Dated : 29-04-2023

M.L. Syal's Helix Institute

S.C.O. 343-345, Top Floor, Sector 34-A, Chandigarh. Ph : 0172-2623155

Test Series [Option-1] for NEET-2023

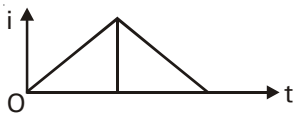
MM : 720 **Time : 3 hrs. 20 min.**

Mock Test

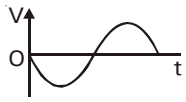
PHYSICS : SECTION-A

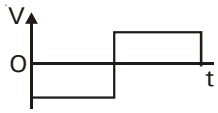
All questions are compulsory in section A

1. A body is thrown horizontally from the top of a tower of height 5 m. It touches the ground at a distance of 10 m from the foot of the tower. The initial velocity of the body is
   (1) 2.5 m/s
   (2) 5 m/s
   (3) 10 m/s
   (4) 20 m/s
2. The kinetic energy of a body of mass 2 kg and momentum of 2 Ns is
   (1) 1 J
   (2) 2 J
   (3) 3 J
   (4) 4 J
3. If force 'F', acceleration 'A' and time 'T' are taken as fundamental quantities, then the dimensions of length will be
   (1) FT^2
   (2) $F^{-1}A^2T^{-1}$
   (3) FA^2T
   (4) AT^2
4. The quality factor of LCR circuit having resistance (R) and inductance (L) at resonance frequency (ω) is given by
   (1) $\frac{\omega L}{R}$
   (2) $\frac{R}{\omega L}$
   (3) $\left(\frac{\omega L}{R}\right)^{1/2}$
   (4) $\left(\frac{\omega L}{R}\right)^{2}$
5. The rays which belong to the electromagnetic spectrum are
   a. microwaves
   b. α-rays
   c. radio waves
   d. γ-rays
   (1) a & b
   (2) b & c
   (3) a, c & d
   (4) a, b & c
6. The kinetic energy needed to project a body of mass 'm' from the earth surface to infinity is (radius of earth = R, acceleration due to gravity on earth surface = g)
   (1) mgR/2
   (2) 2 mgR
   (3) mgR
   (4) mgR/4
7. The current 'i' in an inductance coil varies with time 't' according to following graph



   Which one of the following plots shows the variations of voltage in the coil

   (1)


   (2)


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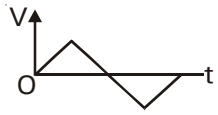


   (4)


8. The temperature of sink of Carnot engine is 27°C. Efficiency of engine is 25%. Then temperature of source is
   (1) 227°C
   (2) 327°C
   (3) 127°C
   (4) 27°C
9. The negative total energy of an orbital electron means that it
   (1) is in stable equilibrium
   (2) is bound to the nucleus
   (3) has emitted a photon
   (4) satisfies Bohr's postulate of quantized angular momentum

10. A conical pendulum is executing circular motion with thread inclined at 37° with the vertical. If the mass of the bob is 100 g, the tension in the string is
(1) 1.25 N
(2) 1.5 N
(3) 2.25 N
(4) 0.75 N

11. Masses of a nucleus, a neutron and a proton are M, m_n and m_p respectively. Then
(1) $M = (A - Z)\, m_n + Zm_p$
(2) $M = Zm_n + (A - Z)\, m_p$
(3) $M < (A - Z)\, m_n + Zm_p$
(4) $M > (A - Z) + Zm_p$

12. Mean kinetic energy of translational motion of gas molecules is
(1) $\frac{3}{2}$ kT
(2) kT
(3) $\frac{1}{2}$ kT
(4) $\frac{3}{2}$ RT

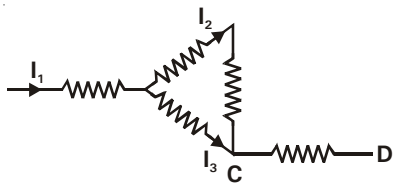
13. With increase in resistance in a series LCR circuit, the resonance frequency
(1) increases
(2) decreases
(3) remains unchanged
(4) may increase or decrease

14. If the critical angle for total internal reflection from a medium to vacuum is 30°, the velocity of light in the medium is
(1) 3×10^8 m/s
(2) 1.5×10^8 m/s
(3) 6×10^8 m/s
(4) $\sqrt{3} \times 10^8$ m/s

15. A stone thrown vertically upwards attains a maximum height of 45 m. In what time the velocity of stone become equal to one half the velocity of throw? (Given: g = 10 m/s^2)
(1) 2s
(2) 1.5s
(3) 1s
(4) 0.5s

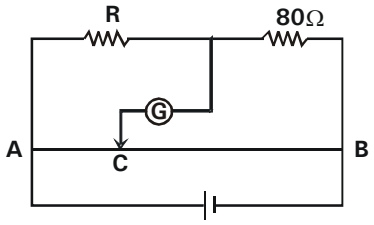
16. If white light is used in Young's double slit experiments, a number of coloured fringes can be seen
(1) with a violet fringe seen next to the central white fringe
(2) with a red fringe seen next to the central white fringe
(3) with a central coloured fringe
(4) with a central black fringe

17. The current in the arm CD is



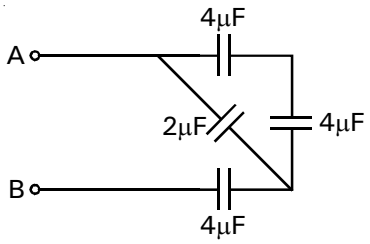
(1) $I_1 + I_2$
(2) $I_2 + I_3$
(3) $I_1 + I_3$
(4) $I_1 - I_2 + I_3$

18. A ring and a solid sphere of same mass and radius are rotating with the same angular velocity about their diameteric axes. Then
(1) it is easier to stop the ring
(2) it is easier to stop the solid sphere
(3) it is equally difficult to stop both of them
(4) it is not possible to stop a rotating body

19. 

AB is a wire of uniform resistance. The galvanometer G shows no current when the length AC = 20cm and CB = 80 cm. The resistance R is equal to
(1) 2Ω
(2) 8Ω
(3) 20Ω
(4) 40Ω

20. The displacement of a particle executing S.H.M. is half its amplitude. The fraction of its kinetic energy will be
(1) $\frac{1}{2}$
(2) $\frac{1}{3}$
(3) $\frac{3}{4}$
(4) $\frac{2}{3}$

21. 

The total capacity of the system of capacitors shown in the figure between points A and B is

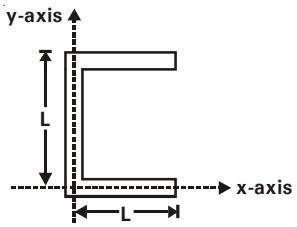
(1) 1 μF
(2) 2 μF
(3) 3 μF
(4) 4 μF

22. A stone is thrown at an angle θ to the horizontal reaches a maximum height H. Then the time of flight of stone will be

(1) $\sqrt{\frac{2H}{g}}$
(2) $\sqrt{\frac{8H}{g}}$
(3) $\frac{2\sqrt{2H\sin\theta}}{g}$
(4) $\frac{\sqrt{2H\sin\theta}}{g}$

23. B, μ_0, H and I are related as (symbols have their usual meaning in magnetism)

(1) $(B - I) = \mu_0 H$
(2) $B = \mu_0 (H - I)$
(3) $H = \mu_0 (B + I)$
(4) $B = \mu_0 (H + I)$

24. 

