Dated : 14-03-2023

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Test Series HMC-8 (Punjab Board Students)

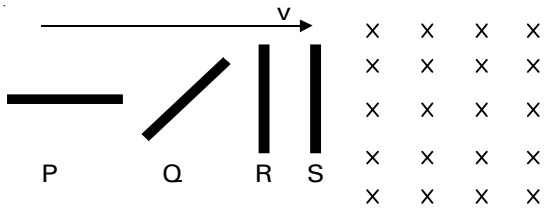
Test-02

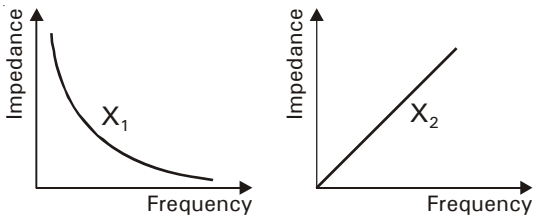
MM : 720 **Time : 3 hrs. 20 min**

Physics	:	Magnetism, EMI, AC, Ray optic and Wave Optics
Chemistry	:	Alcohol, Phenol & Ethers, Aldehydes, Ketones, Carboxylic acids, Amines, Biomolecules, Polymers
Zoology	:	Human Health & Diseases, Immune System, Strategies for Enhancement in food production
Botany	:	Genetic; Viz Principles of Inheritance & Variation, Molecular basis of inheritance

PHYSICS : SECTION-A

All questions are compulsory in section A

1. Which of the following is not an application of eddy currents
   (1) Induction furnace
   (2) Galvanometer damping
   (3) Speedometer of automobiles
   (4) potentiometer
2. A choke coil has
   (1) High inductance and low resistance
   (2) Low inductance and high resistance
   (3) High inductance and high resistance
   (4) Low inductance and low resistance
3. 

   Three conducting rods P, Q and R and one wooden rod S move through a region with magnetic field as shown. If all have same velocity 'v', then the induced emf in the rods satisfy the relation
   (1) $e_R > e_Q > e_P = e_S$ (2) $e_R = e_Q = e_P = e_S$
   (3) $e_R = e_P = e_Q > e_S$ (4) $e_R = e_S > e_Q > e_P$
4. A person is six feet tall. The least size of mirror for him to see his complete image is
   (1) 6 feet (2) 3 feet
   (3) 2 feet (4) depends on position
5. A diffraction pattern is obtained using a beam of yellow light. What happens if the yellow light is replaced by red light?
   (1) No change
   (2) Diffraction bands become narrower
   (3) Diffraction bands become broader
   (4) Diffraction bands disappear
6. 

   In the above graphs X_1 and X_2 are respectively
   (1) inductor and capacitor
   (2) resistor and capacitor
   (3) capacitor and inductor
   (4) inductor and resistor

7. The flux (in weber) linked with a coil at any instant t is given by

$\phi = 10t^2 - 50t + 250$

The induced emf at $t = 3$ s is

(1) -190 V (2) -10 V
(3) 10 V (4) 190 V

8. To get three images of a single object, one should have two plane mirrors at an angle of

(1) 30° (2) 60°
(3) 90° (4) 150°

9. **Assertion** : Work done in moving a charge in a closed loop in a time varying magnetic field is non zero.

Reason : Induced electric field is non-conservative in nature.

(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

10. What is the coefficient of mutual inductance if the magnetic flux changes by 2×10^{-2} Wb in secondary circuit when change in current in primary circuit is 0.01 A?

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

11. To increase Fresnel's distance

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

12. In a YDSE, spacing between two slits is 0.1 mm. If the screen is kept at a distance of 1m from the slits and the wavelength of light is 5000 Å , then the fringe width is

(1) 1 cm (2) 1.5 cm
(3) 0.5 cm (4) 2 cm

13. An alternating voltage $E = 200\sqrt{2}\ \sin(100\ t)$ is connected to a 1 microfarad capacitor through an ac ammeter. The reading of the ammeter shall be

(1) 10 mA (2) 20 mA
(3) 40 mA (4) 80 mA

14. A wire of magnetic moment M and length L is bent in semi-circle. Then its new magnetic moment is

(1) $\frac{M}{\pi}$ (2) $\frac{2M}{\pi}$
(3) M (4) zero

15. For the waves reaching second minimum in single slit diffraction pattern, path difference between the waves reaching from the two edges of the slit is

(1) λ (2) $2\ \lambda$
(3) $0.5\ \lambda$ (4) $1.5\ \lambda$

16. In an ac circuit, V and I are given by

$V = 100 \sin (100\ t)$ volts,

$$I = 100 \sin\left(100t + \frac{\pi}{3}\right) \text{mA}\ .$$

The power dissipated in circuit is

(1) 10^4 watt (2) 10 watt
(3) 2.5 watt (4) 5 watt

17. **Statement-I** : A bulb is connected first with dc and then ac of same rms voltage. It will shine more brightly with AC.

Statement-II : In an ac circuit having capacitance and resistance, the current leads the applied emf.

(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

18. If a bar magnet of magnetic moment M is freely suspended in a uniform magnetic field of strength B, the work done in rotating the magnet through an angle θ is

(1) $MB(1-\sin\theta)$ (2) $MB\sin\theta$

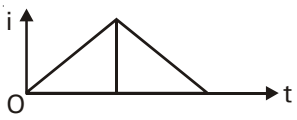
(3) $MB\cos\theta$ (4) $MB(1-\cos\theta)$

19. The image formed by a convex mirror of focal length 30 cm is a quarter of the size of the object. The distance of the object from the mirror is

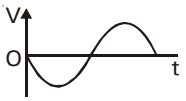
(1) 30 cm (2) 90 cm

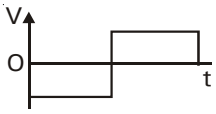
(3) 120 cm (4) 60 cm

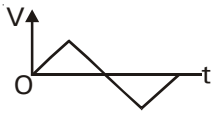
20. The current 'i' in an inductance coil varies with time 't' according to following graph

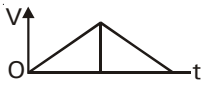


Which one of the following plots shows the variations of voltage in the coil

(1) 

(2) 

(3) 

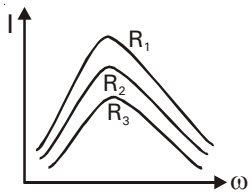
(4) 

21. The angle of minimum deviation measured with a prism is 30° and the angle of prism is 60°. The refractive index of prism material is

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

(3) 3/2 (4) 4/3

22. The resonance curve for series LCR circuit is shown for three different resistances. Then



(1) $R_1 > R_2 > R_3$ (2) $R_1 < R_2 < R_3$

(3) $R_1 = R_2 = R_3$ (4) None of these

23. An ideal transformer has a primary power input of 10 kW. The secondary current when the transformer is on load is 25 A. If the primary secondary turns ratio is 8 : 1, then the potential difference applied in the primary coil is

(1) 1600 V (2) 3200 V

(3) 800 V (4) 16 V

24. **Assertion** :In YDSE, the fringewidth increases when a glass slab is placed in front of one of the slits .

