 10 m/s^2$)
(1) Range of Q on ground is 48.6 m
(2) Both P and Q have same time of flight
(3) Both (1) and (2)
(4) Nethier (1) nor (2)

44. A man wants to cross the river to an exactly opposite point on the other bank. If he can row his boat with $\sqrt{2}$ times the velocity of water current, at what angle to the river current must be keep the boat moving?
(1) 0° (2) 90°
(3) 120° (4) 135°

45. Which of the following pairs has the same dimensional formula?
(1) Energy density and strain
(2) Linear momentum and torque
(3) Linear impulse and energy
(4) Torque and heat

46. **Assertion :** Average speed of a moving particle can never be zero.

Reason : Distance is a scalar quantity.

(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.

47. A particle moves along x-axis in such a way that its coordinate x varies with time t according to the equation $x = (2 - 5t + 6t^2)$ m. The initial velocity of the particle is

(1) -5 m/s (2) 6 m/s

(3) -3 m/s (4) 3 m/s

48. An aeroplane flying 490 m above ground level at 100 m/s, releases a block. How far on ground will it strike?

(1) 0.1 km (2) 1 km

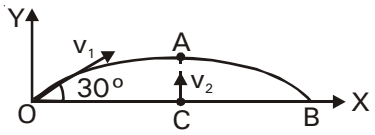
(3) 2 km (4) 3 km

49. A small block slides without friction down an inclined plane starting from rest. Let S_n be the distance travelled from time $t = n-1$ to $t = n$. Then S_n / S_{n+1} is

(1) $\frac{2n-1}{2n}$ (2) $\frac{2n+1}{2n-1}$

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

50. A particle is projected from O with velocity v_1 at an angle of 30° as shown in figure. At the same instant another particle is projected from C, vertically below A (highest point), with a velocity v_2. If both particles collide at A, then $\frac{v_1}{v_2}$ is



(1) 1/2 (2) 1

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

CHEMISTRY : SECTION-A

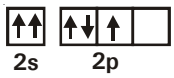
All questions are compulsory in section A

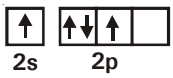
51. Ostwald dilution law is applicable to

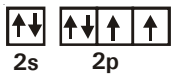
(1) H_2SO_4 (2) HNO_3

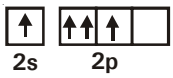
(3) KOH (4) CH_3COOH

52. The orbital diagram in which Aufbau principle, Hund's rule and Pauli's exclusion principle are violated is

(1) 

(2) 

(3) 

(4) 

53. The pH of the solution resulting, when 50 ml of 0.2M CN^- is mixed with 50 ml of 0.2 M HCN, is (pKa of HCN = 10)

(1) 0.699 (2) 10

(3) 10.699 (4) none of these

54. The equilibrium constant of the reaction, $A + B \rightleftharpoons C + D$ is 10. If rate constant of forward reaction is 203, the rate constant of backward reaction is

(1) 20.3 (2) 10.3
(3) 2.03 (4) 203

55. If BOD of river is high, this implies that the river is:

(1) not polluted at all
(2) highly polluted with inorganic chemicals
(3) Highly polluted with organic chemicals which are decomposed by micro–organisms
(4) polluted with pesticides

56. What is/are true about classical smog?

a. It is also called Los Angeles smog
b. It is formed in early hours of winter months
c. It is oxidising in nature

(1) a, c (2) b, c
(3) a, b (4) only b

57. The pH of 10^{-9} M KOH is

(1) 9 (2) 5
(3) 7 (4) near 7

58. $Ba(OH)_2$ is a strong base. The pH of its 0.005 M solution would be

(1) 11.31 (2) 11.7
(3) 12 (4) none of these

59. Which of the following series has λ values definately observed during emission spectrum of H-atom?

(1) Lyman (2) Balmer
(3) Paschen (4) All of these

60. Conjugate acid of OH^- is

(1) H_2O (2) H_3O^+
(3) H^+ (4) O^{2-}

61. An electron makes transition from $3 \rightarrow 2$ and $2 \rightarrow 1$ in an unknown atom with emission of lines of wavelength λ_1 and λ_2. If electron makes transition directly from 3 to 1 with emission of line of wavelength λ_3. Then the correct relation connecting λ_1, λ_2 and λ_3 is

(1) $\lambda_3 = \lambda_1 + \lambda_2$ (2) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

(3) $\lambda_3 = \dfrac{\lambda_1\lambda_2}{\lambda_1 + \lambda_2}$ (4) $\lambda_1 + \lambda_2 + \lambda_3 = 0$

