Dated : 18-04-2023

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Test Series [Option-1] for NEET-2023

MM : 720 **Time : 3 hrs. 20 min.**

Mock Test

PHYSICS : SECTION-A

All questions are compulsory in section A

1. Force between two poles of strength 1Am each placed at a distance of one metre in vacuum is

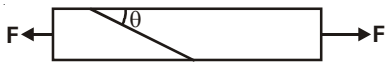
(1) 1 N (2) $\frac{10^{-7}}{4\pi}$ N

(3) 10^{-7} N (4) $4\pi \times 10^{-7}$ N

2. The decimal equivalent of 1/20 upto three significant figures is

(1) 0.0500 (2) 0.05000

(3) 0.0050 (4) 5.0×10^{-2}

3. 

Consider a cross-section making an angle θ with the length of a steel bar under tensile forces as shown. The shear stress on this plane is maximum for θ =

(1) 0° (2) 90°

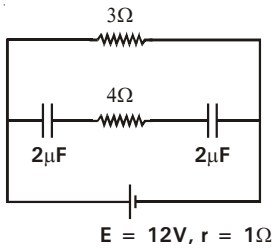
(3) 45° (4) 60°

4. In a refrigerator, the low temperature coils are at a temperature of – 13°C and the compressed gas in the condenser has a temperature of 17°C. The theoretical coefficient of performance is

(1) 9.2 (2) 6.8

(3) 7.6 (4) 8.7

5. In the circuit shown, energy stored in each capacitor in steady state is



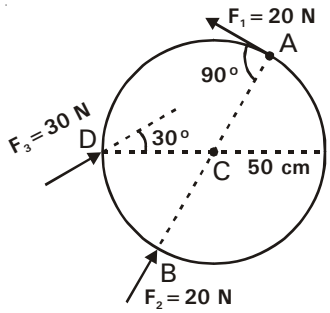
(1) 18.25 μJ (2) 20.25 μJ

(3) 25.5 μJ (4) 32.75 μJ

6. A car is moving with speed 30 m/s towards a hill sounding a horn of frequency 500 Hz. Speed of sound in air is 320 m/s. Frequency of the reflected sound as heard by a person in the car is about

(1) 640 Hz (2) 520 Hz

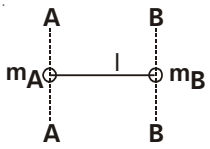
(3) 560 Hz (4) 600 Hz

7. 

A wheel of radius 20 cm has forces applied to it as shown in the above figure. What is net torque about point C?

(1) 2.5 Nm anticlockwise (2) 2 Nm clockwise

(3) 17.5 Nm anti clockwise (4) 3 Nm clockwise

8. 

A point mass m_A is connected to a point mass m_B by a massless rod of length l as shown in the figure. It is observed that the ratio of the moment of inertia of the system about the two axes BB and AA, which is parallel to each other and perpendicular to the rod is $\frac{I_{BB}}{I_{AA}} = 3$. The distance of the centre of mass of the system from the mass A is

(1) (3/4) l (2) (2/3) l
(3) (1/2) l (4) (1/4) l

9. A charged particle is projected in a magnetic field of $\left(2\hat{i} + 3\hat{j}\right)$ tesla and its acceleration is found to be $\left(\hat{i} + x\hat{j}\right)$ m/s^2. The value of x is

(1) 1.8 (2) –0.75
(3) –0.67 (4) 1.5

10. An incompressible fluid flows steadily through a cylindrical pipe which has radius 2r at point A and radius r at B further along the flow direction. If the pressure at point A is P_A and that at point B is P_B then

(1) $P_A = P_B$ (2) $P_A = 4P_B$
(3) $P_A = P_B/4$ (4) $P_A > P_B$

11. A radioactive isotope has a mean life of 20 years. How long will it take the activity to reduce to about 3% of its original value?

(1) 100 years (2) 83 years
(3) 70 years (4) 120 years

12. **Statement-I** : The induced e.m.f. and current will be same in two identical loops of copper and aluminium, when rotated with same speed in the same magnetic field.
Statement-II : When two coils are wound on each other, the mutual induction between the coils is high.

(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

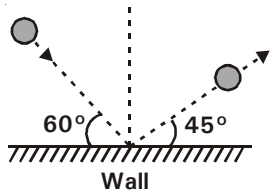
13. A very long solenoid has $6/\pi$ turns per cm length. A current of 5A flows through it. The magnetic field induction at one end of the solenoid on the axis is

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

14. 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 current must he keep the boat moving.

(1) 45° (2) 135°
(3) 60° (4) 120°

15. A ball strikes a wall making angle 60° with the wall and rebounds at angle of 45° with the wall. The coefficient of restitution is



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

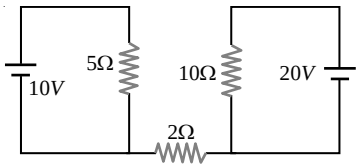
16. A geostationary satellite is lifted to an orbit with four times the initial radius. Its time period in the new orbit is

(1) 192 hours (2) 72 hours
(3) 96 hours (4) 48 hours

17. A free body of mass 5kg at rest is acted upon simultaneously by two forces 24 N and 32 N at right angles to each other. The kinetic energy of the body at the end of 10 s is

(1) 8 kJ (2) 16 kJ
(3) 10 kJ (4) 12.5 kJ

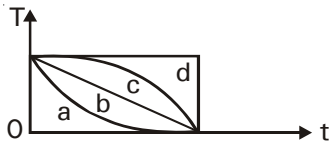
18.



The value of current through 2Ω resistance for the above given circuit is

(1) 5 A (2) 2 A
(3) Zero (4) 4 A

19. A hot liquid is kept in a big room. Its temperature (T) is plotted as a function of time t. Which of the following curves may represent the plot?



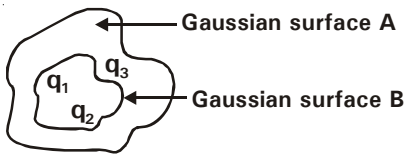
(1) a (2) b
(3) c (4) d

20. What is the de-Broglie wavelength of the α-particle accelerated through a potential difference V?

(1) $\frac{0.3}{\sqrt{V}}$ Å (2) $\frac{12.27}{\sqrt{V}}$ Å

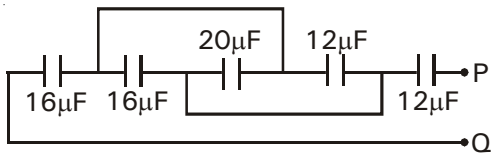
(3) $\frac{0.1}{\sqrt{V}}$ Å (4) $\frac{0.2}{\sqrt{V}}$ Å

21. The electric flux for Gaussian surface B that encloses the charged particles in free space is (given $q_1 = -10$ nC, $q_2 = 36.55$ nC, $q_3 = -16$ nC)



(1) 10^3 Nm^2 C^{-1} (2) 4×10^3 Nm^2 C^{-1}
(3) 8.85×10^3 Nm^2 C^{-1} (4) 3×10^3 Nm^2 C^{-1}

22.



