SAKSHAM
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CCT - 15

TOPIC COVERED

Physics:	Full Syllabus (Class 11 &12)
Chemistry:	Full Syllabus (Class 11 &12)
Botany:	Full Syllabus (Class 11 &12)
Zoology:	Full Syllabus (Class 11 &12)

Duration: 3 hr 20 min **Max Marks: 720**

General Instructions:

- The test will contain 200 Questions of Physics, Chemistry, Botany, and Zoology & The test will be objective type. (Attempt only 180).
- Every subject contains two Section A-35 Questions and Section B-15 Questions (Attempt only 10).
- All 35 Questions of Section-A are Compulsory to attempt.
- Time given for test is 200 minutes.
- Marking is +4 for every correct answer, –1 for every wrong answer.
- You can reattempt the test in case of any technical issue.
- Test will start at 2:00 pm and students can attempt test at any time of their own preferences

PHYSICS

SECTION-A

1. Position of a particle moving along x-axis is given by $x = 6t - 3t^2$, where x is in m and t is in s. Time (t) at which particle will momentarily come to rest is

(1) $\frac{1}{2}$s (2) 2 s

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

2. A boat is moving with velocity $(4\hat{i}+6\hat{j})$ m/s with respect to ground. The water in the river is moving with $(-3\hat{i}-4\hat{j})$ m/s with respect to ground. The velocity of boat with respect to water is

(1) $(7\hat{i}+10\hat{j})$ m/s

(2) $(\hat{i}+2\hat{j})$ m/s

(3) $(-5\hat{i}+7\hat{j})$ m/s

(4) $(-5\hat{i}-8\hat{j})$ m/s

3. A particle is projected with an initial velocity $\vec{v}=(2\hat{i}+4\hat{j})$ m/s. The equation of trajectory of the particle will be (g = 10 m/s^2) (Assume horizontal direction as x-axis and vertically upward as positive y-axis)

(1) $y=2x-\frac{5x^2}{4}$ (2) $y=12x-\frac{3}{4}x^2$

(3) $y=x-\frac{x^2}{4}$ (4) $y=8x-\frac{3}{4}x^2$

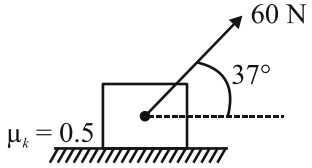
4. A particle is moving in a circle of radius R with constant speed. The time period of particle is T = 2s. In a time $t=\frac{T}{3}$, if the difference between average speed and magnitude of average velocity of the particle is 4 m s^{-1}, then the radius R of the circle is nearly

(1) 14 m
(2) 18.6 m
(3) 2.4 m
(4) 7.4 m

5. Identify the correct statement.

(1) Kinetic friction depends on area of contact for a given normal contact force.
(2) Coefficient of kinetic friction is generally less than coefficient of static friction
(3) The magnitude of kinetic friction cannot be more than static friction
(4) Coefficient of static friction does not depend on surface nature in contact

6. A block of mass 5 kg is resting on rough surface for which coefficient of kinetic friction is 0.5. When a force of F = 60 N is applied, the acceleration of block will be (g = 10 m/s²)



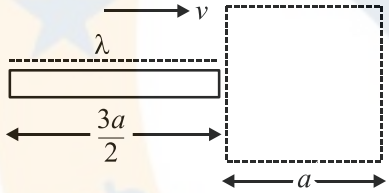
(1) 4.6 m s^{-2} (2) 3.9 m s^{-2}
(3) 8.2 m s^{-2} (4) 2.6 m s^{-2}

7. A particle is moving on a circular path of 10 m radius. At any instant of time, its speed is 5 m/s and speed is decreasing at a rate of 1.5 m/s². The magnitude of net acceleration at this instant is nearly

(1) 4 m/s² (2) 1 m/s²
(3) 2.9 m/s² (4) 3.2 m/s²

8. Figure shown are imaginary cube of side a. A uniformly charged rod of length $\frac{3a}{2}$ moves towards right at uniform speed of v. At t = 0, the right end of the rod first touches left face of the cube.

The correct plot of graph between electric flux through cube versus time is



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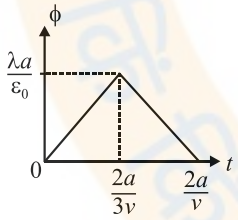

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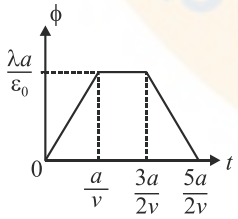

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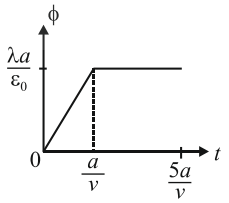

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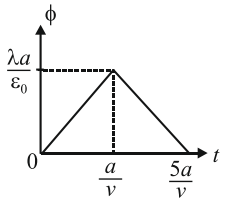
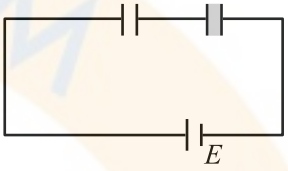


9. A slab of material of dielectric constant 3 has the same area A as the plates of parallel plate capacitor and thickness 3/4 d, where d is plate separation. The new capacity when slab is inserted between the plates is

(1) Unchanged
(2) Twice the original value
(3) Thrice the original value
(4) Four times the original vale

10. Two identical capacitors 1 and 2 are connected in series to a battery as shown in figure. Capacitor 2 contains a dielectric slab of dielectric constant K as shown. Q_1 and Q_2 are charges stored in capacitors. Now dielectric slab is removed and corresponding charges are Q'_1 and Q'_2, then

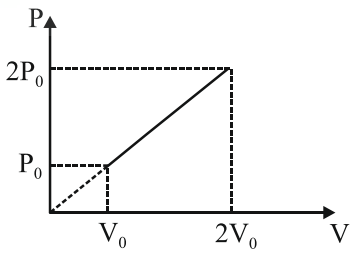


(1) $\frac{Q'_1}{Q_1} = \frac{K+1}{K}$ (2) $\frac{Q'_2}{Q_2} = \frac{K+1}{K}$
(3) $\frac{Q'_2}{Q_2} = \frac{K+1}{2K}$ (4) $\frac{Q'_1}{Q_1} = \frac{K}{2}$

11. Two charges of equal magnitude q are placed in air at a distance of $2a$ apart and third charge $-2q$ is placed at mid-point. The potential energy of the system is

(1) $\frac{-q^2}{8\pi\varepsilon_0 a}$
(2) $\frac{-3q^2}{8\pi\varepsilon_0 a}$
(3) $\frac{-5q^2}{8\pi\varepsilon_0 a}$
(4) $\frac{-7q^2}{8\pi\varepsilon_0 a}$

12. Consider the following PV diagram for a monoatomic gas. The ratio of work done by the gas to the change in internal energy of the gas will be



(1) 1 : 3
(2) 3 : 1
(3) Zero
(4) 1 : 1

13. A monoatomic gas undergoes a polytropic process which is defined by expression PV^3 = constant. The molar specific heat capacity of the gas will be (R is universal gas constant)

(1) R (2) $2R$
(3) $3R$ (4) $2/R$

14. For a heat engine performing between the temperature 273 K and 409.5 K, which among the following cannot be the efficiency?

