Dated : 22-04-2023

M.L. Syal's Helix Institute

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

Test Series HMC-8 [Option -2]

Test - 07

MM : 720 Time : 3 hrs. 20 min.

Physics	:	Magnetism, EMI, AC, Ray Optics, Wave Optics
Chemistry	:	Alchohol, Phenols & ethers, Aldehydes, Ketones & Carboxylic Acids, Amines, Biomolecules, Polymers
Zoology	:	Human health & disease, Immune system, Strategies of enhancement in food production
Botany	:	Reproduction in Flowering Plants, Reproduction in Organism, Morphology of Flowering Plants

PHYSICS : SECTION-A

All questions are compulsory in section A

1. 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
2. A transparent cube of 15 cm edge contains a small air bubble. Its apparent depth when viewed through one face is 6 cm and when viewed through the opposite face is 4 cm. Then the refractive index of the material of the cube is
   (1) 2.0 (2) 2.5
   (3) 1.6 (4) 1.5
3. The coil of dynamo is rotating in a magnetic field. The developed induced e.m.f. changes and the number of magnetic lines of force also changes. Which of the following condition is correct
   (1) Lines of force minimum but induced e.m.f. is zero
   (2) Lines of force maximum but induced e.m.f. is zero
   (3) Lines of force maximum but induced e.m.f. is not zero
   (4) Lines of force maximum but induced e.m.f. is also maximum
4. When the angle of incidence on a material is 60°, the reflected light is completely polarized. The velocity of the refracted ray inside the material is
   (1) $3\times10^8\ ms^{-1}$ (2) $\left(\frac{3}{\sqrt{2}}\right)\times10^8\ ms^{-1}$
   (3) $\sqrt{3}\times10^8\ ms^{-1}$ (4) $0.5\times10^8\ ms^{-1}$
5. An alternating current produces twice as much heat in a resistor as is produced by a direct current of 4 amperes. The peak value of alternating current is
   (1) 6 ampere (2) 4 ampere
   (3) 8 ampere (4) 16 ampere
6. Two plane mirrors are inclined at 80°. A ray incident on one mirror at angle θ after reflection falls on the second mirror and is reflected from there parallel to the first mirror, θ is :
   (1) 50° (2) 45°
   (3) 60° (4) 70°
7. For the same angle of incidence, the angles of refraction in three different media A, B and C are 15°, 25°, and 35°, respectively. Velocity of light will be
   (1) minimum in medium A
   (2) minimum in medium B
   (3) minimum in medium C
   (4) same in all media

8. A conducting disc of diameter 140 cm rotates about its axis at 60 rpm. There is a uniform magnetic field of 0.5 tesla along the axis of the disc. The e.m.f. induced between the centre and the rim of the disc is

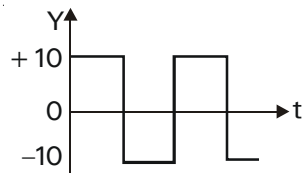
(1) 0.77 volt (2) 0.88 volt

(3) 1.1 volts (4) 0.35 volt

9. A compound microscope uses objective and eye lenses of focal lengths are 1 cm and 2 cm respectively. An object is kept 1.2 cm away from the objective lens. If the final image is formed at least distance of distinct vision, magnifying power of the microscope is

(1) 62.5 (2) 75

(3) 67.5 (4) 72.5

10. 

The r.m.s. voltage of the wave form shown is

(1) 10 V (2) 7 V

(3) 6.37 V (4) None of these

11. The resonant frequency of a series LCR circuit with $L = 2$ H, $C = 32\ \mu$F and $R = 10\ \Omega$ is

(1) 150 rad/s (2) 75 rad/s

(3) 250 rad/s (4) 125 rad/s

12. In Young's double slit experiment, the central bright fringe can be identified

(1) by using white light

(2) as it is narrower than other bright fringes

(3) as it is wider than other bright fringes

(4) as it has a greater intensity than the other bright fringes

13. Points A and B are situated along the extended axis of bar magnet of length 2x at a distance x and 2x respectively from the pole nearer to the points. The ratio of the magnetic field at A and B will be approximately

(1) 64 : 9 (2) 8 : 3

(3) 128 : 27 (4) 8 : 1

14. **Assertion** : Critical angle is minimum for violet colour in visible spectrum of light.

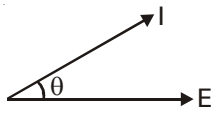
Reason : Refractive index is minimum for violet light.

(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

15. 

The phasor diagram of current and voltage for a circuit is shown above. The possible combination of components are

a. LC b. CR

c. LR d. LCR

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

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

16. An air core solenoid has 1000 turns and is one metre long. Its cross-sectional area is 10 cm^2. Its self inductance is

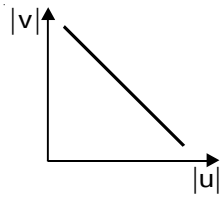
(1) 0.1256 mH (2) 12.56 mH

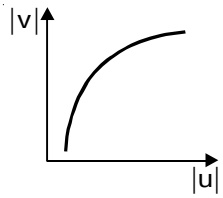
(3) 1.256 mH (4) 125.6 mH

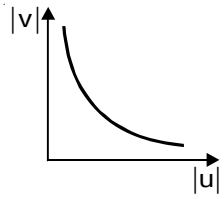
17. Current in a coil changes from 1A to -1A in 1 milli-second. If the mutual inductance between this coil and another nearby coil is 50 milli-henry, then the mean value of the induced voltage in the second coil, is

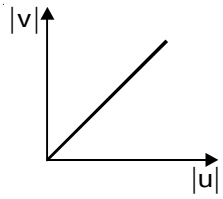
(1) 50 volts (2) 10 volts
(3) 200 volts (4) 100 volts

18. A graph between object distance of a real object and image distance for its real image is drawn for a concave mirror. The shape of the graph is best represented in

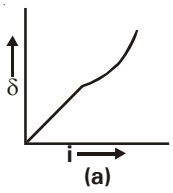
(1) 

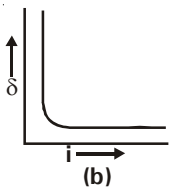
(2) 

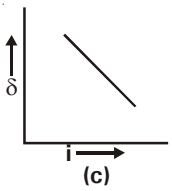
(3) 

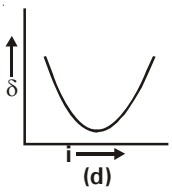
(4) 

19. Which of the following graphs will best represent the angle of deviation δ by a prism versus angle of incidence 'i' for a monochromatic light?

(1) 

(2) 

(3) 

(4) 

20. When an A.C. source is connected to a $100\,\Omega$ resistor, average power drawn is 300 watt. An inductance of 5 H is now connected in series with the resistor such that the net impedance is $150\,\Omega$. Find the average power drawn.