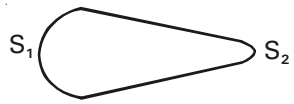
In the above arrangement, three rods are identical in mass and length. The centre of mass is at

(1) $\left(\frac{L}{2}, \frac{L}{2}\right)$
(2) $\left(\frac{L}{3}, 0\right)$
(3) $\left(\frac{L}{3}, \frac{L}{2}\right)$
(4) $\left(0, \frac{L}{3}\right)$

25. If velocity head of a stream of water is equal to 10 cm, then its speed of flow is ($g = 10\ m/s^2$)

(1) 10 m/s
(2) 140 m/s
(3) 1.4 m/s
(4) 0.1 m/s

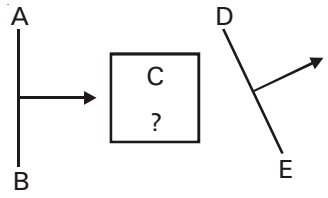
26. A conducting body shown in figure is given some charge. If radii of curvature of two surfaces S_1 and S_2 are in ratio 10 : 1, charge density is



(1) more on surface S_1
(2) more on surface S_2
(3) same on both the surfaces
(4) more on surface S_1 for positive charge and on surface S_2 for negative charge

27. If an n-p-n transistor is biased to work as an amplifier, then

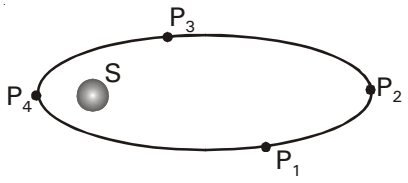
(1) its emitter-base junction is forward-biased and collector base junction reverse-biased
(2) both junctions are forward-biased
(3) both the junctions are reverse-biased
(4) it is immaterial whether the junctions are biased or not

28. 

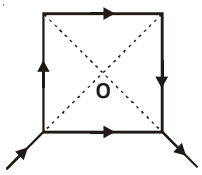
In the figure, a wavefront AB passing through a system C emerges as DE. The system C could be

(1) a slit
(2) a lens
(3) a prism
(4) a glass slab

29. The given figure shows a planet in elliptical orbit around the sun (S). Where will the KE of the planet be maximum?



(1) P_1
(2) P_2
(3) P_3
(4) P_4

30. 

In the square loop made of uniform conducting wire shown above, magnetic field will be

(1) maximum at the centre of the loop
(2) zero at the centre of loop
(3) zero at all points inside the loop
(4) zero at all points outside of the loop

31. A very light ball moving along x-axis with a speed of 12 m/s collides elastically head on with a heavy solid ball moving in same direction with a speed of 3 m/s. After the collision, the light ball will move along x-axis with a velocity

(1) 3 m/s
(2) −12 m/s
(3) 2 m/s
(4) −6 m/s

32. An observer is moving in a circle with a speed 'v'. A source of sound of frequency 'f' is at rest at the centre of the circle. The frequency observed by the observer is (c = speed of sound)

(1) $f\left(\frac{c}{c-v}\right)$

(2) $f\left(\frac{c+v}{c}\right)$

(3) f

(4) $f\left(\frac{c+v}{c-v}\right)$

33. **Assertion** : It is more advantageous to launch rockets in an equitorial plane from west to east.
Reason : At equator, linear velocity of the earth's rotation from west to east is maximum.

(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

34. Increase in length of a uniform wire of weight W, length L and area of crossection A under its own weight is

(1) $\frac{WL}{AY}$ (2) $\frac{WL}{2AY}$

(3) $\frac{2WL}{AY}$ (4) $\frac{WL}{4AY}$

35. In a compound microscope, if the objective produces an image I_o and the eye piece produces an image I_e, then

(1) I_o is virtual but I_e is real
(2) I_o is real but I_e is virtual
(3) I_o and I_e are both real
(4) I_o and I_e are both virtual

PHYSICS : SECTION-B

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

36. Photo-current in general depends upon

a. collector plate potential
b. frequency of incident light
c. intensity of incident light

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

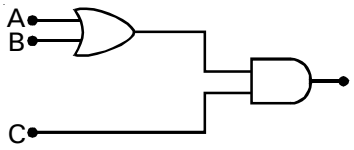
37. An elevator of total mass 900 kg is moving up with a constant speed of 4 ms^{-1}. A frictional force of 1000 N opposes its motion. The power delivered by the motor to elevator is

(1) 20 kW
(2) 40 kW
(3) 32 kW
(4) 16 kW

38. For a given value of current flowing through a wire, drift velocity depends on

a. cross-sectional area of the wire
b. free electrons number density
c. magnitude of the current flowing
d. length of the wire

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

39. 

The circuit shown in the figure gives an output 1 when the input is

(1) A = 0, B = 1, C = 0
(2) A = 1, B = 0, C = 0
(3) A = 1, B = 0, C = 1
(4) A = 1, B = 1, C = 0

40. A cylindrical tube, open at both ends, has a fundamental frequency f_0 in air. The tube is dipped vertically into water such that one-fourth of its length is inside water. The fundamental frequency of the air column now is

(1) $3f_0/4$

(2) f_0

(3) $f_0/2$

(4) $2f_0/3$

41. **Statement-I** : A cycle tyre bursts suddenly. This represents an isothermal process.

Statement-II : For free expansion of a gas in an insulated arrangement, $\Delta Q = \Delta W = \Delta U = 0$.

(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

42. If a rope of length L is pulled from one end by a constant force F, then tension at a distance ℓ from this end is

(1) $F\left(1-\frac{\ell}{L}\right)$

(2) $F\left(1+\frac{\ell}{L}\right)$

(3) $F\left(1+\frac{L}{\ell}\right)$

(4) $F\left(\frac{L}{L-\ell}\right)$

43. An electron of mass m, when accelerated through a potential V, has de-Broglie wavelength λ. The de-Broglie wavelength associated with a proton of mass M accelerated through the same potential difference will be

(1) $\lambda\sqrt{\frac{M}{m}}$

(2) $\lambda\sqrt{\frac{m}{M}}$

(3) $\lambda\left(\frac{M}{m}\right)$

(4) $\lambda\left(\frac{m}{M}\right)$

44. Two stars P and Q emit maximum radiation at wavelength 3600 Å and 4800 Å respectively. The ratio of temperature of P to that of Q is

(1) 1 : 2

(2) 3 : 4

(3) 4 : 3

(4) 2 : 1

45. 

A convex lens of focal length 20 cm is cut in two equal parts by a plane parallel to the principal axis. The two parts are now placed in contact as shown. Power of combination will be

(1) 5 D

(2) 10 D

(3) zero

(4) 2.5 D

46. A piece of copper and the other of germanium are cooled from the room temperature to 80 K, then which of the following would be a correct statement?