In the above arrangement of capacitors, the equivalent capacity between P and Q will be

(1) 4 μF (2) 6 μF
(3) 12 μF (4) 8 μF

23. Projectile is fired with initial velocity $\vec{u} = (12\hat{i} + 9\hat{j})$ m/s, where $\hat{i}$ and $\hat{j}$ are unit vectors along horizontal and vertical directions respectively. Maximum height attained by the projectile is about

(1) 4 m (2) 7.2 m
(3) 21.6 m (4) 8 m

24. Near earth's surface, rate of decrease of gravity per metre height is Δg_0 and rate of decrease of gravity per metre depth inside the earth is Δg_i. Then

(1) $\frac{\Delta g_0}{\Delta g_i} = \frac{1}{2}$ (2) $\frac{\Delta g_0}{\Delta g_i} = 4$

(3) $\frac{\Delta g_0}{\Delta g_i} = 2$ (4) $\frac{\Delta g_0}{\Delta g_i} = \frac{1}{4}$

25. A particle is moving towards positive x-direction at 13 m/s and its constant acceleration is 3 m/s^2 towards negative x-direction. Distance travelled by the particle in 5th second of its motion is

(1) 0.67 m (2) zero

(3) 1.33 m (4) 0.83 m

26. The expression for the efficiency of full wave rectifier is

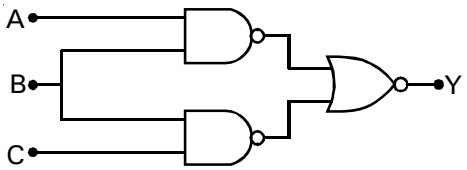
(1) $\eta = \frac{81.2}{1+\frac{r_p}{R_L}}\%$ (2) $\eta = \frac{40.6}{1+\frac{r_p}{R_L}}\%$

(3) $\eta = \frac{20.3}{1+\frac{r_p}{R_L}}\%$ (4) $\eta = \frac{100}{1+\frac{r_p}{R_L}}\%$

27. Fringes of equal width are observed in two Young's double slit experiments. If lights of wavelengths in the ratio 1 : 4 are used and the ratio of the slit separation in the two cases is 1 : 6, the ratio of distance between the slits and the screen in first case to that in the second case is

(1) 1 : 24 (2) 3 : 2

(3) 2 : 3 (4) 24 : 1

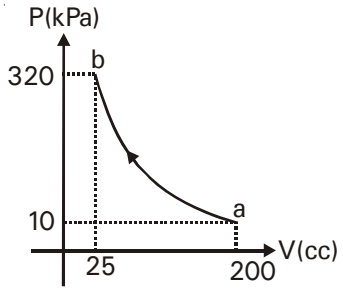
28. 

The circuit shown is equivalent to

(1) OR gate (2) AND gate

(3) NAND gate (4) NOR gate

29. An ideal gas whose atomicity is not known goes from state 'a' to 'b' along the given path as shown. Change in internal energy of the gas, if no heat exchange between system and surroundings takes place, is



(1) 6 J (2) 4.5 J

(3) 9 J (4) 12 J

30. An aeroplane is moving north horizontally, with a speed of 300 m/s, at a place where earth's magnetic field is 0.5 gauss and angle of dip is 37^o . What is induced emf set up between the tips of the wings if they are 10 m apart?

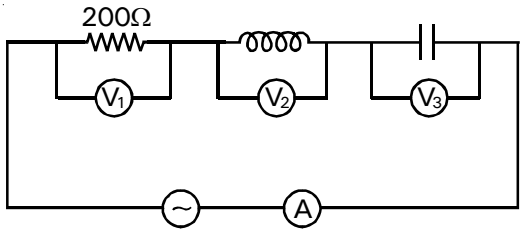
(1) 0.09 V (2) 0.06 V

(3) 0.12 V (4) zero

31. Approximate limit of resolution of 100 cm telescope with visible light of wavelength 5500 $\overset{o}{A}$ is

(1) 67.1 X 10^{-10} rad (2) 43.1 X 10^{-5} rad

(3) 67.1 X 10^{-8} rad (4) 43.1 X 10^{-8} rad

32. 

In the above circuit, applied voltage is 200 V, 50 Hz. Voltmeters V_2 and V_3 read 180 V and 60 V respectively. Reading of voltmeter V_1 is

(1) 40 volts (2) 160 volts
(3) 240 volts (4) 120 volts

33. The amplitude of a damped oscillation decreases to 60% in one complete oscillation after the start. After two more oscillations, the amplitude will decrease to_____ of original.

(1) 16.7% (2) 20%
(3) 36% (4) 21.6%

34. Magnetic moment of an electron in H-atom due to revolution around nucleus is $\frac{sh}{2\pi}$, where s = specific charge of electron and h = Planks's constant. Kinetic energy of this electron is

(1) 4.53 eV (2) 1.51 eV
(3) 3.4 eV (4) 6.8 eV

35. When a bright object is placed 30 cm in front of a thin lens, an erect image is formed at 7.5 cm from the lens. A weak inverted image is also formed at 6 cm in front of the lens due to reflection from the front face of the lens. When the lens is turned around, this weaker inverted image is now formed at 10 cm in front of the lens. Then

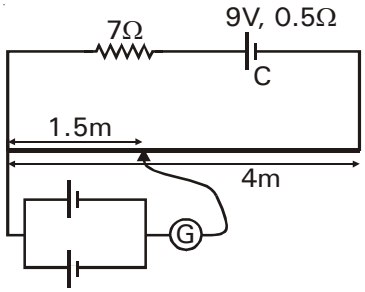
(1) refractive index of glass of lens is 1.5
(2) radii of curvature of surfaces of lens are 10 cm and 15 cm respectively
(3) both (1) and (2)
(4) neither (1) nor (2)

PHYSICS : SECTION-B

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

36. A train of length 120 m, travelling with a speed 18 m/s, crosses another train of same length travelling in opposite direction on a parallel track with a speed of 12 m/s. Time taken by the trains to cross each other is

(1) 4 seconds (2) 12 seconds
(3) 10 seconds (4) 8 seconds

37. 

A resistance of 7Ω and a wire of length 4 m and resistance 6Ω are joined in series and connected to a cell C. A parallel combination of two identical cells is balanced across 1.5 m of the wire. The e.m.f. of each identical cell is

(1) 1.5 V (2) 3 V
(3) 0.75 V (4) 2.5 V

38. To increase Fresnel's distance

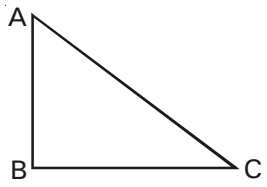
(1) wave length of wave should be increased
(2) wave length of wave should be decreased
(3) size of obstacle should be small
(4) frequency of wave should be decreased

39. Dimensions of $\frac{L}{RCV}$ are (symbols have usual meaning)

(1) $[A^{-1}]$ (2) $[A^{-2}]$
(3) [A] (4) $[A^2]$

40. A machine gun mounted on a 1000 kg car on a horizontal frictionless surface fires 20 bullets per second horizontally. If 10 g be the mass of each bullet and 400 m/s the velocity of each bullet, then the acceleration of car will be
(1) 6 cms^{-2} (2) 10 cms^{-2}
(3) 5 cms^{-2} (4) 8 cms^{-2}

41. A current carrying closed loop in the form of a right angle isosceles triangle ABC is placed in a uniform magnetic field acting along AB. If the magnetic force on the arm BC is $\vec{F}$, the force on the arm AC is



