Dated : 22-04-2023

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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. The stopping potential are V_1 and V_2 with incident lights of wavelengths λ_1 and λ_2 respectively. Then $V_1 - V_2 = ?$

(1) $\frac{hc}{e}\left(\frac{\lambda_1\lambda_2}{\lambda_1-\lambda_2}\right)$ (2) $\frac{hc}{e}\left(\frac{1}{\lambda_1}-\frac{1}{\lambda_2}\right)$

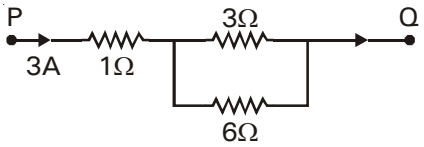
(3) $\frac{he}{c}\left(\frac{1}{\lambda_1}-\frac{1}{\lambda_2}\right)$ (4) $\frac{he}{c\lambda_1\lambda_2}[\lambda_1-\lambda_2]$

2. The value of resistance is $12.45\,\Omega$ and the value of current is 4.2 A. Calculated value of potential difference with due regard to significant figures would be

(1) 52.29 V (2) 52.3 V

(3) 52.0 V (4) 52 V

3. In the figure ratio of current in $1\,\Omega$ and $3\,\Omega$ resistance is



(1) 1 (2) 1.5

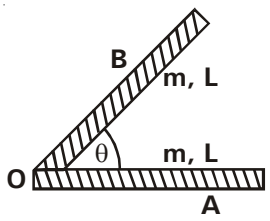
(3) 0.67 (4) 2

4. If the range of a gun which fires a shell with muzzle speed 'v' is R, then angle of elevation of the gun is

(1) $\cos^{-1}\left(\frac{v^2}{Rg}\right)$ (2) $\cos^{-1}\left(\frac{gR}{v^2}\right)$

(3) $0.5\left(\frac{v^2}{Rg}\right)$ (4) $0.5\sin^{-1}\left(\frac{gR}{v^2}\right)$

5.

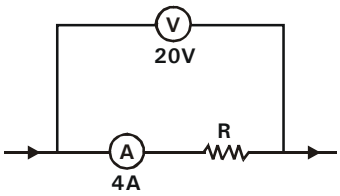


Two rods of mass m and length L each are joined at end O. Moment of inertia about an axis passing through O and perpendicular to the plane will be

(1) $\frac{mL^2}{6}$ (2) $\frac{2mL^2}{3}\cos^2\theta$

(3) $\frac{mL^2}{12}\sin^2\theta$ (4) $\frac{2mL^2}{3}$

6. In the diagram shown, the reading of voltmeter is 20 V and that of ammeter is 4 A. The value of R should be (Consider given ammeter and voltmeter are not ideal)



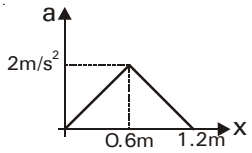
(1) Equal to $5\,\Omega$

(2) Greater from $5\,\Omega$

(3) Less than $5\,\Omega$

(4) Greater or less than $5\,\Omega$ depends on the material of R

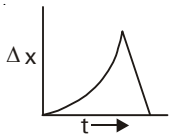
7. A body initially moving with a speed 2 m/s along positive x-axis experiences a force such that its acceleration vs displacement plot is as shown in figure. The maximum velocity of particle is about

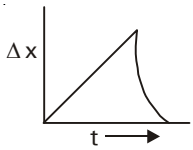


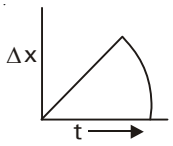
(1) 2 m/s (2) 2.5 m/s

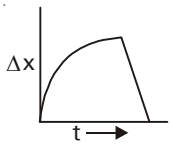
(3) 3 m/s (4) 3.5 m/s

8. Two stones are thrown up vertically and simultaneously but with different speeds. Which graph correctly represents the time variation of their relative positions Δx. Assume that stones do not bounce after hitting ground.

(1) 

(2) 

(3) 

(4) 

9. A man can see clearly the objects lying between 25 cm and 1m. If he wears contact lens to see the far objects, the near point will be shifted by

(1) 10 cm (2) 9.25 cm

(3) 8.33 cm (4) 8.67 cm

10. Two spherical black bodies of radii r_1 and r_2 and with surface temperature 127°C and 527°C respectively radiate the same power. Then the ratio r_1/r_2 =

(1) 1 (2) 2

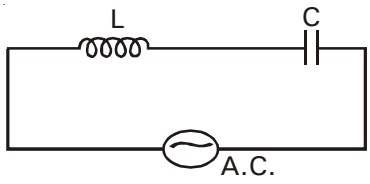
(3) 4 (4) 16

11. Suppose the earth suddenly shrinks uniformly such that its volume becomes $\frac{1}{8}$th. The value of 'g' at a point whose distance from the centre of earth is one half earth's new radius will be

(1) 4.9 m/s² (2) 39.2 m/s²

(3) 9.8 m/s² (4) 19.6 m/s²

12. In the circuit shown here, the voltages in L and in C are



(1) in phase

(2) out of phase 90°

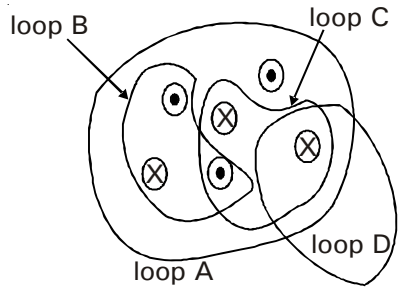
(3) out of phase 180°

(4) in a phase difference which depends upon the values of L and C

13. When the dip circle is deviated at 30° from the magnetic meridian, the angle of dip was found to be 30°, the true angle of dip is

(1) 37° (2) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

(3) $\tan^{-1}\left(\frac{1}{2}\right)$ (4) 45°

14. 

Consider six wires coming into or out of the page, all with the same current. Rank the line integral of the magnetic field (from most positive to most negative). Each loop shown is given a direction in counter clockwise

(1) B > C > D > A (2) B > C = D > A
(3) B > A > C = D (4) C > B = D > A

15. A convex mirror of focal length 50 cm forms an image which is one fourth times the object. The distance of the object from the mirror is

(1) 250 cm (2) 50 cm
(3) 37.5 cm (4) 150 cm

16. A block of mass M and density σ is hanging vertically from a fixed support by a spring of spring constant k. It can oscillate with time period T. This arrangement is completely immersed in a non-viscous liquid of density $\sigma/3$. The time period of oscillation is now

(1) T (2) 2T/3
(3) 3T/4 (4) 3T/2

17. A source of sound emits waves with frequency 250 Hz and speed 320 m/s. One observer moves towards this source and other away from this source, each with a speed 80 m/s relative to the source. The ratio of frequencies heard by the two observers will be

(1) 3 : 2 (2) 5 : 3
(3) 1 : 1 (4) 4 : 3

18. Match the type of radioactive decay in column I with the emissions in column II.

Column I	**Column II**
a. α-decay	p. electrons or positrons
b. β-decay	q. high energy photons
c. γ-decay	r. helium nucleus ^4_2He

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

19. What will be the angle of diffraction for the third secondary maximum due to Fraunhoffer diffraction with sources of light of wave length 750 nm and slit of width 0.55 mm?

