Dated : 15-01-2023

M.L. Syal's Helix Institute

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XII cum Competition Course for Medical

MM : 720

Test - 24

Time : 3 hrs. 20min.

PHYSICS : ELECTROSTATICS, CURRENT ELECTRICITY
CHEMISTRY : SOLUTION, SOLID STATE, SURFACE CHEMISTRY, EXTRACTION, CHEMISTRY IN ACTION
ZOOLOGY : HUMAN REPRODUCTION AND REPRODUCTIVE HEALTH
BOTANY : GENETICS : PRINCIPLES OF INHERITANCE AND VARIATIONS

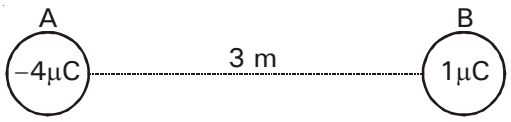
PHYSICS : SECTION-A

All questions are compulsory in section A

1. A glass rod rubbed with silk is used to charge a gold leaf electroscope having air inside the jar and the leaves are observed to diverge. The electroscope thus charged is exposed to X-rays for a short period. Then the leaves will
   (1) not be affected (2) diverge further
   (3) collapse (4) melt

2. A parallel plate capacitor has a capacitance C. If one of the plates is moved to double the distance between them, then new capacitance is
   (1) C (2) 2C
   (3) 0.5 C (4) zero

3. Electric charges q, q, −2q are placed at the corners of an equilateral triangle ABC of side L. The magnitude of electric dipole moment of the system is
   (1) $\sqrt{3}$ qL (2) 2qL
   (3) qL (4) 4qL

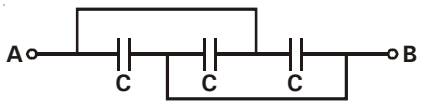
4. 

   In the above arrangement of two charges A and B, on the straight line joining them, electric field will be zero at a distance of
   (1) 2 m from A towards its right
   (2) 2 m from A towards its left
   (3) 3 m from B towards its right
   (4) 1.5 m from B towards its right

5. A wire is stretched uniformly such that its length is doubled. Then resistance of the wire will become
   (1) double (2) four times
   (3) half (4) one fourth

6. When a charge of 2 C is placed in a uniform electric field, it experiences a force of 1000 N. Within this field, maximum potential difference between two equipotential surfaces separated by a distance of 4 cm is
   (1) 10 volts (2) 200 volts
   (3) 40 volts (4) 20 volts

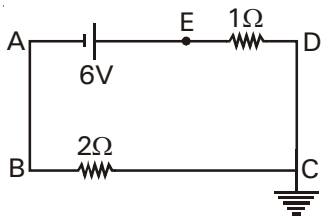
7. The capacitor of capacitance 4 μF and 6 μF are connected in series to a battery of emf 10 V. Then the charge on each capacitor is numerically
   (1) 100 μC (2) 20 μC
   (3) 24 μC (4) 10 μC

8. 

   Three equal capacitors, each with capacitance C are connected as shown in figure. Then the equivalent capacitance between A and B is
   (1) C (2) 3C
   (3) $\frac{C}{3}$ (4) $\frac{3C}{2}$

9. A conductor having a cavity inside is placed in external electric field. Then electric field exists
   (1) in body of conductor but not in the cavity
   (2) in cavity but not in body of conductor
   (3) in cavity as well as body of conductor
   (4) neither in cavity nor in body of conductor

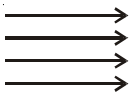
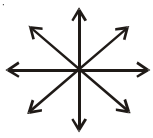
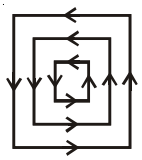
10. In the given circuit, the potential of the point E is



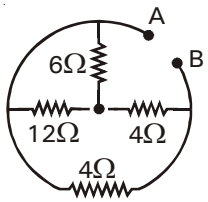
   (1) Zero (2) 4 V
   (3) −2 V (4) 2 V

11. Two point charges Q and − 3Q are placed at some distance apart. If the electric field at the location of Q is E then at the locality of −3Q, it is
   (1) −E (2) E/3
   (3) −3E (4) −E/3

12. Which of the following pattern of electric lines of force is not possible in an electrostatic field?

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

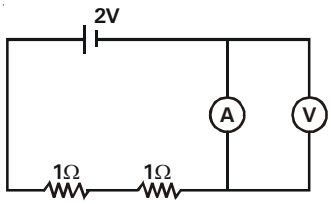
13. In the circuit shown, the equivalent resistance between A and B is



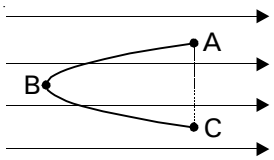
   (1) 6 Ω (2) 3 Ω
   (3) $\frac{8}{3}$ Ω (4) $\frac{16}{3}$ Ω

14. Four particles, each having a charge 'q', are placed on the vertices of a regular pentagon. The distance of each corner from the centre is 'r'. The electric field at the centre of the pentagon is
   (1) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r^2}$ (2) $\frac{1}{4\pi\varepsilon_0}\frac{q}{r}$
   (3) Zero (4) $\frac{1}{4\pi\varepsilon_0}\frac{3q}{r^2}$

15. In the circuit shown, A and V are ideal ammeter and voltmeter respectively. Reading of the voltmeter will be



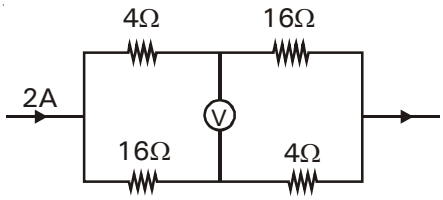
   (1) 2 V (2) 1 V
   (3) 0.5 V (4) Zero

16. 

Let the work done by the field when charge q is shifted from A to B be W_1. Work done when a charge $-2q$ is shifted from B to C is

(1) W_1 (2) $2W_1$

(3) $-W_1$ (4) $-2W_1$

17. 

In the circuit shown below, The reading of the voltmeter V is

(1) 12 V (2) 8 V

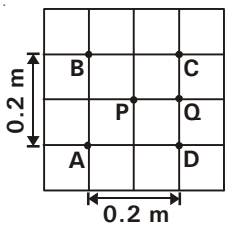
(3) 20 V (4) 16 V

18. If only 4% of the main current in an ammeter is to be passed through a galvanometer of resistance R_G, then the resistance of shunt will be

(1) $\frac{R_G}{48}$ (2) $\frac{R_G}{24}$

(3) $\frac{R_G}{96}$ (4) $48R_G$

19. A, B, C, D, P and Q are points in a uniform electric field. The potentials at these points are V (A) = 2 volt, V (P) = V (B) = V (D) = 5 volt, V (C) = 8 volt. The electric field at P is