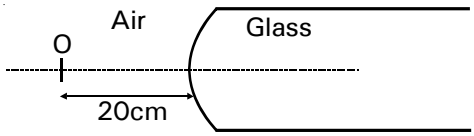
(1) 133.3 W (2) 200 W
(3) 100 W (4) 50 W

21. In YDSE, distance between two coherent sources is 0.2 mm and interference pattern is observed on the screen 80 cm from the sources. If the wavelength of light used is 6000 Å, distance of second bright fringe from the first dark on the same side is

(1) 2.4 mm (2) 4.8×10^{-3} m
(3) 3.6×10^{-3} m (4) 1.2 mm

22. A magnet makes 10 oscillations per minute in earth's magnetic field [H = 0.2 gauss]. By what amount should the field be increased, so that the magnet makes 15 oscillation per minute?

(1) 0.25 gauss (2) 0.4 gauss
(3) 0.3 gauss (4) 0.5 gauss

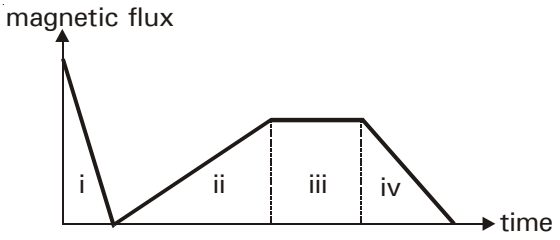
23. 

A point object O is placed in front of a glass rod of refractive index 1.5 having spherical end of radius of curvature 30 cm. Image would be formed at _____ of pole.

(1) 30 cm to the left (2) 60 cm to the right
(3) 45 cm to the left (4) 30 cm to the right

24. When a polaroid sheet is rotated between two crossed polaroids, the intensity of transmitted light will be maximum when angle between their transmission axis is

(1) $\pi/2$ (2) $\pi/3$
(3) $\pi/4$ (4) $\pi/6$

25. 

The magnetic flux through a conducting loop versus time graph is shown above. Correct order of magnitude of induced emf in different regions is

(1) $i > iv > ii > iii$ (2) $i < iv < ii < iii$

(3) $i > iii > iv = ii$ (4) $i > ii = iv > iii$

26. A transformer is employed to reduce 200 volt to 24 V. The primary draws a current of 8 A and the secondary 50 A. Efficiency of the transformer is

(1) 60% (2) 75%

(3) 80% (4) 90%

27. An alternating voltage is connected in series with a resistance R and an inductance L. If the potential drop across the resistance is 200 volt and across the inductance is 150 volt, the applied voltage is

(1) 350 volt (2) 250 volt

(3) 500 volt (4) 300 volt

28. 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

29. A small fish, 4 cm below the surface of a lake is viewed through a thin converging lens of focal length 30 cm held 2 cm above the water surface. Refractive index of water is 1.33. The image of the fish from the lens is at a distance of

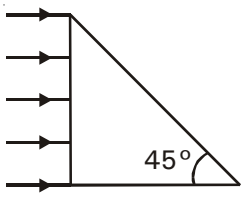
(1) 10 cm (2) 8 cm

(3) 6 cm (4) 4 cm

30. According to a compass in a ship, the ship is sailing due east. If declination at that place is 10° west, then true direction of motion of the ship is

(1) 10° south of east (2) 10° north of east

(3) 10° east of north (4) 10° west of north

31. 

A beam of light consisting of red, green and blue colours is incident on an isosceles right angled prism as shown in the figure. The refractive indices of the material of the prism for red, green and blue colours are 1.39, 1.43 and 1.47 respectively. The prism will separate

(1) red colour from green and blue colours

(2) blue colour from red and green colours

(3) green colour from red and blue colours

(4) all the three colours from one another

32. A candle is kept at a distance equal to double the focal length from the pole of a convex mirror. Its magnification will be

(1) $-1/3$ (2) 1/3

(3) 2/3 (4) $-2/3$

33. Voltage and current in an ac circuit are given by

$$V = 5\sin\left(100\pi t - \frac{\pi}{6}\right) \text{ and } I = 4\sin\left(100\pi t + \frac{\pi}{6}\right)$$

(1) Voltage leads the current by 30°

(2) Current leads the voltage by 30°

(3) Current leads the voltage by 60°

(4) Voltage leads the current by 60°

34. Light of wavelength λ is incident on a slit of width 'd' and distance between screen and slit is D. Then width of central maxima and width of slit will be equal if D is

(1) $\frac{d^2}{\lambda}$ (2) $\frac{2d}{\lambda}$

(3) $\frac{2d^2}{\lambda}$ (4) $\frac{d^2}{2\lambda}$

35. A light beam has 80% intensity from unpolarized light and 20% intensity from plane polarized light. It is passed through a polarizer. On rotating the polarizer, the ratio of maximum intensity to minimum intensity of transmitted light is

(1) 1 (2) 1.5

(3) 1.8 (4) 2

PHYSICS : SECTION-B

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

36. Eddy currents flow

(1) in the direction of magnetic field

(2) in the plane perpendicular to changing magnetic field

(3) in closed loops

(4) both (2) and (3)

37. **Statement-I** : Self induction of a solenoid is proportional to its length, if total number of turns is kept constant.

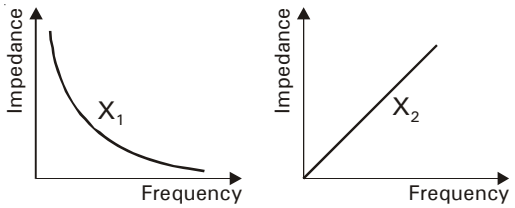
Statement-II : Inserting an iron core in a coil increases its coefficient of self induction.

(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

38. 

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

39. Deviation by a prism is maximum for

(1) violet ray (2) green ray

(3) red ray (4) yellow ray

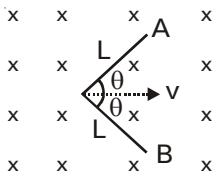
40. The power and type of the lens by which a person can see clearly the distant objects, if a person can not see objects beyond 40 cm, are

(1) -2.5 D and concave lens

(2) -2.5 D and convex lens

(3) -3.5 D and concave lens

(4) -3.5 D and convex lens

41. 

Induced emf between point A and B as shown in figure is

(1) $BLv \sin\theta$ (2) $BLv \cos\theta$

(3) $2BLv\sin\theta$ (4) zero

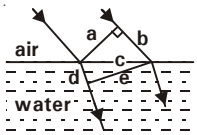
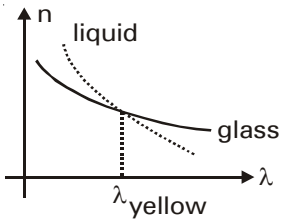
42. 