62. The value of K_w in 0.1M NaCl solution at 25°C is

(1) 1×10^{-7} (2) 7
(3) 1 (4) 1×10^{-14}

63. Which one of the following shows both cationic and anionic hydrolysis?

(1) NaCN (2) $AlCl_3$
(3) CH_3COOK (4) NH_4F

64. Which of the following statements is correct?

(1) At equilibrium concentration of reactants and products become constant because the reaction stops
(2) k_f/k_b for an endothermic reaction increases with increase of temperature
(3) Equilibrium constant of an exothermic reaction increases with increase of temperature
(4) K_p is always greater than K_C

65. Which one of the following is a false statement?

(1) 'α' has values ranging from 0 to 1
(2) K_b for weak base $= \infty$
(3) K_b for a base $\rightarrow \infty$ as $\alpha \rightarrow 1$
(4) K_b for strong bases is $\approx \infty$

66. 1 mole each of CO(g), $H_2O(g)$, $H_2(g)$ and $CO_2(g)$ are placed in one litre flask at 25°C. When following equilibrium is set up

$CO(g) + H_2O(g) \rightleftharpoons CO_2 + H_2(g)$

$K_P = 9$. Hence, which one of the following is true

(1) forward reaction is favoured
(2) backward reaction is favoured
(3) the reaction is at equilibrium
(4) no reaction occurs.

67. The number of radial nodes for 3p orbital is

(1) 3 (2) 4
(3) 2 (4) 1

68. For the reactions,

$A \rightleftharpoons B$; $K_c = 2$; $B \rightleftharpoons C$; $K_c = 4$

$C \rightleftharpoons D$; $K_c = 6$

K_c for the reaction, $A \rightleftharpoons D$ is

(1) $(2+4+6)$ (2) $(2\times4)/6$
(3) $(4\times6)/2$ (4) $2\times4\times6$

69. **Statement- I** : Equilibrium constant can be used to predict the rate of reaction

Statement- II : Higher value of equilibrium constant means reaction attains equilibrium.

(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

70. The frequency of an electromagnetic radiation is 24×10^{14} Hz. The wave number associated with it is

(1) $4\times10^{8}\ cm^{-1}$ (2) $8\times10^{6}\ m^{-1}$
(3) $2.4\times10^{8}\ m^{-1}$ (4) $3\times10^{8}\ cm^{-1}$

71. For the reaction : $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

Equilibrium constant $K_c = \dfrac{[NH_3]^2}{[N_2][H_2]^3}$

Some reactions are written below in column I and their equilibrium constants in terms of K_c are written in column II. Match the following reactions with the corresponding equilibrium constant

	column I		**column II**
i.	$2N_2(g) + 6H_2(g) \rightleftharpoons 4NH_3(g)$	a.	K_c^2
ii.	$2NH_3(g) \rightleftharpoons N_2(g) + 3H_2(g)$	b.	$K_c^{\frac{1}{2}}$
iii.	$\frac{1}{2}N_2(g) + \frac{3}{2}H_2(g) \rightleftharpoons NH_3(g)$	c.	$\dfrac{1}{K_c}$

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

72. pH for the solution of salt undergoing anionic hydrolysis is given by

(1) $pH = ½[pK_w + pK_a + \log C]$
(2) $pH = ½[pK_w + pK_a - \log C]$
(3) $pH = ½[pK_w + pK_b - \log C]$
(4) none of these

73. For NH_3, $K_b = 1.8\times10^{-5}$. K_a for NH_4^+ would be

(1) 1.8×10^{5} (2) 5.56×10^{5}
(3) 1.8×10^{10} (4) 5.56×10^{-10}

74. 10 ml of M/200 H_2SO_4 is mixed with 40 ml of M/200 H_2SO_4. The pH of the resulting solutions is

(1) 6 (2) 2
(3) 0.301 (4) 1

75. The solubility product of AgCl is 1.8×10^{-10}. Precipitation of AgCl will occur only when equal volumes of solutions of

(1) 10^{-4} M Ag^+ and 10^{-4} M Cl^- are mixed
(2) 10^{-7} M Ag^+ and 10^{-7} M Cl^- are mixed
(3) 10^{-5} M Ag^+ and 10^{-5} M Cl^- are mixed
(4) 10^{-10} M Ag^+ and 10^{-10} M Cl^- are mixed

76. For $N_2 + 3H_2 \rightleftharpoons 2NH_3$; then
(1) $K_p = K_c$ (2) $K_p = K_cRT$
(3) $K_p = K_c(RT)^{-2}$ (4) $K_p = K_c(RT)^{-1}$

77. Methane responsible for green house effect and global warming is produced naturally from
(1) Paddy fields (2) Rotten garbage
(3) Coal mines (4) all the above

78. 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

79. The following sets of quantum numbers represent four electrons in an multielectron atom. Which of the following has least energy?
(1) $n = 4, l = 1$ (2) $n = 4, l = 0$
(3) $n = 3, l = 2$ (4) $n = 3, l = 1$