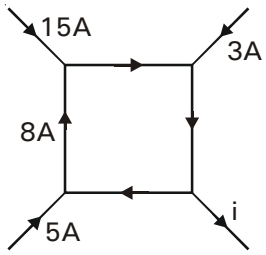
(1) 10 Vm^{-1} along PQ

(2) $15\sqrt{2}$ Vm^{-1} along PA

(3) 5 Vm^{-1} along PC

(4) 5 Vm^{-1} along PA

20. Figure shows a network of currents. Magnitude of currents is shown here. The current i will be



(1) 3 A (2) 13 A

(3) 23 A (4) – 3 A

21. At what distance from a point charge the electric field is 500 V/m and potential is 3000 V?

(1) 6 m (2) 12 m

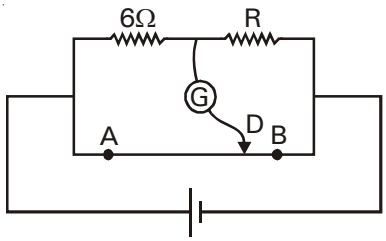
(3) 36 m (4) 144 m

22. A cell has an e.m.f. of 1.5 volts. When short-circuited, it gives a current of 3 amperes. The internal resistance of the cell is

(1) 4.5 Ω (2) 0.5 Ω

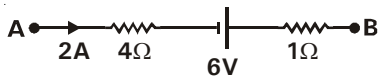
(3) 2 Ω (4) 4 Ω

23. For a given value of current flowing through a wire, drift velocity depends on
    a. cross-sectional area of the wire
    b. number of free electrons per unit volume
    c. magnitude of the current flowing
    d. length of the wire
    (1) both a & d (2) both b & c
    (3) a, b, c & d (4) a, b & c but not d

24. 

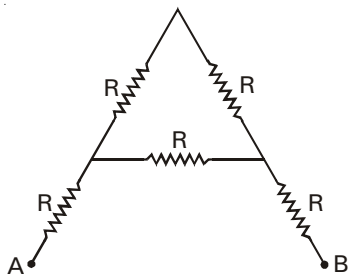
Let the wire AB of a meter-bridge shown above be 50 cm long and no deflection occurs in the galvanometer when AD = 30 cm. Then R is
(1) $14\,\Omega$ (2) $2\,\Omega$
(3) $3\,\Omega$ (4) $4\,\Omega$

25. A current of 2A flows through a wire shown in figure. What is the potential difference $V_A - V_B$?



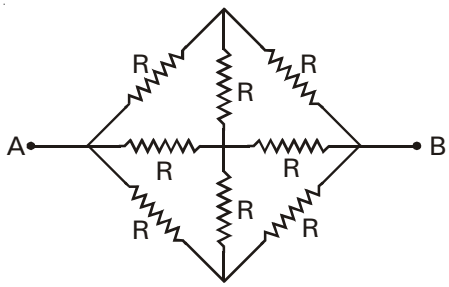
(1) –4 V (2) Zero
(3) –2 V (4) 4 V

26. Find the equivalent resistance between A and B.



(1) 2.67R (2) 2R
(3) 1.33R (4) 0.67R

27. It is required to convert a galvanometer of current range 15 milli-ampere and resistance 50 Ω into a voltmeter of range 150 V. The necessary resistance in series is
(1) 995 Ω (2) 9950 Ω
(3) 1/995 Ω (4) 1/9950 Ω

28. 

The equivalent resistance across AB is
(1) 2R (2) 2.4R
(3) 1.33R (4) 0.67R

29. If six identical cells each having an e.m.f. of 6V are connected in parallel, the e.m.f. of the combination is
(1) 1 V (2) 36 V
(3) 3 V (4) 6 V

30. A 2 μ F capacitance has a potential difference of 200 V across its two terminals. It is disconnected from battery and then another uncharged capacitor is connected in parallel to it. Now, the potential difference becomes 20 volt. Then the capacity of another capacitor will be
(1) 2 μ F (2) 4 μ F
(3) 18 μ F (4) 16 μ F

31. If the current in electric bulb decreases by 0.5%, then the power in the bulb decreases by approximately
(1) 1% (2) 2%
(3) 0.5% (4) 0.25%

32. In a potentiometer arrangement, a cell of emf 1.25 V gives a balance point at 35 cm length of the wire. If the cell is replaced by another cell and the balance point shifts to 63 cm, what is the emf of the second cell?

(1) 2.25 V (2) 5.00 V
(3) 3.75 V (4) 1.25 V

33. A solid metallic sphere has a charge $+3Q$. Concentric with this sphere is a conducting spherical shell having charge $-Q$. The radius of the sphere is 'a' and that of the spherical shell is 'b', $(b > a)$. What is the electric field at a distance R from the centre when $a < R < b$?

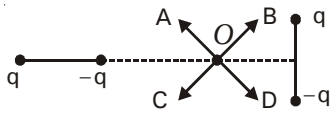
(1) $\frac{1}{4\pi\varepsilon_0}\frac{2Q}{R^2}$ (2) $\frac{1}{4\pi\varepsilon_0}\frac{6Q}{R}$

(3) $\frac{1}{4\pi\varepsilon_0}\frac{3Q}{R^2}$ (4) $\frac{1}{4\pi\varepsilon_0}\frac{4Q}{R^2}$

34. In relation $E = -\frac{dV}{dr}$, negative sign signifies that

(1) E is opposite to V
(2) E is negative
(3) E increases when V decreases
(4) E is directed in the direction of decreasing V

35. Point O in the figure is at same distance from either dipole. Direction of net electric field at point O is along the direction



(1) OA (2) OB
(3) OC (4) OD

PHYSICS : SECTION-B

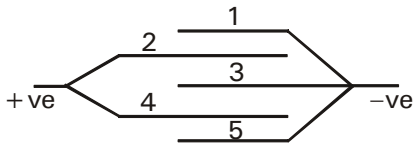
This section has 15 questions, attempt any 10 questions of them.

36. Inward and outward electric flux for a closed surface in units of $N\text{-}m^2/C$ are respectively 2×10^3 and 8×10^3. Then total charge inside surface is [where ε_0 = permittivity constant]

(1) $10^4\varepsilon_0$ C (2) $6\times10^3\varepsilon_0$ C

(3) $-10^4\varepsilon_0$ C (4) $-6\times10^3\varepsilon_0$ C

37.