Figure shows plane waves refracted from air to water and corresponding wave fronts using Huygen's principle. a, b, c, d, e are lengths on the diagram as shown. The refractive index of water with respect to air is

(1) a/e (2) b/e
(3) b/d (4) d/b

43. A glass prism is immersed in a hypothetical liquid. The curves showing the refractive index 'n' as a function of wavelength 'λ' for glass and liquid are as under . When a ray of white light is incident on the prism parallel to base



(1) yellow ray travels without deviation
(2) blue ray is deviated towards the base
(3) red ray is deviated towards vertex
(4) there is no dispersion

44. A glass convex lens ($\mu_G = 1.5$) has a focal length of 8 cm when placed in air. What would be the focal length of the lens when it is immersed in water ($\mu_W = 1.33$)

(1) 12 cm (2) 4 cm
(3) 16 cm (4) 32 cm

45. The light of wavelength 6600 Å is incident on a slit of width 0.3 mm perpendicularly, the angular width of central maxima will be

(1) 0.30° (2) 0.25°
(3) 0.45° (4) 0.15°

46. What is magnetic energy stored in a solenoid in terms of magnetic field B, area A and length L of solenoid?

(1) $\frac{1}{\mu_0}BA^2L$ (2) $\frac{2}{\mu_0}B^2AL$

(3) $\frac{1}{2\mu_0}BA^2L$ (4) $\frac{1}{2\mu_0}B^2AL$

47. A resistance R is connected to an a.c. source and power drawn is P_1. When a capacitor C is connected in series with R, the impedence becomes Z and the power drawn from the source becomes P_2. Then $\frac{P_2}{P_1}$ is

(1) $\frac{R}{\sqrt{Z^2 - R^2}}$ (2) $\frac{R^2}{Z^2}$

(3) $\frac{R}{Z}$ (4) $\frac{Z}{R}$

48. Two vertical plane mirrors are inclined at an angle of 60° with each other. A ray of light travelling horizontally is reflected first from one mirror and then from the other. The resultant deviation is

(1) 60° (2) 120°
(3) 180° (4) 240°

49. Convergence of concave mirror can be decreased by dipping in

(1) water (2) cooking oil
(3) any of these (4) none of these

50. If a resistance of $30\,\Omega$, a capacitor of reactance $20\,\Omega$ and an inductor of reactance $60\,\Omega$ are connected in series to a 100 V, 50 Hz power source, then the power factor of the circuit is

(1) 0.5 (2) 0.4

(3) 0.6 (4) 0.8

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which of the following does not show Cannizaro reaction but gives Haloform reaction

a. Chloral b. Acetaldehyde

c. Benzaldehyde d. Benzophenone

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

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

52. Buna-N synthetic rubber is a copolymer of :

(1) $H_2C=CH-\overset{Cl}{\overset{|}{C}}=CH_2$ & $H_2C=CH-CH=CH_2$

(2) $H_2C=CH-CH=CH_2$ & $H_5C_6-CH=CH_2$

(3) $H_2C=CH-CN$ & $H_2C=CH-CH=CH_2$

(4) $H_2C=CH-CN$ & $H_2C=CH-\overset{CH_2}{\overset{|}{C}}=CH_2$

53. $CH_3-CH=CH-CH_2-CN \xrightarrow[2.\,H_2O]{1.\,DIBAL-H} A$

A is

(1) $CH_3-CH=CH-CH_2CHO$

(2) $CH_3CH_2-CH_2-CH_2CHO$

(3) $CH_3-CH=CH-CH_2COOH$

(4) $CH_3CH_2CH_2CH_2COOH$

54. Which of the following is a biodegradable polymer?

(1) Nylon 2-nylon 6 (2) PHBV

(3) cellulose (4) all the above

55. In aqueous solutions, amino acids mostly exist as

(1) $NH_2-CHR-COOH$ (2) $NH_2-CHR-COO^-$

(3) $\overset{+}{N}H_3CHRCOOH$ (4) $H_3N^+CHRCOO^-$

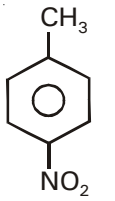
56. An ether is more volatile than an alcohol having the same molecular formula. This is due to

(1) dipolar character of ethers

(2) alcohols have resonating structure

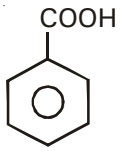
(3) intra molecular hydrogen bonding in alcohol

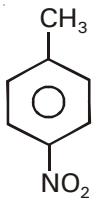
(4) inter molecular hydrogen bonding in alcohol

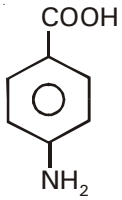
57. 

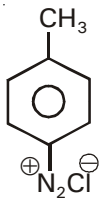
$\xrightarrow{Sn/HCl}$ A $\xrightarrow[0-5^\circ C]{NaNO_2+HCl}$ B

$\xrightarrow[(2)\,KMnO_4]{(1)\,H_3PO_2}$ C Product C is :

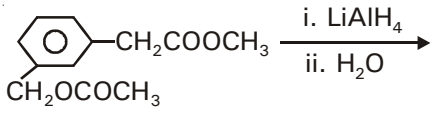
(1) 

(2) 

(3) 

(4) 

58. What is true regarding the following reaction?



(1) One of the products gives positive iodoform test
(2) One of the products is optically active
(3) One of the products is salicylic acid
(4) All the products dissolve in alkali

59. Fehling reagent comprises of two solutions, Fehling solution A and Fehling solution B. Fehling solution A is _____ and Fehling solution B is _____. The correct fill ups respectively are
(1) Rochelle salt, aqueous potasium sulphate
(2) aqueous sodium sulphate, Rochelle salt
(3) alkaline copper sulphate, Rochelle salt
(4) alkaline sodium potassium tartarate, aqueous copper sulphate

60. 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.

61. Which is true for elastomers?
(1) These are synthetic polymers possessing elasticity
(2) These possess very weak intermolecular forces of attractions between polymer chain
(3) Vulcanised rubber is an example of elastomer
(4) All of the above

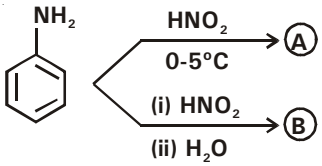
62. The polymer containing strong intermolecular forces like hydrogen bonding is
(1) teflon (2) nylon 6,6
(3) polystyrene (4) natural rubber

63. Match column-I with column-II

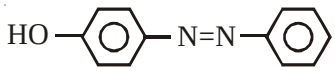
	Column-I (Products formed)		**Column-II (Reaction of carbonyl compound with)**
a.	Cyanohydrin	i.	NH_2OH
b.	Acetal	ii.	RNH_2
c.	Schiff's base	iii.	alcohol
d.	Oxime	iv.	HCN

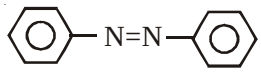
(1) a–i, b–ii, c–iii, d–iv (2) a–iii, b–i, c–ii, d–iv
(3) a–iv, b–iii, c–ii, d–i (4) a–iv, b–iii, c–i, d–ii

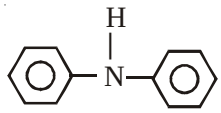
64. Which of the following polymers is used in electrical switches?
(1) Nylon 6 (2) Nylon 6,6
(3) Bakelite (4) Terylene

65. 

Product of reaction of (A) and (B) in basic medium (pH = 9 – 10) is

(1) 

(2) 

(3) 

(4) No reaction

66. **Statement- I** : Some higher members of aliphatic carboxylic acids ($C_{12} - C_{18}$) known as **fatty acids.**

Statement- II : They occur in natural fats as esters of glycerol.