(1) 0.0032 rad (2) 0.0048 rad
(3) 0.0036 rad (4) 0.0072 rad

20. Density of substance at 0°C is 10 gm/cc and at 100°C, its density is 8.9 gm/cc. The coefficient of linear expansion of the substance will be

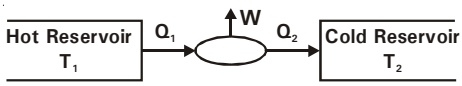
(1) 2.4×10^{-3} /°C (2) 1.2×10^{-3} /°C
(3) 10^{-3} /°C (4) 8.9×10^{-4} /°C

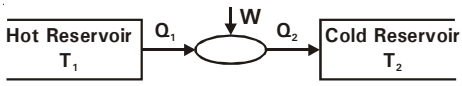
21. **Assertion**: Weighing machine always shows true weight of a body.

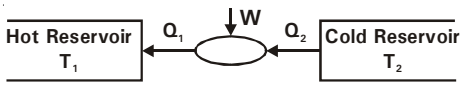
Reason: Weighing machine shows normal reaction exerted by the body on it which is equal to true weight of the body.

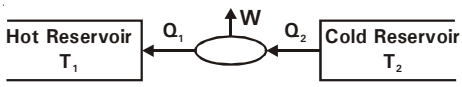
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

22. Which of the following is correct schematic representation of a heat pump?

(1) 

(2) 

(3) 

(4) 

23. If first line of Brackett series of a hydrogen like ion has wavelength 'λ', then ground state energy of an electron of this ion will be

(1) $-\frac{144}{7}\frac{hc}{\lambda}$ (2) $-\frac{36}{5}\frac{hc}{\lambda}$

(3) $-9\frac{hc}{\lambda}$ (4) $-\frac{400}{9}\frac{hc}{\lambda}$

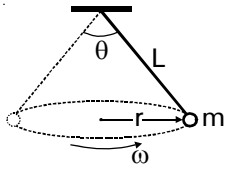
24. Two particles of masses 8 kg and 2 kg respectively are travelling in the same direction along the line joining them with velocities 6 m/s and 4 m/s. After elastic collision, velocity of 8 kg particle will be

(1) 3.8 m/s (2) 4.6 m/s
(3) 5.2 m/s (4) 5.6 m/s

25. Maximum tension in the string of an oscillating simple pendulum is 1.2 times the minimum tension. Then the angular amplitude is

(1) $\cos^{-1}\left(\frac{4}{5}\right)$ (2) $\cos^{-1}\left(\frac{3}{4}\right)$

(3) $\cos^{-1}\left(\frac{7}{8}\right)$ (4) $\cos^{-1}\left(\frac{15}{16}\right)$

26. 

A point mass 'm' attached to the ceiling by a cord of length 'L' moves in a horizontal circle of radius 'r' with a uniform angular velocity 'ω'. Then tension in the cord is

(1) $mg\left(\frac{r}{L}\right)$ (2) $mg\cos\left(\frac{\theta}{2}\right)$

(3) $m(\omega^4 r^2 + g^2)^{\frac{1}{2}}$ (4) $m(\omega^2 r^2 + g^2)^{\frac{1}{2}}$

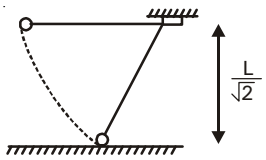
27. Two particles of same masses are moving at right angle with same de Broglie wavelengths λ. They collide and stick together. The de Broglie wavelength of this combination will be

(1) λ (2) $\lambda\sqrt{2}$

(3) $\frac{\lambda}{\sqrt{2}}$ (4) ∞

28. A parallel plate air condenser is connected with a battery. Its charge, potential, electric field and energy are Q_0, V_0, E_0 and U_0 respectively. In order to fill the complete space between the plates a dielectric slab is inserted with the battery still connected. Now the corresponding values Q, V, E and U satisfy

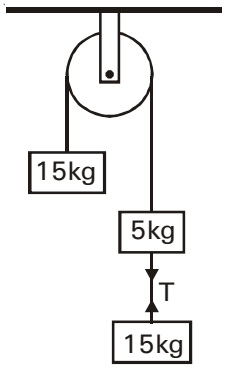
(1) $Q > Q_0$ (2) $V > V_0$
(3) $E > E_0$ (4) none of these

29. 

A ball hung with a string of length L is released from a horizontal position as shown. The point of suspension is at a height $\frac{L}{\sqrt{2}}$ from the floor. In what time after perfectly inelastic collision with the floor does it gets lifted off the floor for the first time?

(1) $2^{1/4}\sqrt{\frac{L}{g}}$ (2) $2^{1/2}\sqrt{\frac{L}{g}}$

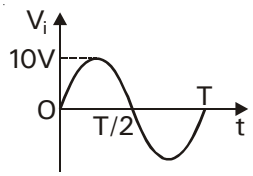
(3) $2^{3/4}\sqrt{\frac{L}{g}}$ (4) $2\sqrt{\frac{L}{g}}$

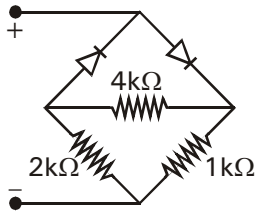
30. 

In the above pulley system, tension T is about

(1) 122N (2) 125N

(3) 129N (4) 132N

31. 



In the given circuit, the maximum output voltage taken across 4 $k\Omega$ resistor is

(1) zero (2) 6.7 V

(3) 8 V (4) 10 V

32. An electron is moving in a circular orbit in a magnetic field of 1×10^{-4} weber/m^2. Its period of revolution is

(1) 3.5×10^{-7} s (2) 7.0×10^{-7} s

(3) 1.05×10^{-6} s (4) 2.1×10^{-6} s

33. 7 moles of a gaseous mixture having volume V and temperature T is compressed to $\frac{1}{4}$th of its initial volume adiabatically. Change in its compressibility if $\gamma = \frac{3}{2}$ is

(1) $-\frac{V}{12RT}$ (2) $-\frac{V}{RT}$

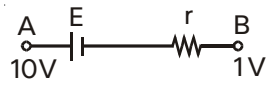
(3) $-\frac{12V}{5RT}$ (4) $-\frac{2V}{3RT}$

34. The sap in trees, which consists mainly of water in summer, rises in a system of capillaries of radius $r = 2.5 \times 10^{-5}$ m. The surface tension of sap is $T = 7.5 \times 10^{-2}$ Nm^{-1} and the angle of contact is 0°. The height to which the sap can rise due to capillary action is

(1) 6 m (2) 0.3 cm

(3) 0.6 m (4) 0.3 m

35. In the figure a part of circuit is shown.

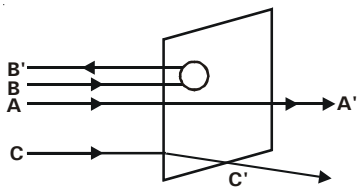


(1) Current will flow from A to B
(2) Current may flow A to B
(3) Current will flow from B to A
(4) Direction of current will depend on resistance r

PHYSICS : SECTION-B

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

36. A beam of fast moving alpha particles were directed towards a thin film of gold. The parts A′, B′ and C′ of the transmitted and reflected beams corresponding to the incident parts A, B and C of the beam, are shown in the adjoining diagram. The number of alpha particles in



(1) B′ will be minimum and in C′ maximum
(2) A′ will be maximum and in B′ minimum
(3) A′ will be minimum and in B′ maximum
(4) C′ will be minimum and in B′ maximum

37. The amplifiers X, Y and Z are connected in series. If the voltage gains X, Y and Z are 10, 20 and 30, respectively and the input signal is 1 mV peak value, then what is the peak output signal voltage if dc supply voltage is 5 V?
(1) 1 V (2) 5 V
(3) 6 V (4) 10 V