Five identical parallel conducting plates each of area A have separation 'd' between successive surfaces. The plates are connected to the terminal of a battery as shown in the figure. The effective capacitance of the circuit is

(1) $\frac{A\varepsilon_0}{4d}$ (2) $\frac{4A\varepsilon_0}{d}$

(3) $\frac{4A\varepsilon_0}{3d}$ (4) $\frac{3A\varepsilon_0}{4d}$

38. The electric field between the plates of a charged parallel plate capacitor is

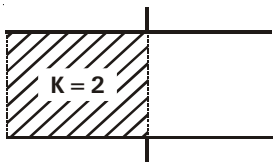
(1) uniform (2) non-uniform
(3) zero (4) radial

39. Electric field intensity at a point in between two parallel sheets with like charges of same surface charge densities σ is

(1) $\frac{\sigma}{2\varepsilon_0}$ (2) $\frac{\sigma}{\varepsilon_0}$

(3) zero (4) $\frac{2\sigma}{\varepsilon_0}$

40. A parallel plate capacitor has capacitance C. When it is one-half filled with a dielectric of dielectric constant 2, then percentage increase in its capacitance is

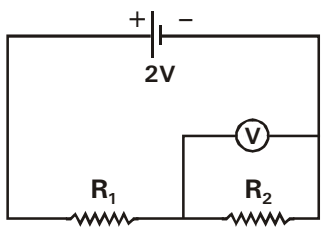


(1) 200% (2) 150%
(3) 100% (4) 50%

41. In an electrolyte 2×10^{18} bivalent positive ions drift to the right per second while 1×10^{18} monovalent negative ions drift to the left per second. Then the current is about
(1) 3 amp to the left
(2) 3 amp to the right
(3) 0.8 amp to the right
(4) 0.8 amp to the left

42. Resistance of tungsten wire at 150°C is 133 Ω. Its resistance temperature coefficient is 0.0045/°C. The resistance of this wire at 500°C will be
(1) 180 Ω (2) 225 Ω
(3) 258 Ω (4) 317 Ω

43. A cell of e.m.f. 2V of negligible internal resistance is connected to resistors R_1 and R_2 as shown in the figure. The resistances of the voltmeter, resistance R_1 and resistance R_2 are respectively 80 Ω, 20 Ω and 80 Ω. What is voltmeter reading?

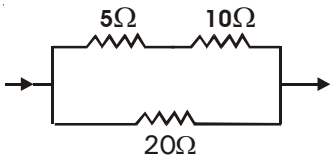


(1) 0.80 V (2) 1.33V
(3) 1.60V (4) 1.78V

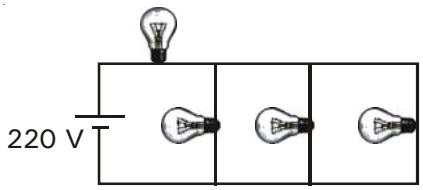
44. A Daniel cell is balanced on 125 cm length of a potentiometer wire. Now the cell is short-circuited by a resistance 2 ohm and the balance is obtained at 100 cm. The internal resistance of the Daniel cell is
(1) 0.5 ohm (2) 1.5 ohm
(3) 1.25 ohm (4) 4/5 ohm

45. The colour of a carbon resistor are brown, yellow, green as read from left to right. The resistance is
(1) $(4 \times 10^4 \pm 5\%)\ \Omega$
(2) $(14 \times 10^5 \pm 20\%)\ \Omega$
(3) $(1.4 \times 10^5 \pm 20\%)\ \Omega$
(4) $(14 \times 10^5 \pm 10\%)\ \Omega$

46. Heat produced in 5 Ω resistor is 4 cal/sec. Heat produced in 20 Ω will be



(1) 12 cal/sec (2) 8 cal/sec
(3) 9 cal/sec (4) 4 cal/sec

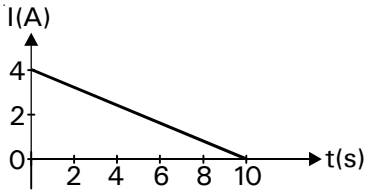
47. 

Four identical bulbs each rated 100 watt , 220 volts are connected across a battery as shown. The total electric power consumed by the bulbs is
(1) 75 watt (2) 400 watt
(3) 300 watt (4) 400/3 watt

48. Sensitivity of potentiometer can be increased by
(1) increasing the e.m.f. of the cell
(2) increasing the length of the potentiometer wire
(3) decreasing the length of the potentiometer wire
(4) none of the above

49. Kirchhoff's second law is based on the law of conservation of
(1) charge (2) energy
(3) momentum (4) none of these

50.



The graph shows the variation of current with time in a circuit. The total charge flowing in the circuit is
(1) 40 C (2) 20 C
(3) 10 C (4) 2 C

CHEMISTRY : SECTION-A

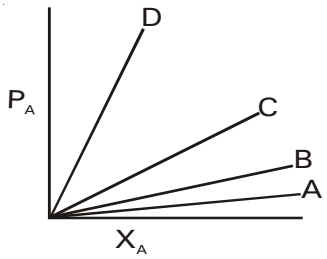
All questions are compulsory in section A

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

$$Ti + 2I_2 \xrightarrow{773\ K} TiI_4 \xrightarrow{1675\ K} Ti + 2I_2$$

(1) Mond's process
(2) poling
(3) Van Arkel Method
(4) zone refining

52. Arrange the following gases in order of decreasing solubility



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

53. Cinnabar is generally concentrated by
(1) froth floatation
(2) roasting
(3) gravity separation
(4) reduction by carbon

54. Ebullioscopic constant for water is 0.513°C kg/mol. The aqueous solution of sugar containing 0.1 mole of it in 200 g of water will boil under a pressure of one atm at
(1) 100.513°C (2) 100.0513°C
(3) 100.256°C (4) 101.025°C

55. Which of the following interface cannot be obtained?
(1) Liquid-liquid (2) Solid-liquid
(3) Liquid-gas (4) Gas-gas

56. Identify the correct statement
(1) Dissolution is the collision of solute particles in solution with solid solute particles and their separation
(2) Crystallisation is the addition of solid solute which increases the concentration of solution
(3) The solution which is in dynamic equilibrium with undissolved solute is saturated solution
(4) Solubility of one substance into another does not depend on nature of substances

57. An AB solid having rock salt structure is doped with 10^{-4} mole % $SrCl_2$, then concentration of cation vaccancies will be
(1) $6.023 \times 10^{15}\ Mol^{-1}$
(2) $6.023 \times 10^{20}\ Mol^{-1}$
(3) $6.023 \times 10^{19}\ Mol^{-1}$
(4) $6.023 \times 10^{17}\ Mol^{-1}$

58. **Assertion** : Copper is extracted by hydrometallurgy from low grade ores.
Reason : The solution containing Cu^{2+} is treated with scrap iron.
(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

59. The anions 'A' form hcp packing and cations 'C' occupy $\frac{2}{3}rd$ of the octaheral voids. The formula of the compound is
(1) A_2C_3 (2) C_2A_3
(3) CA (4) AC_2

60. Leaching of silver is carried out by heating it with a dilute solution of
(1) NaCNS
(2) HCl
(3) NaOH
(4) NaCN in presence of O_2

61. The F-centres are generally seen in solids having
(1) metal deficient defects
(2) metal excess defects
(3) impurity defects
(4) interstial defects

62. Which of the following is not correct about artificial sweetning agent?
(1) Aspartame is used in cold drinks
(2) Alitame is high potency sweetner
(3) Sucralose is not stable at cooking temperature
(4) Sucralose does not provide calories

63. Total vapour pressure of mixture of 1 mole of volatile component A $(P_A^\circ = 100\,mmHg)$ and 3 moles of volatile component B $(P_B^\circ = 60\,mmHg)$ is 75 mm. For this the incorrect statement is
(1) There is + ve deviation from raoult's law
(2) Boiling point of solution has been lowered
(3) Force of attraction between A and B is lesser than between A and A or between B and B
(4) Boiling point of solution is raised