80. Which of the following statements concerning the quantum numbers are correct?
a. Azimuthal quantum number determines the three dimensional shape of the orbital
b. The principal quantum number determines the orientation of the orbital
c. Magnetic quantum number determines the size of the orbital
d. Spin quantum number of an electron determines the orientation of the spin of electron relative to the chosen axis
(1) a & b (2) b & c
(3) c & d (4) a & d

81. **Assertion** : $\frac{h}{4\pi}$ represents the minimum uncertainity product.
Reason : Uncertainity principle is significant for microscopic moving objects.
(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

82. The yield of product in the reaction would be higher at, $A_2(g) + 2B(g) \rightleftharpoons C(g) + Q$ kJ
(1) high temperature and high pressure
(2) high temperature and low pressure
(3) low temperature and high pressure
(4) low temperature and low pressure

83. Bohr's model is not applicable to
(1) H-atom (2) Li^{2+}
(3) Be^{3+} (4) He

84. Which equilibrium in gaseous phase would be unaffected by an increase in pressure
(1) $N_2O_4 \rightleftharpoons 2NO_2$ (2) $N_2 + O_2 \rightleftharpoons 2NO$
(3) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (4) $CO + \frac{1}{2}O_2 \rightleftharpoons CO_2$

85. In stratosphere decomposition and formation of ozone is continuous. The free radical which retards the formation of O_3 is _____
(1) CH_3 (2) Cl
(3) F (4) Cl_2

CHEMISTRY : SECTION-B

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

86. The wavelength of a golf ball weighing 200 g and moving with a speed of 5m/h is of the order
(1) 10^{-10} m (2) 10^{-20} m
(3) 10^{-30} m (4) 10^{-40} m

87. In Antarctica, ozone depletion is due to the formation of the following compounds
(1) acrolein
(2) PNH (poly nuclear hydrocarbons)
(3) SO_2 and SO_3
(4) chlorine nitrate

88. One gram equivalent of aqueous NH_3 & 0.5 gram equivalent of H_2SO_4 are mixed in a beaker. What is true regarding the final resulting solution?
(1) Final solution is a basic buffer
(2) Final solution has $pH < 7$
(3) Final solution has $pH = 7$
(4) pH of final solution changes on dilution

89. One mole of helium is added to the dissociation equilibrium $N_2O_4(g) \rightleftharpoons 2NO_2(g) - x$ kJ keeping the total equilibrium pressure constant. Which one of the following observation/conclusion is correct?
(1) The equilibrium will shift in the forward direction
(2) The equilibrium will shift in the backward direction
(3) the equilibrium will remain undisturbed
(4) The equilibrium constant will change

90. Solubilities of three sparingly soluble salts are equal: M_2X, QY_2, PZ_3. The correct order of their K_{sp} is
(1) $M_2X > QY_2 > PZ_3$ (2) $M_2X = QY_2 > PZ_3$
(3) $PZ_3 > QY_2 > M_2X$ (4) $PZ_3 > QY_2 = M_2X$

91. In a system : $A(s) \rightleftharpoons 2B(g) + 3C(g)$. If the concentration of C at equilibrium is increased by 2 times, it will cause the equilibrium concentration of B to change to
(1) two times of its original value
(2) one half of its original value
(3) $2\sqrt{2}$ times of its original value
(4) $\frac{1}{2\sqrt{2}}$ times of its original value

92. The time period of revolution of an electron in the 1st orbit to that of in the 2nd orbit of H-atom is in the ratio of
(1) 1 : 2 (2) 2 : 1
(3) 1 : 4 (4) 1 : 8

93. **Statement-I** : Both SO_2 and NO_2 are major components of air pollution.
Statement-II : SO_2 forms reducing smog while NO_2 is a component of oxidizing smog.
(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

94. Solutions X and Y contain 1 mole and 2 moles of CH_3COONH_4 per litre respectively. The extent of hydrolysis is
(1) more in X (2) more is Y
(3) same in both (4) unpredictable

95. For the following equilibrium
$NH_2CO_2NH_{4(s)} \rightleftharpoons 2NH_{3(g)} + CO_{2(g)}$
K_p is found to be 0.5 at 4OOK. Hence partial pressure of NH_3 and CO_2 are respectively.
(1) 2 atm, 1 atm (2) 1 atm, 2 atm
(3) 1 atm, 0.5 atm (4) 0.5 atm, 1 atm

96. Degenerate orbitals for hydrogen atom are
(1) 2s, 3p (2) 2s, 2p
(3) 4s, 5s (4) 1s, 2s

97. The acid rain does not contain
(1) sulphuric acid (2) nitric acid
(3) sulphurous acid (4) acetic acid

98. The maximum number of electrons in an atom with $Z = 25$ with $m = 0$ are
(1) 12 (2) 13
(3) 9 (4) 5

99. If the energy of electron in hydrogen atom is –3.4 eV. In which of the following energy levels is electron present?
(1) 1^{st} (2) 2^{nd}
(3) 3^{rd} (4) 4^{th}

