



# Sky Tutorials

fly beyond the sky...

**IIT-JEE | NEET | Foundation**

**NEET**

**Time: 200 Minute**

**M.M. 480**

**ALL INDIA SKY TEST SERIES**

**Saarthak Batch - Neet**

**Date : 26/11/2023**

**SYLLABUS**

PHYSICS	CHEMISTRY	BOTANY	ZOOLOGY
Previous + Photoelectric effect + Atom	Full Syllabus	Full Syllabus	Full Syllabus

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

**INSTRUCTIONS:**

1. This Question paper is divided in to four parts physics, chemistry, botany, zoology Questions paper you have received contains **ALL THE QUESTIONS** in each Part.
2. **In each part all 30 questions are compulsory**, Each Question has four choices (a), (b), (c), (d) out of which **only one is correct & Carry 4 marks each 1 mark** will be deducted for each wrong answer.

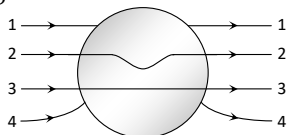
**GENERAL INSTRUCTION**

1. Use only **blue/black pen (avoid gel pen)** for darkening the bubble.
2. Indicate the correct answer for each question by filling appropriate bubble in your **OMR** answer sheet.
3. The answer sheet will be checked through computer hence, the answer of the question must be marked by -shading the circles against the question by dark **blue/black pen**
4. Blank papers, Clipboards, Log tables, Slide Rule, Calculator, Cellular Phones Papers and Electronic Gadgets in any form are **not** allowed to be carried inside the examination hall.

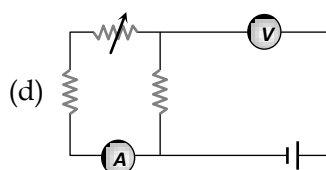
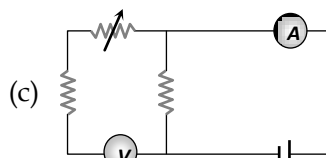
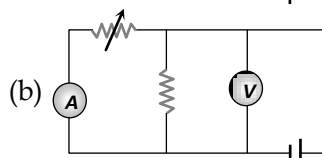
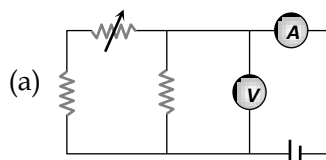
Name of the candidate: \_\_\_\_\_

Signature of the candidate: \_\_\_\_\_ Signature of the invigilator: \_\_\_\_\_

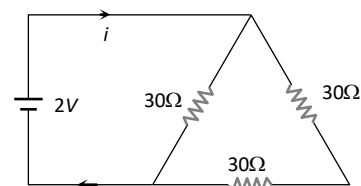
**PHYSICS**  
**SECTION - A**

- +2C and +6C two charges are repelling each other with a force of 12N. If each charge is given -2C of charge, then the value of the force will be  
(a) 4N (Attractive)      (b) 4N (Repulsive)  
(c) 8N (Repulsive)      (d) Zero
- One metallic sphere A is given positive charge whereas another identical metallic sphere B of exactly same mass as of A is given equal amount of negative charge. Then  
(a) Mass of A and mass of B still remain equal  
(b) Mass of A increases  
(c) Mass of B decreases  
(d) Mass of B increases
- The value of electric permittivity of free space is  
(a)  $9 \times 10^9 \text{ NC}^2 / \text{m}^2$       (b)  $8.85 \times 10^{-12} \text{ Nm}^2 / \text{C}^2 \text{ sec}$   
(c)  $8.85 \times 10^{-12} \text{ C}^2 / \text{Nm}^2$       (d)  $9 \times 10^9 \text{ C}^2 / \text{Nm}^2$
- The electric potential  $V$  at any point  $O(x, y, z)$  all in metres) in space is given by  $V = 4x^2 \text{ volt}$ . The electric field at the point  $(1\text{m}, 0, 2\text{m})$  in  $\text{volt/metre}$  is  
(a) 8 along negative  $X$ -axis  
(b) 8 along positive  $X$ -axis  
(c) 16 along negative  $X$ -axis  
(d) 16 along positive  $Z$ -axis
- A metallic solid sphere is placed in a uniform electric field. The lines of force follow the path(s) shown in figure as  
  