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

15. If C_0 and C represent the *rms* speed of monoatomic gas molecules and the speed of sound in that gas, then

(1) $C_0 > C$ (2) $C_0 = C$
(3) $C_0 < C$ (4) None of these

16. Speed of a particle executing SHM is v at mean position. The speed of the particle when its displacement from mean position is equal to $1/4^{th}$ of the amplitude of the motion is

(1) v
(2) $v/4$
(3) $\frac{\sqrt{15}}{4}v$
(4) $\frac{\sqrt{17}}{4}v$

17. The amplitude of the vibrating particle due to superposition of two SHMs in the same direction,

$y_1 = \sin\left(\omega t + \frac{\pi}{3}\right)$ and $y_2 = \sin\omega t$ is

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

18. A violin string of length L is fixed at both ends. Which one of these is not a wavelength of a standing wave on the string?

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

19. A ray of light is travelling in air falls on a transparent glass slab of refractive index $\sqrt{3}$. If the refracted rays and reflected rays are mutually perpendicular. What is angle of incidence?

(1) 30° (2) 45°
(3) 60° (4) 53°

20. A disc is placed on the surface of pond with liquid of refractive index 5/3. A source of light is placed 4 m below the surface. What is minimum area of the disc so that light does not come out of liquid?

(1) 28.26 m^2 (2) 42.4 m^2
(3) 32.62 m^2 (4) 32.6 m^2

21. A converging lens of focal length 50 cm is placed co-axially in contact with another lens of unknown focal length. If the combination behaves like a diverging lens of focal length 50 cm. What is power of second lens?

(1) –2D (2) 2D
(3) 4D (4) –4D

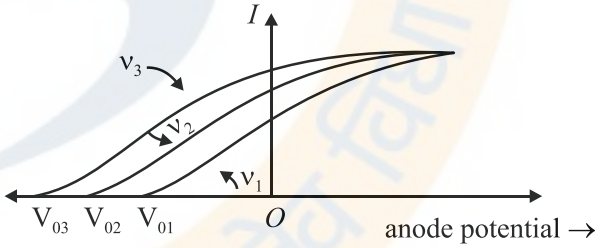
22. Resolving power of compound microscope is given by (symbols have their usual meaning)

(1) $d = \frac{\lambda}{2\mu\sin\theta}$ (2) $\frac{1}{d} = \frac{2\mu\sin\theta}{\lambda}$
(3) $d\theta = \frac{1.22\lambda}{D}$ (4) $\frac{1}{d\theta} = \frac{D}{1.22\lambda}$

23. Laser light of wavelength 630 nm incident on pair of slits produce an interference pattern where bright fringes are separated by 8.1 mm. Another laser light produces interference pattern where bright fringes are separated by 7.2 mm. What is wavelength of second light?

(1) 560 nm (2) 615 nm
(3) 415 nm (4) 712 nm

24. Identify the correct relation for the given diagram for frequency.



(1) $\nu_1 > \nu_2 < \nu_3$ (2) $\nu_2 = \nu_3 < \nu_1$
(3) $\nu_3 > \nu_2 > \nu_1$ (4) $\nu_1 = \nu_2 = \nu_3$

25. A particle is dropped from a height H. The de-Broglie wavelength of the particle as a function of height, just before it reaches the ground, is proportional to

(1) H (2) $H^{-1/2}$
(3) H° (4) $H^{1/2}$

26. There are two sources of light, each emitting with power of 100 W. One emits X-rays of wavelength 1 nm and other visible light at 500 nm. What is ratio of number of photons of X-rays to photons of visible light of given wavelength?

(1) $\frac{1}{200}$ (2) $\frac{1}{300}$
(3) $\frac{1}{400}$ (4) $\frac{1}{500}$

27. The drift velocity of free electron in a conductor is v_0 when the current i is following in it. If both radius and current are halved, the drift velocity will be

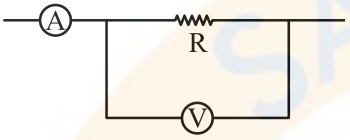
(1) $\frac{v_0}{2}$

(2) $4v_0$

(3) $2v_0$

(4) $\frac{v_0}{4}$

28. The ammeter A reads 4 A and the voltmeter V reads 40 V. The value of resistance R is (Assuming finite value of resistance of ammeter and voltmeter)



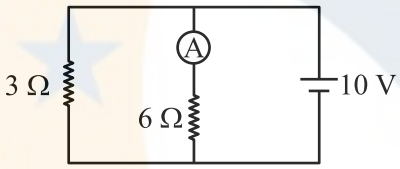
(1) Exactly 10 ohm

(2) Less than 10 ohm

(3) More than 10 ohm

(4) Information insufficient

29. In the given diagram, the reading of the ammeter is (when internal resistance of the battery is zero)



(1) $\frac{5}{3}A$ (2) $\frac{2}{3}A$

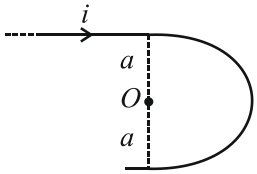
(3) $2A$ (4) $3A$

30. A charged particle of mass m and charge q travels on a circular path of radius r in a uniform perpendicular magnetic field B. The time taken by the particle to complete half revolution is

(1) $\frac{2\pi m}{qB}$ (2) $\frac{\pi m}{qB}$

(3) $\frac{q\pi}{mB}$ (4) $\frac{2\pi q}{mB}$

31. Magnetic field at point O due to the given structure is



(1) $\frac{\mu_0 i}{4a}\left(\frac{1}{\pi}+1\right)(-\hat{k})$ (2) $\frac{\mu_0 i}{2a}(-\hat{k})$

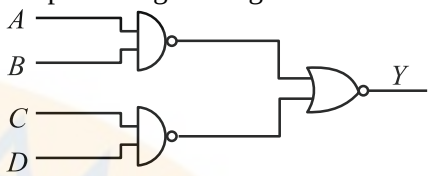
(3) $\frac{\mu_0 i}{2a}(\pi+1)\hat{k}$ (4) $\frac{\mu_0 i}{4a}(\pi+1)(-\hat{k})$

32. A galvanometer having a resistance 20 Ω is shunted by a wire of resistance 2 Ω. If total current is 2A. The part of it passing through the shunt is

(1) $\frac{10}{4}$ (2) $\frac{5}{6}$

(3) $\frac{20}{11}$ (4) $\frac{7}{6}$

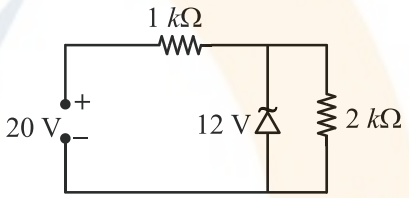
33. The output Y of given logic circuit is



(1) $AB + CD$ (2) $ABCD$

(3) $ABC + D$ (4) $\overline{A \cdot B} + CD$

34. In the given circuit, the current through the resistor 2k Ω is



(1) 2 mA (2) 4 mA

(3) 6 mA (4) 1 mA

35. In a p-n junction

(1) The potential of the p and n-sides becomes higher alternately

(2) The p-side is at higher electrical potential than the n-side

(3) The n-side is at higher electrical potential than the p-side

(4) Both the p and n-side are at the same potential

SECTION – B
(ATTEMPT ANY 10 QUESTIONS)