(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

67. On nitration of aniline, good amount of m-nitro aniline is obtained. This is due to

(1) in nitrating mixture, the ortho,para directing influence of NH_2 group is completely lost

(2) $-NH_2$ becomes $-\overset{+}{N}HSO_4^-$ which is meta directing

(3) $-NH_2$ becomes $-\overset{+}{N}H_3$ which is meta directing

(4) $-NH_2$ becomes $-\overset{-}{N}H\overset{+}{N}O_2$ which is meta directing

68. Gabriel's pthalimide synthesis is used for the preparation of

(1) primary aromatic amine

(2) primary aliphatic amine

(3) secondary amine

(4) tertiary amine

69. Which of the following order is true regarding the acidic nature of monosubstituted acetic acid?

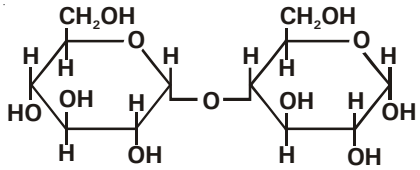
(1) Fluoro acetic acid > chloro acetic acid > bromo acetic acid

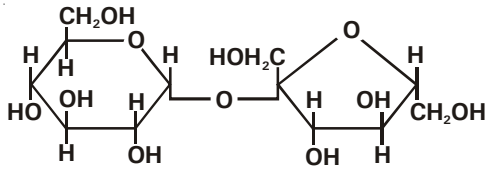
(2) Fluoro acetic acid < chloro acetic acid < bromo acetic acid

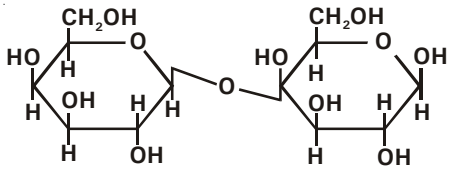
(3) Fluoro acetic acid < chloro acetic acid > bromo acetic acid

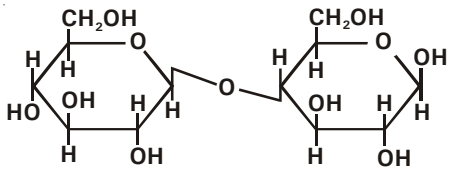
(4) Fluoro acetic acid > chloro acetic acid < bromo acetic acid

70. In disaccharides, if the reducing groups of monosaccharides i.e. aldehydic or ketonic groups are bonded, these are non-reducing sugars. Which of the following disaccharide is a non-reducing sugar?

(1) 

(2) 

(3) 

(4) 

71. Which of the following will be most stable diazonium salt?

(1) $CH_3N_2^+X^-$ (2) $C_6H_5N_2^+X^-$

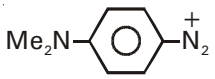
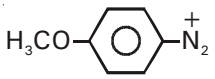
(3) $CH_3CH_2N_2^+X^-$ (4) $C_6H_5CH_2N_2^+X^-$

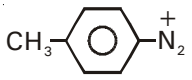
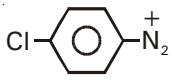
72. Correct statement about amines is
(1) Amines have higher boiling points than hydrocarbons of comparable molecular mass
(2) Aromatic amines are insoluble in water but are soluble in ether, alcohols or benzene.
(3) As the size of alkyl part increases, the solubility of amines in water decreases
(4) All are correct

73. Which one of the following causes effervescence with CO_3^{2-} or HCO_3^-
(1) Phenol
(2) 2,4-dinitrophenol
(3) 2,4,6-trinitrophenol
(4) Both (2) and (3)

74. **Assertion**: The addition polymers formed by the polymerisation of a single monomeric species are known as homopolymers.
Reason : Nylon 6,6 is a homopolymer.
(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

75. Consider the following ions and compare their reactivities in azo-coupling reactions under similar conditions

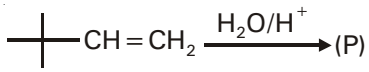
i.  ii. 

iii.  iv. 

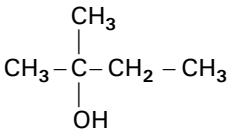
(1) iii < i < iv < ii (2) i < iv < ii < iii
(3) i < ii < iii < iv (4) iii < i < ii < iv

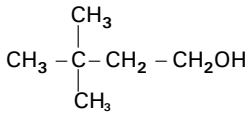
76. Which of the following functional group(s) when attached to para position of benzyl alcohol will decrease its acidic strength but increases its reactivity towards HBr?
(1) $-NO_2$ (2) $-OCH_3$
(3) Cl (4) Both (1) and (3)

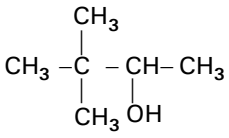
77. The reagents used during Clemenson reduction are
(1) $LiAlH_4/H_3O^+$
(2) Zn-Hg/HCl
(3) NH_2-NH_2, KOH, Glycol
(4) $(CH_3)_2CHOH/[(CH_3)_2C-O]_3Al$

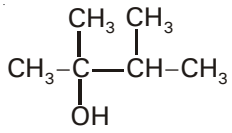
78. 

The major product (P) is

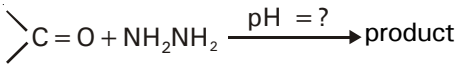
(1) 

(2) 

(3) 

(4) 

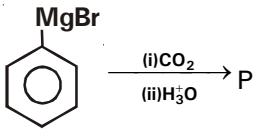
79. In which case, $\rangle C=C\langle$ (alkene) and $\rangle C=O$ (carbonyl group) do not differ?
(1) Hybridisation of carbon
(2) Dipole moment
(3) Energy of double bond
(4) Bond-length of double bond

80. 

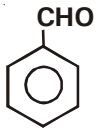
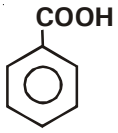
pH required in above reaction is

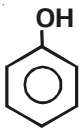
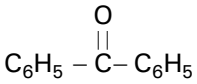
(1) 9–10 (2) 3.5–4.5

(3) 7.5–8.5 (4) 1–2

81. 

In the above reaction, product P is

(1)  (2) 

(3)  (4) 

82. Which set of reactants will produce anisole?

(1) CH_3CHO, RMgX

(2) C_6H_5OH, NaOH, CH_3I

(3) C_6H_5OH, neutral $FeCl_3$

(4) $C_6H_5CH_3$, CH_3COCl, $AlCl_3$

83. The increasing order of the rate of RMgX addition to compounds A-D is

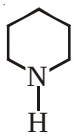
A. HCHO B. CH_3COCH_3

C. $PhCOCH_3$ D. PhCOPh

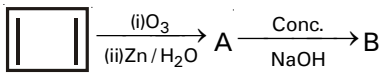
(1) A < B < C < D (2) D < B < C < A

(3) D < C < B < A (4) C < D < B < A

84. Which of the following is the least basic?

(1)  (2) 

(3)  (4) 

85. 