(1) Resistance of each increases

(2) Resistance of each decreases

(3) Resistance of copper increases while that of germanium decreases

(4) Resistance of copper decreases while that of germanium increases

47. A rigid body can be hinged about any point on the x-axis. When it is hinged such that the hinge is at x, the moment of inertia is given by

$$I = 2x^2 - 12x + 27$$

The x-coordinate of centre of mass is

(1) x = 2

(2) x = 0

(3) x = 1

(4) x = 3

48. Two parallel wires carry currents 10A each in opposite directions. One of the wires is infinitely long and the length of the other wire is 1 m. Force acting on either wire, if distance between them is 20 cm, is

(1) 5×10^{-5} N

(2) 4×10^{-5} N

(3) 10^{-4} N

(4) 8×10^{-4} N

49. A block is placed on a rough horizontal surface. A horizontal force is applied to move the block. Then
(1) less force is required for pulling as compared to pushing
(2) more force is required for pulling as compared to pushing
(3) force required for pulling is same as that required for pushing
(4) double force is required for pulling as compared to pushing

50. The volume of air increases by 5% in its adiabatic expansion. The percentage decrease in its pressure will be
(1) 5%
(2) 6%
(3) 7%
(4) 8%

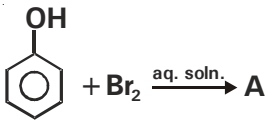
CHEMISTRY : SECTION-A

All questions are compulsory in section A

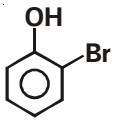
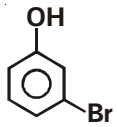
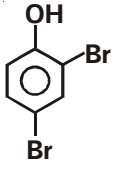
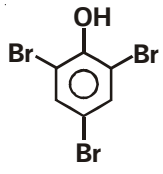
51. Which of the following is employed as a tranquilizer?
(1) Equanil
(2) Tetracyline
(3) Aspirn
(4) Cimetidine

52. Equivalent weight of a salt Na_2SO_4 is
(1) M/1
(2) M/2
(3) M/3
(4) none of these

53. Which monomer is used to prepare Glyptal?
(1) 
(2) $NH_2-(CH_2)_4-COOH$
(3) $HO-(CH_2)_2-OH$
(4) $CH_2=CHCN$

54. 

What is A?

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

55. Which noble gas can diffuse through most commonly used laboratory materials such as rubber?
(1) He
(2) Ne
(3) Ar
(4) Xe

56. During Tollen's reagent test, oxidation state of Ag changes from _____ to zero.
(1) +2
(2) +1
(3) zero
(4) −1

57. Which method of purification is represented by the following equation?

$$Ni + 4CO \xrightarrow{70^0C} Ni(CO)_4 \xrightarrow{180^0C} Ni + 4CO$$

(1) van Arkel process
(2) Zone refining
(3) Mond's process
(4) Cupellation

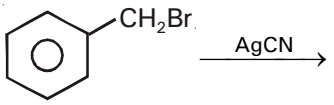
58. Which of the following equation represent enthalpy of atomisation?
(1) $CH_4(g) \rightarrow C(g) + 2H_2(g)$
(2) $CH_4(g) \rightarrow C(s) + 4H(g)$
(3) $CH_4(g) \rightarrow C(g) + 4H(g)$
(4) $CH_4(g) \rightarrow C(s) + 2H_2(g)$

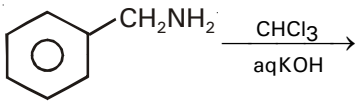
59. Which of the following does not play any role in smog?
(1) SO_2
(2) NO_2
(3) O_3
(4) Freons

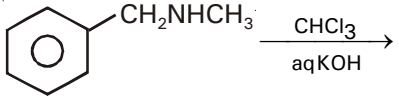
60. The correct formula of calgon is
(1) $Na_2Al_2Si_2O_8$
(2) $Na_6P_6O_{18}$
(3) $NaAlSiO_4$
(4) $R-SO_3H$

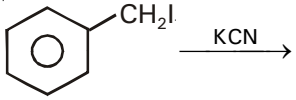
61. **Statement-I** : The presence of a large number of Schottky defect in NaCl lowers its density.
Statement-II : In NaCl, there are approximately 10^6 Schottky pairs per cm^3 at room temperature.
(1) Both statement-I and statement-II are incorrect
(2) Both statement-I and statement-II are correct
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

62. Benzyl isocyanide can be obtained by

A. 

B. 

C. 

D. 

Choose the correct answer from the options given below?

(1) B and C

(2) A and B

(3) A and D

(4) Only B

63. Which of the following does not have a resonance structure?

(1) Benzene

(2) Benzaldehyde (C_6H_5CHO)

(3) Dimethyl ether

(4) $C_6H_5NH_2$

64. The ratio of closed packed atoms to tetrahedral holes in cubic close packing (or fcc) is

(1) 1 : 1

(2) 1 : 2

(3) 1 : 3

(4) 2 : 1

65. The products of reductive ozonolysis of 2-methyl pent-2-ene are

(1) chain isomers

(2) functional isomers

(3) position isomers

(4) tautomers

66. A straight line with negative slope was found in graph of $\ln_e k$ Vs $\frac{1}{T}$ with an angle of 45° with $\frac{1}{T}$-axis (where k is rate constant & T is temperature in kelvin). The energy of activation in calories is

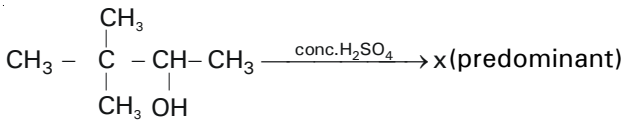
(1) 4.6

(2) 9.2

(3) 8.3

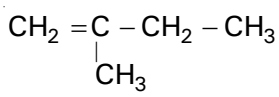
(4) 2

67. In the following reaction sequence



x will be

(1) $(CH_3)_3C\,CH = CH_2$

(2) 

(3) $(CH_3)_2C = C(CH_3)_2$

(4) None of these

68. Which one of the following is not correct for oxidation number?

(1) The number assigned to oxygen will depend upon the bonding state

(2) The number assigned to hydrogen is –1 when bonded to metals in binary compounds

(3) The number is equal to the charge on an ion if the ion is composed of only one atom

(4) In the third period, the highest value of oxidation number changes from 1 to 8

69. 10 millimoles of NH_3 and 80 millimoles of NH_4Br are mixed to form a buffer with pOH. (pK_b of $NH_3 = 4.75$)

(1) 5.65

(2) 8.35

(3) 4.75

(4) 3.85

70. **Assertion** : Benzaldehyde is less reactive in comparison to ethanal towards nucleophilic attack.

Reason : All the C atom in benzaldehyde are sp^2-hybrid.

(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

71. In solid state, $BeCl_2$ exists as

(1) a polymer

(2) a dimer

(3) a monomer

(4) cyclic trimeric form

72. In the reaction

$C_2H_5OH + HX \rightarrow C_2H_5X + H_2O$

the order of reactivity of HX is

(1) $HBr > HI > HCl$

(2) $HI > HBr > HCl$

(3) $HI > HCl > HBr$

(4) $HCl > HBr > HI$

73. $t_{2g}^3 e_g^2$, electronic configuration is present in

(1) Fe^{3+}, weak field ligend

(2) Fe^{3+}, strong field ligend

(3) Mn^{2+}, strong field ligend

(4) Mn^{3+}, weak field ligend

74. Which of the following process involves decrease in the entropy of system?

(1) $Br_2(l) \rightarrow Br_2(g)$

(2) Elongating the rubber band

(3) $N_2(g)$ [10 atm] $\rightarrow N_2(g)$ [1 atm]

(4) hard boiling of egg

75. A compound which does not give a positive test in the Lassaigne's test for N is

(1) Glycine

(2) Hydrazine

(3) Urea

(4) Ethylamine

76. For the following gaseous equilibria X, Y and Z at 300 K

X : $2SO_2 + O_2 \rightleftharpoons 2SO_3$

Y : $PCl_5 \rightleftharpoons PCl_3 + Cl_2$

Z : $2HI \rightleftharpoons H_2 + I_2$

ratio of K_P and K_C in the increasing order is

(1) $X = Y = Z$

(2) $X < Y < Z$

(3) $X < Z < Y$

(4) $Z < Y < Z$

77. Which of the following alkyl halides will give the highest yield of substitution products under conditions favourable to a bimolecular reaction?