Reason : The glass slab introduces additional optical path in the ray passing through it.

(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

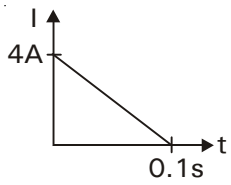
(4) Assertion is false

25. If a plano convex lens (f = 20 cm) is silvered at plane surface, then focal length will become

(1) 20 cm (2) 40 cm

(3) 30 cm (4) 10 cm

26. In a coil of resistance $10\,\Omega$, the induced current developed as a function of time is shown in figure. The magnitude of change in flux through the coil is



(1) 8 Wb (2) 2 Wb

(3) 6 Wb (4) 4 Wb

27. The dispersive powers of glasses of lenses used in a convergent achromatic pair are in the ratio 5 : 3. If the focal length of the concave lens is 15 cm, then the nature and focal length of the other lens would be

(1) convex, 9 cm (2) concave, 9 cm

(3) convex, 25 cm (4) concave, 25 cm

28. n coherent waves of intensity I_0 each superimpose constructively at a point. Intensity of the point is

(1) nI_0 (2) I_0/n

(3) n^2I_0 (4) none of these

29. An alternating voltage is given by

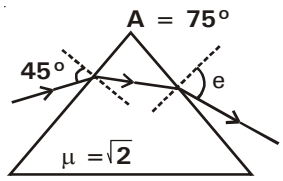
$e = e_1 \sin \omega t + e_2 \cos \omega t$

Then the root mean square value of voltage is given by

(1) $\sqrt{e_1^2 + e_2^2}$ (2) $\sqrt{e_1 e_2}$

(3) $\sqrt{\frac{e_1 e_2}{2}}$ (4) $\sqrt{\frac{e_1^2 + e_2^2}{2}}$

30. For the ray passing through the prism of refracting angle 75° shown below, the angle of emergence 'e' is



(1) 0° (2) 30°

(3) 45° (4) 90°

31. If amplitude of the unpolarised light incident on a polariser is 'a', then the amplitude of the polarised light transmitted through it is

(1) a (2) $\sqrt{2}a$

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

32. A bar magnet is placed vertically on a table. The number of neutral points on the table is/are

(1) 2 (2) 0

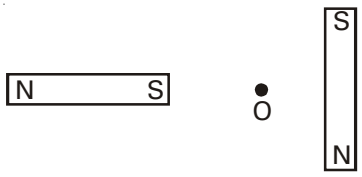
(3) 1 (4) 4

33. A compound microscope uses objective and eye lenses of focal lengths are 1 cm and 2.5 cm respectively. An object is kept 1.2 cm away from the objective lens. If the final image is formed at infinity, magnifying power of the microscope is

(1) 150 (2) 50

(3) 75 (4) 55

34.

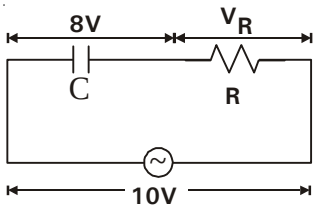


In the above arrangement of two bar magnets of nearly same moment, the direction of resultant magnetic field at point O is

(1)  (2) 

(3)  (4) 

35.



In a series CR circuit shown in figure, the applied voltage is 10 V and the voltage across capacitor is found to be 8V. Then the voltage across R is

(1) 6 V (2) 2 V

(3) 18 V (4) zero

PHYSICS : SECTION-B

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

36. In a Fraunhofer diffraction at a single slit of width 'd' with incident light of wavelength 5500A°, the first minimum is observed at angle of 30°, The first secondary maximum is observed at an angle

(1) $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$ (2) $\sin^{-1}\left(\frac{1}{4}\right)$

(3) $\sin^{-1}\left(\frac{3}{4}\right)$ (4) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$

37. The angle of incidence at which reflected right is totally polarised for reflection from air to glass (refractive index n), is

(1) $\sin^{-1}(n)$ (2) $\sin^{-1}\left(\frac{1}{n}\right)$

(3) $\tan^{-1}\left(\frac{1}{n}\right)$ (4) $\tan^{-1}(n)$

38. In sum and difference method in vibration magnetometer, the time period is more if
(1) similar poles of both magnets are on same sides
(2) opposite poles of both magnets are on same sides
(3) both magnets are perpendicular to each other
(4) nothing can be said

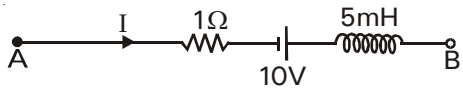
39. 

Figure shows part of a circuit. If $I = 7A$ and is decreasing at a constant rate of 500 A/s, then $V_B - V_A$ is
(1) −1.5 V (2) 2.5 V
(3) −3.5 V (4) 5.5 V

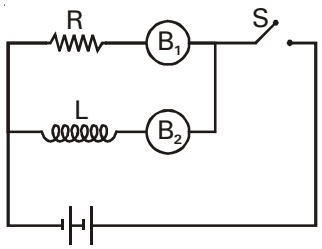
40. An object is placed at a distance 'x' from the focus of a concave mirror and the real image is formed at a distance 'y' from the focus. The focal length of the mirror is

(1) xy (2) $\sqrt{xy}$

(3) $\frac{x+y}{2}$ (4) $\sqrt{\frac{x}{y}}$

41. A circuit consisting of a capacitor and a resistor having resistance $220\,\Omega$ is connected with A.C supply of 220V. The peak current is observed to be 1A. The phase difference between the current and the voltage is
(1) 30° (2) 45°
(3) 60° (4) 90°

42. The following figure shows two bulbs B_1 and B_2 resistor R and an inductor L. When the switch S is turned off



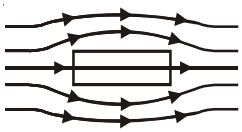
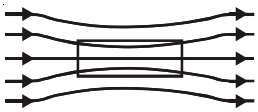
(1) Both B_1 and B_2 die out promptly
(2) Both B_1 and B_2 die out with some delay
(3) B_1 dies out promptly but B_2 with some delay
(4) B_2 dies out promptly but B_1 with some delay

43. The refractive index of water is 4/3 and that of glass is 5/3. What will be the critical angle for the ray of light entering water from the glass

(1) $\sin^{-1}\frac{4}{5}$ (2) $\sin^{-1}\frac{5}{4}$

(3) $\sin^{-1}\frac{1}{2}$ (4) $\sin^{-1}\frac{2}{1}$

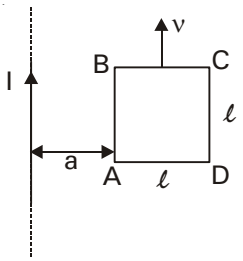
44. Match diagrams in column-I entries in column-II