100. **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

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Which of the following is not the part of Renal pyramid?
(1) Distal convoluted tubule
(2) Collecting ducts
(3) Loop of Henle
(4) Vasa recta

102. If a dehydration reaction links two glucose molecules to produce maltose, then what is the formula of maltose?
(1) $C_{12}H_{24}O_{11}$ (2) $C_{12}H_{20}O_{10}$
(3) $C_{12}H_{24}O_{12}$ (4) $C_{12}H_{22}O_{11}$

103. Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls
(1) Asthma (2) Pleurisy
(3) Emphysema (4) Pneumonia

104. The substances which are reabsorbed actively and passively in the nephron are
(1) Glucose, Amino acids, Na^+ — Actively ; Urea —Passively
(2) Glucose, amino acids, Na^+ — Passively ; Urea —Actively
(3) Glucose—Actively ; Urea, Amino acids, Na^+ — Passively
(4) Glucose—Passively ; Urea, Amino acids, Na^+ —Actively

105. Which of the following set of N-containing compounds can be seen in the retentate?
(1) DNA, Lecithin, Tyrosine
(2) Starch, Cellulose, Inulin
(3) RNA, Lecithin, Rubisco
(4) Insulin, Glycogen, Chitin

106. **Assertion** : Mammals have ability to produce concentrated urine.
Reason : The counter current mechanism operated by loop of Henle and vasa recta helps in reabsorption of water by creating hyperosmolarity of cortical interstitium.
(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

107. What is the percentage of proteins, carbohydrates and ions respectively in a living cell?
(1) 3%, 2%, 1%
(2) 10–15%, 3%, 1%
(3) 5–7%, 10–15%, 3%
(4) 10–15%, 1%, 3%

108. Total volume of air accomodated in lungs at the end of forced inspiration is 6.5 L. After normal expiration 3.5 L of air is present in lungs and after forceful expiration 1.5 L of gases are present in lungs. What is value of IC
(1) 3 L (2) 5 L
(3) 2.5 L (4) 3.5 L

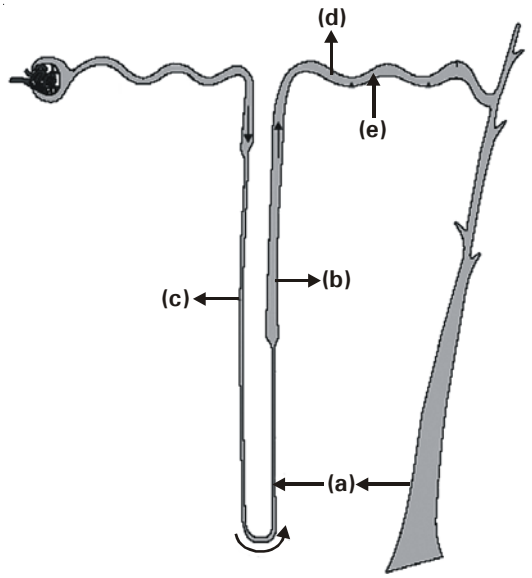
109. Plasma volume is controlled by which of the following when water supply is short?
(1) Cortical nephrons
(2) Juxtamedullary nephrons
(3) Bowman's capsule
(4) PCT

110. Which of the following is incorrect statement?
(1) Inulin is a polymer of fructose
(2) In a polysaccharide chain right end is non reducing and left end is reducing
(3) Dietary proteins are source of essential amino acids
(4) Rubber, drugs, spices, scents are secondary metabolites

111. Which part of kidney has been INCORRECTLY matched with its function?
(1) Bowman's capsule – Podocytes present in the inner wall of Bowman's capsule helps in ultrafiltration
(2) PCT – maximum amount of the ultrafiltrate is reabsorbed here
(3) DCT – It's the only structure influenced by vasopressin
(4) Collecting duct – It plays role in maintenance of pH and ionic balance of the blood by selective secretion of H^+ & K^+ ions.

112. Which of the following would have same pCO_2?
(1) Alveolar air and deoxygenated blood
(2) Oxygenated blood and expired air
(3) Oxygenated blood and alveolar air
(4) Expired air and tissue cells

113. In the given structure of a nephron, what are 'a' to 'e' respectively?



(1) Urea, NaCl, H_2O, Na^+, K^+
(2) Urea, H_2O, NaCl, Na^+, K^+
(3) HCO_3^-, H_2O, urea, K^+, Na^+
(4) NaCl, H_2O, urea, Na^+, HCO_3^-

114. Which of the following statements is correct?
i. Outer cortex and inner medulla are the two zones in kidney
ii. Medulla is divided into renal pyramids
iii. Inwards extensions of cortex between the pyramids is called Renal column of Bertini
(1) i & ii (2) ii & iii
(3) only i (4) i, ii & iii