(1) $CH_3CH_2CH_2CH_2CH_2Br$

(2) $CH_3CH_2CH_2\underset{\displaystyle Br}{\underset{|}{C}}H - CH_3$

(3) $CH_3CH_2 - \underset{\displaystyle Br}{\underset{|}{C}}H - CH_2Br$

(4) $CH_3CH_2 - \underset{\displaystyle CH_3}{\overset{\displaystyle Br}{\overset{|}{\underset{|}{C}}}} - CH_3$

78. Consider the following complexes

I. $CoCl_3.5NH_3$

II. $CoCl_3.3NH_3$

III. $CoCl_3.6NH_3$

The decreasing order of conductance of above complexes in aqueous solution is

(1) I, II, III

(2) II, I, III

(3) III, I, II

(4) III, II, I

79. The ratio of σ to π bonds in C_6H_6 (benzene) molecule is

(1) 4:3

(2) 2:1

(3) 4:1

(4) 1:2

80. Which of the following statements related to the modern periodic table is incorrect?

(1) p-block has 6 columns, because a maximum of 6 electrons can occupy all the orbitals in a p-subshell

(2) d-block has 8 columns, because a maximum of 8 electrons can occupy all the orbitals in a d-subshell

(3) Each block contains number of columns equal to the number of electrons that can occupy that sub shell

(4) s-block has two columns because maximum two electrons are occupied in s-subshell

81. Match the statements given in Column I with the oxidation states given in Column II.

	Column I	**Column II**
i.	Oxidation state of Mn in MnO_2 is	a. + 2
ii.	Most common oxidation state of d-block	b. + 3
iii.	Highest oxidation state of Mn in oxides is	c. + 4
iv.	Characteristic oxidation state of lanthanoids is	d. + 5
		e. + 7

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

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

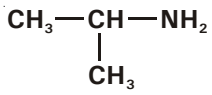
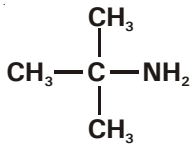
(3) i-c, ii-a, iii-d, iv-b

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

82. The products expected to be formed in Wurtz reaction of a mixture of neopentyl bromide and isopropyl bromide are
a. 2,2,4-trimethylpentane
b. 2,2,5,5,-tetramethyl hexane
c. 2,5-dimethylhexane
d. 2,2,5-trimethylhexane
(1) b, c and d only
(2) a, b, c and d only
(3) a, b and d only
(4) a, b and c only

83. Which of the following would exhibit co-ordination isomerism?
(1) $[Cr(NH_3)_6][Co(CN)_6]$
(2) $[Co(en)_2Cl_2]$
(3) $[(NH_3)_5Co-NH_2-Co(NH_3)_5](NO_3)_5$
(4) $[Cr(en)_2Cl_2]^+$

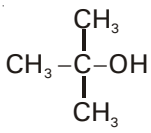
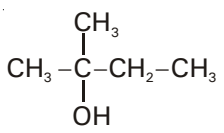
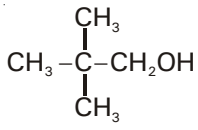
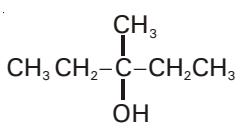
84. For a given mass of a gas at constant temperature, if the volume V becomes three times, then the pressure (p) will become
(1) 3p (2) p/3
(3) 3p/T (4) $9p^2$

85. Which of the following is a primary amine?
(1) $CH_3-CH_2-NH_2$
(2) 
(3) 
(4) All of these

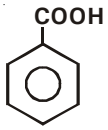
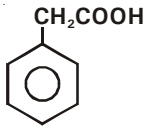
CHEMISTRY : SECTION-B

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

86. Bredig's arc method cannot be used for the preparation of colloidal sol of
(1) Copper (2) Gold
(3) Silver (4) Sodium

87. An alcohol upon heating with Cu metal at 300^0C gives an alkene. It cannot be
(1) 
(2) 
(3) 
(4) 

88. If the de-Broglie wavelength of a particle of mass m is 100 times its velocity, then its value in terms of mass (m) and Planck's constant(h) is
(1) $\frac{1}{10}\sqrt{\frac{h}{m}}$
(2) $10\sqrt{\frac{h}{m}}$
(3) $\frac{1}{10}\sqrt{\frac{h}{m}}$
(4) $10\sqrt{\frac{m}{h}}$

89. Which of the following has minimum pKa value?
(1) FCH_2COOH
(2) $ClCH_3COOH$
(3) 
(4) 

90. The correct order of equivalent conductance at infinite dilution of LiCl, NaCl and KCl is
(1) LiCl > NaCl > KCl
(2) KCl > NaCl > LiCl
(3) NaCl > KCl > LiCl
(4) LiCl > KCl > NaCl

91. BF_3 reacts with water to give HBF_4. What is the change in hybridisation?
(1) sp^2 to sp^3
(2) sp^3 to sp^2
(3) sp to sp^3
(4) sp^2 to sp^3d

92. $HA(aq) + H_2O(l) \rightleftharpoons H_3O^+(aq) + A^-(aq)$
If the equilibrium is dynamic then with passage of time the favourable direction is in the direction of formation of
(1) stronger acid and stronger base
(2) weaker acid and stronger base
(3) weaker acid and weaker base
(4) stronger acid and weaker base

93. **Statement-I** : An azeotropic liquid mixture is one that boils with unchanged composition.

Statement-II : The vapour pressure of a liquid decreases upon dissolution of a non-volatile Solute.

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

94. Number of hydrogen atoms per molecule of a hydrocarbon A having 85.8% carbon is (mol.mass of A = 84 gm/mole)
(1) 20
(2) 12
(3) 6
(4) 10

95. Glucose and Mannose are
(1) enantiomers
(2) conformers
(3) epimers
(4) anomers

96. In case of oxygen family (Group 16)
(1) the tendency for catenation decreases markedly as we go down the group
(2) maximum coordination of oxygen is four due to lack of d-orbital but that of other elements is six due to presence of d-orbital
(3) the tendency to form multiple bonds with C, N and O decreases on going down the group from S to Te
(4) all are correct

97. 32 g of a sample of $FeSO_4$. $7H_2O$(M.wt = 278) were dissolved in dilute H_2SO_4 and water and its volume was made up- to one litre, 25 ml of this solution required 20 ml of 0.02M $KMnO_4$ solution for complete oxidation. Calculate the weight % of $FeSO_4.7H_2O$ in the sample
(1) 34.75
(2) 69.5
(3) 89.5
(4) None of these

98. **Assertion :** PCl_3Br_2 is a polar molecule with polar bonds.