36. A magnet of magnetic moment M oscillating freely in earth's horizontal magnetic field makes n oscillations per minute. If the magnetic moment is doubled and the earth's horizontal field is also doubled, then number of oscillations made per minute would be

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

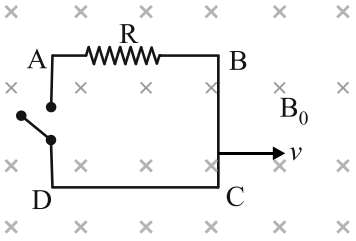
(3) $4\sqrt{2}n$ (4) $2\sqrt{2}n$

37. The rms value of current given by equation $I = (2 + 4\sin \omega t)$ A for a complete cycle is given by

(1) 2 A (2) 4 A

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

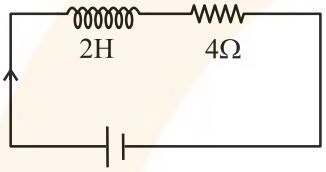
38. Magnetic field B_0 exists perpendicular inwards. The resistance of the loop is R. When the switch is made closed the current induced in the circuit is



(1) $\frac{B_0 \ell v}{R}$ (2) $\frac{3B_0 \ell v}{R}$

(3) $\frac{2B_0 \ell v}{R}$ (4) Zero

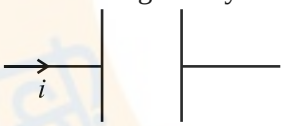
39. Consider the following electric circuit. At a given instant, the current through the battery is 2 A and increasing at a rate 1 A/s. The value of emf of the cell is (assume the cell to be ideal)



(1) 4 V (2) 2 V

(3) 6 V (4) 10 V

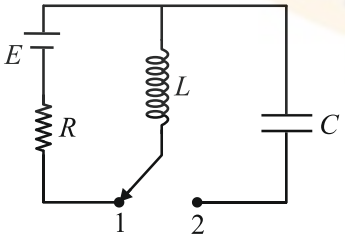
40. A parallel plate capacitor with circular plates of radius R is being charged with a current i as shown in the figure. At the instant shown, the displacement current between the place enclosed between $R/2$ and R is given by



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

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

41. Switch is in position 1 for a long time. At time $t = 0$, it is shifted to position 2. Find the maximum charge which will accumulate on capacitor



(1) $\left(\frac{\sqrt{C}}{L}\right)\frac{E}{R}$ (2) $\frac{E}{\left(\sqrt{2C}\right)R}$

(3) $\sqrt{(LC)}\frac{E}{R}$ (4) $\sqrt{\left(\frac{L}{C}\right)}\frac{E}{R}$

42. Three identical point masses, each of mass 1 kg lie in the x–y plane at points (0, 0) (0, 0.2 m) and (0.2 m, 0). The gravitational force on the mass at the origin is

(1) $1.67\times10^{-11}\left(\hat{i}+\hat{j}\right)N$

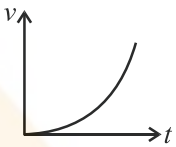
(2) $3.34\times10^{-10}\left(\hat{i}+\hat{j}\right)N$

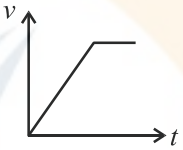
(3) $1.67\times10^{-9}(\hat{i}+\hat{j})\,\mathrm{N}$

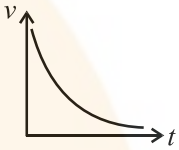
(4) $3.34\times10^{-10}(\hat{i}-\hat{j})\,\mathrm{N}$

43. A piece of cork starts from rest at the bottom of a lake and floats up. Its velocity v is plotted against time t. Which of the following best represents the resulting curve?

(1) 

(2) 

(3) 

(4) 

44. Two drops of equal radius are falling through air with a steady velocity of 5 cm/s. If the two drops coalesce, then its terminal velocity will be

(1) $4^{\frac{1}{3}}\times5$ cm/s

(2) $4^{\frac{1}{3}}$ cm/s

(3) $5^{\frac{1}{3}}\times4$ cm/s

(4) $4^{\frac{2}{3}}\times5$ cm/s

45. A tank of height 5 m is full of water. There is a hole of cross-sectional area 1 cm^2 in its bottom. The initial volume of water that will come out from this hole per second is ($g = 10\ m/s^2$)

(1) $10^{-3}\ m^3/s$

(2) $10^{-4}\ m^3/s$

(3) $10\ m^3/s$

(4) $10^{-2}\ m^3/s$

46. A body is revolving in a vertical circle with constant mechanical energy. The speed of the body at the highest point is $\sqrt{3rg}$. The speed of the body at the lowest position will be

(1) $\sqrt{6gr}$

(2) $3\sqrt{gr}$

(3) $\sqrt{7gr}$

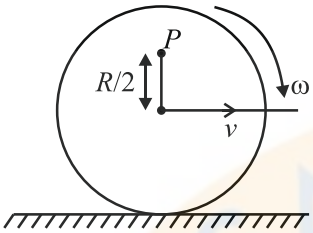
(4) $\sqrt{5gr}$

47. A force $F = (3x^2 + 2x + 1)\ N$ (where x is in metre) is acting on a body of mass 10 kg. The change in kinetic energy of the body when it moves from A (0,1,2) m to B (2, 0, 3) m, will be

(1) 12 J (2) 14 J

(3) 8 J (4) 16 J

48. A disc of mass m and radius R is rolling without slipping as shown in the figure. The velocity of the point P will be



(1) $\frac{3R\omega}{2}$ (2) $\frac{R\omega}{2}$

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

49. A billiards player hits a stationary ball by an identical ball to pocket the target ball in a corner pocket that is at an angle of 40° with respect to the direction of motion of first ball. Assuming the collision as elastic and friction and rotational motion are not important, the angle made by the target ball with respect to the incoming ball is

(1) 40°

(2) 50°

(3) 45°

(4) 60°

50. If 484 J of energy is spent in increasing speed of wheel from 60 rpm to 360 rpm, the moment of inertia of the wheel is

(1) 1.2 kg m^2

(2) 0.3 kg m^2

(3) 1.6 kg m^2

(4) 0.7 kg m^2

CHEMISTRY

SECTION - A

51. Which of the following will not show geometrical isomerism?

(1) pent-2-ene (2) hexa-2, 4-diene

(3) but-1-en-2-ol (4) pent-3-en-2-ol

52. Which one among the following is not a characteristic of equilibrium.

(1) Forward reaction rate and backward reaction rate become equal.

(2) Equilibrium carries a dynamic nature.

(3) At equilibrium amount of both products and reactants become fixed.

(4) At equilibrium reaction get stopped.