What is true regarding the given reaction?

a. A is Butane–1, 4–dial

b. A is glyoxal

c. B is formed by cross aldol reaction

d. B is sodium glycolate ($HOCH_2$–COONa)

e. B is formed by intramolecular cannizaro reaction

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

(3) a, c (4) b only

CHEMISTRY : SECTION-B

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

86. Which of the following compound on reduction with $LiAlH_4$ will lead to Racemization?

(1) acetone (2) benzophenone

(3) acetophenone (4) formaldehyde

87. Bakelite is obtained from phenol by reaction with

(1) HCHO (2) $(CH_2OH)_2$

(3) CH_3CHO (4) CH_3COCH_3

88. Which of the following amine is optically active?

(1) Tertiary-butyl amine

(2) Secondary butyl amine

(3) Isobutyl amine

(4) n-butyl amine

89. Reaction of which ether with aqueous HI leads to the formation of methyl alcohol?

(1) ethyl methyl ether

(2) methyl propyl ether

(3) isopropyl methyl ether

(4) tert-butyl methyl ether

90. Which is not true about carboxylic acid?

(1) RCOOH have higher boiling point than RCHO and R_2 CO of comparable molecular mass

(2) RCOOH exist as dimer in the vapour phase

(3) Phenoxide ion has lesser number of resonating structures than carboxylate anion

(4) All are true statements

91. Highest rate of esterification with alcohols will be given by

(1) HCOOH (2) $(CH_3)_2CHCOOH$
(3) $(CH_3)_3CCOOH$ (4) CH_3COOH

92. Hinsberg's reagent is

(1) CH_3SO_2Cl (2) $C_6H_5SO_2Cl$
(3) $CH_3CH_2SO_2Cl$ (4) $C_6H_5SO_2OH$

93. **Assertion** : α-glucose and β-glucose can show mutarotation.

Reason : α-glucose and β-glucose are anomers.

(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

94. When glucose is treated with excess of phenylhydrazine, it gives

(1) glucose oxime
(2) glucose cyanohydrin
(3) glucosazone
(4) phenylhydrazone of glucose

95. Which of the following polymer has an ester linkage?

(1) PVC (2) SBR
(3) Nylon, 6 (4) Terylene

96. Cumene on atmospheric oxidation yields hydroperoxide of cumene. In acidic medium, this compound gives

(1) phenol (2) resorcinol
(3) phenol + acetone (4) phenol + propanol

97. The most volatile compound is

(1) CH_3CH_2CHO (2) CH_3COCH_3
(3) $CH_3CH_2CH_2OH$ (4) CH_3COOH

98. **Statement-I** : Quantiative evolution of N_2 on reaction with nitrous acid is used in estimation of amino acids and proteins.

Statement-II : N-Ethyl ethanamide can be acylated on reaction with acid chloride in presence of base.

(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. Propene, $CH_3-CH=CH_2$ can be converted to 1-propanol by oxidation. Which set of reagents among following is ideal to effect the conversion

(1) Alkaline $KMnO_4$
(2) B_2H_6 & alkaline H_2O_2
(3) O_3 / Zn dust
(4) OsO_4 / CH_4,Cl_2

100. The best reagent for converting, 2-phenylpropanamide in to 1- phenylethanamine is

(1) excess H_2/Pt (2) $NaOH/Br_2$
(3) $NaBH_4$/methanol (4) $LiAlH_4$/ether

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. The side-effects of the use of anabolic steroids in females include all except
(1) masculinisation and increased aggressiveness
(2) mood swings and depression
(3) breast enlargement and acne
(4) enlargement of clitoris and deepening of voice

102. Find the correct statements for lymph nodes
(1) These are small hollow structures located at different points in the blood vessels.
(2) They serve to trap the micro-organisms or other antigens, which happen to get into them from lymph and tissue fluid.
(3) Antigens trapped in the lymph nodes are responsible for the activation of lymphocytes present there and cause the immune response.
(4) Both (2) and (3)

103. Which one of the following techniques is safest for the detection of cancers?
(1) Magnetic resonance imaging (MRI)
(2) Radiography (X-ray)
(3) Computed tomography (CT)
(4) Histopathological studies

104. **Statement-I** : The principle of immunisation or vaccination is based on the property of memory' of the immune system.

Statement-II : Recombinant DNA technology has allowed the production of antigenic polypeptides of pathogen in bacteria or yeast.
(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

105. Which of the following is an infectious fatal disorder that spreads through conscious behaviour?

(1) Cancer (2) AIDS
(3) Typhoid (4) Tetanus

106. Identify the plant and its effect on the body

(1) Cannabis sativa – has receptors in gastrointestinal tract
(2) Cannabis sativa – affects cardiovascular system
(3) Datura – non-hallucinogenic
(4) Poppy plant –affects cardiovascular system

107. Which of the following helps in overcoming several problems of normal matings?
(1) Inbreeding
(2) Outcrossing
(3) Artifical insemination
(4) All of the above

108. A person exposed to pathogen for tetanus is immunised by administering:
(1) Preformed antibodies
(2) Wide spectrum antibiotics
(3) Weakened germs
(4) Dead germs

109. **Assertion** : Active immunity is slow and takes time to give its full effective response.

Reason : When a host is exposed to antigens, which may be in the form of living or dead microbes, serum albumins and globlins are produced in the host body very slowly.
(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

110. Choose the odd one out with respect to lymphoid organs.
(1) Peyer's patches
(2) Bone Marrow
(3) MALT
(4) Spleen

111. Mature infective stages, sporozoite of *Plasmodium* migrates from
(1) liver to RBC of man
(2) stomach to salivary gland of mosquito
(3) salivary gland to stomach of mosquite
(4) RBC to liver of man

112. To which type of barriers under innate immunity, do the saliva in the mouth and the tears from the eyes, belong?
(1) Physical barriers
(2) Cytokine barriers
(3) Cellular barriers
(4) Physiological barriers

113. Psychological attachment to euphoria & a temporary feeling of well being associated with drugs & alcohol is called
(1) drug abuse (2) withdrawl effect
(3) withdrawl syndrome (4) addiction

114. Choose the correct option

	Drug/Plants	Characteristic	Exception
(1)	Marijuana,hashish, charas, ganja	Affects cardivascular system of the body	Ganja
(2)	Coca plant, *Atropa, Datura*, Heroin	Produce a sense of enphoria and increased energy	*Datura*
(3)	Opium, morphine, heroin, cocaine	Suppress brain function,relieve physical and mental pain	Cocaine
(4)	Barbiturates, amphetamines, smack	Help patients to cope with depression and insomnia	Barbiturates

115. Which of the following can be used to quickly reduce the symptoms of allergy?
a. Steroids b. Adrenalin
c. Vaccines d. Antihistamine
(1) c and d (2) a, b and c
(3) a, b and d (4) a and d

116. Choose the correct match
(1) Egg production – Silver revolution
(2) Milk production – Blue revolution
(3) Food production – Green revolution
(4) Fish production – Yellow revolution