Reason : It has a regular geometry.
(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

99. 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

100. Which of the following property is shown by both white phosphorus and red phosphorus ?
(1) These dissolve in carbon disulphide
(2) These reacts with hot aqueous NaOH to give phosphine
(3) These show phosphorescence in air
(4) White phosphorous has low ignition temperature than red phosphorus

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. An IUD is
(1) LNG-20
(2) condom
(3) vasectomy
(4) pill

102. Which of the layer of in the wall of blood vessel helps to differentiate between artery and vein in addition to the differences in size of lumen?
(1) tunica intima
(2) tunica albuginea
(3) tunica media
(4) tunica externa

103. How many sperms are present approximately in three ejaculations?
(1) 200 million–300 million
(2) 600 million–900 million
(3) 400 million –500 million
(4) 300 million –400 million

104. The gene for Bt protein toxins produced by *Bacillus thuringiensis* are incorporated into several crop plants and are ideal insecticides for several reason like
   a. They are active only against the target insects
   b. Bt proteins bind to specific receptors on the gut membrane of insects (coleopterans, dipterans, lepidopterans)
   c. Taste of plant yield is improved
   d. Plant becomes rich in provitamin A
   (1) a and b only
   (2) a, b and c
   (3) a, b and d
   (4) a, b, c and d

105. Select the incorrect match of event and its time span of occurrence

	Event	Time span of occurrence
(1)	Invertebrates formed and became active	500 myA
(2)	Reptiles dominated earth	50 my A
(3)	Dinosaurs disappeared from earth	65 myA
(4)	Jawless fish existed	350 myA

106. **Assertion** : Steroid hormones regulating menstrual cycle give feedback for secretion of peptide/protein homones involved in menstrual cycle.
Reason : Steroid hormones being fat soluble cannot cross the cell membrane.
   (1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
   (2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
   (3) Assertion is true statement but Reason is false
   (4) Assertion is false

107. How many of the following statements are correct w.r.t genetic drift?
   a. Mostly occurs in small populations
   b. Certain alleles can be lost forever
   c. Founder effects and Bottleneck effect are caused by genetic drift
   d. Mutations are primarily responsible for it
   (1) Two
   (2) Three
   (3) Four
   (4) One

108. Which of the following statement is incorrect w.r.t. human dentition?
   (1) Man has 20 monophyodont teeth and 12 diphyodont teeth
   (2) Teeth are embedded in the socket of jaw bones
   (3) Have different types of teeth in the jaw bones
   (4) Both (1) & (2) are incorrect

109. When a neuron is not conducting any impulse
   a. The axonal membrane is more permeable to K^+ ions
   b. The axonal membrane is nearly impermeable to Na^+ and totally impermeable to negatively charged proteins
   c. Axoplasm contains high concentration of Na^+ and negatively charged proteins
   c. Fluid outside the axon contains low concentration of Na^+ and high concentration of K^+
   (1) a, b and c
   (2) b and d
   (3) b, c and d
   (4) a and b

110. Which of the following statements are true ?
   a. In *Trygon*, the electric organs are capable of generating strong electric shock to paralyse the prey
   b. *Branchiostoma* belongs to urochordata.
   c Fishes have two chambered heart
   d. *Pristis* has internal fertilisation
   (1) b and c
   (2) c and d
   (3) a and d
   (4) b and d

111. Which of the following pair is correctly matched ?
   (1) Rib cage = 26 vertebrae + ribs + sternum
   (2) Scapula–Flat, triangular, between 7^{th}–9^{th} ribs
   (3) Dicondylic skull –all vertebrates
   (4) Pubic symphysis –white fibrous cartilage

112. A DNA tagged with radioactive molecule is allowed to hybridize to DNA in a clone of cells followed by detection using radiography the DNA from clone which appears on photographic film is
   (1) mutated gene
   (2) normal gene
   (3) non-complementary gene
   (4) both (1) and (2)

113. Meiosis-II performs
   (1) separation of sex chromosomes
   (2) synthesis of DNA and centromeres
   (3) separation of homologous chromosomes
   (4) separation of chromatids

114. Match the following

a. Estrogen	i. Secreted by sertoli cells
b. Progesterone	ii. Stimulates leydig cells
c. Inhibin	iii. Proliferation of endometrium
d. LH	iv. Secreted by trophoblast
	v. Prepares endometrium for implantation

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

115. How many of the following have hallucinogenic properties?
Atropa belladona, Datura, Excessive coca alkaloids, Opioids, Cannabinoids, Barbiturates, Benzodiazepines
(1) 4
(2) 5
(3) 6
(4) 7

116. Identify A, B, C & D respectively from the given options

	Name of the disease	**Causative organism**
i.	(A)	*Trichophyton*
ii.	Typhoid	(B)
iii.	(C)	rhino viruses
iv.	Filariasis	(D)

(1) Dermatophytes, *Clostridium*, Flu, *Wuchereria bancrofti*
(2) Ringworm, *Salmonella typhi*, common cold, *Wuchereria bancrofti*
(3) Tinea, *Bacillus typhi*, Influenza, *Ascaris*
(4) Ringworm, *Salmonella typhi*, Common cold, *Ancylostoma*

117. *Entamoeba histolytica* feeds on
(1) mucosa and submucosa of small intestine
(2) food in intestine
(3) blood, mucosa and submucosa of colon
(4) RBCs only

118. Which of the following statement is not correct w.r.t to cell division?
(1) The spindle fibres attach to the chromosomes at the region called chromomere
(2) Best material to study for mitosis is root tip
(3) Mitotic spindle is made up of actin and myosin proteins
(4) both (1) and (3)

119. **Statement-I :** Sperm head has cap like structure called acrosome.
Statement-II : Acrosome is formed by Golgi body but functions like lysosome.
(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

120. Identify the number of CORRECT statements
a. Some elements found in the living tissue are not found in the earth's crust.
b. Tyrosine, phenyl alanine & tryptophan are protein amino acids.
c. Many secondary metabolites are useful to human welfare.
d. The acid soluble pool obtained during chemical analysis of tissue represents, roughly the cytoplasmic composition.
e. As a protein folds to form its secondary & tertiary structure, it loses its primary structure.
f. Peptide bond, glycosidic bond & ester bond are formed by dehydration synthesis.
(1) Three
(2) Five
(3) Four
(4) Two

121. Which among the following is incorrect matching set?
(1) Streptokinase – Therapeutic proteins
(2) Adenine– Substituted Pyrimidine
(3) Collagen–Intercellular ground substance
(4) Blood proteins – albumins

122. The given structure represent .....X..... The genetic material in it is .....Y..... Which of the following is correct option for X and Y

	X	**Y**
(1)	HIV	dsRNA
(2)	Plasmodium	DNA
(3)	HIV	ssRNA
(4)	Rhinovirus	RNA

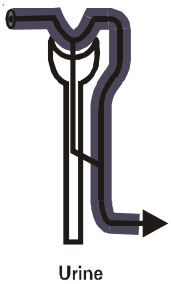
123. Which of the following is not related to tertiary follicle?
(1) Antrum present
(2) Theca differentiated into theca externa and theca interna
(3) Oocyte completes meiosis-I
(4) Can be observed in foetal ovary

124. Which of the following is incorrect about different metabolites or biomolecules in cell?
(1) all biomolecules have turnover
(2) different metabolites are present in same concentration
(3) biomolecules are in metabolic flux
(4) flow of metabolites in metabolic pathway has a definite rate and direction

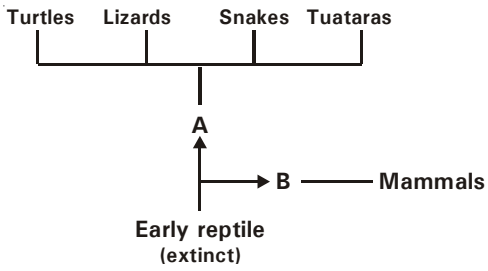
125. Oxytocin and ADH reach their target cells by means of
(1) lymphatic vessels
(2) blood vessels
(3) axons
(4) anterior pituitary

126. The enzyme that is not present in succus entericus is
(1) Lipase
(2) Maltase
(3) Nucleases
(4) Nucleosidase

127. **Statement-I** : Body of mollusca is covered by calcareous shell and is unsegmented with distinct head, foot and visceral hump.
Statement-II : A soft and non spongy layer of skin forms a mantle under the visceral hump.
(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

128. 