64. The depressant used in froth floatation process in extraction of zinc from mixture of sulphide ores is
(1) NaCN (2) NaOH
(3) H_2SO_4 (4) Cresol

65. The depression in freezing point of 0.01 m aqueous solution of urea, NaCl, and Na_2SO_4 is in ratio
(1) 1:1:1 (2) 1:2:4
(3) 1:2:3 (4) 2:2:3

66. An element has bcc structure with cell edge of 288 pm. The density of the element is 7.2 g/cc. The no. of atoms in 208 g of the element are
(1) 24.16×10^{20} atoms
(2) 12.08×10^{23} atoms
(3) 24.16×10^{23} atoms
(4) 36.39×10^{20} atoms

67. Total volume occupied by atoms present in body centered cubic unit cell of a metal is
(1) $\frac{16}{3}\pi r^3$ (2) $\frac{8}{3}\pi r^3$
(3) $\frac{20}{3}\pi r^3$ (4) $\frac{4}{3}\pi r^3$

68. Which of the following electrolyte will have maximum flocculating value for $Fe(OH)_3$ sol?
(1) Na_2S (2) $(NH_4)_3PO_4$
(3) Na_2SO_4 (4) KCl

69. A 5 molar solution of H_2SO_4 is diluted from 1 litre to a volume of 10 litre, the normality of the solution will be

(1) 1 N (2) 0.1 N
(3) 5 N (4) 0.5 N

70. Which of the following is incorrect statement ?
(1) Pencillin G has narrow spectrum
(2) Chloramphenicol is broad spectrum antibiotic
(3) Chloramphenicol has bactericidal effect
(4) Ampicillin and Amoxycillin are synthetic modification of pencillin

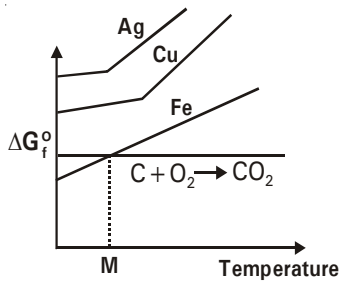
71. Which of the following crystal habits has the parameters as

$a = b \neq c$ and $\alpha = \beta = \gamma = 90^\circ$

(1) hexagonal (2) monoclinic
(3) tetragonal (4) orthorhombic

72. The purpose of ice in Bredig's arc method is
(1) to fetch water
(2) to increase the vapour pressure of vapours
(3) to condense the metal vapours
(4) to increase the temperature of apparatus

73. Choose the correct statement(s)



(1) Fe and C do not show any phase transition
(2) Below point M, C can not reduce the oxide of Fe
(3) Ag and Cu form highly stable oxides
(4) Both (1) and (2)

74. Which of the following is false?
(1) Adsorption is surface phenomenon while absorption is bulk phenomenon
(2) Adsorption can be reversible or irreversible
(3) Adsorption is spontaneous while absorption is non-spontaneous
(4) Adsorption decreases with the passage of time while absorption proceeds with constant speed

75. Copper is purified by electrolytic refining of blister copper. The incorrect statement is/are
(1) impure Cu strip is used as cathode
(2) aqueous $CuSO_4$ is used as electrolyte
(3) pure Cu deposits at cathode
(4) impurities settle down as anode mud

76. Which of the following detergent acts as germicide?
(1) Cetyltrimethyl ammonium chloride
(2) Sodium lauryl sulphate
(3) Sod. -4-(1-dodecyl) benzene sulphonate
(4) All of the above

77. **Statement-I** : During adsorption there is always a decrease in residual forces of the surface.
Statement-II : When a gas is adsorbed, freedom of movement of its molecules become restricted.
(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

78. The formula of Cassiterite ores
(1) SnO_2 (2) $MgCO_3$
(3) PbS (4) Al_2O_3

79. Silicon doped with electron-rich impurity forms _____.
(1) *p*-type semiconductor
(2) *n*-type semiconductor
(3) intrinsic semiconductor
(4) insulator

80. Solute A is quaternary electrolyte and solute B is non electrolyte. If 0.1 M solution of solute B produces an osmotic pressure of 2P, then 0.05 M solution of A at the same temperature will produce an osmotic pressure equal to
(1) 3P (2) 1.5 P
(3) 2P (4) 4P

81. Which of the following process is responsible for the formation of delta at a place where rivers meet the sea?
(1) Emulsification (2) Colloid formation
(3) Coagulation (4) Peptisation

82. Catalyst used for decomposition of potassium chlorate to KCl and O_2 is
(1) V_2O_5 (2) MnO_2
(3) Fe (4) H_2SO_4

83. Which one of the following is/are stochiometric defects ?
a. Schottky defect b. Frenkel defect
c. Interstitial defect d. Vacancy defect
(1) b&d only (2) b&c only
(3) a, c, d (4) a, b, c, d

84. In emulsions, the dispersion medium and dispersed phase are
(1) Both solids (2) Both gases
(3) Both liquids (4) solid and liquid

85. Match the following solids with their types
a. P_4O_{10} p. metallic
b. Brass q. ionic
c. $(NH_4)_3PO_4$ r. amorphous
d. Rb s. molecular
e. Plastic
(1) a-s, b-p, c-q, d-p, e-r
(2) a-r, b-s, c-p, d-q, e-r
(3) a-p, b-r, c-s, d-q, e-s
(4) a-q, b-s, c-q, d-p, e-s

CHEMISTRY : SECTION-B

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

86. Which mixture of the solutions will lead to the formation of negatively charged colloidal sol.?
(1) 50 ml of 1M $AgNO_3$ + 50 ml of 0.2 M KI
(2) 50 ml of 1 M $AgNO_3$ + 50 ml of 1.5 M KI
(3) 50 ml of 1M $AgNO_3$ + 50 ml of 0.1 M KI
(4) 50 ml of 2M $AgNO_3$ + 50 ml of 1.5 M KI

87. In XY_3, Y^- ions have ccp arrangement and X^{3+} ions are present in octahderal voids. The fraction of total number of voids occupied is
(1) 1/3 (2) 1/9
(3) 1/6 (4) 1/12

88. Match Column I and Column II

	Column I		**Column II**
a.	Tranquilizers	(i)	Tegamet
b.	Antihistamine	(ii)	Equanil
c.	Analgesic	(iii)	Cetrizine
d.	Antacid	(iv)	Aspirin

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

89. If K_f value of H_2O is 1.86. The value of ΔT_f for 0.1 m aq. solution of non-volatile solute is
(1) 18.6 (2) 0.186
(3) 1.86 (4) 0.0186

90. Platinum crystallizes in a face-centre cubic crystal with a unit cell length 'a'. The distance between nearest neighbour is
(1) a (2) $a\frac{\sqrt{3}}{2}$
(3) $a\frac{\sqrt{2}}{2}$ (4) $a\frac{\sqrt{2}}{4}$