115. Which of the following animals have antennal glands and protonephridia respectively for excretion?
(1) Scorpions and *Planaria*
(2) Prawns and Rotifers
(3) Insects and *Amphioxus*
(4) Crustaceans and all annelids

116. Most abundant protein in animal world is
(1) Chitin (2) RUBISCO
(3) Cellulose (4) Collagen

117. Which of the following statement is incorrect w.r.t. Nephron ?
(1) Glomerulus is a tuft of capillaries formed from efferent arteriole which is a fine branch of renal artery
(2) Renal tubule starts with double walled Bowman's capsule
(3) DCT's of many nephrons open into common collecting duct
(4) Bowman's capsule enclose glomerulus to form Malpighian or renal corpuscle

118. Identify the substances having glycosidic bond and peptide bond, respectively in their structure:
(1) Glycerol, trypsin (2) Cellulose, lecithin
(3) Inulin, insulin (4) Chitin, cholesterol

119. Which one of the following is correct with reference to hemodialysis?
(1) Heparin is added to blood before it is pumped into a dialyzing unit
(2) Nitrogenous wastes are removed by active transport
(3) After hemodialysis, the blood is pumped back into a suitable artery
(4) Dialyzing unit contains a coiled cellophane tube surrounded by dialyzing fluid having the same composition as that of plasma.

120. The chitinous exoskeleton of arthropods is formed by the polymerisation of :
(1) lipoglycans
(2) keratin sulphate and chondroitin sulphate
(3) D-glucosamine
(4) N-acetyl glucosamine

121. Most of HCO_3^- are reabsorbed in
(1) PCT (2) Loop of Henle
(3) DCT (4) Collecting duct

122. If cardiac output is 6 litre then how much oxygen will be delivered to tissues per minute during resting state?
(1) 300 ml (2) 5 ml
(3) 20 ml (4) 250 ml

123. Which set out of the following has one acidic amino acid and one basic amino acid respectively?
(1) Glycine and leucine
(2) Glutamic acid and lysine
(3) Tyrosine and serine
(4) Methionine and alanine

124. Inhibition of succinate dehydrogenase by malonate is an example of
(1) Non competitive inhibition
(2) Competitive inhibition
(3) End product inhibition
(4) Allosteric inhibition

125. Which of the following statement is correct regarding regulation of kidney's function?
(1) An increase in body fluid volume activate osmoreceptors
(2) Angiotensin-II being a powerful vasoconstrictor decreases GFR
(3) ANF cause vasodilation and thereby decrease blood pressure
(4) Functioning of kidney is not regulated by hormones

126. **Statement-I** : With increase in substrate concentration, velocity of enzymatic reactions rises at first, reaches at maximum velocity which is not further exceeded by rise in substrate concentration.

Statement-II : Prosthetic groups are organic compounds which are tightly bound to apoenzymes.

(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

127. Which of following options is incorrect w.r.t enzyme catalysed reactions?

(1) Transition state structure formed is transient & unstable
(2) Enzymes increase the rate of reaction by lowering the activation energy
(3) Activation energy is difference in average energy content of substrate from transition state
(4) Substrate has to go through much higher energy state or transition state only in exothermic reactions not in endothermic reactions

128. Which of the following is applicable to expiration?

a. passive process
b. relaxation of diaphragm muscles
c. diaphragm is flat
d. ribs and sternum raised

(1) c and d (2) a and b
(3) c only (4) a, b and d

129. The main factor/s for the binding of O_2 with Hb at lung surface is/are

(1) High pO_2 and more H^+ ions
(2) High pCO_2 and more H^+ ions
(3) High temperature and high pO_2
(4) High pO_2 and less H^+ ions

130. Trachea is a straight tube extending upto____ and dividing at the level of _____ vertebra

(1) upper thoracic cavity, third
(2) mid thoracic cavity, fifth
(3) mid thoracic cavity, seventh
(4) upper abdominal cavity, fifth

131. What is true for pulmonary volume and thoracic volume?

a. We can directly alter pulmonary volume without affecting thoracic volume
b. Any change in thoracic cavity volume will be reflected in the pulmonary volume
c. When the pulmonary volume increases thoracic volume decreases and vice versa
d. When the thoracic volume decreases, pulmonary pressure becomes negative

(1) a, b, c, d (2) b, d
(3) only b (4) c, d

132. Which amino acid is sulphur containing amino acid?

(1) Glycine (2) Tyrosine
(3) Cysteine (4) Glutamic acid

133. Stone or insoluble mass of crystallised salts formed within kidney is

(1) Renal calculus (2) Glomerulonephritis
(3) Uremia (4) Renal failure

134. Match the excretory products with the organ that helps in their removal.

	Excretory products	**Excretory organ**
a.	Small amount of nitrogenous waste	i. Sebaceous glunds
b.	NaCl, small amount of urea, lactic acid	ii. Saliva
c.	Sterols, waxes, hydrocarbons	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