The above diagram showing urine formation represents fate of substance which is
(1) filtered and completely reabsorbed
(2) filtered and partially reabsorbed
(3) reabsorbed and secreted
(4) filtered and secreted

129. 

The ancestral reptiles giving rise to reptiles and mammals representing at A and B respectively are
(1) Therapsids and sauropsids
(2) Synapsids and therapsids
(3) Sauropsids and synapsids
(4) Therapsids and pelycosaurids

130. Which of the following statement/s is/are true about reptiles?
a. They have creeping or crawling mode of locomotion
b. Tympanum represents ear
c. Dry cornified skin
d. Viviparous
e. Fertilization internal
f. Epidermal scales or scutes
(1) a, b, c, e, f
(2) a, b, c, d, f
(3) a, c, f
(4) a, c, e, f

131. Listed below are four respiratory capacities (a-d) and four jumbled respiratory volumes of a normal human adult :

	Respiratory capacities	**Respiratory volume**
a.	Residual volume	2500 mL
b.	Vital capacity	3500 mL
c.	Inspiratory reserve volume	1200 mL
d.	Inspiratory capacity	4500 ml

Which one of the following is the correct matching of two capacities and volumes?
(1) (a) 4500 mL, (b) 3500 mL
(2) (b) 2500 mL, (c) 4500 mL
(3) (c) 1200 mL, (d) 2500 mL
(4) (d) 3500 mL, (a) 1200 mL

132. Any change in volume of thoracic cavity is
(1) directly related to change in pulmonary volumes
(2) indirectly related to change in pulmonary volumes
(3) inversely related to change in pulmonary volumes
(4) not related to change in pulmonary volumes

133. BOD of waste water is estimated by measuring the amount of
(1) total organic matter
(2) biodegradable organic matter
(3) oxygen evolution
(4) oxygen consumption

134. Bulk of carbon dioxide (CO_2) released from body tissues into the blood is present as
(1) 70% carbamino-haemoglobin and 30% as bicarbonate
(2) Carbamino-haemoglobin in RBCs
(3) Bicarbonate in blood plasma
(4) Free CO_2 in blood plasma

135. Which of the following is correct match for IUDs?
(1) Lippes loop – Cu^{2+} releasing
(2) Multiload 375 – non medicated
(3) Progestasert – hormone releasing
(4) Saheli – barrier acting

ZOOLOGY : SECTION-B

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

136. Which is FALSE about the stages of prophase-I?
(1) Leptotene – synaptonemal complex
(2) Zygotene – synapsis
(3) Pachytene – recombination nodules
(4) Diplotene – chiasmata

137. In which of the following situations would evolution occur?

	Migration	Variations due to mutations
1.	Absent	low
2.	Absent	absent
3.	Negligible	absent
4.	High	high

138. Which is incorrect w.r.t. to excretion by human kidney?
(1) DCT is capable of reabsorption of HCO_3^-
(2) Ascending limb of loop of Henle is impermeable to electrolytes
(3) Minimum reabsorption occurs in ascending limb of loop of Henle
(4) Collecting duct is permeable to H_2O

139. Foreign gene that codes for enzyme which can convert the substrate into orange colour was introduced in a plasmid. After introduction of plasmid in bacteria present in the petridish containing substrate.
(1) recombinants will give orange colour and non-recombinants will give white colour
(2) recombinants and non-recombinants both produced white colour
(3) recombinants and non-recombinants both produced orange colour
(4) recombinants will give white colour and non-recombinants will give orange colour

140. **Assertion** : Concentration of a number of ions & other materials is significantly higher in vacuoles than in cytoplasm.
Reason : Tonoplast facilitates transport of ions & other materials against concentration gradient into the vacuole.
(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. Which of the following is not an example of biopesticide?
(1) *Trichoderma sps*.
(2) *Nucleopolyhedrovirus*
(3) *Bacillus thuringienesis*
(4) *Monascus purpureus*

142. Find the correct statement regarding *Periplaneta*
(1) The abdomen in both males and females consist of nine segments
(2) In females genital pouch is formed by 7th, 8th and 9th tergum
(3) In males genetial pouch is bounded by 9th, 10th terga and 9th sterna
(4) Anal styles are present only in females

143. Distillation is required for producing certain alcoholic drinks because distillation
(1) improves flavour of the beverage
(2) increases alcoholic content of these drinks
(3) is the only method to purify some drinks
(4) helps to increase shelf life

144. How many among the following are coelomates with jointed appendages and malpighian tubules?

Locusta, Anopheles, Culex, Aedes, Nereis, Pila, Chaetopleura

(1) 3
(2) 5
(3) 4
(4) 6

145. **Statement-I :** Certain pest resistant plants are developed on the mechanism of RNAi

Statement-II : RNAi takes place in both eukaryotes and prokaryotes.

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

146. How many statements is/are correct?

a. There is an extensive compartmentalisation of cytoplasm in all the cells
b. Virchow (1955) first explained that cells are formed from preexisting cells
c. Cell wall is absent in eukaryotes
d. Fluid mosaic model was proposed by Singer and Nicolson after the discovery of electron microscope

(1) One
(2) Three
(3) Four
(4) None

147. Glycogen is

(1) Synthesised in liver, source of energy, forming bile and lipase
(2) Disaccharide stored in liver reacts with ammonia to form protein
(3) Synthesised in blood, stored in liver and muscles to provide glucose
(4) Polysaccharide synthesised and stored in liver

148. Dragonflies & lady bird beetles are used to get rid of ___(A)___ & ___(B)___. A & B are respectively

(1) Aphids, mosquitoes
(2) Aphids, plant pathogens
(3) Mosquitoes, Aphids
(4) Plant pathogens, Butterfly caterpillar

149. In Miller's experiment which of the following amino acids was not found?

(1) Alanine
(2) Glycine
(3) Valine
(4) Aspartic acid

150. Which of the following statement is correct regarding regulation of kidney's function?

(1) An increase in body fluid volume activate osmoreceptors
(2) Angiotensin-II being a powerful vasoconstrictor decreases GFR
(3) ANF cause vasodilation and thereby decrease blood pressure
(4) Functioning of kidney is not regulated by hormones

BOTANY : SECTION-A

All questions are compulsory in section A

151. Which of the following class of fungi includes 'Club fungi?

(1) Phycomycetes
(2) Ascomycetes
(3) Deuteromycetes
(4) Basidiomycetes

152. Which of the following statements is/are correct?

a. Embryo development precedes endosperm development
b. Pollen can be stored in pollen banks
c. All flowering plants show sexual reproduction
d. Stored pollen can be used in crop breeding programmes

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

153. How many times chromosome number, 21 is present in an individual showing Down's syndrome ?

(1) Two times
(2) Three times
(3) Four times
(4) One time only

154. In a plant, if there is no correlation between exposure to light duration and induction of flowering response, then plant is called,

(1) DNP
(2) SDP
(3) LDP
(4) Indeterminate plant

155. Splicing occurs inside

(1) cytoplasm
(2) nucleus
(3) mitochondria
(4) both (1) and (2)