117. Interferons are
(1) proteins secreted by bacteria infected cells
(2) proteins secreted by virus infected cells
(3) polysaccharides secreted by virus infected cells
(4) Glycolipid secreted by bacteria infected cells

118. How many of the following are incorrect regarding bee keeping

a. It is also called apiculture

b. It is maintance of hives of honeybees for production of honey

c. It is not income generating Industry

d. Specialised knowledge is not required

e. Bee keeping is not labour intensive

(1) 5 (2) 3

(3) 2 (4) 1

119. Complete the following using correct option

"Ascaris lumbricoides enter the small intestine through _____and migrate to other organs through _____"

(1) contaminated articles, neurons

(2) contaminated food and water, blood

(3) contaminated syringes, blood

(4) contaminated food and water, axon terminals

120. The rupture of RBCs in Plasmodium infection is associated with

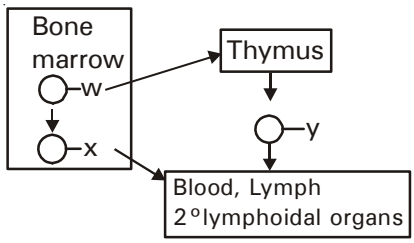
(1) release of a toxic substance, haemozoin

(2) symptom like chill and high fever recurring every three to four days

(3) multiplication of parasites within RBC to form sporozoites

(4) both (1) and (2)

121. Identify W, X and Y in the diagram



	w	x	y
(1)	B-cells	stem cells	T-cells
(2)	Immature lymphocytes	B-cells	T-cells
(3)	T-cells	stem cells	B-cells
(4)	Immature lymphocytes	T-cells	B-cells

122. Symptoms like fever, inflammation, deformities and enlargement of limbs occur in

(1) amoebiasis (2) elephantiasis

(3) giardiasis (4) entritis

123. In radiotherapy, cancer cells are destroyed by targeting them with _____ radiations which_____

(1) non-ionizing; induce rapid cell division

(2) ionizing, destroy rapidly dividing cells

(3) ionizing, decreases the rate of mutations

(4) non-ionizing, deprives them of oxygen

124. Transplantation of tissues/organs to save certain patients often fails due to rejection of such tissues/ organs by the patient. Which type of immune response is responsible for such rejections?

(1) auto-immune response

(2) humoral immune response

(3) physiological immune response

(4) cell-mediated immune response

125. Which among the following cells are responsible for hyper sensitive reactions?

(1) Hepato cytes (2) Kupffer cells

(3) Mast cells (4) Plasma cells

126. Identify the helminthic disease where pathogens are transmitted through female mosquito vector

(1) Ascariasis (2) Dengue

(3) Filariasis (4) Malaria

127. Find the incorrect statements associated with amoebiasis

a. *Entamoeba histolytica* is a protozoan parasite in the small intestine

b. Symptoms include constipation, abdominal pain and cramps, stools with excess mucous and blood clots.

c. Houseflies act as mechanical carriers and pathogen

d. Drinking water and food contaminated by the faecal matter are the main source of infection.

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

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

128. Which of the statement is wrong w.r.t. AIDS

(1) HIV is an enveloped retrovirus that causes immuno deficiency

(2) HIV selectively infects macrophages and killer T- lymphocytes leading to a progressive decrease in their number

(3) There is a time lag of few months to many years between infection and appearance of AIDS symptoms

(4) People at high risk of geting this disease are drug addicts who take drugs intravenously

129. 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

130. FSH hormone administred to cow ⟶ Superovulation with (A) eggs ⟶ mating with elite bull ⟶ (B) celled stages recovered (C) and transferred to (D) mothers
Which of the following is correct w.r.t A,B,C and D for MOET in cattle ?

	A	B	C	D
(1)	6-8	8-32	non surgically	genetic
(2)	8-32	6-8	surgically	surrogate
(3)	6-8	8-32	non surgically	surrogate
(4)	6-10	16-32	surgically	genetic

131. Pathogen cause disease by
(1) Interfering with normal vital activities
(2) Multiplying by countering different preventive barriers in body
(3) Causing morphological and anatomical damage
(4) All of the above

132. Which of the following is an incorrect match?

	Disease	**Causative agent**
(1)	Pneumonia	–*Haemophilus influenzae*
(2)	Malignant malaria	–*Plasmodium falciparum*
(3)	Common cold	–*Rhino virus*
(4)	Ringworm	– *Ascaris*

133. How many of the following statements are correct with regard to Diary farm management?
a. It is management of animals for milk and its products
b. Selection of good breeds is essential
c. The feeding of cattle should be carrried out in non scientific manner
d. Stringent cleanlines and hygiene are of paramount importance
e. Regular visits by veterinary doctors would not be mandatory
(1) 5 (2) 3
(3) 4 (4) 2

134. Which of the following is not included under innate defenses of our body ?
(1) skin
(2) mucus membrane
(3) anti microbial substance in tears
(4) antibodies

135. Which of the following is a pair of viral diseases ?
(1) Common Cold, AIDS
(2) Dysentery, Common Cold
(3) Typhoid, Tuberculosis
(4) Ringworm, AIDS

ZOOLOGY : SECTION-B

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

136. Bacteria like *Streptococcus pneumoniae* and *Haemophilus influenzae* are responsible for
(1) the disease pneumonia in humans which infects the alveoli and erythrocytes.
(2) alveoli get filled with blood leading to severe problems in respiration.
(3) the symptoms like fever, chills, cough and headache, abdominal pain, constipation.
(4) in severe cases, lips and finger nails turn grey to bluish in colour

137. Inbreeding depression is
(1) Decreased productivity due to mating of superior male and inferior female
(2) Decrease in body mass of progeny due to continued close inbreeding
(3) Reduced fertility and productivity due to continued close inbreeding
(4) Reduced motility and immunity due to close inbreeding

138. **Assertion** : Drugs like steroids, adrenalin & antihistamine quickly reduce the symptoms of allergy.
Reason : For the determination of cause of allergy, the patient is exposed to very large doses of possible allergens and the reactions are studied.
(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 statement are true?
a. Only antibody mediated immune response is responsible for graft rejection.
b. Antibiotics are secondary metabolites
c. In the structure of antibody, antigen binding site is towards C-terminal
d. In tissues, macrophages act as cellular barrier
e. The only type of linkage within the heavy chains of antibody is disulphide linkage
(1) 2 (2) 3
(3) 4 (4) 5

140. The neoplastic cells
(1) are a mass of non-proliferating localized cells
(2) remain confined to their original location
(3) grow rapidly, invading and damaging the surrounding normal tissues
(4) both (1) and (3)

141. The immune response of body is not effective against malignant cells as
(1) they do not follow contact inhibition
(2) they have high proliferation capacity
(3) they avoid detection & destruction by immune system
(4) they have neoplastic transformations

142. *Ascaris* and *Wuchereria* are similar in that both are
(1) intestinal parasites
(2) pathogenic helminths
(3) transmitted by female mosquito vectors
(4) both 1 & 2

143. If you keep the sanitary system around yourself sound then the diseases which will not most probably break out are
(1) cholera, diphtheria
(2) cholera, deficiency diseases
(3) cholera, dysentry
(4) all of these