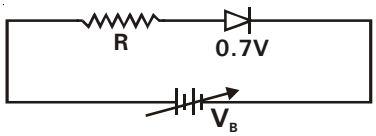
38. A man throws the bricks to a height of 12 m where they reach with a speed of 12 m/s. If he throws the bricks such that they just reach that height, what percentage of energy will be saved ($g = 9.8\ m/s^2$)
(1) 29% (2) 46%
(3) 38% (4) 50%

39. The magnitude of the potential energy per unit mass of the object at the surface of earth is E. Then the escape velocity of the object is
(1) $\sqrt{2E}$ (2) $4E^2$
(3) $\sqrt{E}$ (4) 2E

40. A metre stick is balanced on a knife edge at its centre. When two coins, each of mass 4 gram are put one on the top of the other at the 16 cm mark, the stick is found to be balanced at 40 cm. What is the mass of the metre stick?
(1) 16.8 gram (2) 19.2 gram
(3) 24.6 gram (4) 32.2 gram

41. **Statement-I** : Let two conducting spheres of radius 'a' and 'b' respectively be charged and joined by a wire. Then ratio of electric field of spheres is a : b.
Statement-II : At a point in space, the electric field points towards north. In the region, surrounding this point the rate of change of potential will be zero along the east and west.
(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. Junction diode in the following circuit requires a minimum current of 2mA to be above knee point (0.7V) of its I-V characteristic curve. The voltage across diode is independent of current above knee point, If $V_B = 8V$, then the maximum value of R so that the voltage is above knee point, will be



(1) 4 kΩ (2) 3.65 kΩ
(3) 4.35 Ω (4) 7.3 kΩ

43. A magnetic field of 1×10^{-2} tesla acts at right angle to a coil of area 40 cm^2 with 200 turns. The average emf induced in the coil is 0.5 V when it is removed from the field in time t. The value of t is
(1) 5 millli- sec (2) 12 millli- sec
(3) 8 millli- sec (4) 16 millli- sec

44. In changing state of thermodynamics from A to B state, heat required is Q and work done by system is W. Change in its internal energy is
(1) Q + W (2) Q − W
(3) Q (4) 0.5 (Q − W)

45. At a certain temperature, the r.m.s. velocity for O_2 is 400 m/s. At the same temperature, the r.m.s. velocity for H_2 molecules will be
(1) 100 m/s (2) 25 m/s
(3) 1600 m/s (4) 6400 m/s

46. Let a projectile attains height h at two different horizontal positions x_1, x_2 from starting point, if horizontal range is R, then
(1) $x_1x_2 = R^2$ (2) $x_1 + x_2 = R$
(3) $\frac{x_1x_2}{x_1 + x_2} = R$ (4) $\frac{x_1 + x_2}{2} = R$

47. In CGS system, the Young's modulus of a steel wire is 2×10^{12}. To double the length of a wire of unit cross-section area, the force required is
(1) 4×10^6 dynes (2) 2×10^{12} dynes
(3) 2×10^{12} newtons (4) 2×10^8 dynes

48. A particle of mass 5 kg located at the position $(\hat{i} + \hat{j})$ m has a velocity $2(\hat{i} - \hat{j} + \hat{k})$ m/s. Its angular momentum about y-axis is
(1) − 10 kg-m^2/s (2) − 8 kg-m^2/s
(3) 12 kg-m^2/s (4) zero

49. A 50 cm long wire of density 6.4 g/cm^3 and Young's modulus 2×10^{11} N/m^2 is stretched between two fixed supports such that extension produced in the wire is 0.16 mm. Fundamental frequency of transverse vibration in the wire is
(1) 125 Hz (2) 225 Hz
(3) 150 Hz (4) 100 Hz

50. In a plane electromagnetic wave in vacuum the equation of magnetic vector can be written as $B_y = (10^{-8}T) \sin(5 \times 10^6\pi x + 1.5 \times 10^{15}\pi t)$. The peak value of electric field vector in the wave is
(1) 3 V/m (2) 3×10^8 V/m
(3) 10^{-8} V/m (4) 3×10^{-8} V/m

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which isomerism is shown by $[Co(NH_3)_4Cl_2]NO_2$ and $[Co(NH_3)_4Cl(NO_2)]Cl$?
(1) geometrical (2) optical
(3) linkage (4) ionisation

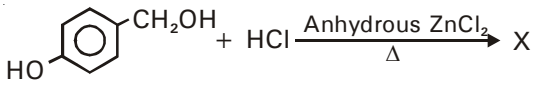
52. Oxidation number of carbon in C_3O_2 is/are
(1) zero (2) 0, +2
(3) +2 (4) +2, −2

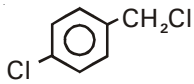
53. The reaction between CH_3Cl and hydroxide ion to yield methanol and chloride ion follows a
(1) second order kinetics
(2) first order kinetics
(3) zero order kinetics
(4) third order kinetics

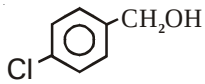
54. Bond angle of 180° is/are present in
(1) XeF_2 (2) XeF_4
(3) CO_2 (4) All of these

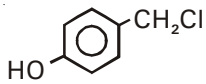
55. The correct ionic radii order is
(1) $N^{3-} > O^{2-} > F^- > Na^+$
(2) $N^{3-} > Na^+ > O^{2-} > F^-$
(3) $Na^+ > O^{2-} > N^{3-} > F^-$
(4) $O^{2-} > F^- > Na^+ > N^{3-}$

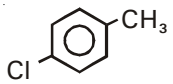
56. The product X in the given reaction will be,



(1) 

(2) 

(3) 

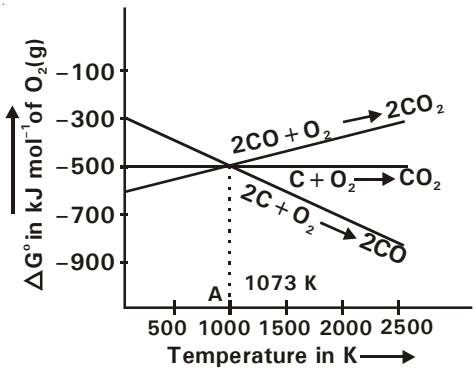
(4) 

57. The half life of a reaction becomes 2 times when the reactant concentration is doubled. The order of reaction is

(1) zero (2) 2

(3) 4 (4) 5

58.



The correct statement is

(1) below point A CO is better reducing agent than carbon

(2) as T rises tendency of carbon to get converted into CO increases

(3) above point A carbon is better reducing agent than CO

(4) all are correct

59. Which of the following will not enhance nutritional value of food?

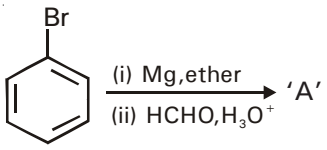
(1) Minerals

(2) Artificial sweeteners

(3) Vitamins

(4) Aminoacids

60.