(1) $\sqrt{2}\vec{F}$ (2) $-\sqrt{2}\vec{F}$
(3) $-\vec{F}$ (4) $\vec{F}$

42. A can filled with water is revolved in a vertical circle of radius 4 meter with constant speed and the water just does not fall down. The time period of revolution will be about
(1) 1 second (2) 10 second
(3) 8 second (4) 4 second

43. A thin prism of refractive index 1.5 produces a minimum deviation 'D' in air. If it is now placed inside a liquid of refractive index 1.3, then the minimum angle of deviation will be approximately
(1) 0.5 D (2) 0.4 D
(3) 0.3 D (4) 0.6 D

44. A resistor and a capacitor are connected to an A.C. supply of 200 volt, 50 hertz in series. The current in the circuit is 2 A. If the power consumed in the circuit is 100 watt, then the resistance in the circuit is
(1) 100 ohm (2) 25 ohm
(3) $\sqrt{125 \times 75}$ ohm (4) 400 ohm

45. **Assertion :** Spraying of water causes cooling.
Reason : For an isolated system, surface energy increase on the expense of internal energy.
(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

46. Which of the following waves have minimum wavelength?
(1) Infrared rays (2) UV-rays
(3) Radio waves (4) X-rays

47. If an orbital electron of the hydrogen atom jumps from the ground state to a higher energy state, its orbital speed reduces to half its initial value. If the radius of the electron orbit in the ground state is r, then the radius of the new orbit would be
(1) 2r (2) 4r
(3) 8r (4) 16r

48. Two moles of a diatomic gas at 27°C is compressed isothermally to half of its volume. The work done on the gas in the process is about
(1) 4500 joules (2) 4000 joules
(3) 5000 joules (4) 3500 joules

49. Escape velocity from the earth is approximately 11 km/s. The escape velocity from a planet having twice the radius and the same mean density as the earth, will be
(1) 22 km/s (2) 11 km/s
(3) 5.5 km/s (4) 15.5 km/s

50. A second harmonic has to be generated in a string of length L stretched between two rigid supports. The point where the string has to be plucked and touched are respectively
(1) $\frac{L}{4}$ and $\frac{L}{2}$ (2) $\frac{L}{4}$ and $\frac{3L}{4}$
(3) $\frac{L}{2}$ and $\frac{L}{4}$ (4) $\frac{L}{2}$ and $\frac{3L}{4}$

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which of the following boron trihaldies does not fume in moist air?
(1) BF_3 (2) BCl_3
(3) BBr_3 (4) All fume in air

52. Which of the following will not undergo Cannizzaro reaction?
(1) HCHO (2) C_6H_5CHO
(3) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CHO$ (4) $CH_3-CH_2-\overset{\displaystyle O}{\overset{\|}{C}}-CH_3$

53. The basic flux among the following is
(1) silica (2) borax
(3) magnesite (4) galena

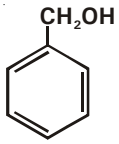
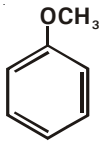
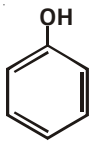
54. The NH_3 released on quantitative reaction of 0.6 gm Urea with sodium hydroxide (NaOH) can be neutralised by
$NH_2CONH_2 + 2NaOH \rightarrow Na_2CO_3 + 2NH_3$
(1) 200 ml of 0.2 N HCl
(2) 200 mL of 0.4 N HCl
(3) 100 mL of 0.1 N HCl
(4) 100 mL of 0.2 N HCl

55. The polymer used for making tyre cords, fabrics and ropes and is obtained by heating caprolactum with water at high temperature is
(1) Nylon 6, 6 (2) Nylon 6
(3) Orlon (4) Dacron

56. Binary compounds of hydrogen are not known for
(1) Cs (2) Zr
(3) C (4) Ar

57. C_2H_5ONa reacts with X to form simple ether. X and name of the reaction is
(1) CH_3Cl, Kolbe's synthesis
(2) C_2H_5Cl, Wurtz's synthesis
(3) C_2H_5Cl, Williamson's synthesis
(4) $(C_2H_5)_2SO_4$, Groove's process

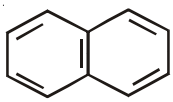
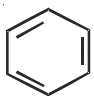
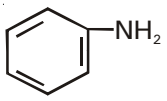
58. **Statement-I** : The sooty material formed by condensation of vapourised C^n small molecules consists mainly of fullerenes consisting of even number of carbon atoms above 350 only.
Statement-II : All the carbon atoms in C_{60} fullerene are equal and they undergo sp^2 hybridisation.
(1) Both statement-I 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

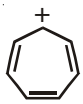
59. Which of the following can give purple colour with neutral $FeCl_3$?
a. 
b. 
c. 
d. 
(1) b and d only (2) a and b only
(3) b and c only (4) all of these

60. Which of the following oxoacid of sulphur has – O–O– linkage?
(1) H_2SO_4 sulphuric acid
(2) $H_2S_2O_8$, peroxodisulphuric acid
(3) $H_2S_2O_7$, pyrosulphuric acid
(4) H_2SO_3, sulphurous acid

61. The minimum dipole moment in the following molecules is for (where A is the central atom)
(1) AB_3 having one lone pair on central atom
(2) AB_4 Tetrahedral
(3) AB_4Y having no lone pair on central atom
(4) AB having two lone pairs on B atom

62. Non-benzenoid aromatic compounds among the following is

(1) 
(2) 
(3) 

(4) 

63. If X is a member of chalcogen family, the highest stability of X^{2-} is exhibited by
(1) oxygen (2) selexium
(3) tellurium (4) sulphur

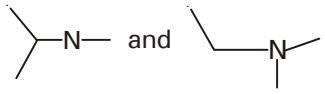
64. Which of the following is incorrect for SN^1 mechanism?
(1) It follows 2-step kinetics
(2) It is accompanied by complete stereochemical inversion
(3) It invovles the formation of carbocation
(4) It occurs in the polar solvents

65. Which of the following is the strongest acid ?
(1) HClO (2) $HClO_2$
(3) $HClO_3$ (4) $HClO_4$

66. The incorrect statement about van der Waal constants 'a' and 'b' is
(1) their value depends on nature of a gas
(2) 'a' is a measure of intermolecular attractive forces within the gas
(3) 'a' depends on temperature and pressure
(4) 'b' is a measure of size of gas particle

67. Which of the following is a gem dicarboxylic acid?
(1) Malonic acid (2) Succinic acid
(3) Acetic acid (4) Adipic acid

68. In Antarctica, ozone depletion is due to hydrolysis of
(1) acrolein (2) PAN
(3) SO_2 and SO_3 (4) chlorine nitrate

69. 