(a) 1      (b) 2      (c) 3      (d) 4
- In a conductor 4 coulombs of charge flows for 2 seconds. The value of electric current will be  
(a) 4 volts      (b) 4 amperes  
(c) 2 amperes      (d) 2 volts
- Drift velocity  $v_d$  varies with the intensity of electric field as per the relation  
(a)  $v_d \propto E$       (b)  $v_d \propto \frac{1}{E}$   
(c)  $v_d = \text{constant}$       (d)  $v_d \propto E^2$
- If the resistance of a conductor is  $5 \Omega$  at  $50^\circ\text{C}$  and  $7 \Omega$  at  $100^\circ\text{C}$  then the mean temperature coefficient of resistance of the material is  
(a)  $0.008/^\circ\text{C}$       (b)  $0.006/^\circ\text{C}$   
(c)  $0.004/^\circ\text{C}$       (d)  $0.001/^\circ\text{C}$

9. Express which of the following setups can be used to verify Ohm's law

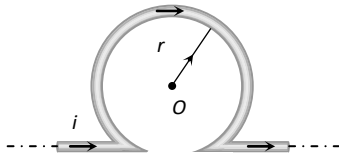


10. The current in the adjoining circuit will be



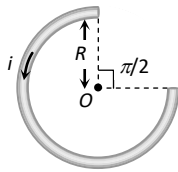
- (a)  $\frac{1}{45}$  ampere      (b)  $\frac{1}{15}$  ampere  
(c)  $\frac{1}{10}$  ampere      (d)  $\frac{1}{5}$  ampere
11. How much energy in kilowatt hour is consumed in operating ten 50 watt bulbs for 10 hours per day in a month (30 days).  
(a) 1500      (b) 5,00      (c) 15      (d) 150
12. Two electric bulbs (60 W and 100 W respectively) are connected in series. The current passing through them is  
(a) More in 100 W bulb      (b) More in 60 W bulb  
(c) Same in both      (d) None of these
13. An electric bulb is designed to draw power  $P_0$  at voltage  $V_0$ . If the voltage is  $V$  it draws a power  $P$ . Then  
(a)  $P = \left(\frac{V_0}{V}\right)^2 P_0$       (b)  $P = \left(\frac{V}{V_0}\right)^2 P_0$   
(c)  $P = \left(\frac{V}{V_0}\right) P_0$       (d)  $P = \left(\frac{V_0}{V}\right) P_0$

14. An infinitely long straight conductor is bent into the shape as shown in the figure. It carries a current of  $i$  ampere and the radius of the circular loop is  $r$  metre. Then the magnetic induction at its centre will be



- (a)  $\frac{\mu_0}{4\pi} \frac{2i}{r} (\pi+1)$  (b)  $\frac{\mu_0}{4\pi} \frac{2i}{r} (\pi-1)$   
 (c) Zero (d) Infinite

15. A current  $i$  ampere flows in a circular arc of wire whose radius is  $R$ , which subtend an angle  $3\pi/2$  radian at its centre. The magnetic induction  $B$  at the centre is



- (a)  $\frac{\mu_0 i}{R}$  (b)  $\frac{\mu_0 i}{2R}$  (c)  $\frac{2\mu_0 i}{R}$  (d)  $\frac{3\mu_0 i}{8R}$

16. A proton, a deuteron and an  $\alpha$ -particle having the same kinetic energy are moving in circular trajectories in a constant magnetic field. If  $r_p, r_d$  and  $r_\alpha$  denote respectively the radii of the trajectories of these particles, then

- (a)  $r_\alpha = r_p < r_d$  (b)  $r_\alpha > r_d > r_p$   
 (c)  $r_\alpha = r_d > r_p$  (d)  $r_p = r_d = r_\alpha$

17. The radius of a circular loop is  $r$  and a current  $i$  is flowing in it. The equivalent magnetic moment will be

- (a)  $ir$  (b)  $2\pi ir$  (c)  $i\pi r^2$  (d)  $\frac{1}{r^2}$

18. The energy of a charged capacitor is given by the expression ( $q$  = charge on the conductor and  $C$  = its capacity)