The major product 'A' is

(1) Phenol (2) Benzyl alcohol

(3) Benzaldehyde (4) Acetophenone

61. The molar conductance at infinite dilution for acetic acid is, given :

Λ_m^∞ (HCl) = 420 Ω^{-1} cm^2 mol^{-1}

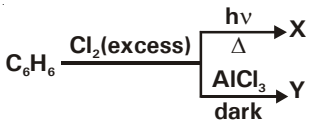
Λ_m^∞ (NaCl) = 200 Ω^{-1} cm^2 mol^{-1}

Λ_m^∞ (CH_3COONa) = 96 Ω^{-1} cm^2 mol^{-1}

(1) 316 Ω^{-1} cm^2 mol^{-1} (2) 504 Ω^{-1} cm^2 mol^{-1}

(3) 716 Ω^{-1} cm^2 mol^{-1} (4) 31.6 Ω^{-1} cm^2 mol^{-1}

62. Consider the following reactions



Identify the incorrect statement regarding X & Y

(1) X is formed by addition reaction

(2) Y is a product of electrophilic substitution reaction

(3) X is an aromatic compound and used as an powerful insecticide

(4) Y is an aromatic compound

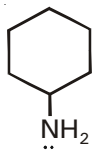
63. The superoxide O_2^- ion is stable only in the presence of cations such as

(1) K (2) Rb

(3) Cs (4) All of these

64. Most basic compound among the following is

(1)



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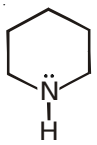

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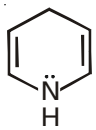
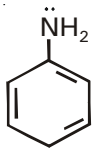


(4)



65. **Assertion** : $H_3PO_3 \rightarrow H_3PO_4 + PH_3$ is a disproportionation reaction.
Reason : Oxidation state of P can vary from 0 to +5.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

66. The correct statement is/are
(1) Meadow sweet contains salicylaldehyde
(2) Vanillin contains cinnamaldehyde
(3) Formalin contains formic acid
(4) Both 1 & 2

67. Hybridisation and magnetic nature of central metal in the complex, $[Ni(CN)_4]^{2-}$
(1) dsp^2, paramegnetic
(2) dsp^2, diamagnetic
(3) sp^3, paramagnetic
(4) sp^3, diamagnetic

68. Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis gives _____.
(1) 2 molecules of glucose
(2) 2 molecules of glucose + 1 molecule of fructose
(3) 1 molecule of glucose + 1 molecule of fructose
(4) 2 molecules of fructose

69. An orbital is designated by_____ quantum numbers while an electron in an atom is designated by _____ quantum numbers.
(1) three, four (2) four, three
(3) three, three (4) four, four

70. Ammonical solution of cuprous chloride give red precipitate with
(1) $H-C\equiv C-CH_3$ (2) $CH_2=CH_2$
(3) $(C_2H_5)_2C=CH_2$ (4) $CH_3-C\equiv C-C_2H_5$

71. Identify the mismatch
(1) Bakelite — electrical switches
(2) PHBV — controlled release of drugs
(3) Neoprene — conveyer belts
(4) PAN — non-breakable crockery

72. The correct decreasing order of acidic strength of HClO, HBrO, HIO is
(1) HClO > HBrO > HIO (2) HBrO > HIO > HClO
(3) HClO > HIO > HBrO (4) HIO > HBrO > HClO

73. Which of these reagents does not react with glucose?
(1) $NaHSO_3$ (2) HCN
(3) HI/Red P (4) NH_2OH

74. The spontaneous nature of a reaction is impossible if
(1) $\Delta H = +ve, \Delta S = +ve$
(2) $\Delta H = -ve, \Delta S = -ve$
(3) $\Delta H = -ve, \Delta S = +ve$
(4) $\Delta H = +ve, \Delta S = -ve$

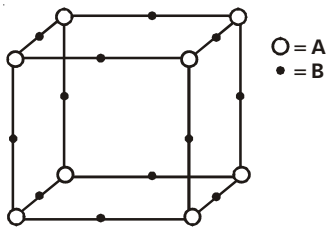
75. At 373 K, $K_w = 10^{-12}$. A solution having pH = 6.5 would be
(1) Acidic (2) Basic
(3) Neutral (4) Buffer

76. If molecular mass of O_2 and SO_2 are 32 and 64 respectively. If one litre of O_2 at 15°C and 750 mm pressure contains N molecules, the number of molecules in one litre of SO_2 under the same conditions of temperature and pressure will be
(1) 2N (2) N
(3) 0.5 N (4) 4N

77. If ten volumes of H_2 gas reacts with 15 volumes of O_2 gas, how many volumes of water vapours are produced?
(1) 5 V (2) 2 V
(3) 2.5 V (4) 10 V

78. One molal solution of a carboxylic acid in benzene shows the elevation of boiling point of 1.518 K. The degree of association for dimerization of the acid in benzene is (K_b for $C_6H_6 = 2.53$ K/m)
(1) 60% (2) 70%
(3) 75% (4) 80%

79. A compound has a unit cell of the type shown in the figure



If atoms along one of edges are removed, the resultant stochiometry will be
(1) AB (2) A_3B_{11}
(3) A_3B_{26} (4) $A_{12}B_{13}$

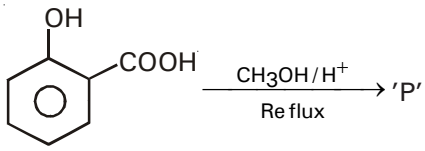
80. The molarity of 0.006 mole of NaCl in 100 mL solution is
(1) 0.6 (2) 0.06
(3) 0.006 (4) 0.066

81. **Statement- I** : Pentan-2-one and pentan-3-one are metamers as well as geometrical isomers.
Statement- II : Isomers are homologues of each other.
(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

82. Stability of hydrides of carbon family
(1) $CH_4 > SiH_4 > GeH_4 > SnH_4 > PbH_4$
(2) $CH_4 < SiH_4 < GeH_4 < SnH_4 < PbH_4$
(3) $CH_4 > SnH_4 > GeH_4 > SiH_4 > PbH_4$
(4) $CH_4 > SiH_4 > PbH_4 > SnH_4 > GeH_4$

83. Chlorofluorocarbons are effective scavengers for ozone due to
(1) photolytic reaction of O_2 producing chlorine radicals
(2) photochemical synthesis of O_3
(3) photolytic decomposition of O_3 by chlorine radical into O_2
(4) photolytic production of oxides of nitrogen

84. Which one is not a consequence of lanthanide contraction?
(1) Similarity in properties of lanthanides
(2) Similarity in size of 4d and 5d series
(3) Basic strength of oxides and hydroxides decreases from La to Lu.
(4) Similar colour of $4f^n$ and $4f^{14-n}$ configurations

85. 

What is true regarding product 'P'?
(1) It is phenyl salicylate
(2) It is a component of oil of winter green
(3) It is called as methyl salicylate
(4) Both (2) & (3)

CHEMISTRY : SECTION-B

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

86. pH of a solution produced when an aqueous solution of pH 6 is mixed with an equal volume of an aqueous solution of pH 3 is about
(1) 4.5 (2) 4.0
(3) 4.3 (4) 3.3

87. 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

88. **Statement- I** : Amorphous boron and aluminium metal on heating in air form B_2O_3 and Al_2O_3 respectively

Statement- II : With dinitrogen at high temperature they (B & Al) form nitrides.