144. Which of these is an auto-immune disease?
(1) Rheumatoid arthritis
(2) Allergy
(3) Anaphylactic shock
(4) AIDS

145. **Statement-I** : Inbreeding is the breeding of the unrelated animals, which may be between individuals of the same breed.
Statement-II : Out crossing is the best breeding method for animals that are below average in productivity in milk production, growth rate in beef cattle, etc.
(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

146. Select the correct match
(1) Alcohol – stimulant of physiological functions
(2) Anabolic steroids – decrease muscle strength cents
(3) Nicotine – increases blood pressure and heart beat rate
(4) Cannabinoids – no effect on cardiovascular system

147. Which of the following is an edible fresh water fish?
(1) *Hilsa* (2) *Catla*
(3) *Sardine* (4) Mackerel

148. Which among the following is not the property of malignant tumour?
(1) Uncontrolled proliferative ability
(2) breakdown of regulatory mechanism of cell growth
(3) Contact inhibition
(4) Oncogenic transformation

149. Anamnestic response in human body is triggered when
(1) stratum corneum prevents entry of foreign agents
(2) interferons inhibit viral replication
(3) target cells are killed by natural killer cells
(4) body encounters similar pathogen for second time

150. Which of the following is not a cell of the immune system?
(1) B-lymphocyte (2) T--lymphocyte
(3) leucocytes (4) α -interferons

BOTANY : SECTION-A

All questions are compulsory in section A

151. Ginger is a stem and not a root because it
a. is differentiated into nodes and internodes
b. contains scale leaves
c. stores reserve food
(1) both a & b (2) b only
(3) a, b & c (4) both a & c

152. Axile placentation differs from free central in having
(1) syncarpus ovary
(2) multilocular ovary
(3) apocarpus ovary
(4) polycarpellary ovary

153. **Statement-I** : Flower is the reproductive unit in angiosperms.
Statement-II : A typical flower has four different kinds of whorls.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

154. How many of these shows oestrus cycle
sheep, rat, apes, deer, dog, monkey
(1) Four (2) Five
(3) Six (4) Three

155. "Ovule is a small structure attached to placenta by means of a stalk called _____, which fuses with body of the ovule in region called _____, which represents junction between ovule and funicle. Each ovule has one or two protective envelopes called _____, which encircle the ovule except at tip where a small opening called _____ is organised. Opposite to this end, is _____, representing basal part of ovule."
Correct fill-up of above paragraph in sequence is
(1) micropyle, funicle, hilum, integument, chalaza
(2) funicle, hilum, integument, chalaza, micropyle
(3) hilum, chalaza, integument, funicle, micropyle
(4) funicle, hilum, integuments, micropyle, chalaza

156. How many meiotic divisions are required for formation of 100 pollen grains and 100 functional megaspores respectively?
(1) 100, 100 (2) 25, 100
(3) 100, 25 (4) 25, 25

157. Thorn
(1) is a modification of axillary bud
(2) meant for protection against browsing animals
(3) is found in *Citrus and Bougainvillea*
(4) all of these

158. Epipetalous condition is found in
(1) Chilli (2) Tobacco
(3) *Petunia* (4) All

159. Swollen leaf base is called as
(1) stipule (2) petiole
(3) pulvinus (4) amplexicaul

160. A *Citrus* seed was squeezed. Many embryos came out of it. It shows
(1) polyembryony (2) hologamy
(3) apomixis (4) both (1) and (3)

161. Find the correct match
(1) Rhizome of *Oxalis*
(2) Bulbils of *Agave*
(3) Offset of Potato
(4) Eyes of *Bryophyllum*

162. Pick the false statement
(1) A typical angiospermic anther is bilobed with each lobe having two theca
(2) The pollen grain represents male gametophyte
(3) Exine is made up of sporopollenin
(4) A typical angiospermic anther is monothecous

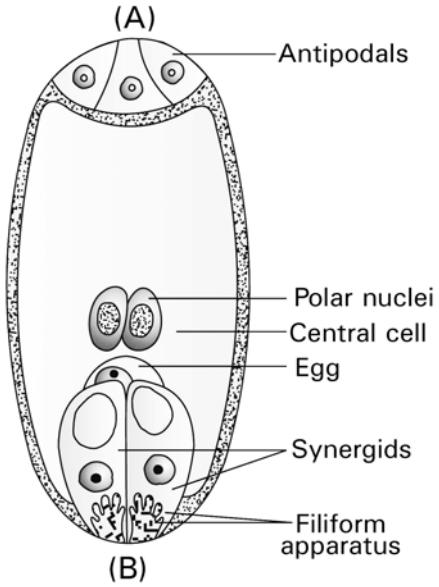
163. In cymose inflorescence, the main axis has _____ growth and flowers are arranged in _____ order.
(1) limited, acropetal
(2) unlimited, Aacropetal
(3) limited, basipetal
(4) unlimited, basipetal

164. How many chromosomes are present in the gamete of Potato?
(1) 8 (2) 24
(3) 12 (4) 4

165. Oldest viable seed of which plant has been discovered
(1) 2000 year old seed of *Phoenix dactylifera* at king Herod's palace near the dead sea
(2) 10,000 year old seed of *Lupinus arcticus* from king Victoria palace
(3) 10,000 year old seed of *Lupinus arcticus* from Arctic tundra
(4) 1000 year old seed of lotus plant from Anamalai hills

166. Which of the following is a modification of root meant for mechanical support?
(1) tap roots of turnip
(2) adventitious roots of sweet potato
(3) stilt roots of maize
(4) pneumatophores of *Rhizophora*

167. Pick the incorrect statement regarding the following diagram



(1) It is eight celled and seven nucleated
(2) It is monosporic type
(3) (A) represents chalazal end
(4) (B) represents micropylar end

168. Match the entries in column I with column II

	Column I		Column II
a.	Perispermic	(i)	Castor, Sunflower
b.	Albuminous	(ii)	Groundnut
c.	Non–Albuminous	(iii)	Beet

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

169. A botanist wants to create a hybrid variety of papaya plant. Which step is not required during its artificial hybridization?
(1) Bagging
(2) Rebagging
(3) Selection of parents
(4) Emasculation

170. Clones are
(1) morphologically similar only
(2) genetically similar only
(3) both morphologically and genetically similar
(4) morphologically disimilar and genetically similar

171. From the list given below, how many plants have underground stem modification?
Trapa, Vanda, Colocasia, Potato, Ginger, Carrot, Sweet potato, Onion, *Crocus.*
(1) 5 (2) 7
(3) 6 (4) 8

172. Zygomorphic flower is when
(1) any vertical section passing through its centre divides the flower into two equal parts
(2) there is only one vertical section possible to cut flower into two equal parts
(3) when cutting flower through any plane is not possible
(4) all of the above

173. Cylindrical portion below the level of cotyledons is
(1) epicotyl (2) hypocotyl
(3) plumule (4) radicle

174. Match the figures of leaves in column I with their characteristics in column II.

Column I		**Column II**
a.		p. Pinnately compound
b.		q. Reticulate venation
c.		r. Palmately compound
d.		s. Parallel venation