91. Heating mixture of Cu_2O and Cu_2S will give
(1) $Cu + SO_2$ (2) $Cu + SO_3$
(3) $CuO + CuS$ (4) Cu_2SO_3

92. What happens when a lyophilic sol is added to a lyophobic sol?
a. Lyophobic sol is protected.
b. Lyophilic sol is protected.
c. Film of lyophilic sol is formed over lyophobic sol.
d. Film of lyophobic sol is formed over lyophilic sol.
(1) a & c (2) b & c
(3) c & d (4) a & d

93. Which of the following statements is incorrect regarding vapour pressure of a liquid?
(1) More volatile liquids have high vapour pressure
(2) Vapour pressure of a liquid increases with increase in surface area
(3) A volatile liquid with high vapour pressure has low boiling point
(4) More volatile liquids have higher mole fraction in vapour phase in comparison to their mole fraction in solutions

94. The vacant space in body centred cubic lattice (b.c.c.) unit cell is about
(1) 32% (2) 10%
(3) 23% (4) 46%

95. **Assertion**: Non ideal solutions form azeotropic mixture.
Reason: Boiling point of azeotropic mixture is always higher than boiling point of its both components.
(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

96. Mixture of volatile components A and B has total vapour pressure (in torr)
$P = 254 - 119\, x_A$
where x_A is mol fraction of A in mixture. Hence p_A^0 and p_B^0 are (in torr)
(1) 254, 119 (2) 119, 254
(3) 135, 254 (4) 154, 119

97. Low levels of noradrenaline
a. increase the signal-sending activity
b. make the person suffer from depression
c. lower the signal-sending activity
(1) both a & b (2) a only
(3) b only (4) both b & c

98. **Statement- I** : Mole fraction of gas in the solution is proportional to the partial pressure of the gas over the solution.
Statement- II : Higher is the value of K_H, higher is the solubility of gas in liquid.
(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

99. The number of occupied octahedral voids in 468 g of ideal NaCl is
(1) N_A (2) $8N_A$
(3) $16\, N_A$ (4) $N_A/8$

100. Dishwashing soaps a resynthetic detergents with their chemical nature as
(1) non-ionic (2) cationic
(3) anionic (4) zwitter ion

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Oogenesis is regulated by
(1) steroidal hormone released by sertoli cells
(2) protein hormone released by cells of anterior pituitary
(3) ICSH secreted by interstitial cells
(4) GnRH from anterior pituitary

102. All is true about IUDs except for
(1) these are ideal contraceptives for the females who want to delay pregnancy or space children
(2) It is one of the most widely accepted methods of contraception in India
(3) It is the terminal method to prevent pregnancy and has very poor reversibility
(4) IUDs work by either increasing phagocytosis of sperms, suppressing sperm motility or by making the uterus unsuitable for implantation

103. How many of the following are paired structures in female reproductive system?

Vas Deferens , Epididymis, Fallopian tube, Ovary, Uterus, Scrotal sacs, Vagina

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

104. Which of the following is incorrect w.r.t. Amniocentesis?
(1) It is test based on chromosomal pattern in cells obtained from amniotic fluid
(2) Detects all types of defects in foetus like cleft palate
(3) Detects enzymatic and biochemical abnormalities
(4) Legally banned for sex determination in India

105. During menstrual cycle in female, decrease in the level of oestrogen and progesterone causes
(1) release of ovum from the ovary
(2) endometrial growth
(3) growth of myometrium
(4) rupture of uterine blood vessels leading to sloughing of endometrium or uterine epithelium

106. Finger like projections which help in collection of ovum are attached to which structure of female reproductive system?
(1) Infundibulum (2) Fimbrae
(3) Uterus (4) Ovary

107. The function of corpus luteum is to
(1) maintain pregnancy
(2) shed endometrium in case there is no pregnancy
(3) help in ovulation
(4) secrete mainly estrogen

108. Arrange the following in the correct sequence as they are formed or occur during embryonic development.
a. External genitalia
b. First movement of foetus
c. Separation of eyelids
d. Heart
(1) $d \rightarrow b \rightarrow a \rightarrow c$ (2) $d \rightarrow a \rightarrow b \rightarrow c$
(3) $d \rightarrow b \rightarrow c \rightarrow a$ (4) $d \rightarrow a \rightarrow c \rightarrow b$

109. How many statements are not correct?
a. Secretions of acrosome and nucleus help the sperms to enter ovum
b. Cyclic menstruation is an indicator of normal reproductive phase
c. Milk produced during initial days of lactation is rich in antibodies IgA
d. A stimulatory reflex occurs between uterine contractions and oxytocin secretion that causes parturition
(1) Four (2) One
(3) Three (4) Two

110. Which of the following options are correct? Interstitial spaces outside seminiferous tubules in human testis do not contain
a. interstitial cells
b. small blood vessels
c. immunologically competent cells
d. leydig cells
e. male germ cells
(1) a & e (2) b & c
(3) c & e (4) only e

111. How many zygotes will be formed in a test tube if 40 ova are mixed with 200 sperms under optimal conditions required for fertilization?
(1) 240 (2) 200
(3) 120 (4) 40

112. How many of the following have DNA content equal to that of freshly formed zygote?

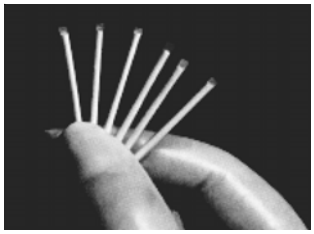
1° oocyte undergoing meiosis-I, 2° oocyte, 2° spermatocyte, 1st polar body, 2nd polar body, spermatid, ovum

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

113. Scrotum holds the testis & provides a temperature
(1) 2 – 2.5° C lower than normal internal body temperature
(2) 2 – 2.5° C higher than normal internal body temperature
(3) higher than body temperature in summers & lower than body temperature in winters
(4) equal to that of internal body temperature

114. Mark the incorrectly matched pair related to contraceptive methods
(1) Implant–effective for 3-5 years
(2) Multiload 375–hormone releasing pill
(3) LNG-20–makes uterus unsuitable for implantation
(4) Lippes loop–non medicated IUD

115. The contraceptive device shown below



(1) is inserted to cover the cervix during coitus
(2) is a medicated IUD
(3) helps in gamete transport
(4) contain hormones and is placed under the skin to prevent pregnancy

116. Menstrual cycle starts with the
(1) follicular phase that lasts for 14 days
(2) menstrual phase that lasts for 3-5 days
(3) luteal phase that lasts for 10 days
(4) follicular phase that lasts for 10 days

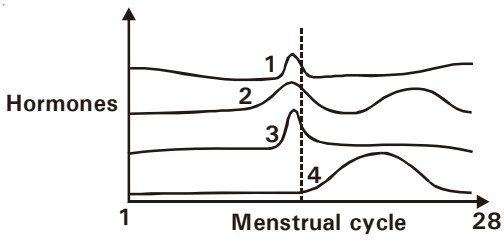
117. Induced abortion / MTP
(1) was legalised by Indian government in 1965
(2) is chiefly performed to control the population
(3) is safe upto the second trimester
(4) none of these