Column I		**Column II**
a.		p. paramagnetic
b.		q. diamagnetic
c.		r. ferromagnetic

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

45. A simple telescope, consisting of an objective of focal length 60 cm and a single eye lens of focal length 5 cm is focussed on a distant object is such a way that parallel rays comes out from the eye lens. If the object subtends an angle 2^o at the objective, the angular width of the image
(1) 10^o (2) 24^o
(3) 50^o (4) $1/6^o$

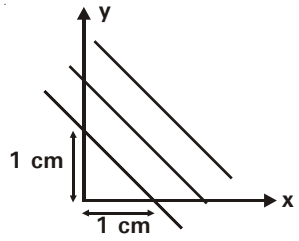
46. A squre loop ABCD of side'ℓ' is moving with constant velocity ABCD parallel to an infinite current carrying wire. Emf induced in the loop is



(1) zero (2) clockwise
(3) anticlockwise (4) variable

47. An a.c. source of frequency 50 Hz is connected to an inductor of 2H and negligible resistance. A current of r.m.s. value I_0 flows in the coil. When the frequency of the voltage is changed to 400 Hz keeping the magnitude of voltage same, the current is now
(1) $8I_0$ (2) $4I_0$
(3) $I_0/4$ (4) $I_0/8$

48. Which of the following is False?
(1) To an observer on the earth the stars appear to twinkle because of the refractive index fluctuations in the earth's atmosphere.
(2) If a plane glass slab is kept over various coloured letters, the red letter appears least raised.
(3) A diminished virtual image of a real object can be formed in concave mirror.
(4) The phenomenon utilised in an optical fibre, an endoscope and in explaining shining of air bubble in water is total internal reflection.

49. 

Wavefronts are represented by the planes shown. The propagation of wave can take place at
(1) 45^o with the +ve x-direction
(2) 135^o with the +ve x-direction
(3) 60^o with the +ve x-direction
(4) not sufficient data

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

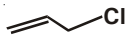
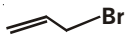
(1) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\tan\delta'\right)$ (2) $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

(3) 90° (4) 45°

CHEMISTRY : SECTION-A

All questions are compulsory in section A

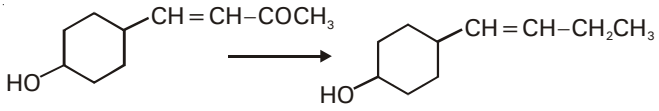
51. Ethanal can be converted into but-2-enal by
(1) Wurtz reaction
(2) Etard reaction
(3) Aldol condensation
(4) Rosenmund reduction

52. The most reactive towards Williamson's synthesis is
(1)  (2) 
(3)  (4) 

53. The IUPAC name of Malonic acid is
(1) Butane dioic acid (2) Pentane dioic acid
(3) Propane dioic acid (4) But-2-ene dioic acid

54. The polymer obtained when acetone is saturated with hydrogen chloride gas is
(1) Mesitylene (2) Mesityloxide
(3) Phorone (4) Diacetone alcohol

55. The most suitable reagent for the following conversion is



(1) Zn-Hg|HCl (2) Na in liq. NH_3
(3) $NaBH_4$ (4) NH_2–NH_2, $-OH^-$

56. The catalyst used in oppenauer oxidation is
(1) $Al(OEt)_3$ (2) $[(CH_3)_3CO]_3Al$
(3) $AlH(i\text{-}bu)_2$ (4) $LiAlH(O\text{-}t\text{-}bu)_3$

57. Which of the following is the strongest acid?
(1) HCOOH (2) C_6H_5COOH
(3) CH_3COOH (4) CH_3CH_2COOH

58. The process & alkyl halide used for the preparation of cyclohexyl methanol by SN mechanism is
(1) reduction of cyclohexyl bromide
(2) hydrolysis of cyclohexyl bromide
(3) hydrolysis of cyclohexyl methylbromide by aq. NaOH
(4) hydrolysis of cyclohexylbromide by concentrated NaOH

59. $RCN + SnCl_2 + HCl \rightarrow RCH=NH \xrightarrow{H_3\overset{+}{O}} RCHO$
The above reaction is
(1) Rosenmund reduction
(2) Etard reaction
(3) Stephen reaction
(4) Gattermann Koch reaction

60. Match the reagents with the transformations

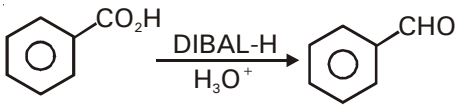
	Transformations		**Reagent**
a.	Hexanol → Hexanal	i.	DIBAL—H
b.	Ethanenitrile → Ethanal	ii.	O_3/H_2O-Zn dust
c.	But-2-ene → ethanal	iii.	PCC
d.	p-Flourotoluene → p-flourobenzaldehyde	iv.	CrO_2Cl_2 & H_2O

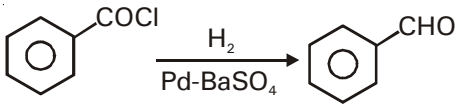
(1) a-i, b-iii, c-ii, d-iv (2) a-iii, b-i, c-ii, d-iv
(3) a-iv, b-ii, c-i, d-iii (4) a-iv, b-ii, c-iii, d-i

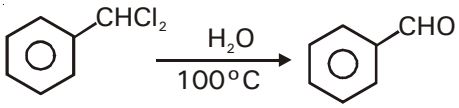
61. Which of the following reactions of glucose can be explained only by its cyclic structure?
(1) Glucose forms pentaacetate.
(2) Glucose reacts with hydroxylamine to form an oxime.
(3) Pentaacetate of glucose does not react with hydroxylamine.
(4) Glucose is oxidised by nitric acid to gluconic acid.

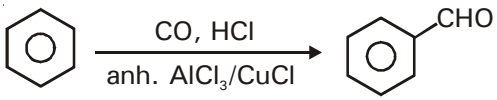
62. Which amines are engaged in intermolecular association due to hydrogen bonding?
(1) only 1° amines
(2) only 2° amines
(3) only 3° amines
(4) both 1° and 2° amines

63. The Gattermann Koch aldehyde synthesis is represented by

(1) 

(2) 

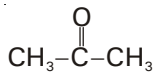
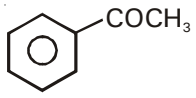
(3) 

(4) 

64. Bisulphites are formed by
(1) CH_3COCH_3 (2) $CH_3COC_6H_5$
(3) $C_6H_5COC_6H_5$ (4) All of these

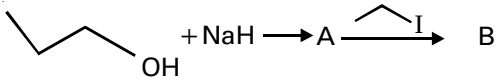
65. Which of the following statements is incorrect?
(1) intermolecular forces of attraction are weakest in elastomers.
(2) Thermosetting polymers are highly cross-linked polymers
(3) Fibres possess high tensile strength and high modulus
(4) Thermoplastic polymers have greater intermolecular forces of attraction than fibres

66. Which of the following reactions will not result in formation of C–C bonds?
(1) Reimer Tiemann
(2) Wurtz reaction
(3) Cannizaro reaction
(4) Friedel craft acylation

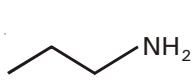
67. For the addition reactions with HCN and $NaHCO_3$; CH_3CHO is less reactive than
(1) HCHO
(2) 
(3) 

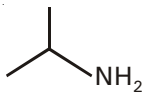
(4) $C_2H_5COC_2H_5$

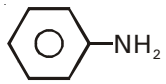
68. The reaction
$Ar\overset{+}{N}_2\,Cl^- \xrightarrow{Cu/HCl} ArCl + N_2 + CuCl$ is named as
(1) Sandmeyer reaction
(2) Gatterman reaction
(3) Claisen reaction
(4) Carbylamine reaction

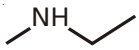
69. 