53. Which of the following reactions will define ΔH°_f?

(1) $C(\text{diamond}) + O_2(g) \rightarrow CO_2(g)$

(2) $(1/2)H_2(g) + (1/2)F_2(g) \rightarrow HF(g)$

(3) $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

(4) $CO(g) + (1/2)O_2(g) \rightarrow CO_2(g)$

54. At equilibrium which can't be zero

(1) E_{cell}

(2) ΔG_{cell}

(3) ΔS

(4) ΔG°_{cell}

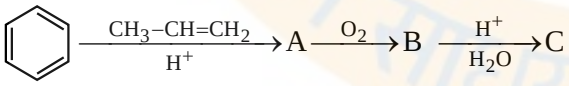
55. Molarity and molality of a solution of a liquid (mol. wt. = 50) in aqueous solution is 9 and 10 respectively. What is the density of solution?

(1) 1 g/cc

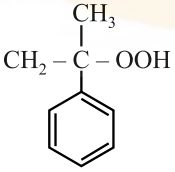
(2) 0.95 g/cc

(3) 1.05 g/cc

(4) 1.35 g/cc

56. 

Select the correct statement about above reaction:



(1) A is cumene (2) B is

(3) C is phenol (4) All are correct

57. All aldehydes reduces:

(1) Tollen's reagent

(2) Fehling solution

(3) Benedict solution

(4) All of the above

58. The rate of formation of B, $\left(\frac{d[B]}{dt}\right)$ is the following reaction with respect to A is

$3A \rightarrow 2B$

(1) $\frac{-3}{2}\frac{d[A]}{dt}$ (2) $\frac{-1}{2}\frac{d[A]}{dt}$

(3) $\frac{-1}{3}\frac{d[A]}{dt}$ (4) $\frac{-2}{3}\frac{d[A]}{dt}$

59. The potential energy of an electron in the He^+ ion is –12.08 eV. Indicate in which excited state, the electron is present:

(1) First (2) Second

(3) Third (4) Fourth

60. 24 g Mg metal reacts with water, then how many moles of H_2 will be liberated:

(1) 2 mol (2) 4 mol

(3) 3 mol (4) 1 mol

61. The equivalent weight of a metal is 4.5 and the molecular weight of its chloride is 80. The atomic weight of the metal is:

(1) 18 (2) 9

(3) 4.5 (4) 36

62. Which order is correct about acidity?

(1) $C_6H_5OH > C_6H_5COOH > CH_3COOH$

(2) $C_6H_5OH > CH_3COOH > C_6H_5COOH$

(3) $CH_3COOH > C_6H_5COOH > C_6H_5OH$

(4) $C_6H_5COOH > CH_3COOH > C_6H_5OH$

63. Correct order of stability of species

N_2, N_2^+, N_2^-

(1) $N_2 > N_2^+ = N_2^-$

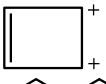
(2) $N_2 > N_2^+ > N_2^-$

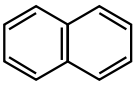
(3) $N_2 > N_2^- > N_2^+$

(4) $N_2^+ > N_2 > N_2^-$

64. Which of the following is antiaromatic species?

(1) 

(2) 

(3) 

(4) 

65. The IUPAC name of the given compound is

$$\begin{array}{l} CH_2-CH-CH_2 \\ | \quad\quad | \quad\quad | \\ CN \quad\; CN \quad CN \end{array}$$

(1) 1, 2, 3-tricyanopropane
(2) 2-cyanopentane initrile
(3) 1, 3-dicarbonitrile propane
(4) Propane-1,2,3-tricarbonitrile

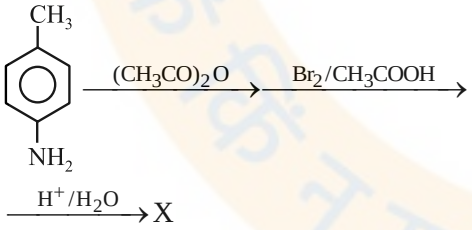
66. Excess nitrate in drinking water can cause a disease called
(1) Mottling of teeth
(2) Liver damage
(3) Blue baby syndrome
(4) Skin disease

67. Arrange the following in order of increasing masses:
(i) 1 molecule of oxygen
(ii) 1 atom of nitrogen
(iii) 1 mol of water
(iv) 1×10^{-10} g of iron
(1) ii < i < iii < iv (2) i < ii < iv < iii
(3) ii < i < iv < iii (4) i < ii < iii < iv

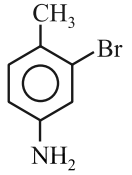
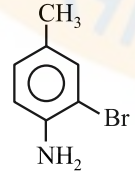
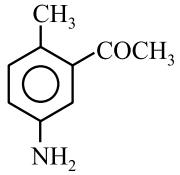
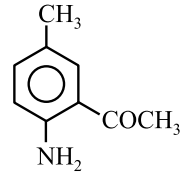
68. The olefin which on ozonolysis gives CH_3CH_2CHO and CH_3CHO is:
(1) 1-butene (2) 2-butene
(3) 1-pentene (4) 2-pentene

69. The percentage increase in temperature of gas when it is heated at constant pressure to increase the volume by 30% is
(1) 20% (2) 30%
(3) 23.08% (4) 40.15%

70.



What is X?

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

71. Which of these are polysaccharides of glucose?
(1) Starch
(2) Cellulose
(3) Glycogen
(4) All of these

72. The reaction $3ClO^-_{(aq)} \rightarrow ClO^-_{3(aq)} + 2Cl^-_{(aq)}$ is an example of:
(1) Oxidation Reaction
(2) Reduction Reaction
(3) Disproportionation
(4) Decomposition Reaction

73. Among the following the weakest base is:
(1) $C_6H_5CH_2NH_2$ (2) $C_6H_5CH_2NHCH_3$
(3) $O_2N–CH_2NH_2$ (4) CH_3NHCHO

74. In the following reaction,

$$CH_3CH_2COOH \xrightarrow[\text{Red P}]{Br_2} \text{'X'} \xrightarrow{NH_3(alc.)} \text{'Y'}$$

The product 'Y' is:
(1) Lactic acid (2) Alanine
(3) Ethylamine (4) Propylamine

75. Which of the following order of size is correct:
(1) $K^+ > Ca^{+2} > S^{-2} > Cl^-$
(2) $Fe > Fe^{+2} < Fe^{+3}$
(3) $O^{+2} > O^+ > O^- > O^{-2}$
(4) $Na^+ < Ne < F^- < O^{-2}$

76. Which of the following statement are true and false?
(a) In PCl_5 hybridisation is sp^3d and it has a trigonal pyramidal structure.
(b) The angle between the P-Cl bonds is 90°, which is same for all the P and Cl present in PCl_5
(c) The bond length of P-Cl in axial position is higher than in equatorial position
(d) PCl_5 have zero dipole moment
Choose the correct option.
(1) TFTT (2) FTTT
(3) FFTT (4) TFFT

77. The solubility of AgCl at 20°C is 1.435×10^{-3} g/L. The solubility product is:
(1) 1.0×10^{-10} (2) 2.05×10^{-6}
(3) 1.035×10^{-5} (4) 108×10^{-3}

78. The intermediate during the addition of HCl to propene in the presence of peroxide is:
(1) $CH_3\overset{\bullet}{C}HCH_2Cl$
(2) $CH_3\overset{+}{C}HCH_3$
(3) $CH_3CH_2\overset{\bullet}{C}H_2$
(4) $CH_3CH_2\overset{+}{C}H_2$