118. Identify the correct match
(1) Umbilical cord – Helps to transport substances to & from the embryo
(2) Placenta – facilitates supply of oxygen & nutrients to the embryo
(3) hCG, hPL & relaxin – produced only during pregnancy
(4) All are correctly matched

119. Of the following processes that occur during spermatogenesis, which is the correct sequence in which they occur?
A – Spermateleiosis
B – Mitosis
C – Meiosis
D – Spermiation
(1) A–B–C–D (2) C–B–A–D
(3) B–C–A–D (4) B–C–D–A

120. Oogenesis is different from spermatogenesis as
(1) it produces four female gametes per cycle which are similar in size and DNA content
(2) the process initiates only after puberty
(3) it is a continous process without any breaks
(4) as no more oogonia are formed within each foetal ovary after birth

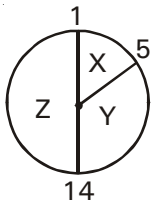
121. **Assertion** : A sudden fall or jolt, insertion of a vaginal tampon, active participation in some sports like horseback riding and cycling can cause a female to lose her virginity.
Reason : The hymen is often torn during the first coitus.
(1) Both Assertion and Reason are true and the reason is 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

122. 

In the diagram shown above, 1, 2, 3 and 4 are respectively.
(1) Estrogen, LH, FSH, Estrogen
(2) Progesterone, Estrogen, FSH, LH
(3) FSH, Estrogen, LH, Progesterone
(4) LH, FSH, Progesterone, Estrogen

123. Changes in GnRh pulse frequency in females is controlled by the circulating levels of
(1) Progesterone and Inhibin
(2) Estrogen and progesterone
(3) Estrogen and inhibin
(4) Progesterone only

124. In the given representation of 28 days menstrual cycle (with phases X,Y and Z), the events given as A,B and C match with which given phases of menstrual cycle ?



A. cervical mucus becomes thin
B. uterine glands become more secretory
C. level of gonadotropins increase gradually
(1) A–X, B–Y, C–Z (2) A–Y, B–Z, C–Y
(3) A–Y, B–Z, C–X (4) A–Y, B–X, C–Z

125. **Statement-I** : In spermiogenesis, spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

Statement-II : FSH acts on the Sertoli cells and stimulates process of spermiogenesis.

(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

126. 16 celled stage of human embryo is

(1) larger than fertilized egg
(2) smaller than fertilized egg
(3) of same size as fertilized egg
(4) four times larger than fertilized egg

127. Which of the following statements for spermatogenesis are true but do not hold true for Oogenesis?

(a) It results in the formation of haploid gametes
(b) Differentiation of gamete occurs after the completion of meiosis
(c) Meiosis occurs continuously in a mitotically dividing stem cell population
(d) It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary
(e) It is initiated at puberty

Choose the most appropriate answer from the options given below

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

128. Match the ARTs with their description

i. Collected gametes are made to form zygote in the lab	a. ZIFT
ii. Transfer of ovum from donor to the oviduct of the recipient	b. GIFT
iii. Sperm is injected into the ovum in vitro.	c. ICSI
	d. AI
	e. IVF

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

129. How many of the following statements are correct?

a. Female sex accessory ducts are oviducts, uterus & vagina
b. Glandular layer that lines the uterine cavity is endometrium
c. Uterine fundus is upper dome like part of uterus
d. Steroidal ovarian hormones work through membrane bound receptors
e. Female primary sex organs are sites of gametogenesis and also assist in transport of gametes

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

130. Freshly released human egg has 22 autosomes and

(1) one Y-chromosome
(2) one X-chromosome
(3) two X-chromosomes
(4) one X-chromosome and one Y-chromosome

131. What is not true for emergency contraceptive?

(1) It can be used to avoid possible pregnancy due to casual unprotected intercourse
(2) It involves administration of progesterone or progesterone oestrogen combination within 72 hours of coitus
(3) It is terminal method of contraception
(4) Insertion of intrauterine devices within 72 hrs. of coitus is effective.

132. India launched a nation wide family planning programme in

(1) 1950 (2) 1951
(3) 1952 (4) 1953

133. Find incorrect match

(1) FSH $\rightarrow$ sertoli cells $\rightarrow$ spermiogenic factors
(2) LH $\rightarrow$ ovary $\rightarrow$ ovulation
(3) ICSH $\rightarrow$ sertoli cells $\rightarrow$ androgens
(4) FSH $\rightarrow$ ovary $\rightarrow$ maturation of follicles

134. In periodic abstinence method of birth control Couples abstain from coitus from day

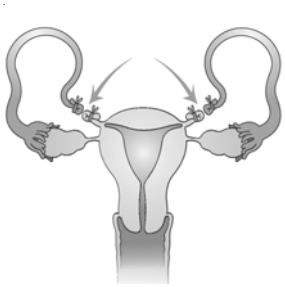
(1) 10 to 17 of menstrual cycle
(2) 4 to 28 of menstrual cycle
(3) 1 to 7 of menstrual cycle
(4) 20 to 25 of menstrual cycle

135. Purpose of vasectomy is to prevent

(1) egg formation
(2) embryonic development
(3) sperm formation
(4) fertilization

ZOOLOGY : SECTION-B

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

136. 

Which of the following statements are correct w.r.t. above figure?

a. Showing vasectomy
b. Showing tubectomy
c. Transport of gametes blocked
d. Surgical method
e. Prevent ovulation

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

137. In the following structures, starting from seminiferous tubules which will be at fourth position related to sperm transport ?
Seminiferous tubules, Epididymis, Rete testis, Vasa efferentia, Vas Deference , Urethra
(1) Vasa efferentia (2) Epididymis
(3) Urethra (4) Rete testis

138. **Assertion** : As long as the mother breast-feeds the child fully, chances of conception are almost nil upto 6 months after child birth.
Reason : Lactational amenorrhea is based on the fact that ovulation and therefore the menstrual cycle does not occur during the period of intense lactation following parturition.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

139. How many of the following techniques involve invivo fertilization ?
ICSI, IUI, GIFT, ZIFT, IUT
(1) Two (2) Three
(3) Four (4) Five

140. Seminal plasma, the fluid part of semen, is contributed by
i. Seminal vesicle
ii. Prostate
iii. Urethra
iv. Bulbourethral gland
(1) i and ii (2) i, ii and iv
(3) ii, iii and iv (4) i and iv

141. Which of the following statement about Saheli is correct?
(1) It is an oral contraceptive taken once a week
(2) It has very few side effects and high contraceptive value
(3) It is non steroidal preparation formulated by CDRI, Luckhnow
(4) All are correct

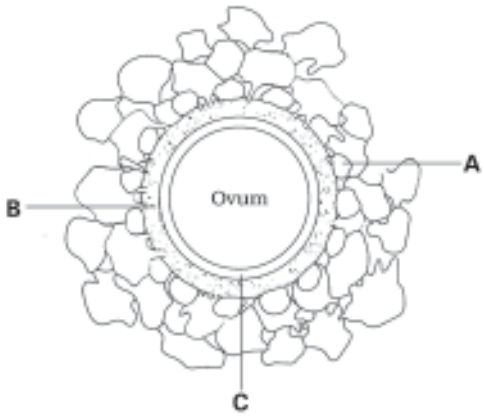
142. Match the following

a.	Ovaries	i.	birth
b.	Oviduct	ii.	ovulation
c.	Uterus	iii.	fertilisation
d.	Vagina	iv.	pregnancy

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

143. Which of the following contraceptive methods cannot be used exclusively by females?
(1) Condoms
(2) Diaphragms
(3) Progestasert
(4) All of these can be used

144. The marked increase in the blood steroids during the last months of pregnancy are almost entirely due to
(1) placental secretions
(2) ovarian secretions
(3) pituitary secretions
(4) hypothalamus secretion

145. 