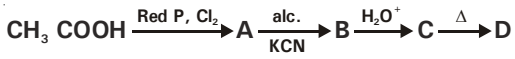
The final product 'B' is
(1) ethyl propyl ether
(2) methyl propyl ether
(3) dimethyl ether
(4) all of these

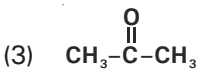
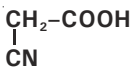
70. Which of the following amines cannot be prepared by Hofmann Bromamide degradation?
(1) 

(2) 

(3) 

(4) 

71. 

In the above reaction, the final product D is
(1) CH_3COOH (2) CH_3CH_2COOH
(3)  (4) 

72. The product of the following reaction is

n-propylbenzene $\xrightarrow[(ii)\ H_3O^+]{(i)\ KMnO_4,\ OH^-,\Delta}$

(1) 1-phenylpropanoic acid
(2) benzoic acid
(3) 1-phenyl acetic acid
(4) acetic acid

73. Which one of the following can be called as carbinol?
(1) grain alcohol (2) rubbing alcohol
(3) wood spirit (4) rectified spirit

74. Phenol can not be distinguished from ethanol by which reagents
(1) $NaOH/I_2$ (2) neutral $FeCl_3$
(3) Br_2/H_2O (4) Sodium metal

75. Which of the following is a biodegradable polymer and is a polyester ?
(1) Nylon 2-nylon 6 (2) PHBV
(3) dextron (4) both (2) and (3)

76. A carbonyl compound reacts with HCN to form cyanohydrin which on hydrolysis forms a racemic mixture of α -hydroxy acid. the carbonyl compound is
(1) Formaldehyde (2) Acetaldehyde
(3) Acetone (4) Diethyl ketone

77. The compound which does not react with acidic $K_2Cr_2O_7$ (at 298 K) is
(1) Ethyl alcohol (2) Acetaldehyde
(3) Iso-propyl alcohol (4) Propanone

78. Identify the mismatch
(1) Cannizaro reaction ; $\bar{N}u = OH^-$
(2) Aldol condensation ; $\bar{N}u$ = carbanion
(3) Claisen schmidt ; $\bar{N}u = EtO^-$
(4) Acetal formation, $\bar{N}u$ = ROH

79. **Statement-I** : Nowadays, p-tolyl sulphonyl chloride is used in distinction of amines.
Statement-II : All types of amines (1°, 2°, 3°) react with the above reagent.
(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

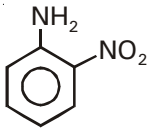
80. The pair of compounds that can not be differentiated by Tollen's reagent is
(1) Benzaldehyde and benzyl alcohol
(2) Pentanal and diethyl ether
(3) 2-pentanol and 2-pentanone
(4) Pentanal and 2-pentanone

81. When alkyl halide is heated with dry Ag_2O, it produces
(1) Ester (2) Ether
(3) Ketone (4) Alcohol

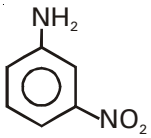
82. Correct order of K_b among the following in aqueous medium is
(i) NH_3 (ii) $EtNH_2$
(iii) $(Et)_2NH$ (iv) Et_3N
(1) i < ii < iii < iv (2) iv > iii > ii > i
(3) ii > iv > i > iii (4) iii > iv > ii > i

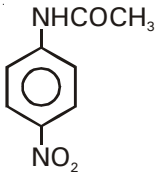
83. **Assertion** : In natural rubber repeating unit is isoprene.
Reason : Natural rubber has trans configuration at every double bond.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

84. Aniline is acetylated, then nitrated and finally hydrolysed to give X as major product. The correct structure of X is

(1) 

(2) 

(3) 

(4) 

85. Which of the following functional groups of glucose interact to form cyclic hemiacetal leading to pyranose structure?
(1) Aldehyde group and hydroxy group at C-5
(2) Aldehyde group and hydroxy group at C-4
(3) Aldehyde group and hydroxy group at C-6
(4) Aldehyde group and hydroxy group at C-3

CHEMISTRY : SECTION-B

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

86. Reaction of acetyl chloride with primary amine is an example of
(1) nucleophillic addition
(2) electrophillic addition
(3) free radical substitution
(4) nucleophillic acyl substitution

87. $[(CH_3)_3N^+(C_2H_5)]\ OH^- \xrightarrow{Heat} Y$
In the above reaction, Y comprises of
(1) Alkene, water and tertiary amine
(2) Alkene only
(3) Tertiary amine only
(4) Tertiary amine and an alcohol.

88. Which of the following is correct?
(1) Iodoform can't be obtained on warming NaOH and iodine with ethanamide
(2) On reduction of with any aldehyde, secondary alcohol is formed
(3) In alcohols, the boiling point increases with increase in branching of carbon chain of isomers
(4) The solubility of alcohols in water increases with increase in size of alkyl chain

89. Which of the following compounds polymerises to form PAN?
(1) $CH_2=CHCOOCH_3$
(2) $CH_2=CH-CN$
(3) $CH_2=CHOCOCH_3$
(4) $CH_2=CH-Cl$

90. The least volatile among the following is
(1) Dimethyl ether
(2) Ethanol
(3) Methanol
(4) Diethyl ether

91. **Assertion** : Benzaldehyde is enolisable and so can show cannizaro reaction.
Reason : Benzaldehyde is more reactive than formaldehyde towards oxidation.
(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

92. Which one of the following is most suitable halogen acid for cleaving ethers, like ROR ?
(1) Conc.HI (2) Conc.HCl
(3) Conc. HF (4) Conc. HNO_3

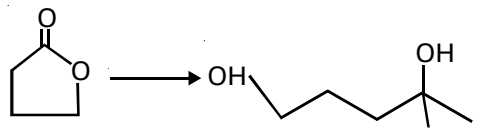
93. An ester A with molecular formula $C_9H_{10}O_2$. was treated with excess of CH_3MgBr and the complex formed was treated with H_2SO_4 to give olefin B. Ozonolysis of B gave a ketone with molecular formula C_8H_8O which shows +ve iodoform test. The structure of A is
(1) $C_6H_5COOC_2H_5$
(2) $C_2H_5COOC_6H_5$
(3) $H_3COCH_2COC_6H_5$
(4) $p-H_3COC_6H_5COCH_3$