135. Which of the following set includes only secondary metabolites?

(1) Abrin, Ricin, DNA
(2) Vinblastin, curcumin, Glucose
(3) Morphine, Codeine, Ricin
(4) Monoterpenes, Diterpenes, Amino acid

ZOOLOGY : SECTION-B

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

136. Which of the following are applicable to alveoli?

a. ciliated epithelium
b. squamous epithelium
c. avascular bags
d. thin walled
e. irregular walled

(1) b, c and d (2) b, d and e
(3) c, d and e (4) b, c, d and e

137. Match the items given in Column I with those in Column II and select the correct option given below:

	Column I		Column II
a.	Tidal volume	i.	2500 – 3000 mL
b.	Inspiratory Reserve volume	ii.	1100 – 1200 mL
c.	Expiratory Reserve volume	iii.	500 – 550 mL
d.	Residual volume	iv.	1000 – 1100 mL

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

138. **Assertion** : The structure of amino acids change in the solutions of different pHs..

Reason : Amino acid have ionizable nature due to presence of $-NH_2$ and $-COOH$ groups..

(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

139. The functioning of kidney is efficiently monitored and regulated by hormonal feedback involving
(1) Hypothalamus, JGA and heart
(2) Hypothalamus, JGA, Liver, Thyroid
(3) Hypothalamus, JGA, Thymus
(4) Hypothalamus, Adrenal, Heart, Pancreas

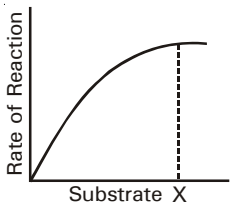
140. Osmolarity in cortex and inner medulla is respectively
(1) 300 $mosmL^{-1}$ and 600 $mosmL^{-1}$
(2) 800 $mosmL^{-1}$ and 1200 $mosmL^{-1}$
(3) 300 $mosmL^{-1}$ and 1200 $mosmL^{-1}$
(4) 600 $mosmL^{-1}$ and 800 $mosmL^{-1}$

141. Which one of the following statements in regard to the excretion by the human kidneys is correct?
(1) Ascending limb of Loop of Henle is impermeable to electrolytes
(2) Descending limb of Loop of Henle is impermeable to water
(3) Distal convoluted tubule is incapable of reabsorbing HCO_3^-
(4) Nearly 99 per cent of the glomerular filtrate is reabsorbed by the renal tubules

142. Identify CORRECT statements among followings
a. Many lipids have both glycerol and fatty acid
b. Phospholipids are found in cell membrane
c. Lecithin is an example of phospholipid
d. Palmitic acid has 16 carbons including carboxyl carbon
(1) a, b & c (2) b, c & d
(3) a, c & d (4) a, b, c & d

143. 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

144. Given graph is showing the relationship between rate of enzyme reaction & concentration of substrate. At concentration of substrate greater than X, the



(1) rate of reaction tends toward zero
(2) Rate of reaction is limited by the enzyme concentration
(3) Substrate shows feed back inhibition
(4) Product has an inhibitory effect

145. How many of the following are true w.r.t. acid insoluble fraction?
a. Contains 4 types of organic compounds
b. Contains 3 types of polymers
c. Contain only biomacromolecules with molecular weight $\geq$ 10000 daltons
d. Contain lipids
(1) three (2) four
(3) two (4) one

146. **Statement- I** : Metabolic reactions result in transformation of biomolecules..

Statement- II : There is no uncatalysed metabolic conversion in living systems.

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

147. Uracil and ribose join to form
(1) Uridylic acid (2) Uridine
(3) UMP (4) UTP

148. The amount of filterate formed by kidneys per minute is called _____and it accounts to _____in a healthy individual is respectively
(1) Glomerular blood flow,125/ min
(2) Glomerular filtration rate , 180L/day
(3) Renal blood flow , 125ml/day
(4) Glomerular filtration rate , 125L/day

149. In mammals, which blood vessel would normally carry largest amount of urea?
(1) Hepatic Portal Vein (2) Renal Vein
(3) Dorsal Aorta (4) Hepatic Vein

150. Which among following statements is NOT correct?
(1) Biosynthetic pathways are catabolic pathways always
(2) Some pathways consume energy while others release energy
(3) The steady state is a non-equilibrium state
(4) Anabolic pathways are also called synthetic pathways

BOTANY : SECTION-A

All questions are compulsory in section A

151. The most obvious and technically complicated feature of all living organism is
(1) reproduction
(2) metabolism
(3) growth
(4) ability to sense surroundings

152. **Statement-I** : Viruses possess their own metabolic system.
Statement-II : Viruses are readily killed by antibiotics.
(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