- (a)  $\frac{q^2}{2C}$  (b)  $\frac{q^2}{C}$  (c)  $2qC$  (d)  $\frac{q}{2C^2}$

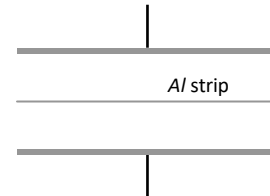
19. Separation between the plates of a parallel plate capacitor is  $d$  and the area of each plate is  $A$ . When a slab of material of dielectric constant  $k$  and thickness  $t$  ( $t < d$ ) is introduced between the plates, its capacitance becomes

- (a)  $\frac{\epsilon_0 A}{d+t \left(1 - \frac{1}{k}\right)}$  (b)  $\frac{\epsilon_0 A}{d+t \left(1 + \frac{1}{k}\right)}$   
 (c)  $\frac{\epsilon_0 A}{d-t \left(1 - \frac{1}{k}\right)}$  (d)  $\frac{\epsilon_0 A}{d-t \left(1 + \frac{1}{k}\right)}$

20. Eight small drops, each of radius  $r$  and having same charge  $q$  are combined to form a big drop. The ratio between the potentials of the bigger drop and the smaller drop is

- (a) 8 : 1 (b) 4 : 1 (c) 2 : 1 (d) 1 : 8

21. As shown in the figure, a very thin sheet of aluminium is placed in between the plates of the condenser. Then the capacity



- (a) Will increase  
 (b) Will decrease  
 (c) Remains unchanged  
 (d) May increase or decrease

22. A charge of  $40\mu C$  is given to a capacitor having capacitance  $C = 10\mu F$ . The stored energy in ergs is

- (a)  $80 \times 10^{-6}$  (b) 800 (c) 80 (d) 8000

23. A long magnetic needle of length  $2L$ , magnetic moment  $M$  and pole strength  $m$  units is broken into two pieces at the middle. The magnetic moment and pole strength of each piece will be

- (a)  $\frac{M}{2}, \frac{m}{2}$  (b)  $M, \frac{m}{2}$  (c)  $\frac{M}{2}, m$  (d)  $M, m$

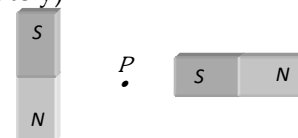
24. A long magnet is cut in two parts in such a way that the ratio of their lengths is 2 : 1. The ratio of pole strengths of both the section is

- (a) Equal (b) In the ratio of 2 : 1  
 (c) In the ratio of 1 : 2 (d) In the ratio of 4 : 1

25. A small bar magnet of moment  $M$  is placed in a uniform field  $H$ . If magnet makes an angle of  $30^\circ$  with field, the torque acting on the magnet is

- (a)  $MH$  (b)  $\frac{MH}{2}$  (c)  $\frac{MH}{3}$  (d)  $\frac{MH}{4}$

26. Two equal bar magnets are kept as shown in the figure. The direction of resultant magnetic field, indicated by arrow head at the point  $P$  is (approximately)

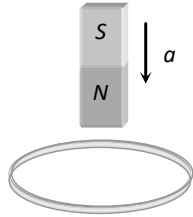


- (a)  $\rightarrow$  (b)  $\nearrow$  (c)  $\searrow$  (d)  $\uparrow$

27. The magnetic field to a small magnetic dipole of magnetic moment  $M$ , at distance  $r$  from the centre on the equatorial line is given by (in M.K.S. system)

- (a)  $\frac{\mu_0}{4\pi} \times \frac{M}{r^2}$  (b)  $\frac{\mu_0}{4\pi} \times \frac{M}{r^3}$   
 (c)  $\frac{\mu_0}{4\pi} \times \frac{2M}{r^2}$  (d)  $\frac{\mu_0}{4\pi} \times \frac{2M}{r^3}$

28. A metallic ring is attached with the wall of a room. When the north pole of a magnet is brought near to it, the induced current in the ring will be



- (a) First clockwise then anticlockwise  
 (b) In clockwise direction  
 (c) In anticlockwise direction  
 (d) First anticlockwise then clockwise

29. The dimensions of magnetic flux are

- (a)  $MLT^{-2}A^{-2}$  (b)  $ML^2T^{-2}A^{-2}$   
 (c)  $ML^2T^{-1}A^{-2}$  (d)  $ML^2T^{-2}A^{-1}$