94. Match the following enzyms given in Column I with the reactions they catalyse given in Column II.

Column I		Column II	
i.	Invertase	a.	Decomposition of urea into NH_3 and CO_2
ii.	Maltase	b.	Conversion of glucose into ethyl alcohol
iii.	Pepsin	c.	Hydrolysis of maltose into glucose
iv.	Urease	d.	Hydrolysis of cane sugar
v.	Zymase	e.	Hydrolysis of proteins into peptides

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

95. The following conversion



requires 'Y' equivalents of Grignards reagent
The value of 'Y' is
(1) 2 (2) 3
(3) 1 (4) 4

96. The best reagent to convert allyl alcohol into acrolein is
(1) $KMnO_4/H^+$
(2) CrO_3, glacial CH_3COOH
(3) $KMnO_4/OH^-$
(4) LAH

97. **Statement-I** : (+) Lactose is a reducing sugar and does not exhibit mutarotation.
Statement-II : All reducing sugar shows mutarotation.
(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

98. Acetamide on treating with _____ gives methylamine
(1) PCl_5 (2) $NaOH + Br_2$
(3) sodalime (4) hot conc. H_2SO_4

99. **Assertion** : Like bromination of benzene, bromination of phenol is also carried out in presence of Lewis acid.
Reason : Lewis acid polarises bromine molecule.
(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

100. Which of the following has highest K_a?
(1) $p-NO_2-C_6H_4COOH$
(2) $C_6H_5CH_2COOH$
(3) $CH_3C_6H_4COOH$
(4) $p-CH_3O-C_6H_4-COOH$

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Among the following edible fishes, which one is marine fish having rich source of omega-3-fatty acids.
(1) Mackerel (2) Mystus
(3) Magur (4) Mrigala

102. The practice of mating of animals within the same breed but having no common ancestors on either side of their pedigree up to 4–6 generation is known as
(1) cross breeding
(2) out crossing
(3) in breeding
(4) interspecific hybridisation

103. Which of the following drugs are not obtained from the same source?
(1) Caffeine, cocaine (2) morphine, Opium
(3) Codeine, morphine (4) Ganja, Charas

104. Hypersensitivity to substances like pollen & dust can be treated through use of
(1) Steroids (2) Antihistamine
(3) Adrenaline (4) All of these

105. Which is the basic principle of vaccination?
(1) Antibody formation
(2) Antigen introduction
(3) Memory
(4) Stimulation of T-lymphocytes

106. **Assertion** : Organ transplantation patients are given immunosuppressive drugs.
Reason : Transplanted tissue has antigens which stimulate the specific immune response of the recipient.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

107. Which of the following is incorrect for bee keeping?
(1) Knowledge of nature and habit of bees
(2) Catching and hiving of swarms
(3) Beekeeping is labour-intensive
(4) Management of bee hives during different seasons

108. Which of the following disease is correctly matched with its symptoms?

	Disease	**Symptom**
(1)	typhoid	intestinal perforations
(2)	amoebiasis	difficulty in breathing
(3)	pneumonia	pain in stomach
(4)	ringworm	muscular cramps

109. Choose the pair of helminthal diseases
(1) Filariasis and Malaria
(2) Dengue and Hepatitis
(3) Ascariasis and Taeniasis
(4) Dysentry and Cholera

110. Packs of a cigarette carry a statutory warning "cigarette smoking is injurious to health" Why?
(1) The major stimulatory component, nicotine in tobacco in cigarettes is highly poisonous and habit forming
(2) Nicotine lowers blood pressure and increases heart rate
(3) Cigarette smoke releases nicotine in the atmosphere
(4) both 1 & 2

111. Which among the following interferes with transport of neurotransmitter dopamine?
(1) Morphine (2) Hashish
(3) Cocaine (4) barbiturates

112. Match the following

	Column-I		**Column-II**
a.	Trichomoniasis	i.	Fungi
b.	Syphillis	ii.	Bacteria
c.	Ringworm	iii.	Protozoa
d.	Elephantiasis	iv.	Virus
e.	Genital warts	v.	Helminth

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

113. Bacterial disease that affects lungs & is common in immunocompromised people is
(1) Pneumonia (2) Common cold
(3) Typhoid (4) Chicken pox

114. Which of the following disorder does not differentiate between self and non-self cells?
(1) SCID (2) AIDS
(3) Rheumatoid arthritis (4) All of these

115. **Statement- I** : Inbreeding helps to obtain pure lines in animals.
Statement- II : Crossbreeding is carried out to overcome inbreeding depression
(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

116. Which of the following technique is usually used for detection of breast cancer?
(1) CT-scan (2) Sonography
(3) MRI (4) Mammography

117. In an antibody monomer, disulphide bonds can be seen in
a. between two light chains
b. between two heavy chains
c. between heavy and light chains
d. within light chains
(1) b, c & d (2) a, b & d
(3) a, c & d (4) a & d

118. HIV decreases natural immunity of the body by
(1) destroying B-cells
(2) attacking killer T cells
(3) attacking suppressor T cells
(4) attacking helper T cells

119. What is common between Hisardale & Mule?
(1) Both are products of out breeding
(2) They are prepared by crossing superior animals of same breed
(3) They are products of breeding between closely related animals of same breed
(4) All of these

120. If you suspect major deficiency of antibodies in a person to which of the following would you look for confirmatory evidence ?
(1) serum globulins (2) fibrinogen in plasma
(3) haemocytes (4) serum albumins

121. Match the following structures with the function each performs
a. A foreign macromolecule that may endanger the body
b. Long-lived cells that help the body respond quickly to previously encountered antigens
c. Macromolecules that agglutinate foreign molecules in the blood stream
i. lymph node ii. B-lymphocyte
iii. thymus gland iv. antibody
v. antigen vi. memory cells
Which of the following set is correct?
(1) a–v, b–vi, c–iv (2) a–iv, b–i, c–ii
(3) a–iii, b–v, c–ii (4) a–v, b–iv, c–vi

122. Identify the group of sexually transmitted diseases which are not completely curable
(1) HIV, Genital warts, Wyphilis
(2) HIV, Genital herpes, Gonorrhoea
(3) Genital herpes, Hepatitis B, HIV
(4) Trichomoniasis HIV, Chlamydiasis

123. Choose the correct option

	Barrier type	Examples	Exception
(1)	Physiological barriers	Saliva, tears, HCl in stomach	Tears
(2)	Cellular barriers	Neutrophils monocytes, NK cells	NK cells
(3)	Physical barriers	Skin,mucous coating in GIT, interferons	Interferons
(4)	Cytokine barriers	Interferons, complement system, antibodies	Interferons

124. *Entamoeba histolytica* is a protozoan parasite living in
(1) stomach (2) small intestine
(3) large intestine (4) oesophagus