The above two compounds are_____ isomers
(1) chain (2) position
(3) metamers (4) functional

70. Match the coordination compounds given in Column I with the central metal atoms given in Column II and assign the correct code :

Column I		**Column II**	
a.	Chlorophyll	i.	rhodium
b.	Blood pigment	ii.	cobalt
c.	Wilkinson catalyst	iii.	calcium
d.	Vitamin B_{12}	iv.	iron
		v.	magnesium

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

71. Increasing order of paramagnetic character of following complexes
I. $[Ni(CN)_4]^{2-}$
II. $[Ni(Cl)_4]^{2-}$
III. $[Ni(CO)_4]$
(1) I < I < III (2) I = II < III
(3) I = III < II (4) I = II = III

72. $CH_3 - C \equiv CH \xrightarrow[1\%\ HgSO_4]{40\%\ H_2SO_4}$ A. A will be

(1) Propanal
(2) n-propylhydrogen sulphide
(3) Acetone
(4) Propanol

73. Metal that forms imide with NH_3 is

(1) Li (2) Mg
(3) K (4) Na

74. A cubic solid is made of two elements P and Q. Atoms of Q are at the corners of the cube and P at the body-centre. The coordination numbers of P and Q are respectively

(1) 4 and 8 (2) 4 and 4
(3) 8 and 4 (4) 8 and 8

75. Which of the following molecule has minimum total number of lone pairs?

(1) XeF_4 (2) XeF_6
(3) XeF_2 (4) XeO_3

76. The time required for completion of zero order reaction is

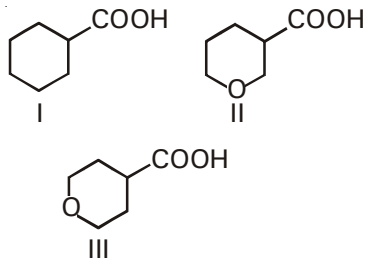
(1) $\frac{[A_0]}{k}$ (2) $\frac{[A_0]}{2k}$

(3) $\frac{0.693}{k}$ (4) infinite

77. The alcohol that produces turbidity immediately with $ZnCl_2$ + conc. HCl at room temperature

(1) 1-hydroxybutane
(2) 2-hydroxybutane
(3) 2-hydroxy-2-methylpropane
(4) 1-hydroxy-2-methylpropane

78. The correct order of acid strength of the carboxylic acids



I II III

is

(1) I > II > III (2) II > III > I
(3) III > II > I (4) II > I > III

79. The density of a gas at 27°C and 1 atm is d. Pressure remaining constant, at which of the following temperatures will its density become 0.75 d?

(1) 20°C (2) 30°C
(3) 400 K (4) 300 K

80. **Assertion** : Frenkel Defect is the defect shown by ionic solids where smaller ion (usually cation) is dislocated from its normal site to an interstitial site.
Reason : Frenkel Defect decreases the density of the solid.

(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

81. One litre of a buffer solution containing 0.01 M NH_4Cl and 0.1 M NH_4OH has a pH of about

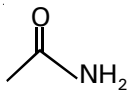
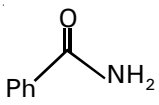
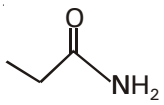
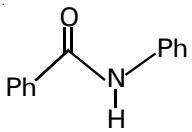
$(K_{b(NH_4OH)} = 1.0 \times 10^{-5})$

(1) 10 (2) 4
(3) 6 (4) 9

82. Which of the following compound does not exist?
(1) CoF_2 (2) Mn_2O_7
(3) MnO_3F (4) MnF_7

83. Which of the following is incorrect w.r.t. Alkali metals?
(1) Cs and K are useful as electrodes in photoelectric cells
(2) Lithium salts are mostly hydrated
(3) The O_2^- ion is stable only in presence of large cations such as K, Rb, Cs
(4) Alkali metals donot react with halogens

84. Which of the following cannot show Hoffmann-Bromamide reaction?

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

85. In the conversion
$NH_2OH \rightarrow N_2O$
the equivalent weight of NH_2OH will be
(1) $\frac{M}{4}$ (2) $\frac{M}{2}$
(3) $\frac{M}{5}$ (4) $\frac{M}{1}$

CHEMISTRY : SECTION-B

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

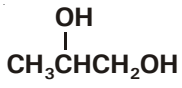
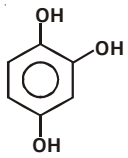
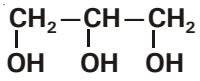
86. The difference between heat of reaction at constant pressure and at constant volume for the following reaction at 300 K in kJ is
$C_6H_{16}(l) + 12O_2(g) \rightarrow 8CO_2(g) + 8H_2O(l)$
(1) -14.5 (2) -9.97
(3) $+9.97$ (4) $+14.5$

87. A mixture contains 5.4 g of Al, 1.2 g of Mg and 4.6 g of C_2H_5OH. The ratio of their moles is
(at. wt. of Al = 27 and Mg = 24)
(1) 4 : 1 : 2 (2) 2 : 1 : 5
(3) 2 : 1 : 4 (4) 2 : 3 : 4

88. **Assertion** : Toluene or substituted toluene is converted to benzylidene diacetate on treating with chromic oxide in acetic anhydride.
Reason : The benzylidene diacetate is a chromium complex which can be hydrolysed to corresponding benzaldehyde with aqueous acid.
(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

89. In general, the melting and boiling point of transition metals
(1) increases gradually across the period from left to right
(2) decreases gradually across the period from left to right
(3) first increases till the middle of the period and then decreases towards the end
(4) first decreases regularly till the middle of the period and then increases towards the end

90. A compound X on reaction with methyl magnesium iodide evolves methane and on acetylation, its molecular mass increases by 84 units. The compound X can be

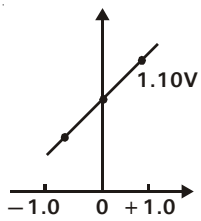
(1) 
(2) 
(3) 
(4) CH_3OH

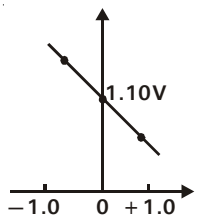
91. Which graph correctly correlates E_{cell} as a function of concentrations for the cell (for different values of M and M')?

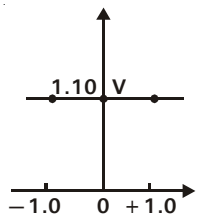
$Zn(s) + Cu^{2+}(M) \rightarrow Zn^{2+}(M') + Cu(s)$;

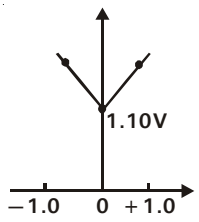
$E^{o}_{cell} = 1.10V$

X-axis : $\log_{10}\frac{[Zn^{2+}]}{[Cu^{2+}]}$, Y-axis : E_{cell}

(1) 

(2) 

(3) 

(4) 

92. Which solution will show the maximum vapour pressure at 300 K?

(1) 1 M $C_{12}H_{12}O_{11}$ (2) 1 M CH_3COOH

(3) 1 M $MgCl_2$ (4) 1 M NaCl

93. Identify the incorrect statement about stereomers of glucose

(1) glucose and galactose are epimers and enantiomers

(2) glucose and mannose are epimers but not enantiomers

(3) α-D-glucose and β-D-glucose are anomers but not enantiomers

(4) α-D-glucose and β-D-glucose are diastereomers

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

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

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.	$\frac{1}{K_c}$

(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

95. **Statement-I** : Enthalpy of dilution of a solution is independent of the original oncentration of solution.

Statement-II : Heat added to system at higher temperature causes greater randomness than when the same quantity of heat is added to it at lower temperature.