30. Magnetic flux  $\phi$  (in weber) linked with a closed circuit of resistance 10 ohm varies with time  $t$  (in seconds) as

$$\phi = 5t^2 - 4t + 1$$

The induced electromotive force in the circuit at  $t = 0.2$  sec. is

- (a) 0.4 volts (b) -0.4 volts  
 (c) -2.0 volts (d) 2.0 volts

31. The magnetic flux linked with a circuit of resistance 100 ohm increases from 10 to 60 webers. The amount of induced charge that flows in the circuit is (in coulomb)

- (a) 0.5 (b) 5 (c) 50 (d) 100

32. An e.m.f. of 5 volt is produced by a self-inductance, when the current changes at a steady rate from 3 A to 2 A in 1 millisecond. The value of self-inductance is

- (a) Zero (b) 5 H (c) 5000 H (d) 5 mH

33. An alternating current of frequency ' $f$ ' is flowing in a circuit containing a resistance  $R$  and a choke  $L$  in series. The impedance of this circuit is

- (a)  $R + 2\pi fL$  (b)  $\sqrt{R^2 + 4\pi^2 f^2 L^2}$   
 (c)  $\sqrt{R^2 + L^2}$  (d)  $\sqrt{R^2 + 2\pi fL}$

34. For high frequency, a capacitor offers  
 (a) More reactance (b) Less reactance  
 (c) Zero reactance (d) Infinite reactance

35. The de-Broglie wavelength associated with the particle of mass  $m$  moving with velocity  $v$  is  
 (a)  $h/mv$  (b)  $mv/h$  (c)  $mh/v$  (d)  $4 \times 10^4$

### SECTION -B

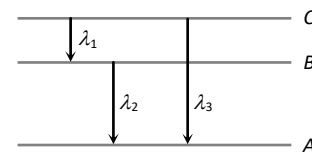
36. What will be the ratio of de-Broglie wavelengths of proton and  $\alpha$ -particle of same energy  
 (a) 2 : 1 (b) 1 : 2 (c) 4 : 1 (d) 1 : 4

37. A photon of energy 3.4 eV is incident on a metal having work function 2 eV. The maximum K.E. of photo-electrons is equal to  
 (a) 1.4 eV (b) 1.7 eV (c) 5.4 eV (d) 6.8 eV

38. The work function of a substance is 4.0 eV. The longest wavelength of light that can cause photoelectron emission from this substance is approximately  
 (a) 540 nm (b) 400 nm  
 (c) 310 nm (d) 220 nm

39. In the  $n^{\text{th}}$  orbit, the energy of an electron  $E_n = -\frac{13.6}{n^2} \text{ eV}$  for hydrogen atom. The energy required to take the electron from first orbit to second orbit will be  
 (a) 10.2 eV (b) 12.1 eV  
 (c) 13.6 eV (d) 3.4 eV

40. Energy levels A, B, C of a certain atom corresponding to increasing values of energy i.e.  $E_A < E_B < E_C$ . If  $\lambda_1, \lambda_2, \lambda_3$  are the wavelengths of radiations corresponding to the transitions C to B, B to A and C to A respectively, which of the following statements is correct

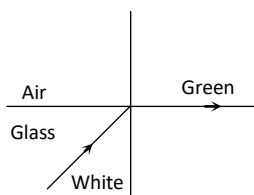


- (a)  $\lambda_3 = \lambda_1 + \lambda_2$  (b)  $\lambda_3 = \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$   
 (c)  $\lambda_1 + \lambda_2 + \lambda_3 = 0$  (d)  $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

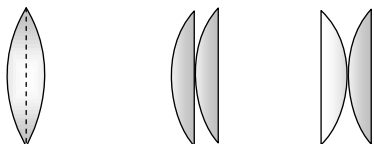
41. In Bohr model of hydrogen atom, the ratio of periods of revolution of an electron in  $n=2$  and  $n=1$  orbits is