(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

89. The co-ordination compound which effectively inhibits the growth of tumours is

(1) Cis-platin (2) EDTA

(3) Wilkinson's catalyst (4) Nickel carbonyl

90. 19.7 kg of gold was recovered from a smuggler. How many atoms of gold were recovered ? (Au = 197)

(1) 6.02×10^{22} (2) 6.02×10^{23}

(3) 6.02×10^{24} (4) 6.02×10^{25}

91. Which is the correct order of decreasing acidic character of the following oxides?

MnO, MnO_2, Mn_2O_3, Mn_2O_7, Mn_3O_4

(1) $MnO > MnO_2 > Mn_2O_3 > Mn_3O_4 > Mn_2O_7$

(2) $MnO > Mn_3O_4 > Mn_2O_3 > Mn_2O_7 > MnO_2$

(3) $Mn_2O_7 > MnO_2 > Mn_2O_3 > Mn_3O_4 > MnO$

(4) $Mn_2O_7 > Mn_2O_3 > Mn_3O_4 > MnO_2 > MnO$

92. Identify mismatch

	Compound	**Type of reaction shown**
(1)	RBr	Nucleophilic substitution
(2)	RCHO	Nucleophilic addition
(3)	RCOR	Electrophilic substitution
(4)	$C_6H_5NH_2$	Electrophilic substitution

93. Which member of chalcogens has highest tendency for catenation?

(1) Po (2) O

(3) S (4) Se

94. **Assertion** : Phenol gives white ppt. of 2,4, 6–Tribromophenol on reaction with Br_2/H_2O.

Reason : Phenol is more acidic than alcohols

(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

95. The six membered cyclic structure of glucose is called pyranose structure, in analogy with Pyran which is a cyclic organic compound with

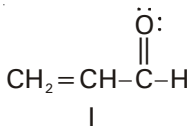
(1) one oxygen atom and five carbon atoms in the ring

(2) two oxygen atom and five carbon atoms in the ring

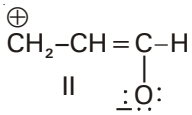
(3) one oxygen atom and six carbon atoms in the ring

(4) one oxygen atom and four carbon atoms in the ring

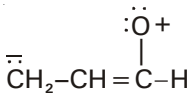
96. Arrange the following resonating structures according to decreasing order of stability



I



II



III

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

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

97. Match column I and II

	Column-I		Column-II
a.	Dialysis	i.	Cleansing action of soap
b.	Peptisation	ii.	Coagulation
c.	Emulsification	iii.	Colloidal sol formation
d.	Electrophoresis	iv.	Purification

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

98. Which of the following layering pattern will have a void fraction of 0.26?
(1) ABCCBAABC (2) ABBAABBA
(3) ABCABCABC (4) ABCAABCA

99. S_N1 and S_N2 is not favourable in
(1) $CH_2 = CHCl$ (2) $PhCH_2Cl$
(3) CH_3OCH_2Cl (4) $CH_2 = CHCH_2Cl$

100. The oxygen atom of OSF_4 is at
(1) one of the equitorial position having S–O bond
(2) one of the axial position having S–O bond
(3) one of the equitorial position having S = O bond
(4) one of the axial position having S = O bond

ZOOLOGY : SECTION-A

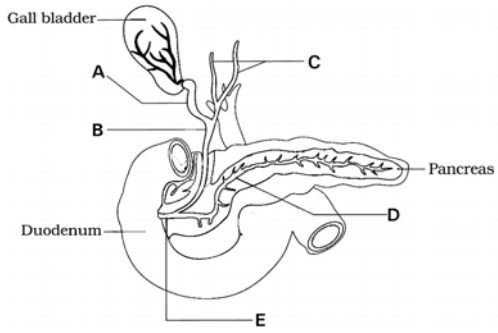
All questions are compulsory in section A

101. ATP ase and actin binding sites are present in which part of myosin
(1) head and short arm (2) cross arm and tail
(3) tail only (4) head only

102. How many statements are correct among the following?
a. Hormones are non-nutrient chemicals
b. Hormones act as inter cellular messengers
c. Hormones are produced in trace amounts
d. Hormones are released directly into blood
e. Hormonal response is usually faster than neural co-ordination
(1) one (2) two
(3) three (4) four

103. Which among the following statement is correct w.r.t. proteins?
(1) A protein is imagined as a line, the left end is represented by last amino acid and right end is represented by first amino acid.
(2) The first amino acid is C-terminal amino acid, the last amino acid is N-terminal amino acid
(3) In protein, both right and left handed helices are observed
(4) Tertiary structure is absolutely necessary for many biological activities of proteins

104. Choose the correct statement about the labelled parts A - E shown in the figure



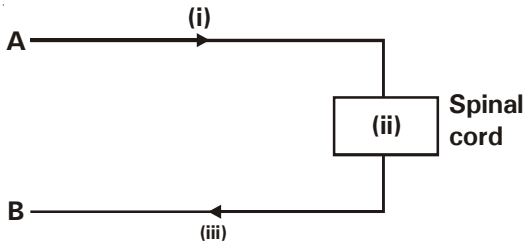
(1) A carries bile, while C carries salivary amylase
(2) E carries juice containing enzymes for digestion of carbohydrates, proteins, lipids and nucleic acids and functional at alkaline pH
(3) Secretion that will pass through D carry enzymes which break nucleic acids into their final products
(4) Secretions passing through B contain the main fat digesting enzyme

105. Health is affected by
(1) genetic disorders – deficiencies with which a child is born and deficiencies/defects which the child inherits from parents from birth;
(2) infections
(3) life style including food and water we take, rest and exercise we give to our bodies, habits that we have or lack etc
(4) all of these

106. **Statement-I** : Tubular secretion helps to maintain ionic balance and pH of body fluids.
Statement-II : As the filterate passes upward in loop of Henle it gets diluted.
(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

107. Factors which favour formation of oxyhaemoglobin are
a. high pO_2
b. high temperature
c. low H^+ concentration
d. low pH
e. low pCO_2
(1) a, c and e (2) a, b and d
(3) b, c and e (4) b, c and d

108.



If the above scheme represents reflex arc, what is true about i, ii & iii?

(1) (i) are afferent neurons that enter the ventral root of spinal cord
(2) (ii) are neurons that are concentrated in CNS and are chiefly sensory in nature
(3) (iii) constitute the efferent pathway that carry message towards effectors
(4) (i) has motor neurons while (iii) has sensory neurons

109. An isolated population of moths with approximately equal numbers of white winged and black winged members was disturbed by a calamity. Only a few white-winged moths remained to form the next generation. This kind of change in the gene pool is called

(1) gene migration
(2) genetic recombination
(3) blocked gene flow
(4) genetic bottle neck effect

110. The person starts suffering from infections that could have been otherwise overcome such as those due to bacteria especially *Mycobacterium*, viruses, fungi and even parasites like *Toxoplasma* because of decrease the number of

(1) helper T-lymphocytes (2) T-killer cells
(3) B-cells (4) T-memory cells

111. An exclusively marine animal having unsegmented coelomated and radially symmetrical body with distinct oral and aboral surfaces is a member of

(1) Ctenophora (2) Mollusca
(3) Annelida (4) Echinodermata

112. Choose the correct option

	Contraceptive method	Mode of action	Exception
(1)	Periodic abstinance, lactational amenorrhoea	Prevent insemination and ovulation	Lactational amenorrhoea
(2)	Progestasert, LNG-20, Multiload 375	Alter the quality of cervical mucus to retard sperm entry	Multiload 375
(3)	Diaphragms, vaults, cervical caps, condoms	Prevent meeting of sperm and egg	Condoms
(4)	Implants, injections, oral pills	Inhibit ovulation and implantation	Implants

113. A body cavity lined by mesoderm is called coelom. Animals that donot show this coelom are

(1) *Apis* (2) *Ancylostoma*
(3) *Asterias* (4) *Aplysia*

114. Treatment for ADA deficiency is being done by

(1) enzyme replacement therapy by injecting enzyme in blood
(2) periodic infusion of lymphocytes containing ADA, cDNA into body
(3) clinical gene therapy
(4) all of these

115. Which of these are correctly characterized with no single exception?

(1) Microtubules, microvilli, microfilaments - cytoskeletal structures
(2) Ribosomes, lysosomes, microbodies - single membrane bound
(3) Cilia, flagella, microvilli - locomotory structures
(4) Ribosome, nucleolus, nucleus - contain nucleic acids

116. Annelids and arthropods, can be divided into 2 equal identical halves by

(1) only one plane passing through the central axis
(2) only two planes passing through the central axis
(3) any plane passing through the central axis
(4) no plane can divide them into equal halves

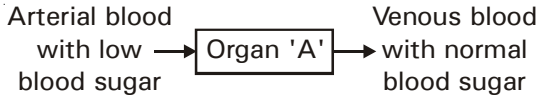
117. Alexander Flemming while working on _____ observed _____ growing on one of his unwashed plates that was _____.