153. Under optimum condition bacterial cells divide once in 20 minutes by binary fission. How many bacteria will be produced in 2 hours with same rate of division?
(1) 8 (2) 32
(3) 128 (4) 64

154. Cell wall of fungi is made up of
(1) Chitin only
(2) chitin and polysaccharide
(3) fungal cellulose
(4) cellulose

155. Producers belong to kingdoms
(1) Monera, Protista and Plantae
(2) Monera, Protista and Fungi
(3) Monera and Fungi
(4) Plantae only

156. The main criteria for classification used by R.H. Whittaker (1969) include
a. cell structure
b. thallus organisation
c. mode of nutrition & reproduction
d. habitat
(1) b, c & d (2) a, b & d
(3) a, b & c (4) a, b, c & d

157. Dikaryotic stage is characteristic of
(1) ascomycetes and zygomycetes
(2) basidiomycetes and phycomycetes
(3) basidiomycetes and ascomycetes
(4) zygomycetes and phycomycetes

158. Which statement is false about Euglenoids?
(1) Majority of them are fresh water organisms found in stagnant water
(2) Most common method of reproduction is sexual in *Euglena*
(3) Instead of a cell wall, they have a pellicle
(4) They have two flagella, a short & a long one

159. **Assertion** : Archaebacteria can survive in extreme conditions.
Reason : Their cell wall structure is different from other bacteria.
(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

160. Which of the following help us to learn about feeding of habits and behaviour of wild animals?
(1) Herbarium (2) Zoo
(3) Key (4) M anual

161. Methanogens are found in
(1) marshy areas (2) hot springs
(3) salty areas (4) gut of carnivores

162. Cyanobacteria
(1) oxidises inorganic substances like nitrates
(2) can live in freshwater/marine water
(3) do not possess cell wall
(4) do not photosynthesise but can fix atmospheric nitrogen

163. Fungi has been placed in a separate kingdom as it differs from plants in
(1) cell membrane
(2) multicellularity
(3) cell wall composition and nutrition
(4) absence of cell wall

164. Which of the following taxonomic aid gives complete information of any one taxon?
(1) Flora (2) Monograph
(3) Herbarium (4) Key

165. Chemosynthetic autotrophic bacteria oxidise various inorganic substances such as nitrates, nitrites and ammonia and use the released energy for
(1) phospholipid production
(2) protein production
(3) cholesterol production
(4) food production

166. Select the incorrect one w.r.t. reproduction
(1) It is a characteristic of living organisms
(2) Production of progeny possessing features more or less similar to those of parents
(3) It is an all inclusive defining characteristic of living beings
(4) No non living object is capable of reproducing

167. **Assertion** : An organism represents/occupies a place or position in the system of classification.
Reason : Live specimen of plants and animals are found in botanical gardens.
(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

168. Which of the following is not a fungal disease?
(1) White rust of crucifers
(2) Red rot of sugarcane
(3) Black rust of wheat
(4) Citrus canker

169. Which of the following statement is false?
(1) Fungi is a unique kingdom of heterotrophic organisms
(2) Yeast is a unicellular fungus
(3) Fungi show great diversity in morphology and habitat
(4) Most fungi are autotrophic and absorb soluble organic matter from dead substrates

170. Fungi differ from plants in having
(1) cellulosic cell wall
(2) Non-cellulosic cell wall
(3) Chlorophyll
(4) Starch as reserve food

171. How many of the following statement is/are true
i. *Neurospora* is used extensively in biochemical and genetic work
ii. Truffle is edible and considered as delicacies
iii. Rusts and Smuts are parasitic forms that belong to class Basidiomycetes
iv. Conidia are asexual spores produced endogenously on the special mycelium called condiophore
(1) 3 (2) 2
(3) 1 (4) 4

172. Character that unified the whole plantae kingdom in two kingdom system was
(1) Cell wall (2) Nucleus
(3) Pigment type (4) Multicellularity

173. Which is correct w.r.t. members of chrysophyta?
(1) Includes dinoflagellates and golden algae
(2) Macroscopic and float actively in water currents
(3) Few of them are photosynthetic
(4) Found in fresh water as well as in marine environments

174. Viroids are characterised by all except
(1) low molecular weight RNA
(2) Infectious particles
(3) known to cause disease in plants
(4) Possess protein coat

175. Choose the correct pair
(1) Monera – cellular body organisation
(2) Protista – tissue system
(3) Fungi – mostly aquatic
(4) Plantae – holozoic nutrition

176. In fungi sexual reproduction is by
(1) oospores (2) ascospores
(3) basidiospores (4) all of these

177. Select the odd one out
(1) *Agaricus* (2) Puff balls
(3) Bracket fungi (4) *Mucor*

178. _____show most extensive metabolic diversity
(1) Bacteria (2) Protista
(3) Plantae (4) Fungi