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

175. Select the odd one out w. r. t fabaceae
(1) monocarpellary
(2) dithecous anther
(3) endospermous seed
(4) vexillary aestivation

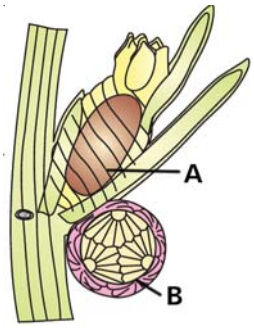
176. Which of the following statement is incorrect?
(1) embryo develops at the chalazal end of embryo sac
(2) most zygotes divide only after certain amount of endosperm is formed
(3) endosperm is an adaptation to provide nutrition to developing embryo
(4) endosperm development precedes embryo development

177. The floral formula of Ashwagandha is
(1) $\%\,\delta\,\varphi\;P_{(3+3)}\,A_{(3+3)}\,\underline{G_{(1)}}$
(2) $\oplus\,\delta\,\varphi\;K_{(5)}\,\overset{\frown}{C_{(5)}\,A_5}\,\underline{G_{(2)}}$
(3) $Br\,\delta\,\varphi\;P_{3+3}\,\underline{G_{(\overline{3})}}$
(4) $\oplus\,\delta\,\varphi\;P_{3+3}$ or $_{(3+3)}\,\underline{G_{(\overline{3})}}$

178. Pollen tetrad is commonly covered by
(1) proteinaceous wall (2) cellulosic wall
(3) pectin wall (4) callose wall

179. **Assertion** : Apomixis is a form of asexual reproduction
Reason : Some species of Asteraceae and Grasses have evolved this special mechanism
(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

180. Dehydration and dormancy of mature seeds
a. are crucial for storage of seeds
b. can be used as food through out the year
c. help to raise crop in the next season
(1) Both a & b (2) Both b & c
(3) c only (4) a, b & c

181. 

Select the incorrect option w.r.t. to above diagram
(1) *Chara* plant (2) Dioecious
(3) A is Oogonium (4) B is antheridium

182. Autogamy can occur in a chasmogamous flower if:
(1) pollen matures before maturity of ovule
(2) ovules mature before maturity of pollen
(3) both pollen and ovules mature simultaneously
(4) the flower shows self incompatibility

183. Which of the following is not a stem modification
(1) Tendril of grape
(2) Tendril of pea
(3) Phylloclade of *Opuntia*
(4) Cladode of *Ruscus*

184. Pollen-Pistil interaction involves
a. development of style stigma
b. entry of pollen tube into the ovule
c. pollen tube growth through style
d. development of male gamete in pollen grain
(1) b, d are correct (2) b, c are correct
(3) a, b, c are correct (4) c only

185. Arrange the following w.r.t. increasing life span Crow, Horse, Banana, Fruitfly, Parrot, Banyan tree.
(1) Fruitfly, Crow, Horse, Banana, Parrot, Banyan tree
(2) Crow, Fruitfly, Banana, Horse, Parrot, Banyan tree
(3) Fruitfly, Crow, Banana, Horse, Parrot, Banyan tree
(4) Banana, Fruitfly, Crow, Horse, Banyan tree, Parrot

BOTANY : SECTION-B

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

186. Which one is hermaphrodite?
(1) Earthworm, *Sponge* and Leech
(2) Cockroach, *Ascaris* and *Hydra*
(3) Earthworm, *Ascaris* and Leech
(4) *Ascaris,* Cockroach and *Hydra*

187. Half–inferior ovary is found in
(1) mustard (2) guava
(3) cucumber (4) plum

188. 

In the above structure of a leaf, A, B and C are
(1) Lamina, Stipule & Axillary bud respectively
(2) Stipule, Lamina & Leaf base respectively
(3) Lamina, Leaf base & Petiole respectively
(4) Lamina, Axillary bud & Leaf base respectively

189. Which is incorrect w.r.t. flower?
(1) Flower is a modified shoot where in the shoot apical meristem changes to floral meristem
(2) Internodes do not elongate and the axis gets condensed
(3) Apex produces different kinds of floral appendages laterally at successive nodes
(4) Flower is reproductive unit in Gymnosperms

190. Bicarpellary and superior ovary which becomes two chambered due to the formation of false septum is found in
(1) *Argemone* (2) *Petunia*
(3) Mustard (4) Both (1) & (3)

191. Match the asexual reproductive structure in column-I with their figures in column-II

Column I		**Column II**
a.	*Chlamydomonas*	p. 
b.	*Penicillium*	q. 
c.	Sponge	r. 

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

192. Which of the following is not a 'drupe' type of fruit?
(1) Mango (2) Coconut
(3) Peach (4) Cucumber

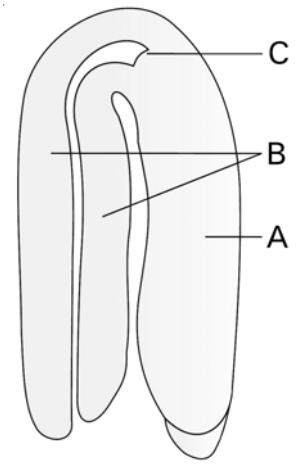
193. Dicot seed show all the characters except
(1) Presence of epicotyl
(2) Two cotyledons
(3) Presence of hypocotyl
(4) presence of epiblast

194. When the placenta develop at the base of the ovary and a single ovule is attached to it, the placentation is
(1) marginal (2) free central
(3) axile (4) basal

195. **Statement- I** : In diploid organisms, specialised cells called meiocytes undergo meiosis
Statement- II : At the end of mitosis, only one set of chromosomes gets incorporated into each gamete
(1) Both statement -I and statement- II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement- II is correct

196. What features are common to diverse organisms?
(1) They have to reach a certain stage of growth & maturity, before they can reproduce sexually
(2) Period of growth is called the juvenile phase in animals and vegetative phase in plants
(3) Juvenile phase is of variable durations in different organisms
(4) All of these

197. Given diagram represents _____ and parts labelled A, B & C are respectively



(1) Dicot embryo, Hypocotyl, Cotyledons, Plumule
(2) Monocot embryo, Hypocotyl, Cotyledons, Plumule
(3) Dicot embryo, Epicotyl, Plumule, Cotyledons
(4) Monocot embryo, Hypocotyl, Plumule, Cotyledons

198. In *Opuntia,* the stem is modified into a flattened green structure to perform the function of leaves is called
(1) cladode (2) phyllode
(3) phylloclade (4) leaf bladder

199. **Assertion** : Stem can be morphologically differentiated from root
Reason : Stem bear nodes & internodes, multicellular hair while root lacks nodes and bear unicellular hairs.
(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

200. How many of the following flowers how axile placentation?
Tomato, Mustard, *Argemone*, *Dianthus*, China rose, Lemon, Primrose, Sunflower, Marigold
(1) 3 (2) 4
(3) 5 (4) 2