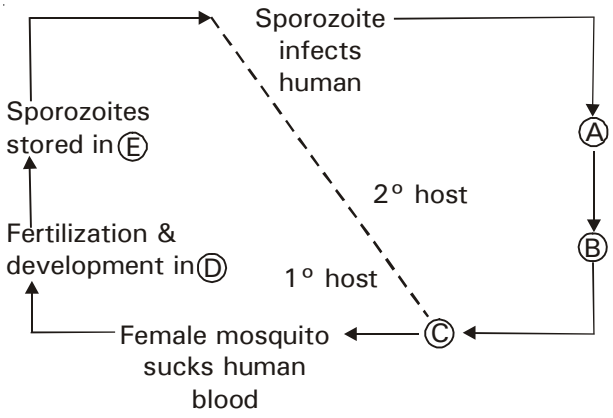
125. Which of the following would be important while selecting an animal for breeding in dairy farming?
(1) High yield and long lactation period
(2) Tolerance to local climatic conditions
(3) Resistance to diseases
(4) All of these

126. Which of the following would not be an effective treatment for AIDS?
(1) Immunosuppressive therapy
(2) Anti-viral therapy
(3) Immunopotentiation
(4) None of these

127. Which of the following groups include edible marine fishes only?
(1) Mrigal, Catla (2) Rohu, Pomfret
(3) Mrigal, Common carp
(4) Pomfret, Hilsa

128. Malaria caused by which of the following is the most serious and fatal?
(1) *P. vivax* (2) *P. malariae*
(3) *P. falciparum* (4) *P. ovale*

129. Identify A to E w.r.t. malarial parasite



(1) Human liver, human RBCs, asexual gametocytes, mosquito gut, mosquito salivary glands.
(2) Mosquito salivary glands, mosquito gut, gametocytes, human RBCs, human liver.
(3) Mosquito gut, mosquito salivary glands, gametocytes, human liver, human RBCs
(4) Human liver, human RBCs, sexual stages, mosquito gut, mosquito salivary glands

130. Incorrect statement is
(1) Cellular oncogenes are found in normal cells
(2) Oncogenic transformation is due to activation of proto oncogenes
(3) Identification of genes in individuals with inherited susceptibility of cancer is not possible
(4) Carcinogens are cancer causing substances

131. Which of the following are the symptoms of typhoid?

a. sustained high fever

b. weakness

c. stomach pain

d. constipation & intestinal perforation

e. headache, anorexia

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

132. Which of the following affects of anabolic steroids are useful to enhance performance in sports?

a. Promote protein synthesis

b. Increase aggression
c. Cause mood swings
d. Increase muscle mass and strength

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

(3) b and d only (4) a and c only

133. Which of the following helps in prevention of acquiring fungal diseases?

(1) Warm and humid conditions

(2) Use of anti fungal drugs

(3) Avoid sharing of contaminated articles like towel, comb

(4) All of these

134. Introduction of which of the following in the body is known to provide immediate but temporary immunity

(1) Live attenuated microbes

(2) Heat killed microbes

(3) Chemical antigens

(4) Immunoglobulins

135. An effective sedative & painkiller in patients who have undergone surgery is

(1) amphetamine (2) barbiturates
(3) benzodiazepine (4) morphine

ZOOLOGY : SECTION-B

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

136. What is incorrect w.r.t poliomyelitis?

(1) Viral disease

(2) Pathogen enters body via contaminated food and water

(3) Damage to dorsal horn of spinal cord

(4) Paralysis

137. Which of the following statements are False regarding AIDS?

a. Transmission of HIV-infection can also occur from mother to her child through placenta.

b. The time lag between infection and appearance of AIDS symptoms may vary from few days to some weeks

c. HIV is an enveloped virus enclosing DNA genome

d. ELISA is widely used diagnostic test for AIDS

e. Due to HIV infection, the person starts suffering from infection which may be those of bacteria especially *Mycobacterium,* viruses, fungi & parasites like *Toxoplasma*.

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

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

138. A farmer is maintaining 'X' breed of cattle on his farm in an isolated area. He finds the yield & fertility decreases after 6-7 generations. He can overcome this and yet maintain purity of 'X' breed by crossing

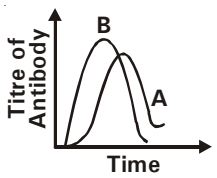
(1) 6th generation animals with the 1st generation

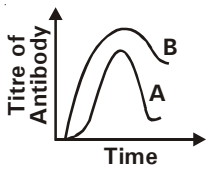
(2) 'X' breed animals on his farm with 'Y' breed of cattle on his farm

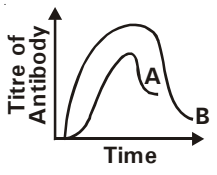
(3) 'X' breed animals on his farm with 'X' breed being maintained on a different farm

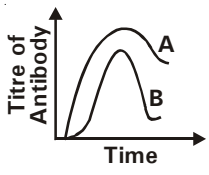
(4) indigeneous 'X' breed with the exotic 'Z' breed

139. Study the graph given below and identify the correct set which represents primary (A) and anamnestic (B) response respectively

(1) 

(2) 

(3) 

(4) 

140. The_____ fertilised eggs are recovered _____ and transferred to surrogate mothers in MOET.

(1) 8–32 celled, nonsurgically

(2) 16–32 celled, nonsurgically

(3) 8–32 celled, surgically

(4) none of these

141. **Statement- I** : Lymphocytes undergo division in both primary & secondary lymphoid organs

Statement- II : Maturation of lymphocytes into antigen specific cells occurs in bone marrow & thymus

(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

142. The products obtained from the following plant are known as narcotics and has receptors on

(1) CNS & liver
(2) CNS & GIT
(3) Brain & respiratory centres
(4) Liver & Kidneys

143. Which of the following is incorrect regarding malignant tumours?

(1) Grow very rapidly

(2) Invade and damage surrounding tissues

(3) Starve normal cells

(4) Do not show metastasis

144. The active form of Entamoeba histolytica feeds upon

(1) food in intestine

(2) blood only

(3) erythrocytes, mucosa and submucosa of colon

(4) mucosa and submucosa of colon only

145. Which of the follwing diseases have been controlled by the use of vaccines?

(1) Polio, pneumonia and malaria

(2) Polio, pneumonia and tetanus

(3) filariasis, pneumonia and tetanus

(4) filariasis, pneumonia and malaria

146. **Assertion** : For herd improvement in animals MOET is an ideal method.