156. Read the following statements
a. Plants produced through micropropagation are somaclones
b. *Saccharum officinarum* has low yield and resistance against red rot.
c. Semidwarf rice varieties were derived from IR–10 developed at IRRI, Philippines
d. Germplasm collection is basic step in breeding a new genetic variety of a crop

How many statements are wrong?
(1) 3
(2) 2
(3) 4
(4) 1

157. Which is incorrectly matched?

(1)	Endothecium	nutrition
(2)	Epidermis	protection
(3)	Tapetum	pollenkitt
(4)	Sporogenous cell	potential pollen mother cell

158. **Statement-I** : Promoter is a DNA sequence that provide binding site for RNA polymerase.
Statement-II : By switching the position of promoter with terminator, the definition of coding and template strands could be reversed .
(1) Both statements I & II are correct
(2) Both statements I & II are incorrect
(3) Statements I is correct but statement II is incorrect
(4) Statements I is incorrect but statement II is correct

159. A population growing in a habitat with limited resources shows initially a lag phase, followed by phases of acceleration and deceleration and finally an asymptote, when the population density reaches the carrying capacity. If a plot of N in relation to time t is drawn, it will result in
(1) exponential curve
(2) straight line
(3) sigmoid curve
(4) triangular pyramid

160. Diapause differs from hibernation in being
(1) occurring only in summer
(2) occurring only in winter
(3) suspended developmental stage
(4) inactive state of adult organism

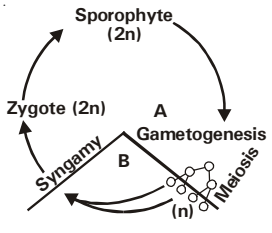
161. A nitrogen fixing bacteria which shows synmbiotic association with roots of leguminous plant is
(1) *Rhizobium*
(2) *Frankia*
(3) *Xanthomonas*
(4) *Mycobacterium*

162. Which of the following is central dogma of molecular biology?
(1) DNA $\xrightarrow{\text{Translation}}$ mRNA $\xrightarrow{\text{Transcription}}$ protein
(2) DNA $\underset{\text{Reverse transcription}}{\overset{\text{Transcription}}{\rightleftharpoons}}$ mRNA $\xrightarrow{\text{Translation}}$ protein
(3) DNA $\xrightarrow{\text{Replication}}$ mRNA $\xrightarrow{\text{Translation}}$ protein
(4) DNA $\underset{\text{Transcription}}{\overset{\text{Reverse transcription}}{\rightleftharpoons}}$ RNA $\xrightarrow{\text{Translation}}$ protein

163. Satellite DNA
(1) normally code for important proteins
(2) forms a small portion of human genome
(3) is not inheritable
(4) forms the basis of DNA fingerprinting

164. 'Red tides' in coastal waters are developed due to super abundance of
(1) *Gonyaulax*
(2) *Navicula*
(3) *Noctiluca*
(4) euglenoids

165. Identify the following type of life cycle



(1) haplontic
(2) diplontic
(3) haplodiplontic
(4) diplohaplontic

166. Select the incorrect statement regarding the anatomy of a typical monocotyledonous stem
(1) Phloem parenchyma is absent
(2) Vascular bundles are scattered, conjoint, collateral and closed
(3) Each vascular bundle is surrounded by a bundle sheath
(4) Ground tissue is differentiated into cortex, endodermis, pericycle and pith

167. Count the number of members belonging to liliaceae from the list given below
Tulip, *Lupin, Sesbania, Gloriosa*, *Tomato, Aloe*, *Asparagus*, *Colchicum autumnale*
(1) 5
(2) 3
(3) 2
(4) 6

168. Match the entries in column-I with entries in column-II w.r.t biomagnification of DDT in an aquatic food chain

	Column-I (Organisms)	Column-II (DDT concentration)
a.	Large fish	I. 0.003 ppb
b.	Zoo plankton	II. 2 ppm
c.	Fish- eating bird	III. 0.04 ppm
d.	Small fish	IV. 25 ppm
e.	Water	V. 0.5 ppm

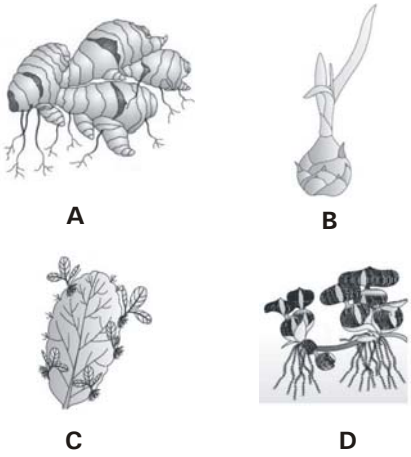
(1) a–I, b–II, c–III, d–VI, e–V
(2) a–II, b–I, c–V, d–III, e–IV
(3) a–II, b–III, c–IV, d–V, e–I
(4) a–III, b–II, c–I, d–IV, e–V

169. Which of the following statement is incorrect?
(1) Museums have collection of preserved plant and animal specimens
(2) Insects are preserved in insect boxes
(3) Herbaria serve as quick referral system in taxonomical studies
(4) Taxonomic key are tools that help in classification, by observing live specimens

170. Places of occurrence of PEPCase and Rubisco are respectively
(1) stroma and cytoplasm
(2) cytoplasm and stroma
(3) cytoplasm and grana
(4) both are found in cytoplasm

171. The embryo sac of an angiospermic plant is
(1) 7 celled, 8 nucleate structure
(2) 8 celled, 7 nucleate structure
(3) 7 celled, 7 nucleate structure
(4) 3 celled, 8 nucleate structure

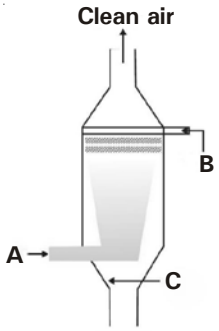
172. Which of the following option is incorrect w.r.t vegetative progagules in angiosperms



(1) A– Rhizome of Ginger
(2) B– Bulbil of *Agave*
(3) C–Leaf buds of *Bryophyllum*
(4) D– Stolons of Water hyacinth

173. What is incorrect w.r.t. ozone hole?
(1) It is a large area of thinned ozone layer
(2) It is due to depletion of ozone in stratosphere
(3) It is particularly marked over antarctic region
(4) It leads to increased trapping of UV radiation that now cannot reach Earth's atmosphere

174. Identify the following diagram and label A, B & C respectively



(1) Scrubber; dirty air; water or lime spray; particulate matter
(2) ESP; water or lime spray; dirty air; grounded plates
(3) Catalytic converter; electrodes; dirty air; particulate matter
(4) Scrubber; particulate matter; water or lime spray; dirty air

175. Which of the following pairs of inheritance / crosses show same phenotypic & genotypic ratio in the F_2 generation?
(1) Test cross & complete dominance
(2) Co-dominance & incomplete dominance
(3) Complete dominance & incomplete dominance
(4) Back cross & test cross

176. What is not correct for slime molds?
(1) They do not have chlorophyll
(2) Somatic parts are without cell walls
(3) They are mostly parasitic forms
(4) Spores are formed inside sporangia

177. DNA is a polymer of nucleotides which are linked to each other by 3'-5' phosphodiester bond. To prevent polymerisation of nucleotides, which of the following modifications would you choose?
(1) Replace purine with pyrimidines
(2) Remove/Replace 3' OH group in deoxy ribose
(3) Remove/Replace 2' OH group with some other group in deoxy ribose
(4) Both (2) and (3)

178. Write down the type of succession (Primary or Secondary) in following habitats-newly created pond and abandoned farm lands respectively

(1) Primary and secondary

(2) Secondary and primary

(3) Primary and primary

(4) Secondary and secondary

179. In which of the following step, Direct ATP synthesis occur during glycolysis?

(1) Glucose -6-P $\rightarrow$ Fructose-6-P

(2) Succinyl CoA $\rightarrow$ Succinic acid

(3) 1, 3-Diphosphoglyceric acid $\rightarrow$ 3-PGA

(4) Fructose 6–P $\rightarrow$ Fructose 1, 6 Diphosphate

180. **Assertion**: In a prokaryotic cell, translation can begin much before the mRNA is fully transcribed.