From the given figure identify the part that bears receptors for sperm
(1) C (2) A
(3) B & C (4) B

146. Foetal ejection reflex in human female is induced by
(1) fully developed foetus & placenta
(2) mild uterine contractions
(3) oxytocin from neurohypophysis
(4) positive oxytocin feedback

147. **Statement I :** Progestogen– Estrogen combination contraceptive pills have to be taken daily for period of 27 days.

Statement II : These pills alter the quality of cervical mucus to retard entry of sperm.

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

148. Uterine endometrium gets repaired in

(1) follicular phase under influence of estrogen
(2) follicular phase under influence of progesterone
(3) luteal phase under influence of progesterone
(4) luteal phase under influence of estrogen

149. Implantation involves

(1) attachment of morula to uterine tissue
(2) attachment of morula to myometrium of uterus
(3) attachment of blastocyst and its complete embedding in endometrium of uterus
(4) none of these

150. Identify the correct statement on 'inhibin'

(1) Is produced by nurse cells in testes and inhibits the secretion of LH
(2) Inhibits the secretion of LH,FSH and prolactin
(3) Is produced by granulose cells in ovary and inhibits the secretion of FSH
(4) Is produced by granulose cells in ovary and inhibits the secretion of LH

BOTANY : SECTION-A

All questions are compulsory in section A

151. How many types of genotypes and phenotypes are obtained if pink flowered plant is crossed with pink flowered plant in Snapdragon?

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

152. All given traits of garden pea can express themselves in heterozygous condition, except

(1) tall stem (2) wrinkled seed
(3) violet flowers (4) green pod

153. What is the probability of having affected daughters if mother is a carrier and father is affected for a sex-linked recessive disorder?

(1) 100% (2) 50%
(3) 75% (4) 25%

154. Select the correct statement

(1) A true breeding plant is always homozygous recessive in its genetic constitution
(2) Back crosses are performed to know the effect of sex on transmission of a particular character
(3) Variations are the differences which appear between individuals of the different species
(4) Sahiwal cows in Punjab were developed through artificial selection and domestication from ancestral wild cows

155. Which of the following statements are false?

a. The unmodified allele which represents the original phenotype is the dominant allele.
b. If modified allele forms the normal enzyme then it is equivalent to unmodified allele and produces same phenotype.
c. Recessive trait is seen due to non functional enzyme or because no enzyme is produced.
d. Modified allele is responsible for production of normal enzyme only

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

156. Pick the true statement

(1) Mendel worked on 14 pairs of contrasting characters in pea.
(2) Mendel failed to discover linkage.
(3) All the genes for seven characters chosen by Mendel lie on seven different chromosomes.
(4) Mendel worked for seven years on pea plant(1857-1866)

157. *Drosophila* was chosen for genetical experiments because

(1) a large number of progeny are produced after each mating
(2) completes life cycle in one year
(3) bisexuality
(4) all the above

158. Thalassaemia occurs when

(1) there is equal production of haemoglobin subunit chains alpha and beta.
(2) each alpha globin gene produces only about half as much protein as a beta globin gene.
(3) a mutation occurs on the X chromosome
(4) there is a reduced synthesis of one of the globin subunit chains

159. Consider the following statements A,B,C and D and select the option having incorrect statements

A. Mendelian experiments had a large sampling size, which gave greater credibility to the data that he collected.

B. Recessive allele influences the appearance of the phenotype even in the presence of an alternative allele

C. In multiple alleles, number of types of genotypes will depend upon the number of alleles

D. In F_2 generation of a mendelian monohybrid cross, the tall and dwarf traits were identical to their parental types and showed blending.

(1) A and C (2) C and D

(3) B and D (4) B and C

160. Which of the following statement is not true ?

(1) Dominance is not an autonomous feature of the gene

(2) Multiple alleles are studied at population level

(3) ABO blood group is an example of multiple allelism

(4) Starch synthesis in pea is controlled by more than one gene

161. Identify the chromosomal disorder characterised by these symptoms

a. Tall stature

b. Gynaecomastia

c. Mental retardation

(1) Down's syndrome

(2) Klinefelter's syndrome

(3) Edward's syndrome

(4) Cri du chat syndrome

162. In a population, frequency of dominant allele is 0.8. what percentage of population will show dominant phenotype?

(1) 64% (2) 32%

(3) 96% (4) 4%

163. What are Punnett Squares used for

(1) finding out the results of genetic crosses between organisms of known genotypes

(2) finding out the results of genetic crosses between organisms of unknown genotypes

(3) testing for the presence of recessive alleles

(4) predicting the DNA sequence of a given gene

164. In a dihybrid cross , F2 generation, 6400 plants were produced. How many are homozygous round with green seeds ?

(1) 1600 (2) 400

(3) 200 (4) 3200.

165. Select the incorrect statement

(1) Cystic fibrosis is autosomal recessive gene disorder

(2) Phenylketonuria is due to hypoploidy

(3) SCA heterozygote individual is resistant to malaria

(4) Turner's syndrome is an example of monosomy

166. A set of genes will be in a complete linkage when the progeny phenotypes for parental (P) and recombinant (R) types are

(1) P = 50%, R = 50%

(2) P > 50%, R < 50%

(3) P = 100%, R = 0%

(4) P = 0, R = 100%

167. I^A and I^B, the two alleles of gene I express their own types of sugars in an individual with AB blood group because of

(1) complete dominance

(2) pleiotropy

(3) multiple allelism

(4) co-dominance

168. **Statement- I :** Chromosomes as well as genes occur in pairs.

Statement- II : Two alleles of a gene pair are located on homologous sites on homologous chromosomes.

(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

169. The phenotypic and genotypic ratio is same in case of

(1) Complementary genes

(2) Monohybrid cross

(3) Dihybrid cross

(4) Dihybrid test cross

170. How many statements are correct ?

a. Mendelian disorders may be dominant or recessive

b. Mendelian disorders are mainly determined by alteration in the single gene

c. Colourblindness occurs in about 8 percent of males

d. Myotonic dystrophy is inherited as autosomal recessive trait

(1) Three (2) One

(3) Four (4) Two

171. **Assertion**: Haemophilia in humans is a sex-linked recessive disease

Reason: The carrier female is homozygous and responsible for transmitting haemophilia to sons.