79. Select the incorrect statement about ozone.
(1) Its formation is endothermic
(2) During its formation from oxygen entropy increases
(3) Its pure liquid form is dark blue
(4) It is thermodynamically unstable

80. If NaCl is doped with 10^{-5} mol% of $SrCl_2$, the concentration of cation vacancies will be:
($N_A = 6.02 \times 10^{23}$ mol^{-1})
(1) 6.02×10^{23} mol^{-1} (2) 6.02×10^{16} mol^{-1}
(3) 6.02×10^{27} mol^{-1} (4) 6.02×10^{14} mol^{-1}

81. Which of the following complex show G.I.?
(1) $[Ma_4]$ (2) $[Ma_5b]$
(3) $[Ma_4b_2]$ (4) $[M(AA)_2]$

82. In the metallurgy of iron, when limestone is added to the blast furnace, the calcium ions end up in:
(1) Calcium silicate (slag)
(2) Gangue
(3) Metallic calcium
(4) Calcium carbonate

83. $CH_3CH_2Cl \xrightarrow{NaCN} (X) \xrightarrow{Ni/H_2} (Y)$
$\xrightarrow[\text{Acetic anhydride}]{} (Z)$
(Z) in the above reaction sequence is:
(1) $CH_3CH_2CH_2NHCOCH_3$
(2) $CH_3CH_2CH_2NH_2$
(3) $CH_3CH_2CH_2CONHCH_3$
(4) $CH_3CH_2CH_2CONHCOCH_3$

84. Hydrogen gas diffuse $3\sqrt{3}$ times to that of a hydrocarbon (C_nH_{2n-2}), under identical conditions of temperature and pressure, n is
(1) 2 (2) 3
(3) 4 (4) 5

85. The boiling point of noble gas are illustrative of the operation of forces of the types:
(1) Ion-dipole
(2) Dipole-induced dipole
(3) Ion-induced dipole
(4) London dispersion forces

SECTION – B
(ATTEMPT ANY 10 QUESTIONS)

86. For which of the following equilibrium $K_P > K_C$.
(1) $2SO_2(g) + O_2 \rightleftharpoons 2SO_3(g)$
(2) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$
(3) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$
(4) $C_2H_5OH(aq) + CH_3COOH(aq) \rightleftharpoons CH_3COOC_2H_5(aq) + H_2O(aq)$

87. The attacking reagent of Nitration of benzene is
(1) NO_2 (2) $NO_2^{\oplus}$
(3) $NO_3^{\ominus}$ (4) NO_2^{+}

88. One mole of an ideal gas at 300 K is expanded isothermally from initial volume of 1 L to 10 L. The ΔU for this process is (R = 2 cal mol^{-1} K^{-1}).
(1) 163.7 cal (2) zero
(3) 138.1 cal (4) 9 L atom

89. By which of the following purest form of hydrogen is obtained:
(1) $CaH_2 + H_2O$
(2) Al + KOH
(3) Electrolysis of water using the impurities of $Ba(OH)_2$
(4) All of these

90. The resistance of 0.5 M solution of an electrolyte in a cell was found to be 50 Ω. If the electrodes in the cell are 2.2 cm apart and have an area of 4.4 cm^2 then the molar conductivity (in S m^2 mol^{-1}) of the solution is
(1) 0.2 (2) 0.02
(3) 0.002 (4) None of these

91. Mark the IUPAC name of given complex $[Cr(NH_3)_3(H_2O)_3]Cl_3$
(1) Triamminetriaquachromate(III)chloride.
(2) Triaquatriaminechromium(III)chloride.
(3) Triamminetriaquachromium(III) chloride.
(4) All of these.

92. If dipole moment of $NX_3 > NY_3$ and bond angle of $NX_3 > NY_3$ then which of the following is correct:
(1) 'X' may be 'F' & 'Y' may be hydrogen
(2) 'X' may be 'H' & 'Y' may be 'F'
(3) 'X' may be 'F' & 'Y' may be Cl
(4) None of these

93. Which of the following will act as only oxidising agent?
(1) HNO_2 (2) $KMnO_4$
(3) H_2O_2 (4) SO_2

94. If 70% of a first order reaction was completed in 52 minutes, 50% of the same reaction would be completed in approximately (log 3 = 0.47)
(1) 30 minutes (2) 42 minutes
(3) 40 minutes (4) 52 minutes

95. Values of successive ionisation energy of element 'x' is:

IE_1	IE_2	IE_3	IE_4	IE_5	(KJ/mol)
140	360	570	920	2240	

Incorrect statement is:
(1) 'X' has four valence electron
(2) 'X' is in 4th group
(3) X is a p-block element
(4) 'X' forms XO_2 type oxide

96. The radius of second stationary orbit in Bohr's atom is R. The radius of 3rd orbit will be:
(1) 9R (2) $\frac{R}{4}$
(3) $\frac{9R}{4}$ (4) 2R

97. Which of the following is an example of absorption?

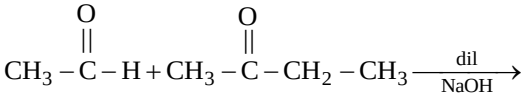
(1) Water on silica gel
(2) Water on calcium chloride
(3) Hydrogen on finely divided nickel
(4) Oxygen on metal surface

98. The common oxidation states of group 15^{th} elements are –3, +3 and +5, the stability of –3 oxidation state decreases down the group due to

A. inert pair effect
B. increase in size
C. increase in metallic character

(1) A only (2) A, B and C
(3) B and C only (4) A and B only

99. How many types of aldols are formed in following reaction:



(1) 2 (2) 4
(3) 6 (4) 8
(Consider only structural not stereo)

100. The freezing point (°C) of a solution containing 0.1 g of $K_3[Fe(CN)_6]$ (molecular weight 329) in 100 g of water
(K_f = 1.86 K kg mol^{-1}):

(1) -2.3×10^{-2} (2) -5.7×10^{-2}
(3) -5.7×10^{-3} (4) -1.20×10^{-2}

BOTANY

SECTION – A

101. Growth cannot be taken as defining property of living organisms because
(1) Non-living objects also exhibit growth by accumulation of material on them
(2) Unicellular organisms do not show growth
(3) Only few multicellular organisms show growth
(4) Growth and reproduction are mutually inclusive events in all organisms

102. Cell wall is impregnated with silica in
(1) Diatoms (2) Dinoflagellates
(3) Slime moulds (4) Euglenoids

103. Member of Monera that completely lack a cell wall is
(1) *Anabaena* (2) *Mycoplasma*
(3) *Thermoplasma* (4) *Vibrio*

104. Which one is **odd** w.r.t. sporophyte of bryophytes?
(1) Foot (2) Seta
(3) Capsule (4) Gemmae

105. Stored food material in brown algae is
(1) Oil and proteins
(2) Mannitol and laminarin
(3) Starch only
(4) Floridean starch

106. Whorled phyllotaxy is present in
(1) *Alstonia* (2) *Calotropis*
(3) China rose (4) Sunflower

107. Endarch type of arrangement of xylem
(1) Is seen in roots
(2) Is found in primary xylem
(3) Has protoxylem towards the periphery
(4) Lacks metaxylem