(1) *Staphylococcus*; Mould; *Penicillium*
(2) *Penicillium*; bacterium; *Staphylococcus*
(3) *Streptococcus*; Mould; *Penicillium*
(4) *Penicillium*; fungus; *Staphylococcus*

118. Which among the following events are related with S-Phase?

(1) DNA content doubles
(2) Centriole duplicates
(3) Chromosome number doubles
(4) Both (1) & (2)

119. Consider the following & identify organ 'A'. Which hormone is responsible for this change in blood sugar and from where was it secreted?



(1) Pancreas, glucagon & pancreas respectively
(2) Liver, glucagon and pancreas respectively
(3) Liver, insulin and pancreas respectively
(4) Pancreas, insulin and liver respectively

120. The mucosa of stomach has gastric glands. Gastric glands have three major types of cells. Find the correct statement
(1) mucus neck cells which secrete mucus;
(2) peptic or chief cells which secrete secrete HCl and intrinsic factor
(3) parietal or oxyntic cells which secrete the proenzyme pepsinogen
(4) all of these

121. **Assertion :** Modification enzymes present in *E.coli* as part of its restriction modification system protect its own DNA from being cleaved.
Reason : Modification enzymes catalyze the addition of a methyl group to one or two bases usually within the recognition sequence of the restriction enzyme making it unrecognisable.
(1) Assertion is true statement but Reason is false
(2) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(3) Assertion is false
(4) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion

122. Which of the following Gnathostome does not belong to tetrapoda?
(1) *Chelone* (2) *Pterophyllum*
(3) *Hyla* (4) *Macropus*

123. Which of the following statement is correct?
(1) According to panspermia, life originated from decaying & rotting matter
(2) Louis Pasteur accepted the theory of spontaneous generation
(3) According to theory of spontaneous generation life comes from pre-existing life
(4) Formation of life was preceded by chemical evolution

124. According to Singer and Nicolson model for the structure of cell membrane, which one of the following is true for lipids and proteins?
(1) Lipids can flip flop from one lipid monolayer to other
(2) Protein can flip flop from one lipid monolayer to other
(3) Both lipids and proteins can flip flop
(4) Neither lipids nor proteins can flip flop

125. How many of the following REs give sticky ends?
BamH I, Pvu I, Cla I, Xho I, Eco RI, Hind II, EcoR V, Sal I, Pst-I
(1) 8 (2) 6
(3) 7 (4) 9

126. Diploid chromosome number is 8. What shall be the number of chromatids in each daughter cell after meiosis?
(1) 8 (2) 4
(3) 2 (4) 16

127. Choose the odd one out w.r.t. ancestors of Mammals
(1) Synapsids (2) *Pelycosaurs*
(3) Therapsids (4) Sauropsids

128. Identify the animal shown below and select the right option

	Animal	Site of occurrence
(1)	A jawless vertebrate	Fresh water ponds
(2)	*Ichthyophis*	Sea and oceans
(3)	*Petromyzon*	Ocean
(4)	*Myxine*	Fresh water river

129. Identify the bone correctly matched to its location in the human body
(1) Scapula — dorsal part of thorax between 2nd and 7th ribs
(2) Sternum — dorsal midline of the thorax
(3) Hyoid bone — at the roof of buccal cavity
(4) Patella — covering the knee dorsally

130. DNA content in which of the following pairs is likely to be the same in mammals
a. 1st polar body and 2nd polar body
b. secondary oocyte and fertilized egg
c. male and female gametes as these are released from gonads
d. spermatid and sperm.
e. sertoli cell and follicular cell
(1) b, c, d and e (2) a, b, c and e
(3) b, d and e (4) c and d only

131. The vestibular apparatus consists of the
(1) otolith organ and cochlea
(2) otolith organ and eustachian canal
(3) cochlea and semi-circular canals
(4) otolith organ and semi-circular canals

132. How many of the following cells are likely to be rich in lipid synthesising enzymes?
Luteal cells, Sertoli cells, Anterior pituitary cells, Granulosa cells, Leydig cells, cells of adrenal cortex.
(1) 2 (2) 3
(3) 4 (4) 6

133. A. Elution of DNA bands
B. Use of ethidium bromide
C. Restriction digestion
D. Running gel electrophoresis
E. Ligation
Arrange the above proper sequence as these are done for r-DNA technology
(1) C–E–A–B–D (2) C–B–A–D–E
(3) C–D–B–A–E (4) E–C–B–A–D

134. An example of antagonistic hormones controlling homeostasis is

(1) Thyroxine and parathyroid hormone in calcium balance

(2) Insulin and glucagon in glucose metabolism

(3) Progestins and estrogens in sexual differentiation

(4) Epinephrine and norepinephrine in fight-or flight responses

135. ART can help a man with low sperm count to have his own child through

(1) IUT (2) A.I.
(3) GIFT (4) ZIFT

ZOOLOGY : SECTION-B

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

136. Select the correct option regarding direction of

	Primer extension	Complimentary DNA, at site of primer attachment
(1)	5′–3′	3′–5′
(2)	5′–3′	5′–3′
(3)	3′–5′	3′–5′
(4)	3′–5′	5′–3′

137. Which of the following is true statement?

(1) Toddy, a traditional drink of south India is made by fermenting sap from palms with the help of *Lactobacillus*.

(2) Antibiotics have greatly improved our capacity to completely treat deadly diseases like poliomyelitis, AIDS and Hepatitis B.

(3) Floating debris is removed by sequential filteration whereas soil and pebbles are removed by sedimentation.

(4) BOD of waste water is inversely propotional to polluting potential of the water.

138. Which of the following is the correct statements ?

(1) *Salmonella typhi* is a pathogenic viruse which causes typhoid fever in human beings.

(2) *Salmonella typhi* generally enter the large intestine through food and water contaminated with them and migrate to other organs through blood.

(3) Sustained high fever (39° to 40°C), weakness,stomach pain, constipation, headache and loss of appetite are some of the common symptoms.

(4) All of these

139. Which of the following is correct for the following transgenic plants?

	Pest Resistant Plant	Bt Cotton
(1)	Silencing of specific tRNA due to complimentary dsRNA	Killing of insect due to conversion of inactive toxin to active toxin.
(2)	dsRNA triggers protection against nematode infestation.	Choice of cry gene will vary depending upon targeted pest.
(3)	Source of complementary RNA could be from an infection by viruses having DNA genome.	Cry II Ab control corn borer and cry I Ab control cotton boll worms
(4)	Based on masking of native gene.	Based on method of cellular defence.