(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

172. Why cannot human genetics be studied like plants and animals?

(1) Long reproductive span

(2) Limited number of offsprings

(3) Controlled selective breeding is possible

(4) Both (1) and 2)

173. Hardy Weinberg principle is not applicable in which of the following conditions ?

(1) Random mating population

(2) Population showing mutation

(3) Large population

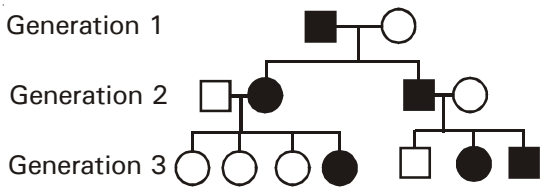
(4) Non migrating population

174. How many linkage groups are present in male *Drosophila*?

(1) 4 (2) 8

(3) 5 (4) 23

175. A pedigree is shown below for a disease that is autosomal dominant. The genetic makeup of the first generation is



(1) Aa,Aa (2) Aa,aa

(3) Aa,AA (4) AA,Aa

176. Father of experimental genetics is

(1) Bateson

(2) Mendel

(3) Morgan

(4) Muller

177. How many statements are correct *w.r.t* Law of Dominance ?

a. Characters are controlled by discrete units called factors

b. F_2 organisms have the monohybrid phenotypic ratio 3:1

c. Factors donot occur in pairs

d. This law explains the appearance of both the parental characters in F_1 generation.

e. In a pair of dissimilar factors, one member acts as dominant while the other is recessive

(1) a, c, d (2) a, d, e

(3) a, b, e (4) b, d, e

178. Short stature with small round head, big furrowed tongue, partially open mouth with characteristic palm crease are symptoms of

(1) Cri–du–chat syndrome

(2) Down's syndrome

(3) Turner's syndrome

(4) Klinefelter's syndrome

179. How many statements is/are incorrect?

a. In incomplete dominance, for flower colour in 4 O' clock plant the F_2 generation resulted in-1(red) :2(pink) :1(white)

b. Sickle cell anaemia is an example of pleiotropy

c. In mendelian dihybrid cross, the phenotypic ratio 9 : 3 : 4

d. Morgan carried out several experiments (dihybrid crosses) in *Drosophila* to study genes that were sex-linked.

(1) One (2) Two

(3) Three (4) Four

180. Sex of the chick embryo is determined by

(1) sperms (2) egg

(3) environment (4) ploidy level

181. Which of the following statement is incorrect?

(1) Sex linked traits show criss-cross inheritance.

(2) Morgan and Bridges proved that genes are located on chromosomes

(3) In fruitfly, strength of linkage between body colour gene and eye colour gene is higher than that between genes for eye colour and wing size.

(4) Morgan discovered linkage in sweet pea.

182. Which of the following is not a feature of polytene chromosomes ?

(1) They are formed by somatic pairing of homologous chromosomes

(2) They represent diplotene chromosome bivalents

(3) These are found in salivary gland cells of fruitfly

(4) These chromosomes have balbiani rings which are sites of active transcription

183. Match the column w.r.t characters and dominant traits

	Column -I		Column-II
a.	Pod colour	(i)	Round
b.	Seed shape	(ii)	Violet
c.	Pod shape	(iii)	Green
d.	Flower colour	(iv)	Inflated

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

184. What is not true for sickle cell anaemia?
(1) It occurs when both the parent are atleast the carriers
(2) It is caused by substitution of valine by glutamic acid at 6th position of β -globin chain
(3) Mutant haemoglobin undergoes polymerization under low oxygen tension
(4) Carriers are resistant to Malaria

185. Polyploidy is induced by
(1) UV rays (2) Nitrous acid
(3) Colchicine (4) Crossing over

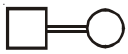
BOTANY : SECTION-B

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

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

187. If gene frequency between genes A and B is 24%, C and A is 14%, C and D is 8%, D and A is 6% and B and C is 10%, what will be the sequence of these genes in a chromosome?
(1) A, B, C, D (2) A, C, B, D
(3) B, C, D, A (4) B, A , C, D

188. On crossing homozygous white eyed female with hemizygous red eyed male, the observed result was
(1) 50% females – red eyed
all males –red eyed
(2) all females – red eyed
all males – white eyed
(3) all females – white eyed
50% males – redeyed
50% males – white eyed
(4) all males – red eyed
all females – white eyed

189.  , this symbol in pedigree represents
(1) dizygotic twins
(2) monozygotic twins
(3) consanguineous marriage
(4) carrier of sex-linked recessive

190. Which of the following traits shows criss-cross inheritance?
(1) Sickle cell anaemia (2) Haemophilia
(3) Albinism (4) Cystic fibrosis

191. Select the incorrect match
(1) Alkaptonuria – Accumulation of homogentisic acid
(2) Cystis fibrosis – Abnormally viscid mucus in body
(3) Thallassemia – Reduced amount of dystrophin
(4) Albinism – No synthesis of melanin

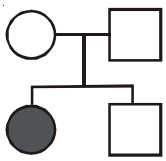
192. If a plant with genotype AaBBCcDd is selfed, what will be the number of types of gametes, offsprings, phenotypes and genotypes respectively?
(1) 8,64,8,27 (2) 8,8,64,27
(3) 4,64,4,27 (4) 8, 16, 8,27

193. Gene A and B are 12 map units apart. A heterozygous individual, whose parents were AAbb and aaBB would be expected to produce gamete in the following frequency
(1) 44% AB, 6% Ab, 6% aB, 44% ab
(2) 6% AB, 44% Ab, 44% aB, 6% ab
(3) 12% AB, 38% Ab, 38% aB 12% ab
(4) 38% AB, 12% Ab, 12% aB, 38% ab

194. **Assertion** : Cross over frequency is used in formation of linkage map.

Reason : Recombination frequencies are directly proportional to distance between genes.
(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

195. In *Drosophilla*, gene for eye colour (w) and wing size (m) are linked and present on X-chromosome. What is recombination frequency between white eyed and miniature size?
(1) 18.6% (2) 37.2%
(3) 50% (4) 9.1%

196. 

What is true about trait analyzed by pedigree?

a. It can be Haemophilia
b. It can be autosomal dominant
c. It can be sex-linked recessive
d. It can be alkaptonuria
e. It can be autosomal recessive

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

197. **Statement-I** : Some mutations involve changes in whole set of chromosomes.

Statement-II : Sickle cell anemia is caused due to change of one base in the gene coding for beta chain of hemoglobin.

(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

198. "When two pairs of traits are combined in a hybrid, the segregation of one pair of characters is independent of the segregation of the other pair of characters". This is

(1) Law of dominance
(2) Law of segregation
(3) Law of independent assortment
(4) None of the above

199. Usually the recessive character is expressed only when present in a double recessive condition. However single recessive gene can express itself in human beings when the gene is present on

(1) the X chromosme of the female
(2) the X chromosome of the male
(3) any autosome
(4) either an autosome or X chromosome

200. The recombination frequency

a. is directly proportional to distance between linked genes
b. between two genes cannot exceed 50%
c. helps to determine the relative order of genes

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