108. The innermost layer of cortex is called
(1) Epidermis (2) Endodermis
(3) Hypodermis (4) Pericycle

109. The endoplasmic reticulum that does **not** bear ribosomes on its surface
(1) Is the major site of lipid synthesis
(2) Gives rise to RER
(3) Forms lysosomes
(4) Forms glycoproteins and glycolipids

110. A unique feature of prokaryotic cell is the presence of
(1) 70 S ribosomes
(2) Chitinous cell wall
(3) Naked genetic material, not enveloped by nuclear membrane
(4) Double stranded DNA

111. Which of the following phase(s) is/are characterised by splitting of centromere?
(1) Mitotic anaphase and anaphase I
(2) Meiotic anaphase I and anaphase II
(3) Mitotic anaphase and anaphase II
(4) Mitotic metaphase and metaphase II

112. Which of the following is **incorrect** about facilitated diffusion?
(1) Requirement of membrane proteins
(2) Uphill transport
(3) No requirement of energy
(4) Highly selective in nature

113. Deficiency of which mineral first appears in young leaves?
(1) Nitrogen (2) Calcium
(3) Potassium (4) Phosphorus

114. First action spectrum of photosynthesis was described by
(1) T.W. Engelmann (2) Julius von Sachs
(3) Joseph Priestley (4) Jan Ingenhousz

115. Which of the given is major limiting factor influencing the rate of photosynthesis?
(1) Light intensity
(2) CO_2 concentration
(3) Temperature
(4) Water

116. Which of the given respiratory substrate has respiratory ratio equal to unity?
(1) Carbohydrate (2) Protein
(3) Oxalic acid (4) Tripalmitin

117. TCA cycle takes place in
(1) Inner membrane of mitochondria
(2) Matrix of mitochondria
(3) Nucleoplasm
(4) Peroxisome

118. Arithmetic growth rate in plants can be expressed mathematically by which of the given equations?
(1) $L_t = L_0 + rt$ (2) $W_1 = W_0e^{rt}$
(3) $L_t = L_0e^{rt}$ (4) $L_t = L_0 \times rt$

119. Formation of the structure called vital link between two successive generations
(1) Is a pre-fertilisation event
(2) Is absent in sexual reproduction
(3) Occur inside the body in case of internal fertilization
(4) Is absent in unicellular organisms.

120. In a pollen grain, sporopollenin is absent in all, **except**
(1) Germ pore
(2) Intine
(3) Exine
(4) Cytoplasm

121. The largest cell of the embryo sac initially contains
(1) 1 nucleus
(2) 2 nuclei
(3) 8 nuclei
(4) 7 nuclei

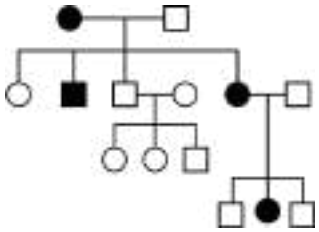
122. Pollination by water is seen in
(1) Bamboo
(2) *Vallisneria*
(3) *Eichhornia*
(4) *Yucca*

123. Which of the following traits of pea plant **cannot** express itself in heterozygous condition?
(1) Yellow pod
(2) Axial flower
(3) Inflated pod
(4) Yellow seed

124. What is the phenotypic ratio of recombinants in F_2 generation in Mendel's dihybrid cross on pea plant?
(1) 9: 3: 3: 1
(2) 3: 1
(3) 1: 1
(4) 1: 3

125. A dihybrid cross is
(1) ttRr × ttRr
(2) Ttrr × Ttrr
(3) ttrr × ttrr
(4) TtRr × TtRr

126. Given pedigree chart does not shows the inheritance of trait like



(1) Autosomal recessive trait
(2) X-linked recessive trait
(3) Autosomal dominant trait
(4) X-linked dominant trait

127. Colour blindness is a/an
(1) X-linked recessive disorder
(2) X-linked dominant disorder
(3) Autosomal recessive disorder
(4) Autosomal dominant disorder

128. The sickle-cell anemia is caused by substitution of
(1) Valine (Val) by Glutamic acid (Glu) at the sixth position of β-chain of haemoglobin
(2) Glutamic acid (Glu) by Valine (Val) at the sixth position of β-chain of haemoglobin
(3) Valine (Val) by Glutamic acid (Glu) at the first position of β-chain of haemoglobin
(4) Glutamic acid (Glu) by Valine (Val) at the first position of β-chain of haemoglobin

129. The entire collection of diverse alleles for all genes, of a given crop is called
(1) Selection of parents
(2) Germplasm collection
(3) Cross hybridisation
(4) Commercialisation of new cultivars

130. Swiss cheese is ripened with the help of
(1) *Lactobacillus*
(2) Yeast
(3) *Propionibacterium*
(4) *Penicillium*

131. Organisms which can tolerate a wide range of temperature and which are restricted to narrow range of salinity are respectively called
(1) Eurythermal and euryhaline
(2) Eurythermal and stenohaline
(3) Stenothermal and euryhaline
(4) Stenothermal and stenohaline

132. Pyramid of biomass in grassland ecosystem
(1) Is inverted or spindle shaped
(2) Has producers placed on the top
(3) Includes species belonging to two or more trophic levels
(4) Is upright

133. Among the vertebrates, maximum diversity is of
(1) Fishes (2) Birds
(3) Amphibians (4) Reptiles

134. All of the following are direct economic uses or narrowly utilitarian services of biodiversity, **except**
(1) Food
(2) Fiber
(3) Industrial products
(4) Oxygen

135. Which of the given is **not** a greenhouse gas?
(1) CH_4 (2) CFC
(3) CO_2 (4) NH_3

SECTION - B
(ATTEMPT ANY 10 QUESTIONS)

136. All of the following have locomotory structures, **except**
(1) *Paramoecium* (2) *Entamoeba*
(3) *Trypanosoma* (4) *Plasmodium*

137. Pigments present in green algae are
(1) Chlorophyll a and b
(2) Chlorophyll a and c
(3) Chlorophyll a and d
(4) Chlorophyll a only

138. Prop roots are found in
(1) Banyan tree (2) Maize
(3) Sugarcane (4) *Rhizophora*

139. Algal cell wall is made up of all the following materials, **except**
(1) Chitin (2) Galactans
(3) Cellulose (4) Calcium carbonate

140. The event which occurs in diplotene of prophase I is
(1) Terminalisation of chiasmata
(2) Recombination of genetic material
(3) Synapsis of chromosomes
(4) Dissolution of synaptonemal complex

141. Choose the **odd** one w.r.t. chief sink for mineral elements.
(1) Apical meristem (2) Mature leaves
(3) Young leaves (4) Developing fruits

142. Nitrogen fixation is
(1) $N_2 \rightarrow NO_3^-$ (2) $NO_3^- \rightarrow NO_2^-$
(3) $N_2 \rightarrow NH_3$ (4) $NH_3 \rightarrow NO_2^-$

143. The primary CO_2 acceptor molecule during C_3 – cycle is
(1) 5-C ketose sugar
(2) 5-C aldose sugar
(3) 3-C ketose sugar
(4) 3-C aldose sugar