(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

96. The number of OH units directly linked to boron atoms in $Na_2B_4O_7 . 10H_2O$ is

(1) 2 (2) 3

(3) 4 (4) 10

97. Phosphorous in organic compounds is estimated as

(1) $Mg_2P_2O_7$ (2) $Mg_3(PO_4)_2$

(3) $MgHPO_4$ (4) $Ca_3(PO_4)_2$

98. Which of the following reaction cannot evolve phosphine?

(1) White P + $Ca(OH)_2$ (2) AlP + $H_2O \rightarrow$

(3) $H_3PO_4 \xrightarrow{\Delta}$ (4) PH_4I + NaOH $\rightarrow$

99. Which of the following is based on Tyndall effect?

a. Tail of comet
b. Delta formation
c. Blue colour of sky
d. Coagulation

(1) both a & b (2) both a & c
(3) both b & c (4) both c & d

100. The type of isomerism shown by **$[Co(en)_2(NCS)_2]Cl$ and $[Co(en)_2(NCS)Cl]NCS$** is

(1) co-ordination (2) ionization
(3) linkage (4) all of these

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. _____ undergoes strong contractions during birth of baby and is made up of _____muscles

(1) Endometrium, smooth
(2) Myometrium, smooth
(3) Myometrium, skeletal
(4) Perimetrium, smooth

102. Which of the following is true?

(1) Choanocytes line the spongocoel and canals in coelenterates.
(2) Digestion is both extracellular and intracellular in coelenterates and ctenophora.
(3) Metagenesis is alternation of generation between asexual medusae and sexual polyp forms.
(4) In *Ascaris* sexes are separate, males are longer than females.

103. Identify the correct match

(1) Anaphase-II–Disjunction of chromosomes
(2) Zygotene–Recombination nodule
(3) Diplotene–Chiasmata formation
(4) Pachytene–Synapsis

104. In contrast to osteichthyes, chondrichthyes have

(1) two chambered heart
(2) paired appendages
(3) swim bladder
(4) persistant notochord

105. A comparison of the volume of the filterate formed per day (180 litres) with that of the urine released (1.5 litres) suggest that nearly _____ of filterate has been reabsorbed.

(1) 95 % (2) 97 %
(3) 99 % (4) 70 %

106. Which of the following statement is false?

(1) plasmids can be used to carry only small fragments of DNA
(2) BAC and YAC have been used in human genome project
(3) using pBR 322, insertional inactivation of amp^R gene can be achieved by using enzyme Pst-I
(4) while preparing recombinant bacteria, with the help of reporter gene encoding β-galactosidase, transformant that are nonrecombinant colonies remain white

107. The level of organization, body symmetry and coelom are similar in

(1) Platyhelminthes and Aschelminthes
(2) Achelminthes and Annelids
(3) Annelids and Arthropoda
(4) Ctenophora and Platyhelminthes

108. Identify the animal with cartilagenous endoskeleton, scaleless body, persistent notochord and 6-15 pairs of gill slits

(1) Saw fish (2) *Clarias*
(3) Lamprey (4) *Protopterus*

109. A chemosensitive area situated adjacent to the rhythm centre is highly sensitive to

(1) N_2 and CO_2 (2) CO_2 & H^+ ion
(3) H^+ ions only (4) N_2 and O_2

110. Malpighian tubules in cockroach absorb nitrogenous waste products and convert them into uric acid which is excreted out by

(1) Excretory pore
(2) Hind gut
(3) General body surface
(4) Spiracles

111. Which of the following group of biomolecules has only secondary metabolites?

(1) Glucose, glycine, adenine
(2) Tyrosine, uracil, vinblastin
(3) Nicotine, vinblastin, ricin
(4) Lecithin, abrin, curcumin

112. **Assertion :** An injection of morphine can be given to a patient, who has recently undergone surgery and is crying with pain.

Reason : Morphine is a very effective sedative and can be used as analgesics.

(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

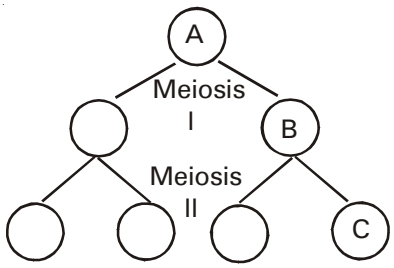
113. Match the column-I with column-II

	Column-I		Column-II
a.	P-wave	i.	Depolarisation of ventricles
b.	QRS complex	ii.	Repolarisation of ventricles
c.	T-waves	iii.	Coronary ischemia
d.	Reduction in the size of T-waves	iv.	Depolarisation of atria
		v.	Repolarisation of atria

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

114. Ejaculatory duct is formed by the union of
(1) vas deferens and prostatic urethra
(2) vas deferens and duct from seminal vesicle
(3) penile urethra and membranous urethra
(4) vas deferens and membranous urethra

115.



What is true about A, B and C in the given diagram representing meiosis ?
(1) DNA content of B and C will be same
(2) Ploidy of A and B is same but DNA content is half in B compared to A
(3) DNA content of C is half the DNA content of B but ploidy is same
(4) DNA content of C is 1/4th the DNA content of B and ploidy is same as B

116. Sleeping sickness is caused by
(1) *Leishmania* (2) *Trypanosoma*
(3) *Giardia* (4) *E.coli*

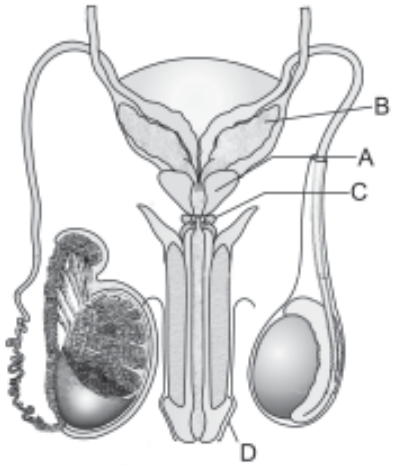
117. How many statements are true regarding STP?
i. Secondary treatment includes aeration tanks where flocs are formed
ii. Sequential filtration is followed by sedimentation
iii. Flocs help to reduce the BOD of the primary sludge
iv. A small part of activated sludge is pumped back into Anaerobic sludge digestor to serve as inoculum
(1) two (2) three
(3) four (4) one

118. **Statement- I** : In vitro fertilization involves fertilization outside the body followed by embryo transfer.

Statement- II : Gametes from the donor are collected and induced to form zygote under simulated conditions in the laboratory.
(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

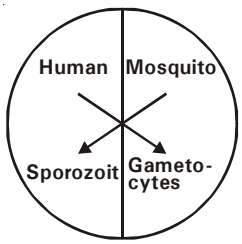
119. Which among the following is incorrect?
(1) Catecholamines stimulate glycogen breakdown
(2) Glucocorticoids stimulate erythropoiesis and kidney functioning
(3) Insulin enhances cellular glucose uptake and utilisation by hepatocytes
(4) Aldosterone mainly acts on renal tubules and stimulates reabsorption of water, sodium ions and potasium ions

120. Identify A, B, C and D respectively from the given figure



(1) seminal vesicle, cowper's gland, prostate gland, glans penis
(2) cowper's gland, seminal vesicle, prostate gland, glans penis
(3) prostate gland, seminal vesicle, cowper's gland, glans penis
(4) prostate gland, seminal vesicle, cowper's gland, foreskin

121. Represented below is the transmission pattern of some disease in human. Which one of the following could be an example?