Reason : LH is used to induce multiple follicular development

(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

147. Cells into which HIV enters and replicates with the help of reverse transcriptase are

(1) Red blood cells (2) Neutrophils
(3) Platelets (4) Macrophages

148. Artificial insemination is better than natural insemination in cattle because

(1) semen of good bulls can be provided everywhere

(2) there are less chances of spread of contagious diseases

(3) it is more economical

(4) all the above

149. Match the column

i. Marine fishes	a. Wax
ii. Fresh water fishes	b. Fruit orchards
iii. Bee pastures	c. Sardine
iv. Honey bee products	d. Common carp

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

150. How many of the following protozoan diseases are vector borne?

Common cold, Dengue, Chickengunya, Hepatitis, Filariasis, Malaria, Amoebiasis

(1) One (2) Three
(3) Five (4) Six

BOTANY : SECTION-A

All questions are compulsory in section A

151. The number of phenotypes and genotypes respectively in ABO blood grouping in human is

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

152. Select the incorrect match w.r.t HGP

(1) YAC and BAC – cloning vectors
(2) Y chromosome – 2968 genes
(3) SNPs – 1.4 million location where single base DNA difference occur in human
(4) Dystrophin – largest known human gene

153. The first genetic material could be

(1) protein (2) carbohydrates

(3) DNA (4) RNA

154. Which of the following characteristics represent 'Inheritance of blood groups' in humans?

a. Dominance
b. Co-dominance
c. Multiple allele
d. Incomplete dominance
e. Polygenic inheritance

(1) a, c and e (2) b, c and e

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

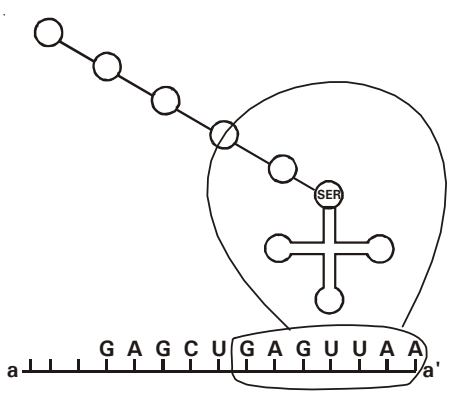
155. Which of the following statements are correct?

a. A monohybrid always produces two types of gametes in equal proportions.
b. All tall plants of F_2 generation are pure tall plants.
c. Homozygous parent produces all gametes that are similar.
d. Dominant trait may be homozygous or heterozygous but recessive trait is always heterozygous.

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

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

156.



a. Identify the polarity from a to a', in the diagram
b. Mention how many more amino acids are expected to be added to this polypeptide chain.

(1) a = 5'-3', b = 0 (2) a = 3'-5', b = 0

(3) a = 5'-3', b = 6 (4) a = 3'-5', b = 6

157. If Meselson and Stahl's experiment is continued for four generations in bacteria. The ratio $^{15}N/^{15}N$, $^{15}N/^{14}N$, $^{14}N/^{14}N$ containing DNA in the fourth generation would be

(1) 1 : 1 : 0 (2) 1 : 4 : 0

(3) 0 : 1 : 3 (4) 0 : 1 : 7

158. Which of the following statement is incorrect about translation?

(1) Order & sequence of amino acids are defined by the sequence of bases in mRNA
(2) UTR's are required for efficient translation process
(3) Amino acids are added one by one, translated into polypeptide sequence dictated by mRNA & represented by DNA
(4) For initation, there is a special t-RNA referred to as initator t-RNA

159. **Statement-I** : 3300 books would be required to store the information of DNA sequence from a single human cell, if each book contain 1000 pages and each page has 1000 letters on it.

Statement-II : Total estimated cost of HGP was 9 billion US dollar if cost of sequencing is US $ 3 per base pair

(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

160. Broad fore head, stubby fingers, open mouth are the symptoms of syndrome named

(1) Down's (2) Turner's

(3) Klinefelter's (4) Edward's

161. The semi-conservative DNA replication in chromosomes was experimentally proved in eukaryotes (*Vicia faba*) by

(1) Taylor using ^{15}N
(2) Meselson using ^{3}H uridine
(3) Stahl using ^{32}P
(4) Taylor using ^{3}H thymidine

162. The test cross ratio demonstrated by the genotype AABBCCDdEE will be

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

163. How many of the following statements is/are correct w.r.t. sickle cell anaemia disease?

a. Homozygous individuals for Hb^S (Hb^SHb^S) show the diseased phenotype
b. Heterozygous (Hb^AHb^S) individuals appear apparently unaffected
c. Heterozygous individuals are carriers of the disease as there is 100 percent probability of transmission of mutant gene in the progeny
d. Mutant haemoglobin molecule undergoes polymerisation under low oxygen tension causing the change in the shape of the RBC

(1) One (2) Two

(3) Three (4) Four

164. During DNA replication, opening of the DNA helix is facilitated by

(1) helicases (2) *rho* factor
(3) RNA polymerase (4) *sigma* factor

165. According to chromosomal theory of inheritance two alleles for one character are located on

(1) homologous sites on non–homologous chromosomes
(2) different loci on homologous chromososomes
(3) Homologous sites on homologous chromosomes
(4) different loci on non–homologous chromosomes

166. Which of the following statement is correct?

(1) In honey bee, worker bees are fertile
(2) Allosomes are found in all cells of the human
(3) In grasshopper, genetic makeup of egg determines the sex of offspring
(4) Drones are sterile male honey bees

167. Which of the following crosses and resultant phenotypic ratios are mismatched?

	Cross		**Phenotypic ratio**
(1)	Tt × Tt	—	3 : 1
(2)	tt × Tt	—	2 : 1
(3)	TtYy × ttyy	—	1 : 1: 1: 1
(4)	TtYy × TtYy	—	9 : 3 : 3 : 1

168. In DNA sequencing the deoxynucleotides are joined together by phosphodiester bond between

(1) 3′ hydroxyl of deoxyribose sugar of a nucleotide and a free 5′ phosphate group on sugar residue of other nucleotide
(2) 5′ hydroxyl of sugar of a nucleotide and a free 3′ phosphate group on sugar residue of other nucleotide
(3) both 1 and 2
(4) none of these

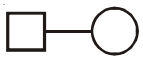
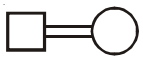
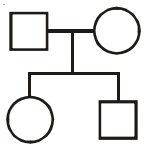
169. A polysome is

(1) a group of several chromosomes
(2) a group of ribosomes attached to m-RNA
(3) The structure responsible for organisation of spindle pole
(4) an organism in which the cells have more than the diploid level of DNA.

170. Sex of chick and human is respectively determined by genetic makeup of

(1) sperm and egg (2) egg and sperm
(3) egg and egg (4) sperm and sperm

171. Match description in column I with the symbols used in human pedigree analysis in column II.

Column I		**Column II**
a.		p. consanguineous mating
b.		q. mating
c.		r. parents above and children below
d.		s. sex unspecified

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

172. Select the incorrect statement

(1) UAA is an initiator codon
(2) UGA is a stop codon
(3) UGG codes for tryptophan
(4) AUG codes for methionine

173. **Assertion** : Gametes are always pure for a trait.
Reason : Gametes receive only one allele or one factor for a character after meiosis.