144. Which of the given plant hormone is known as 'stress hormone'?
(1) Auxin (2) Kinetin
(3) Abscisic acid (4) Ethylene

145. The synergid cells
(1) Are present at chalazal end of embryo sac
(2) Do not contain filiform apparatus
(3) Are the sites where male gametes are discharged from pollen tube
(4) Are diploid in nature

146. Presence of more than two alleles for a gene is known as
(1) Co-dominance
(2) Pleiotropy
(3) Multiple allelism
(4) Incomplete dominance

147. Trisomy of sex chromosome results in
(1) Down's syndrome
(2) Klinefelter's syndrome
(3) Turner's syndrome
(4) Cystic fibrosis

148. Exponential growth
(1) Occurs under limited resources
(2) Has J-shaped curve
(3) Shows asymptote at carrying capacity
(4) Is the realistic demonstration of growth of most organisms

149. Some of the water-soluble substances present in decomposing detritus go down into the soil horizon and get precipitated there. This process is called
(1) Anabolism (2) Leaching
(3) Fragmentation (4) Humification

150. "A water body 'X' has very high BOD." It indicates that it is/has
(1) High amount of dissolved oxygen
(2) Suitable for growth of aquatic organisms
(3) High polluting potential
(4) No organic matter in it

ZOOLOGY

SECTION - A

151. What is **true** about Balanoglossus, Sepia and Antedon?

(1) All belongs to same phylum
(2) All possess water vascular system
(3) All exhibit radial symmetry
(4) All possess true coelom

152. Unlike echinoderms, the annelids show

(1) Presence of true coelom
(2) Radial symmetry
(3) Presence of water vascular system
(4) Presence of metamerism

153. Choose the **correct** statement w.r.t. *Periplaneta*

(1) In males, genital pouch is bounded dorsally by 9^{th} and 10^{th} sterna and ventrally by the 9^{th} tergum
(2) Brain is represented by sub-oesophageal ganglion
(3) In male, a pair of testes lying on each lateral side in 2^{nd} – 6^{th} abdominal segments
(4) In female, a pair of spermatheca are present in the 6^{th} abdominal segment.

154. Choose the **mismatch** w.r.t. *Periplaneta*.

(1)	Phallic gland	Paired gland present in male cockroach
(2)	Collaterial gland	Paired gland present in female cockroach
(3)	Anal cerci	Paired, jointed structures, present in both male and female cockroach
(4)	Forewings	Cover the hind wings and are not used in flight

155. Which of the following is **correct** set of glands that secrete inactive enzymes?

(1) Gastric gland, Pancreas
(2) Pancreas, Intestinal glands
(3) Gastric glands, Gall bladder
(4) Pancreas, Gall bladder

156. Which of the following statements is not true w.r.t. regulation of respiration?

(1) Respiratory rhythm centre is primarily responsible for regulation of respiration
(2) Pneumotaxic centre can reduce the duration of inspiration to alter the respiratory rate
(3) Chemosensitive area in medulla oblongata is highly sensitive to CO_2 and hydrogen ions
(4) The role of pH in the regulation of respiratory rhythm is quite insignificant.

157. A unique vascular connection exists between the digestive tract and liver. The blood vessel carries blood from __A__ to __B__ organ before delivered to systemic circulation. Here A and B are

	A	B
(1)	Liver	Intestine
(2)	Kidney	Heart
(3)	Intestine	Liver
(4)	Heart	Liver

158. Select a hormone secreted by some tissues / organs which **not** categorized under organized endocrine glands

(1) Rennin
(2) Cortisol
(3) ANF
(4) Aldosterone

159. Which of the following structures is **incorrectly** matched with their description?

	Structures	Description
(1)	Smooth muscles	Unstriated and involuntary
(2)	Cartilaginous joints	Bones involved are joint together with the help of dense fibrous connective tissue
(3)	Pectoral girdle	Help in the articulation of upper limbs with axial skeleton
(4)	Thoracic vertebrae	Forms rib cage together with ribs and sternum

160. To restore the resting potential at the site of excitation in neuron, __A__ ions diffuse within fraction of second on __B__ side of membrane. Choose the option that **correctly** fill the blanks A and B respectively.

	A	B
(1)	Na^+	In
(2)	K^+	In
(3)	Na^+	Out
(4)	K^+	Out

161. All of the following hormones influence the glucose metabolism, **except**

(1) Epinephrine
(2) Cortisol
(3) Insulin
(4) Aldosterone

162. Which of the following pairs of hormones have receptors on the cell membrane of the target cells?

(1) Epinephrine, glucagon
(2) Thyroxine, progesterone
(3) Insulin, cortisol
(4) PRL, estradiol

163. Which of the following events is **not** included in pre-fertilization and fertilization events in human?

(1) Transportation of ovum and sperms simultaneously to the ampullary region of the fallopian tube
(2) Fusion of a sperm with an ovum
(3) Formation of a haploid ootid by second meiotic division
(4) Implantation of blastocyst in endometrium of the uterus

164. If a human male ejaculates about 250 millions sperms during a coitus, how many of them must show vigorous motility for normal fertility?

(1) 150 millions (2) 100 millions
(3) 60 millions (4) 120 millions

165. In assisted reproductive technology, AI involves

(1) Transfer of ovum into fallopian tube
(2) *In-vivo* fertilisation
(3) *In-vitro* fertilisation
(4) Transfer of zygote into fallopian tube

166. Which of the following contraceptive method has composition and mode of action similar to that of pills but are effective for much longer time period?

(1) Multiload 375 (2) Implants
(3) Condoms (4) Lippes loop

167. Which of the following is **not** true about evolution of man?

(1) *Homo erectus* existed in Java about 5 mya
(2) Neanderthal man lived in near east and central Asia between 1,00,000-40,000 years back
(3) *Homo sapiens* arose during ice age between 75,000-10,000 years ago
(4) Agriculture came around 10,000 years back

168. Identify the below given diagram and choose the **correct** option about it.

(1) Shows variety of beaks of Darwin's finches
(2) Shows adaptive convergence
(3) Shows analogy
(4) Shows convergent evolution

169. Pneumonia differs from Typhoid in that

(1) Pneumonia is a bacterial disease while typhoid is a viral disease
(2) Pneumonia spreads by droplets released from infected person whereas typhoid spreads through contaminated food and water
(3) Pneumonia is a communicable disease whereas typhoid is STD
(4) Pathogen of pneumonia infects the lungs whereas that of typhoid affect nose and respiratory passage

170. Which of the following statements is **correct** for acquired immunity?

(1) B-lymphocytes are responsible for cell mediated immunity
(2) All types of antibodies have only two light chains and four heavy chains
(3) T-cells are essential for cell mediated immune response and also stimulated humoral immune response
(4) B-lymphocytes are not responsible for anamnestic response

171. Select the option that involves crossing between two different breeds to develop breed which may be superior to existing breeds.

(1) Inbreeding
(2) Out-crossing
(3) Cross-breeding
(4) Interspecific hybridisation

172. Insertional inactivation of which of the following selectable marker facilitate identification of recombinants and non-recombinants by blue-white screening?