(1) Dengue (2) Filariasis
(3) Malaria (4) both (2) and (3)

122. What is correct about 'Hisardale'?
(1) It is a cross between same breeds of sheep
(2) Cross between Bikaneri ewes & marino rams
(3) Developed in Karnal
(4) All of these

123. Ernest Chain & Howard Florey
(1) helped Fleming to discover pencillin
(2) worked with Fleming to isolate penicillin
(3) recognised full potential of pencillin as an effective antibiotic
(4) coined the term antibiotic

124. Choose the incorrect match
(1) Microinjection — direct injection of r-DNA in nucleus
(2) Biolistic — bombardment of microparticles with DNA
(3) Gene gun — transfer of disarmed pathogen
(4) PCR — multiple copies of DNA *in vitro*

125. Vestibular apparatus consists of
(1) Semicircular canals and cochlea
(2) Organ of Corti and macula
(3) Otolith organ and semicircular canals
(4) Cochlear duct and otolith organ

126. Which is correct option?

	Structure	Components	Exception
1	A band	Actin filament myosin filament H-zone	H-zone
2	I- band	M-line H-zone actin filament	Actin filament
3	H-zone	Actin filament myosin filament m line	Actin filament
4	Sarcomere	A-band I-band Z-line	A-band

127. Which of the given is incorrect statement?
(1) Some of the land reptiles went back into water to evolve into fish like reptiles *Ichthyo saurus* probably 200 mya
(2) About 65 mya the dinosaurs suddenly disappeared from earth
(3) North American mammals were overridden by South American fauna when both continents joined
(4) The most successful story is the evolution of man with language skills and self consciousness

128. Validity of GM research & safety of introducing GM-organisms for public services is done by
(1) GEAC (2) GEEC
(3) EAGC (4) EGAC

129. In the table given, a, b & c are respectively

	Primitive man	**Brain capacity**
i.	*Homo erectus*	(a)
ii.	(b)	1400 cc
iii.	*Homo habilis*	(c)

(1) 1200 cc, *Australopithecines*, 650-800 cc
(2) 900 cc, Neanderthal man, 650-800 cc
(3) 650-800 cc, Neanderthal man, 900 cc
(4) 900 cc, *Dryopithecus*, 1200 cc

130. Which of the following group includes all bacterial diseases?
(1) Kusht rog, Plague, Kali Khansi
(2) Dengue, Dysentary, Gal ghotu
(3) Break bone fever, Lock jaw, Rabies
(4) Polio, Flu, Enteric fever

131. How is it ensured to produce a dsRNA in tobacco plant to control *Meloidegyne incognitia* infection?
(1) Genes introduced undergo transcription repeatedly
(2) DNA introduction is such that it produces both sense & anti-sense RNA
(3) One copy of the RNA is procured from nematode & one is genetically engineered
(4) Both strands of introduced DNA act as template one by one

132. The "clot buster" given to the patients of acute heart attack is sourced from
(1) bacteria (2) fungi
(3) protozoan (4) plant

133. What is correct w.r.t. probe?
(1) single stranded RNA molecule
(2) tagged with radioactive molecule
(3) detected by using autoradiography
(4) all of these

134. Which of the following is incorrect difference between Darwin's variations and de Vries mutations?

	Darwin's variations		De Vries mutations
(1)	Minor	–	Large
(2)	Directional	–	Directionless
(3)	Discontinuous	–	Continuous
(4)	Useful	–	Mostly harmful

135. An incorrect pair is
(1) Lysosomes and vacuoles → Part of endomembrane system
(2) Golgi apparatus → site of formation of glycoproteins and glycolipids
(3) RER → Actively involved in protein synthesis and secretion
(4) Ribosomes and centrioles → Present in most plant and animal cells

ZOOLOGY : SECTION-B

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

136. The disease in which defence mechanism of the body cannot fully cope with the situation and fibrosis occurs causing serious lung damage is
(1) asthma
(2) occupational respiratory disorder
(3) emphysema
(4) bronchitis

137. Most of the organelle duplication takes place during _____phase
(1) G_0 (2) G_1
(3) G_2 (4) S phase

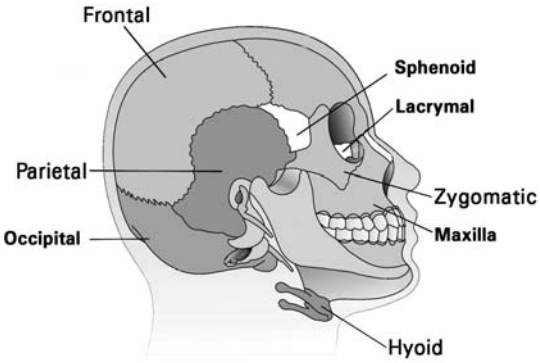
138. What is true about lymph?
(1) Important carrier for nutrients and hormones
(2) Fats are absorbed through lymph in the lacteals
(3) Has specialised lymphocytes responsible for immune response
(4) All of the above

139. How many of the given are marsupials?
Numbat, Flying phalanger, Tasmanian cat, Spotted cuscus, Lemur, Sugar glider, Koala
(1) Seven (2) Six
(3) Five (4) Four

140. **Assertion** : Enzymes of succus entericus act on end products of reactions catalysed by other enzymes.
Reason : Final steps of digestion occur very close to mucosal epithelium.
(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

141. Hormones are ___(i)___ chemicals, act as ___(ii)___ messengers and are produced in ___(iii)___ amounts. Mark the option which fill the blanks correctly
(1) (i) Nutrient, (ii) intercellular, (iii) Trace
(2) (i) Non-nutrient (ii) intercellular, (iii) trace
(3) (i) Non-nutrient, (ii) intra-cellular,(iii) large
(4) (i) Nutrient, (ii) Intracellular, (iii) trace

142. In given diagram of human skull, how many bones are INCORRECTLY marked?



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

143. Which of the following is an incorrect match?

	Cell type		Secretion
(1)	Peptic cells	–	Pepsinogen
(2)	Oxyntic cells	–	HCl
(3)	Paneth cells	–	Lysozyme
(4)	Acini of pancreas	–	Insulin

144. Find the number of correct statements
a. the manipulation of living organisms by the human race cannot go on any futher, without regulation
b. ethical standards are not important to evaluate the morality of all human activities
c. biological significance of manipulation is also important
d. genetic modifications of organisms can have unpredictable results
(1) 1 (2) 2
(3) 3 (4) 4

145. Mark the statements true (T) or false(F)
a. androgens are produced by Sertoli cells
b. sperms get nourishment from nurse cells
c. menstrual cycle ceases during pregnancy
d. the presence of X or Y chromosome in the sperm determines the sex of embryo
(1) a-T, b-T, c-T, d-F (2) a-F, b-T, c-T, d-T
(3) a-T, b-T, c-T, d-F (4) a-F, b-F, c-T, d-T

146. Find the correct statement
(1) Minimum reabsorption occurs in ascending limb of Loop of Henle
(2) Osmoreceptors are activated by changes in ionic concentration, blood volume, body fluid volume
(3) Juxta glomerular apparatus is formed by cellular modification of afferent arteriole and DCT
(4) All of these

147. **Statement-I** : The endomembrane system includes those organelles whose functions are coordinated.
Statement-II : Microbodies are a part of endomembrane system
(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