140. The implanted embryo ensures its own survival against the negative feedback effect of progesterone by helping in

(1) producing progesterone

(2) producing a hormone to take over the job of pituitary LH

(3) increasing estrogen production

(4) producing a hormone to neutralise rising levels of progesterone

141.

Identify the given figure as well as the reflected right place of its multiplication in human body

	Organism	Site of multiplication
(1)	HIV-DNA virus	Macrophages
(2)	Oocyst of *Plasmodium*	Mosquito gut
(3)	Oocyst of *Plasmodium*	Human RBC
(4)	HIV-Retrovirus	Macrophage

142. **Statement-I** : Coca alkaloid or **cocaine** is obtained from coca plant *Erythroxylum coca*, native to South America.

Statement-II : **Coke** or **crack** interferes with the transport of the neuro-transmitter dopamine.

(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

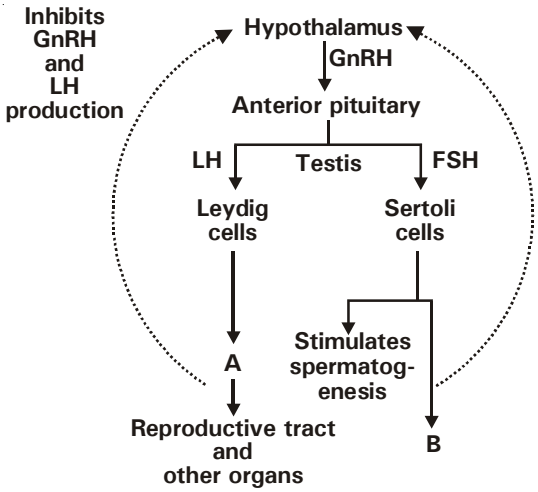
(4) Statement-I is incorrect but statement-II is correct

143. Organic cofactor tightly bound to apoenzyme is
(1) coenzyme (2) metal ion
(3) NAD (4) Haem

144. What needs to be followed by a person undergoing kidney transplant?
a. Tissue matching
b. Blood group matching
c. Cyclosporin A after graft
d. Immuno stimulators after graft
(1) a, b and d (2) a and d
(3) b and d (4) a, b and c

145. 'Lub' sound of the heart is heard as A-V valves close due to
(1) higher pressure in ventricles than in atria
(2) higher pressure in aortae than in ventricles
(3) higher pressure in ventricles than in aortae
(4) higher pressure in atria than in ventricles

146.



The hormones released at site A and B are
(1) testosterone and inhibin
(2) inhibin and testosterone
(3) testosterone and androgen binding protein
(4) inhibin only

147. Match the following

	Column-I		Column-II
i.	Cyclostomata	a.	Unpaired fins
ii.	Osteichthyes	b.	Skin cast
iii.	Amphibia	c.	Scale less skin
iv.	Reptilia	d.	Air bladder

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

148. From the sexually transmitted diseases mentioned below, identify the one which does not specifically affect the sex organs:
(1) Syphilis (2) AIDS
(3) Gonorrhea (4) Genital warts

149. **Assertion** : *Tyrannosaurus rex* was about 20 feet in height & have huge fearsome dagger like teeth.
Reason : About 95 mya, dinosaurs suddenly disappeared.
(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

150. Which among the following vesicular structures are formed by process of packaging in golgi apparatus?
(1) Microsomes (2) Lysosomes
(3) Centrosomes (4) Microbodies

BOTANY : SECTION-A

All questions are compulsory in section A

151. Which of the sacred groves is the last refuge for a large number of rare and threatened plants?
(1) Khasi & Jaintia Hills in Meghalaya
(2) Western Ghat region of Karnataka & Maharashtra
(3) Aravalli hills of Rajasthan
(4) Sarguja, Chanda & Bastar area of M.P.

152. RNA pol III synthesises
a. mRNA b. tRNA
c. snRNA d. 5s rRNA
(1) a, b, c (3) a, b, d
(3) a, c,d (4) b, c, d

153. The giant redwood tree(*Sequoia sempervirens*) is a/an
(1) angiosperm (2) gymnosperm
(3) pteridophyte (4) bryophyte

154. Viruses cannot multiply on its own because they
(1) lack cellular machinery to replicate their genetic material
(2) do not possess well developed sex organs
(3) canot reproduce at all
(4) have ribosome

155. Gynaecomastia is shown by the disease
(1) Turner syndrome
(2) Down syndrome
(3) Klinefelter syndrome
(4) Haemophilia

156. Choose the CORRECT match w.r.t. PGRs
(1) Auxins - thining of cotton, walnut and cherry
(2) Cytokinins - delay leaf senescence
(3) Ethylene - increase length of grape stalks
(4) ABA - used extensively in tissue culture for morphogenesis

157. Plants follow different pathways in response to environment or phases of life to form different kind of structures. It is called plasticity & is found in
(1) Cotton, Apple, *Hedera*
(2) Cotton, Coriander, and larkspur
(3) *Hedera*, Cotton, Okra
(4) Cauliflower, Cotton, Coriander

158. Match the type of flowers in column-I with their description in column-II

Column-I		Column-II
a. hypogynous	p.	Ovary is inferior as margin of thalamus grows upward enclosing ovary completely and other parts arise above this
b. perigynous	q.	Ovary is half-inferior as the gynoecium is situated in the centre and other parts on the rim of thalamus at same level
c. epigynous	r.	Ovary is superior as gynoecium occupy highest position and other parts below it

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

159. The statement that is true for C_4 plant is
(1) a slight rise in oxygen concentration can lower the rate of photosynthesis
(2) chloroplasts are dimorphic
(3) CO_2 fixation occurs only once
(4) CO_2 saturation is at 450 µl/L of CO_2 of air

160. The stability of DNA helix is due to
(1) stacking interaction (2) hydrogen bond
(3) both (1) & (2) (4) glycosidic bond

161. The distance between the two strands of DNA is almost constant because
(1) purine of one strand is opposite the pyrimidine of the other strand
(2) pairing is always between double ringed purines and single ringed pyrimidines
(3) the two strands are coiled in a right handed fashion
(4) both (1) and (2)

162. Which of the following is not a characteristic of bio-diversity hot spots?
(1) High levels of species richness
(2) Endemism
(3) Species are not threatened
(4) Accelerated habitat loss

163. On a logarithmic scale, the straight line graph of species area relationship is described by equation
(1) $\log C = \log S + Z \log A$
(2) $\log S = \log C + Z \log A$
(3) $\log Z = \log C + Z \log A$
(4) $\log A = \log C + Z \log S$

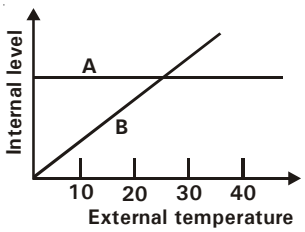
164. Who is the noble prize winner for the development of semi dwarf varieties of wheat?
(1) Norman E. Borlaug (2) Maheshwari
(3) Robert May (4) Gurudev S. Khush

165. For the given sequence of mRNA, find the sequence of amino acid coded?
- AUG UUU UUC UUC -
(1) Val – Phe – Phe – Phe –
(2) Met – Phe – Phe – Phe –
(3) Met – Phe – Ser – Leu –
(4) Val – Phe – Ser – Leu –

166. Select the false statement
(1) taxonomic categories together constitute taxonomic hierarchy
(2) each category is a unit of classification
(3) groups represents category and category further denotes a rank
(4) taxonomic categories are merely morphological aggregates

167. When F_2 tall plant are selfed
(1) all offspring are tall
(2) 2/3 tall plants produce both tall and dwarf in the ratio of 3 : 1
(3) all offspring are dwarf
(4) 50 % offsprings are tall and 50% dwarf

168.