Reason: Transcription and translation can be coupled in bacteria as there is no separation of cytosol and nucleus in bacteria.

(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion

(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion

(3) Assertion is true statement but Reason is false

(4) Assertion is false

181. Study carefully the given floral diagram and select the option which correctly represents the related floral formula (F.F).

(1) $\oplus \male\!\!\female P_{(3+3)}A_{3+3}G_{(3)}$

(2) $\oplus \male\!\!\female P_6A_6G_{(3)}$

(3) $\oplus \male\!\!\female P_{5+5}A_{(5)}G_{(2)}$

(4) $\oplus \male\!\!\female K_{(5)}C_{(5)}A_{(5)}G_{(2)}$

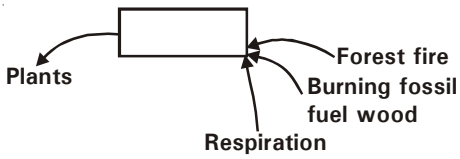
182. Adventitious roots are found in

(1) Mustard plant

(2) Wheat

(3) *Monstera*

(4) Carrot

183. 

Name the biogeochemical cycle shown above and name the activity of the living organism not depicted in the cycle by which this nutrient is returned to the atmosphere respectively.

(1) Phosphorus cycle, autotrophs

(2) Carbon cycle, decomposition

(3) Carbon cycle, heterotrophs

(4) Phosphorus cycle, weathering

184. Study the four statements (a-d) given below and select the TWO CORRECT ones out of them

Statements :

a. A lion eating a deer and a sparrow feeding on grain are ecologically similar in being predators

b. In interaction of sea anemone and clown fish, the latter is a commensal

c. Predator ultimately lead to extinction of prey species.

d. Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders.

Options :

(1) c & d

(2) a & d

(3) a & b

(4) b & c

185. Increase in grape size can be obtained by application of

(1) Auxin

(2) Cytokinin

(3) Gibberellin

(4) Abscissic acid

BOTANY : SECTION-B

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

186. In humans ABO blood group is an example of multiple allelism. Anil has blood group A. How many alleles would be present in a somatic cell and his sperm respectively.

(1) 3, 2

(2) 2, 2

(3) 3, 1

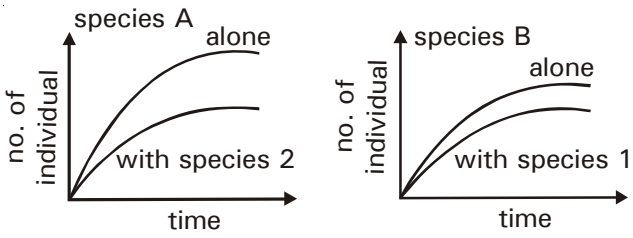
(4) 2, 1

187. Study the following statements and choose the incorrect statement
   a. Copper is absorbed in the form of cupric ions
   b. Mn is an essential component of chlorophyll
   c. Si is a beneficial element
   d. The part of plant that shows deficiency symptoms does not depend upon mobility of element.
   e. Mostly the anatomical changes are indicative of certain element deficiences and called deficiency symptoms.
   (1) a, b, c
   (2) b, c, d
   (3) b, d, e
   (4) a, b, d

188. Which of the following statement is incorrect w.r.t. pomato?
   (1) It is a somatic hybrid of tomato and potato
   (2) Isolated protoplast of two different species of plants were fused to get hybrid protoplast
   (3) Hybrid protoplast can be further grown to form a new plant
   (4) It has all the desired combination of characters for its commercial utilisation

189. **Assertion** :The law of dominance is used to explain the expression of only one of the parental character in a monohybrid cross in the F_1 generation .
   Reason : The law of dominance explains the proportion of 3:1 obtained at the F_2 generation .
   (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

190. In laboratory experiments, two species of a protozoan (species A and B) were grown alone and in the presence of the other species. The following graph shows growth of species A and species B, both alone and when in a mixed culture with other species.



   Which of the following conclusions can be drawn from the graph?
   (1) competitive exclusion occured in these experiments
   (2) both species are affected by interspecific competition but species A is affected less
   (3) both species are affected by interspecific competition but species B is affected less
   (4) both species are affected equally by interspecific competition

191. m-RNA with a sequence 5′ GCUAGGCUC 3′ will be produced by DNA having
   (1) coding strand 3′GCTAGGCTC 5′
   (2) template strand 3′CGATCCGAC5′
   (3) template strand 5′CGATCCGTC 3′
   (4) coding strand 5′GCUAGGCUC 3′

192. Housefly belongs to the order,
   (1) Primata
   (2) Insecta
   (3) Diptera
   (4) Carnivora

193. In which of the following plant/s, sex organ are borne on gametophyte?
   a. Moss
   b. *Sphagnum*
   c. *Adiantum*
   d. *Marsilea*
   e. *Azolla*
   (1) a and b
   (2) c, d and e
   (3) a, b, c, d and e
   (4) only a

194. The F_0 part of complex V, in respiratory ETC, is a/an _____ membrane protein and has _____ (respectively)
   (1) intrinsic, ATP synthase
   (2) integral, proton channel
   (3) extrinsic, proton channel
   (4) peripheral, ATP synthase

195. How many species are currently facing the threat of extinction?
(1) 15,500
(2) 45000
(3) 2 million
(4) 498

196. Which of the following statement is incorrect?
(1) Pollen represent male gametophyte
(2) Dioecy prevent both autogamy and geitonogamy
(3) *Ophioglossum* has 1260 chromosomes in its meiocyte
(4) Parthenocarpic fruits contain seeds that are produced without fertilization

197. Cross-section of a plant material, under a microscope, showed radially arranged vascular bundles and four xylem strands with exarch condition of protoxylem. Organ should be
(1) monocot root
(2) dicot stem
(3) monocot stem
(4) dicot root

198. **Statement-I** : Mendel worked with tiny fruitflies, *Drosophilla melanogaster*.
Statement-II : Fruitfly can be grown on simple synthetic medium 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

199. What is not common to C_3 & C_4 plants?
(1) At low light conditions neither group responds to high CO_2 conditions
(2) At high light intensities both C_3 & C_4 plants show increase in the rates of photosynthesis
(3) Current availability of CO_2 levels is limiting to both C_3 & C_4
(4) Both have Rubisco for fixation of CO_2

200. What is true about carrier proteins in active transport
(1) These are highly specific
(2) These are insensitive to inhibitors
(3) The carriers involved in active transport don't require energy for moving molecules against conc. gradient
(4) The transport rate by active transport does not show saturation kinetics

Space for rough work

Space for rough work