148. Insulin cannot be administered orally because
(1) it would be digested
(2) its conversion into its active form will not occur
(3) it would not be able to enter blood due to its large size
(4) maturation of insulin can occur only in blood

149. Tubectomy inhibits
a. production of gonadotropins
b. ovulation
c. follicle growth
d. transport of female gamete to urerus
(1) a and d (2) b and c
(3) b and d (4) only d

150. Mark the incorrect statement/s
a. RUBISCO is the most abundant organic compound found in biosphere
b. Insulin is a heteropolymer
c. Lipids are generally hydrophilic substances
d. Saturated fatty acids have R-group with only carbon-carbon single bond
(1) a and b (2) b and d
(3) a and c (4) a, c and d

BOTANY : SECTION-A

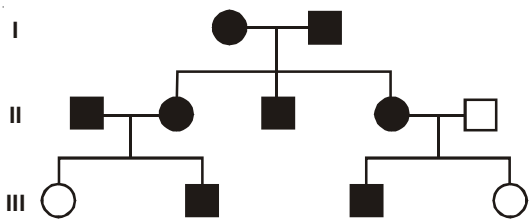
All questions are compulsory in section A

151. In Maize
(1) autogamy is promoted
(2) male and female flowers are present on separate plants
(3) geitonogamy can occur but autogamy is prevented
(4) endosperm is absent in seed

152. *Cycas* plant is a
(1) haploid gametophyte
(2) diploid gametophyte
(3) diploid sporophyte
(4) haploid sporophyte

153. **Statement-I** : Biological names are generally in latin and written in italics.
Statement-II : The first word denoting the genus starts with a capital letter.
(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

154. In the following pedigree the genotype of I–generation is



(1) both are homozygous dominant
(2) both are recessive
(3) at least one parent is heterozygous
(4) cannot be depicted

155. Inside chloroplast, light reaction and dark reactions occur respectively in
(1) grana and stroma
(2) stroma and stromal lamellae
(3) grana and stromal lamellae
(4) thylakaid membrane and stromal lamellae

156. Cell walls of chrysophytes are indestructive as they are embedded with _____
(1) calcium carbonate (2) cellulose
(3) silica (4) phosphorous

157. According to Sutton and Boveri segregation of a pair of factors is because of
(1) splitting of chromosomes at anaphase of mitosis
(2) segregation of homologous chromosomes at anaphase of meiosis–I
(3) random arrangement of chromosomes at equator during meiosis–I
(4) random arrangement of chromosomes at equator during mitosis

158. Select the incorrect statement w.r.t pteridophytes
(1) *Salvinia* is heterosporous
(2) Female gametophyte are retained on parent sporophyte for variable periods
(3) *Selaginella* have microphylls
(4) Sporophyte bears both male and female sex organ, antheridia and archegonia

159. Which of the following statement is correct?
(1) Iron is absorbed as Fe^{2+}
(2) Structural components like Ca are frequently remobilised from older parts to younger parts
(3) Xylem transports only inorganic nutrients
(4) Chief sinks for mineral elements are growing regions of the plants

160. **Assertion :** Split-gene arrangement is a characteristic feature of eukaryotes.
Reason : The split-gene arrangement complicates the definition of a gene in terms of DNA segment.
(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

161. Which of the following statement is incorrect?
(1) Tulip flower has tricarpellary syncarpous gynoecium
(2) Tomato fruit is a berry
(3) Lily seeds are endospermic
(4) Lupin yields colchicine

162. Internode elongation just prior to flowering in plants with rosette habit is
(1) Bolting (2) Etiolation
(3) Thinning (4) Apical dominance

163. Which of the following statements is incorrect w.r.t decomposition?
(1) Catabolism is carried out by bacterial and fungal enzymes
(2) Humus undergoes decomposition at very slow rate
(3) Low temperature and anaerobiosis increases rate of decomposition
(4) Fragmentation is break down of detritus into smaller particles

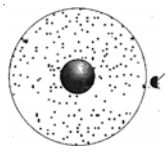
164. Match column-I with column-II and select the correct option

	Column-I		**Column-II**
a.	Catalytic converter	i.	Hospital waste
b.	ESP	ii.	Solid waste
c.	Landfills	iii.	Particulate matter
d.	Incinerator	iv.	CO, NO_x

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

165. If Meselson and Stahl's experiment is continued for four generations in bacteria. The ratio $^{15}N/^{15}N$, $^{15}N/^{14}N$, $^{14}N/^{14}N$ containing DNA in the fourth generation would be
(1) 1 : 1 : 0 (2) 1 : 4 : 0
(3) 0 : 1 : 3 (4) 0 : 1 : 7

166. Match the types of gametes in coloumn-I with their figures in coloum-II

Column-I		**Column-II**	
a.	Isogametes of *Cladophora*	p.	
b.	Heterogametes of *Fucus*	q.	
c.	Heterogametes of *Homo sapiens*	r.	

(1) a-p, b-r, c-q (2) a-q, b-r, c-p
(3) a-r, b-q, c-p (4) a-q, b-p, c-r

167. Select the odd one out w.r.t bacterial structure
(1) Presence of nucleus
(2) Presence of mesosomes
(3) Absence of membrane bound organelles
(4) Formation of spore under unfavourable conditions

168. Identify the correct statement w.r.t. lac operon.
(1) Regulation of lac operon is like regulation of enzyme synthesis by its own product
(2) In an operon, repressor binds to promoter and prevents RNA polymerase to bind
(3) β –galactosidase enzyme breaks galactose sugar
(4) Inducer does not bind to operator

169. How many of the following show alternate phyllotaxy?
***Alstonia,* Guava, Sunflower, *Calotropis,* China rose, Mustard**
(1) 2 (2) 3
(3) 4 (4) 1

170. Which one of the following pairs of organisms are exotic species introduced in India?
(1) Water hyacinth, *Prosopis cinereria*
(2) Nile perch, *Ficus religiosa*
(3) *Lantana camara*, Water hyacinth
(4) *Ficus religiosa*, *Lantana camara*

171. **Statement-I** : Natality and immigration contribute to an increase in population density.

Statement-II : Mortality and emigration contribute to a decrease in population density.

(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

172. Bark includes

a. Secondary phloem b. Secondary cortex
c. Cork d. Phellogen
e. Secondary xylem

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

173. Which of the following statement is not correct for fermentation?

(1) NADH is oxidised to NAD+ slowly in fermentation
(2) There is net gain of 2 ATP for each molecule of glucose degraded
(3) Fermentation accounts for partial breakdown of glucose
(4) Fermentation breakdown glucose to CO_2 & H_2O

174. During microsporogenesis, meiosis occurs in:

(1) Endothecium
(2) Microspore mother cells
(3) Microspore tetrads
(4) Pollen grains.