(1) Gene for β-galactosidase
(2) Ampicillin resistance gene
(3) Tetracycline resistance gene
(4) Kanamycin resistance gene

173. Recombinant DNA can be directly injected into the nucleus of an animal cell by
(1) Microinjection method
(2) Biolistic or gene gun method
(3) Heat shock method
(4) Disarmed plasmid of *Agrobacterium tumefaciens*

174. Adenosine deaminase (ADA) deficiency, a genetic defect can be cured temporarily by all of the following treatments, **except**
(1) Bone marrow transplantation
(2) Enzyme replacement therapy
(3) Periodic infusion of genetically engineered lymphocytes having functional ADA cDNA
(4) Oral intake of adenosine deaminase tablets

175. Which of the following statements is **incorrect** w.r.t. molecular diagnosis?
(1) PCR is now routinely used to detect HIV in suspected AIDS patients
(2) PCR is a powerful technique to identify all inborn diseases
(3) ELISA is based on the principle of antigen-antibody interaction
(4) Recombinant DNA technology serves the purpose of early diagnosis

176. Read the following statements and choose the **correct** option.
(A) Lymph vessel called lacteal is present in mucosa of small intestine
(B) Amino acids and glucose are actively absorbed in small intestine
(1) (A) and (B) both are correct
(2) (A) and (B) both are incorrect
(3) Only (A) is incorrect
(4) Only (B) is incorrect

177. What will be the pCO_2 and pO_2 in the oxygenated blood as compared to those in the deoxygenated blood?
(1) pCO_2 lesser, pO_2 higher
(2) pCO_2 higher, pO_2 lesser
(3) pCO_2 higher, pO_2 higher
(4) pCO_2 lesser, pO_2 lesser

178. Match Column-I with Column-II and choose the **correct** answer.

	Column-I		Column-II
(a)	SAN	(i)	Heart stops beating
(b)	Purkinje fibres	(ii)	Atherosclerosis
(c)	Cardiac arrest	(iii)	Pacemaker
(d)	CAD	(iv)	Ventricular musculature

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

179. In hemodialysis, dialyzing fluid contains all the constituents as in plasma, **except**
(1) NaCl (2) Urea
(3) H_2O (4) K^+

180. Skeletal muscle fibres are classified as red and white fibres, based primarily on the amount of __A__ in them. Choose the option that **correctly** fills the blank.
(1) Mitochondria
(2) Myoglobin
(3) Sarcoplasmic reticulum
(4) ATP

181. Insufficient quantity of vitamins in diet affect directly formation of all **except**
(1) NAD
(2) FAD
(3) Flavin mononucleotide
(4) Lipids

182. The biomolecule that cannot be hydrolysed further is
(1) Inulin (2) Insulin
(3) Lactose (4) Glucose

183. Select the **incorrect** statement about electrical synapses.
(1) They are rare in our system
(2) Impulse transmission is faster as compared to a chemical synapse
(3) Pre and post synaptic membranes possess a wide gap between them
(4) Neurotransmitters are absent at these synapses

184. Which set of structures share similar ploidy levels?
(1) Spermatogonia, ovum
(2) Spermatid, secondary oocyte
(3) Ootid, primary oocyte
(4) Spermatozoa, primary spermatocyte

185. During electrophoresis, the separated bands of DNA are cut out from the agarose gel and extracted from the gel piece. This is called
(1) elution
(2) degradation
(3) polymerization
(4) denaturation.

SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

186. Cuboidal epithelium is **not** present in
(1) Fallopian tubes
(2) PCT of nephron
(3) Ducts of glands
(4) DCT of nephron

187. Choose the **correct** statement for benign tumors.
(1) Cells are loosely arranged so easily dislodge
(2) Remains confined to their original location
(3) Invade and damage the surrounding normal tissues and are highly fatal
(4) Starving the normal cells and also show property of metastasis

188. Which of the following statements is **incorrect**?
(1) PNS Consists of afferent and efferent nerve fibres
(2) Nodes of Ranvier are exclusively found in myelinated nerve fibres
(3) Blind spot and yellow spot are present in inner layer of wall of the eye ball
(4) Posterior portion of sclera is called cornea

189. Which of the following hormone stimulates glycogenolysis and gluconeogenesis?
(1) Insulin (2) Glucagon
(3) Aldosterone (4) LH

190. Which of the given steps of PCR involve enzyme *Taq* polymerase that adds new nucleotide?
(1) Denaturation (2) Annealing
(3) Extension (4) Primer attachment

191. In which of the following natural selection, more individuals acquire value other than the mean character value?
(1) Stabilising
(2) Directional
(3) Disruptive
(4) Balancing

192. Choose the **mismatch**.

(1)	Cleavage	Mitotic division in zygote
(2)	Inner cell mass	Group of cells attached to trophoblast on the inner side
(3)	hPL	Secreted by ovary
(4)	Placenta	Facilitate the supply of oxygen and nutrients to embryo

193. A large haploid secondary oocyte and a tiny first polar body can be seen in
(1) Primary oocyte
(2) Primary follicle
(3) Secondary follicle
(4) Tertiary follicle

194. The most distinctive feature of echinoderms is the presence of water vascular system which helps in all **except**
(1) Locomotion
(2) Respiration
(3) Capture and transport of food
(4) Generation of nerve impulse

195. Saheli is a type of oral contraceptive pill for females.
(1) A non-steroidal preparation which prevents ovulation
(2) Contains only progesterone which prevents implantation
(3) A steroidal preparation which prevents both ovulation and implantation
(4) A non-steroidal preparation which prevents implantation

196. Select the **incorrect** match w.r.t. hormones, their source and function.

	Hormone	**Source**	**Function**
(1)	Gastrin	Stomach	HCl secretion
(2)	CCK	Stomach	Contraction of gall bladder
(3)	Secretin	Duodenum	Secretion of bicarbonate ions from pancreas
(4)	GIP	Duodenum	Inhibits gastric motility and gastric secretion

197. In which biomolecule is peptide bond likely to be found?
(1) Collagen (2) Chitin
(3) Cellulose (4) Choline

198. Zwitterion form is one at which the monomeric form of proteins exists as electrically neutral moiety at a specific pH. This is true for
(1) Trihydroxypropane (2) Amino acids
(3) DNA (4) RNA

199. The conduction system of human heart does not include

(1) SA node

(2) AV node

(3) Mitral valve

(4) Purkinje fibres

200. Fill up the blanks.

I. *Agrobacterium* vectors are used to introduce __A__ specific genes into the host plant.

II. RNAi occurs in all eukaryotic organisms as a method of __B__.

III. The genes __C__ and __D__ control cotton bollworms.

IV. __E__ has been introduced in *Bt* corn to prevent infection corn borer.

A to E in above statements can be–

(1) A-fungal, B-pest resistance, C-*cry* IAb, D-*cry* IIAb, *E*-*cry* IAc

(2) A-nematode, B-protection against nematodes, C-*cry* IAc, D-*cry* IIAb, E-*cry* IAb

(3) A-nematode, B-cellular defence, C-*cry* IIAb, D-*cry* IAc, E-*cry* IAb

(4) A-Virus, B-Protection against viral infection, C-*cry* IAc, D-*cry* IIAb, E-*cry* IIAc.