Above graph shows response of two different species (A & B) to an external factor, the two species A and B respectively represent
(1) Human and bird
(2) Fish and molluscan
(3) Human and snakes
(4) Lizard and birds

169. The size of vascular bundles in a dorsiventral leaf is dependent on
(1) Size of lamina (2) Size of veins
(3) Number of veins (4) Number of stomata

170. Which statement about cellular respiration is FALSE?
(1) All organisms perform cellular respiration
(2) Carbon dioxide is a product of the Krebs cycle
(3) Glycolysis and fermentation are carried out in mitochondria under anaerobic conditions
(4) Glycolysis results in the breakdown of glucose to pyruvate molecules

171. Which one of the following forms dense mats on soil and reduce impact of falling and prevent soil erosion?
(1) Mosses (2) Liverworts
(3) Ferns (4) Blue green algae

172. Identify the following diagram. In which family would you find it and also select correct features

(1) Poaceae, perianth, actinomorphic symmetry, epipetalous
(2) Liliaceae, perianth, actinomorphic symmetry, epiphyllous
(3) Solanaceae, perianth, zygomorphic symmetry, epipetalous
(4) Liliaceae, perianth, zygomorphic symmetry, epiphyllous

173. Release of phosphates and nitrates in rivers and lakes leads to
(1) eutrophication
(2) reduced algal growth
(3) increased animal growth
(4) increased growth of decomposers

174. **Statement-I** : In dicot stem, vascular bundles are conjoint, collateral and closed.
Statement-II : Central portion of dicot stem constitute the pith.
(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

175. In reptiles and birds, the fertilised eggs are covered by
(1) cell membrane
(2) hard calcareous shell
(3) hard siliceous shell
(4) pellicle

176. Which statement is incorrect with respect to angiospermic seed?
(1) Endosperm is triploid
(2) Embryo may have one, two or more cotyledons
(3) Seed may be produced without fertilization in some species of Asteraceae and grasses
(4) Persistent nucellus is called perisperm

177. Which of the following is not a basidiomycete?
(1) Toadstools (2) Puffballs
(3) Morels (4) Mushroom

178. Following is a biofortified crop rich in vitamin A
(1) Pea
(2) Mustard
(3) Bitter gourd
(4) Carrot

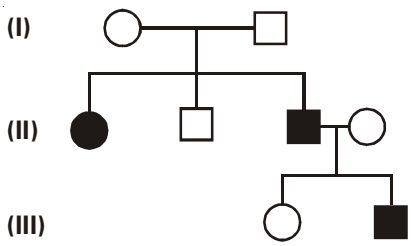
179. How many of the following statements are correct?
a. In plants, after fertilisation the sepals, petals and stamens of the flower wither and fall off
b. After syngamy diploid zygote is formed inside the ovule
c. Ovules with embryo develop into fruits
d. Wall of fruit is called pericarp
(1) Two (2) Three
(3) One (4) Four

180. Mammals, including man show which type of sex determination?
(1) XX-XY type (2) ZZ-ZW type
(3) XX-XO type (4) ZZ-ZO type

181. Out of the six kingdoms, the eukaryotes and prokaryotes are placed in _____ and _____ kingdoms respectively
(1) 2, 4 (2) 1, 5
(3) 3, 3 (4) 4, 2

182. How many algae among the list given below are brown algae?
Chara, Dictyota , Chondrus, Chlorella, Gelidium, Porphyra, Fucus, Sargassum
(1) 1
(2) 2
(3) 3
(4) 4

183. Following pedigree shows the inheritance of a trait. The trait most likely could be



(1) Haemophilia
(2) Colour blindness
(3) Sickle cell anaemia
(4) Myotonic dystrophy

184. Monera comprises of
(1) cynobacteria and viruses
(2) bacteria and protozoa
(3) all prokaryotic organisms
(4) bacteria and diatom

185. **Assertion** : Pteridophytes are more advanced to bryophytes.

Reason : The sporophyte in pteridophytes is free living, green and independent.

(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

BOTANY : SECTION-B

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

186. How many ATPs are produced inside the mitochondria during complete oxidation of one pyruvate molecule?

(1) 15 (2) 12
(3) 11 (4) 4

187. How many statements are incorrect w.r.t seed germination ?

a. Gibberellins break seed dormancy and promote seed germination.

b. Most seeds require poor aeration for germination.

c. In epigeal germination, cotyledons remain in the soil.

d. Sufficient amount of food is required for proper seed germination.

(1) Two (2) One
(3) Four (4) Three

188. A protist which is responsible for red tides in sea is

(1) *Trichodesmium* (2) diatoms
(3) *Gonyaulax* (4) *Chlamydomonas*

189. Following condition invariably leads to autogamy.

(1) Cleistogamous flower
(2) Chasmogamous flower
(3) Pistillate flower
(4) Staminate flower

190. The accessibility of promoter regions at prokaryotic DNA in many cases is regulated by the interaction of proteins with

(1) regulator

(2) structural genes

(3) operator

(4) all of these

191. Choose the **incorrect** statement

(1) 2.4 % of India's land area shares 8.1 percent of global species diversity

(2) 45000 species of plants and twice as many as animals have been recorded from India

(3) more than 1,000 plant species and more than 3,00,000 animal species are yet to be discovered

(4) according to May's global estimates only 22% of total species have been recorded so far

192. Name the mineral which is needed during the formation of mitotic spindle

(1) Mg (2) C
(3) P (4) Ca

193. Match the roots in column I with their structures in column II.

Column I	**Column II**
a. Prop roots	p. come out of ground and grow vertically upwards to get oxygen for respiration
b. Stilt roots	q. supporting roots coming out of lower nodes of stem
c. Pneumatophores	r. hanging structures that support a tree

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

194. Sex ratio is the characteristic of

(1) organism (2) Population
(3) biotic community (4) ecosystem

195. **Statement-I** : Phloem is responsible for transport of food from source to sink.

Statement-II : Bidirectional translocation of organic nutrients occurs through phloem.

(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

196. The possibility of a female becoming a haemophilic is extremely rare because

(1) mother of such a female has to be at least carrier & father should be haemophilic

(2) father of such a female has to be at least carrier & mother should be haemophilic

(3) female have one X-chromosome

(4) female chromosome is very long

197. BOD refers to the amount of oxygen that would be consumed if all the organic matter in one litre of water were oxidised by bacteria. BOD test measures rate of uptake of oxygen by micro-organisms in a sample of water, thus BOD is

(1) Direct measure of the organic matter present in the water

(2) Indirect measure of the organic matter present in the water

(3) Direct measure of the inorganic matter present in the water

(4) Indirect measure of the inorganic matter present in the water

198. **Assertion** : Both hydrarch and xerarch succession lead to mesic conditions.

Reason : As succession proceeds there is increase in the number of species as well as increase in biomass..

(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

199. During DNA replication deoxyribonucleoside triphosphates

(1) act as substrates

(2) provide energy for polymerisation

(3) help in recombination

(4) both (1) & (2)

200. 

The given pyramid is

(1) Pyramid of biomass in an aquatic ecosystem

(2) Pyramid of biomass in a grassland ecosystem

(3) Pyramid of energy in an aquatic ecosystem

(4) Pyramid of numbers in a grassland ecosystem