175. Name the scientist who has been called Darwin of the "20th century" and was one of the 100 greatest scientist of all time

(1) T.O. Diener (2) Ernst Mayr
(3) Linnaeus (4) S.R. Kashyap

176. Denitrification is carried by

(1) *Bacillus, Rhodopseudomonas*
(2) *Nitrobacter, Nitrosomonas*
(3) *Rhizobium, Frankia*
(4) *Pseudomonas, Thiobacillus*

177. Identify the family on the basis of following features.

a. bisexual, actinomorphic flower
b. valvate aestivation
c. five stamens, epipetalous
d. bicarpellary, synarpous, axile placentation
e. berry fruit

(1) Brassicaceae (2) Solanaceae
(3) Fabaceae (4) Liliaceae

178. Blue eye colour in human is recessive to brown eye colour. The expected children of a marriage between blue eyed woman and brown eyed male who had a blue eyed mother are likely to be

(1) all blue eyed
(2) three blue eyed, one brown eyed
(3) all brown eyed
(4) one blue eyed and one brown eyed

179. In a population of 1000 plants of *Antirrhinum*, 640 plants develop red flowers, 320 develop pink and 40 develop white flowers. What is the allelic frequencey of R & r allele respectively?

(1) 0.5 and 0.5 (2) 0.8 and 0.2
(3) 0.2 and 0.8 (4) 0.4 and 0.6

180. Choose the correct statement

a. Mammals from cold climate have shorter ear and limbs to minimise heat loss
b. Seals have thick layer of fat below skin that act as insulator
c. Archaebacteria flourish in narrow temperature range of 37°C
d. Desert lizards have physiological ability to deal with high temperature

(1) a & b (2) b & c
(3) c & d (4) d & a

181. Calvin cycle involves

(1) reductive carboxylation
(2) oxidative carboxylation
(3) carboxylation
(4) decarboxylation

182. Which of the following statement is correct?

(1) Grasshopper is an example of XO type of sex determination
(2) Male produces one type of gamete in XY sex determination
(3) Henking traced a specific cytoplasmic structure through spermatogenesis in few insects
(4) Sickle cell anaemia is an example of genomatic mutation

183. Excess of _____ inhibit calcium translocation in shoot apex

(1) Mn (2) C
(3) Zn (4) Fe

184. How many of the following statements are incorrect?

a. Sporopollenin is absent in the region of germ pore
b. Intine is made of pectocellulose
c. Pollen kit is the feature of anemophillous flower
d. Cytoplasm of pollen grain is surrounded by a plasma membrane
e. Pollen grains are 25–50 micrometers in diameter

(1) one (2) two
(3) four (4) five

185. Which of the following is incorrect w.r.t. prions?

(1) are agents causing infectious neurological diseases

(2) have size smaller than viruses

(3) consists of abnormally folded protein

(4) cause disease like BSE (Bovine Spongiform encephalopathy) in cattle.

BOTANY : SECTION-B

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

186. **Statement-I** : Castor seeds are endospermic.

Statement-II : Endosperm formed as a result of double fertilisation, is a food storing tissue in seed.

(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

187. Choose the correct pair of statements

a. Emasculation is required in case of unisexual flowers

b. Pollen pistil interaction is a dynamic process

c. Orchid fruit contains only a few tiny seeds

d. Fruits formed as a result of fertilisation could be a false fruit

(1) a & b (2) c & d

(3) a & c (4) b & d

188. Cylindrical meristem

(1) occupies the distant most region of the stem axis.

(2) regenerates parts removed by the grazing herbivores

(3) occurs in the mature regions of roots and shoots of many plants that produce woody axis.

(4) is subterminal in position.

189. Which is correct w.r.t. ETS?

(1) Number of ATP molecules synthesised depends on the nature of electron donor

(2) Oxidation of one molecule of NADH gives rise to 2 molecules of ATP

(3) Oxidation of one molecule of $FADH_2$ produces 3 molecules of ATP

(4) Oxygen acts as the final hydrogen donor

190. Which of the following is incorrect match?

(1) Sulphur – component of allyl oil in onion

(2) Iron – activates aconitase

(3) Molbdenum – association of ribosome subunit

(4) Zinc – synthesis of auxin

191. **Assertion :** Inheritance of a character is also affected by promoter and regulatory sequence of a structural gene.

Reason : Sometimes the regulatory sequences are loosely defined as regulatory genes, even though these sequence do not code for any RNA or protein.

(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

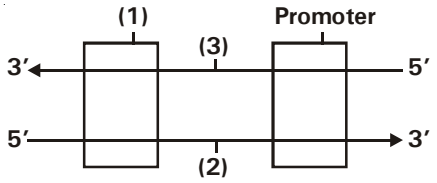
(4) Assertion is false

192. Main reservoirs of phosphorus are

(1) Atmosphere (2) Oceans

(3) Rocks (4) Forests.

193. What is the correct statement in the given diagram, two DNA strands represented are ready for transcription?



(1) Strand (3) has nucleotide sequence similar to mRNA

(2) Strand (2) is the coding strand

(3) RNA polymerase will bind to (1) region

(4) Promoter is present down stream to structural gene

194. Species diversity decreases as we move away from equator towards the poles because

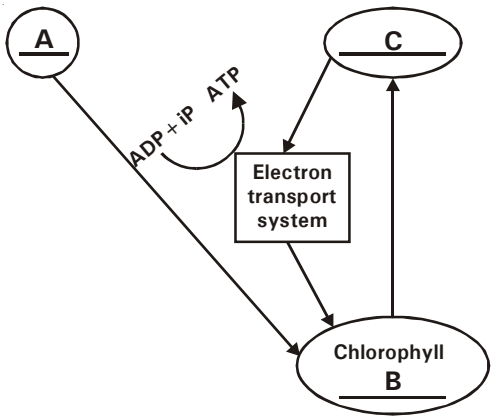
(1) temperature increases with increase in latitude

(2) temperature decreases with increase in latitude

(3) higher temperature and humidity favours species diversity

(4) both (2) & (3)

195. Complete the flow chart for cyclic photophosphorylation and choose the correct option



(1) A - light, B - P_{680}, C - electron donor
(2) A - light, B - P_{700}, C - electron acceptor
(3) A - dark, B - P_{700}, C - electron acceptor
(4) A - dark, B - P_{680}, C - electron donor

196. In *E.coli*, DNA is mode up of 4.6×10^6 bp. How many nucleosomes and spirals will be present respectively
(1) 4.6×10^4, 4.6×10^5
(2) 4.6×10^3, 4.6×10^6
(3) zero, 4.6×10^5
(4) 2.3×10^4, 2.3×10^5

197. Mycoplasma are characterised by
(1) simplest and smallest organisms
(2) absence of cell wall
(3) can survive without oxygen
(4) all of the above

198. How many of the following statements are correct
a. Coconut water contains cytokinins
b. ABA acts antagonistic to gibberellic acid
c. The photoperiod in plants is perceived at leaves
d. Vernalisation enable the plant to have sufficient time to reach maturity
e. The term synergistic action of hormones refer to when one hormone affects more than one function
(1) 2 (2) 3
(3) 4 (4) 5

199. Match the crop variety bred by hybridisation and selection in column I with the resistance to diseases in column II.

Column I		**Column II**	
a.	Pusa Komal	p.	curl blight black rot
b.	Pusa Sadabahar	q.	bacterial blight
c.	Pusa Snowball	r.	chilly mosaic virus

(1) a-q, b-r, c-p (2) a-q, b-p, c-r
(3) a-r, b-p, c-q (4) a-p, b-q, c-r

200. Why compressed natural gas (CNG) is considered better than diesel?
a. It burns most efficiently
b. Very little of it is left unburnt
c. It is cheaper than diesel
d. It cannot be siphoned off by thieves
(1) a, b & d (3) b, c & d
(3) a & c (4) a, b, c & d