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

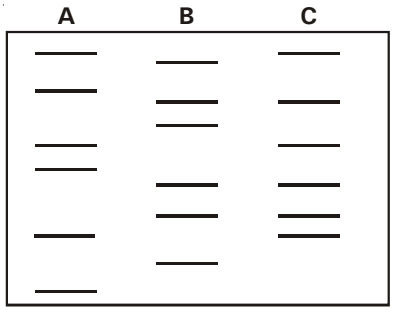
174. What would be the length of DNA containing 20000 base pairs?

(1) 68000 A (2) 34000 A
(3) 10000 A (4) 1 m

175. Which is the inducer of lac operon?

(1) Maltose (2) Galactose
(3) Lactose (4) Glucose

176. Below is the diagram of gel electrophoresis showing 3 rows of band. Out of 3 rows A, B, C; one row is of child and other two rows of parents. Which row is of child?



(1) A (2) B
(3) C (4) data insufficeint

177. Which of the following statement is incorrect w.r.t. lac operon?
(1) Lac operon is switched on in the presence of lactose in the medium
(2) The kind of regulation of lac operon can also be viewed as regulation of enzyme synthesis by its substrate
(3) β -galactosidase pumps lactose into the cell
(4) The lac regulator gene, i gene, codes for a repressor that switches off the operon

178. The term "Linkage" was coined by
(1) W. Sutton (2) T.H. Morgan
(3) T. Boveri (4) G. Mendel

179. Which was the first human chromosome to be completely sequenced?
(1) Chromosome 22 (2) Chromosome 1
(3) Chromosome 21 (4) Chromosome X

180. Linkage is
(1) stronger between genes located far away from each other upon the chromosome
(2) stronger between genes located close together upon the chromosome
(3) not dependent upon the distance between the genes
(4) depends upon the nature of the concerned genes

181. Select the correct option

	Direction of RNA synthesis	Direction of reading of the template DNA strand
(1)	5' – 3'	3' – 5'
(2)	3' – 5'	5' – 3'
(3)	5' – 3'	5' – 3'
(4)	3' – 5'	3' – 5'

182. **Statement-I** : Human blood group is an example of quantitative inheritance .
Statement-II : In polygenic trait, higher number of genes are involved in determining a phenotype, greater variety would be expected in F_2 generation.
(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

183. Which set of viruses given below are RNA viruses i.e. have RNA as genetic material?
(1) TMV & λ phage (2) QB & TMV
(3) λ phage & T_2 (4) λ phage & QB virus

184. In sea urchin DNA, which is double stranded, 17 % of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are:
(1) G - 17 %, A - 33 %, T - 33 %
(2) G - 8.5 %, A - 50 %, T - 24.5 %
(3) G - 34 %, A - 24.5 %, T - 24.5 %
(4) G - 17 %, A - 16.5 %, T - 32.5 %

185. If recombination frequency between AB = 13% BC = 20% AD = 5% DB = 8%. Find the distance between CD
(1) 15 units (2) 12 units
(3) 8 units (4) 13 units

BOTANY : SECTION-B

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

186. Which of the following statement is correct ?
(1) Three types of RNA polymerase are present in bacteria
(2) rRNA act as template for protein synthesis
(3) In tailing, adenylate residue are added at 3'–end in a template dependent manner
(4) RNA polymerase uses nucleoside triphosphates as substrate

187. Which of the following statement is correct?
(1) Cistron is that segment of DNA coding for a polypeptide
(2) Structural genes in a transcription unit are monocistronic in prokaryotes
(3) Introns are said to be those sequences that appear in mature or processed RNA
(4) Classical example of point mutation is Down syndrome

188. Three babies a, b and c with blood groups B, O and AB respectively were mixed up in a hospital. After consideration of the data below, which of the following represents the correct baby and parent combinations?

Couple	Blood group
(I)	A and A
(II)	A and B
(III)	B and O

(1) I–c, II–b, III–a (2) I–b, II–a, III–c
(3) I–b, II–c, III–a (4) I–a, II–b, III–c

189. The process of splicing represents
(1) dominance of DNA world
(2) the dominance of RNA world
(3) ancient feature of genome
(4) reminiscent of antiquity

190. **Assertion** : Termination of translation requires ATP and *rho* factor.
Reason : When release factor binds to the stop codon, it terminates translation and releases the polypeptide from ribosome .
(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

191. Which of the following statements are incorrect?
(1) A very low level of expression of *lac* operon has to be present in bacterial cell all the time
(2) *Lac* operon shows negative regulation
(3) The development & differentiation of embryo into adult organism are a result of coordinated regulation & expression of very few gene
(4) sRNA was known before the genetic code was postulated

192. Which is incorrect statement w.r.t. Haemophilia?
a. Heterozygous male carrier may transmit the disease to sons
b. The possibility of a male being a haemophilic is extremely rare
c. Queen Victoria was a carrier of the disease
d. Heterozygous female carriers do not transmit the disease to sons
(1) both b & c (2) both a & d
(3) a, b & d (4) a, b, c & d

193. Hershey and Chase by conducting experiments on bacteriophages proved that DNA is genetic material because they found that
(1) bacteria were radioactive, when they were infected by viruses with radioactive protein
(2) bacteria were radioactive, when they were infected by viruses with radioactive DNA
(3) bacteria were radioactive in both the cases
(4) bacteria lacked radioactivity

194. **Statement-I** : A true breeding line is one that shows stability in the inheritance of the trait for several generations.
Statement-II : Mendel selected 14 true breeding pea plant varieties.
(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

195. When Mendel self hybridized the F_1 plants (RrYy), he found that dominant and recessive traits of a single character are segregated in a
(1) 9 : 1 ratio (2) 3 : 3 ratio
(3) 3 : 1 ratio (4) 10 : 6 ratio

196. During DNA replication, the term leading strand is applied to the one which replicates in
(1) 5′ → 3′ direction continuously
(2) 3′ → 5′ direction continuously
(3) 5′ → 3′ direction discontinuously
(4) 3′ → 5′ direction discontinuously

197. Reasons for non-recognition of Mendel's work are
(1) lack of proper communication system in those days.
(2) his work was acceptable to the biologists of that time
(3) Mendel explained continuous variations observed in nature acceptable to the biologists of that time
(4) Mendel gave the physical proof for the existence of factors

198. Following is not a step of DNA finger printing
(1) Hybridization using probe
(2) Southern blotting
(3) Gel electrophoresis
(4) Digestion of DNA by exonucleases

199. A woman with normal vision, but whose father was colour blind, marries a colourblind man. Suppose that the fourth child of this couple was a boy. This boy
(1) must have normal colour vision
(2) will be partially colour blind since he is heterozygous for the colour blind mutant allele
(3) must be colour blind
(4) may be colour blind or may be of normal vision

200. Which genetic basic of proof about codons was proved by frame shift mutation?
(1) Codons are triplet and read in a contiguous manner
(2) Codons are universal
(3) Degeneracy of codons
(4) Unambiguous nature of codons