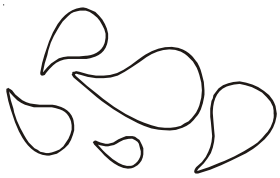
179. How many of the following statements are incorrect?
a. Group represents category and category further denotes a rank
b. Rank or taxon is the unit of classification
c. There are 9 obligate categories
d. Classification is a single step process
e. Species is the only natural category
(1) Two (2) Three
(3) Four (4) Five

180. Select the incorrect one w. r . t *Physarum*
(1) A slime mould
(2) Saprophytic protista
(3) Production of resistant spores with cellulose wall
(4) presence of chlorophyll-a

181. Select the incorrect match
(1) Diatoms – soap box symmetry
(2) Euglena – uniflagellate
(3) Dinoflagellate – red tide
(4) Protista – unicellular eukaryotes

182. Select the members of sac fungi
(1) *Rhizopus* and *Mucor*
(2) *Peziza* and *Morchella*
(3) *Puccinia* and *Ustilago*
(4) *Fusarium* and *Alternaria*

183. Identify the shape of bacteria shown in given diagram



(1) Cocci (2) Vibrio
(3) Sprillium (4) Bacillus

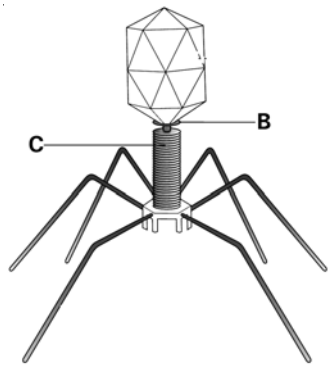
184. Viruses are classified in kingdom
(1) Animalia (2) Plantae
(3) Protista (4) None of these

185. Number of capsomeres found in TMV is
(1) 90 (2) 2130
(3) 2000 (4) 1900

BOTANY : SECTION-B

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

186. In diagram of bacteriophage indentify the labels B and C respectively



(1) Collar & Helical tail
(2) Helical tail & collar
(3) Tail & Polyhedral head
(4) Head & collar

187. **Statement-I** : *Frankia* form root nodule with non-leguminous plants.

Statement-II : Chemosynthetic bacteria help in recycling of nutrients..

(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

188. All single-celled eukaryotes are placed under protista and boundaries of this kingdom are
(1) well defined (2) merely defined
(3) not well defined (4) broadly defined

189. Fungal spores produced asexually at the top of hyphae are
(1) Conidia (2) Oidia
(3) Aplanospores (4) Sporangiophore

190. Which of the following is true about Protista?
(1) Its members are primarily aquatic
(2) Its cell body contains a well defined nucleus
(3) They reproduce asexually and sexually
(4) All of these

191. Identify correct sequence of taxa in hierarchy
(1) class, family, species, genus, order
(2) species, genus, family, order, class
(3) phylum, class, family, species, order
(4) species, genus, phylum, family, class

192. Identify the organism with following characteristics
i. It is photosynthetic autotroph
ii. Colonies surrounded by gelatinous sheath
iii. Often form blooms in polluted water bodies
(1) Archaebacteria (2) Cyanobacteria
(3) Mycoplasma (4) Actinomycetes

193. The Mycoplasma are organisms that
a. completely lack a cell wall
b. are the smallest living cells known and can survive without oxygen
c. may be pathogenic in animals and plants
(1) both a & b (2) c only
(3) a, b & c (4) both a & c

194. Select the incorrect match w.r.t. order
(1) Man – Primata
(2) Housefly – Diptera
(3) Mango – Sapindales
(4) Wheat – Poaceae

195. Select the incorrect one w.r.t. herbarium

(1) ex-situ conservation of plants and animals occurs

(2) it is a store house of collected and dried plant specimens

(3) herbarium sheets carry a label providing information about date and place of collection

(4) quick referral system in taxomonical study

196. Select the body organisation of members of kingdom Fungi

(1) cellular

(2) multicellular / loose tissue

(3) tissue / organ

(4) tissue / organ / organ system

197. Extract of Tobacco with Mosaic disease was called *Contagium vivum fluidum* by

(1) Ivanowski (2) Beijerinck

(3) Pasteur (4) Stanley

198. Carl Woese suggested that six kingdoms naturally cluster into three domains Archaea, Bacteria and Eukarya. Which of the following is correct w.r.t. to Archaea?

(1) Resemble eukarya in all respect

(2) Have different structural feature of cell membrane

(3) Completely differ from both prokaryotes and eukaryotes

(4) Resemble bacteria in all respect

199. According to biological concept of species, species are characterised by having

(1) Different ancesstory

(2) common gene pool

(3) Fundamental similarities

(4) Both (2) and (3)

200. Which of the following is a red dinoflagellate

(1) *Gonyaulax* (2) *Rhizopus*

(3) *Euglena* (4) *Salmonella*