- (a) 2 : 1 (b) 4 : 1  
 (c) 8 : 1 (d) 16 : 1

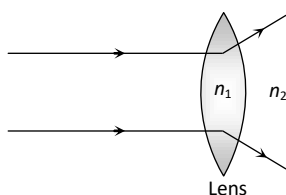
42. Rutherford's  $\alpha$ -particle experiment showed that the atoms have  
 (a) Proton (b) Nucleus  
 (c) Neutron (d) Electrons
43. For total internal reflection to take place, the angle of incidence  $i$  and the refractive index  $\mu$  of the medium must satisfy the inequality  
 (a)  $\frac{1}{\sin i} < \mu$  (b)  $\frac{1}{\sin i} > \mu$   
 (c)  $\sin i < \mu$  (d)  $\sin i > \mu$
44. White light is incident on the interface of glass and air as shown in the figure. If green light is just totally internally reflected then the emerging ray in air contains



- (a) Yellow, orange, red  
 (b) Violet, indigo, blue  
 (c) All colours  
 (d) All colours except green
45. Two similar plano-convex lenses are combined together in three different ways as shown in the adjoining figure. The ratio of the focal lengths in three cases will be



- (a) 2 : 2 : 1 (b) 1 : 1 : 1  
 (c) 1 : 2 : 2 (d) 2 : 1 : 1
46. Two thin lenses of focal lengths 20 cm and 25 cm are placed in contact convex. The effective power of the combination is  
 (a) 45 dioptres (b) 9 dioptres  
 (c) 1/9 dioptre (d) 6 dioptres
47. The relation between  $n_1$  and  $n_2$ , if behaviour of light rays is as shown in figure is

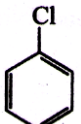
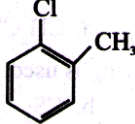
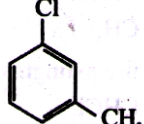


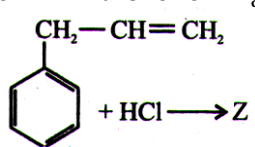
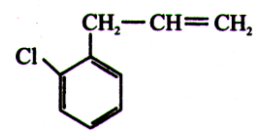
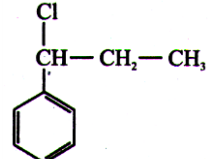
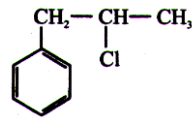
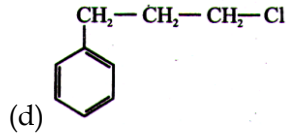
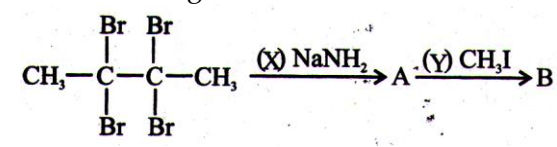
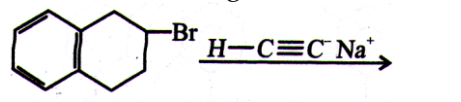
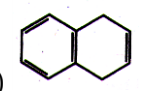
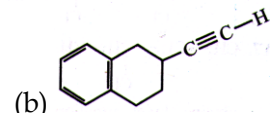
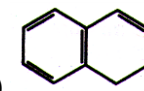
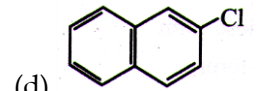
- (a)  $n_1 \gg n_2$  (b)  $n_2 > n_1$  (c)  $n_1 > n_2$  (d)  $n_1 = n_2$

48. If the ratio of amplitude of two waves is 4 : 3, then the ratio of maximum and minimum intensity is  
 (a) 16 : 18 (b) 18 : 16  
 (c) 49 : 1 (d) 94 : 1
49. In Young's double slit interference experiment, the slit separation is made 3 fold. The fringe width becomes  
 (a) 1/3 times (b) 1/9 times  
 (c) 3 times (d) 9 times
50. In Young's experiment, the distance between the slits is reduced to half and the distance between the slit and screen is doubled, then the fringe width  
 (a) Will not change  
 (b) Will become half  
 (c) Will be doubled  
 (d) Will become four times

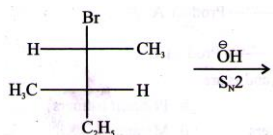
## CHEMISTRY

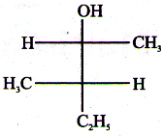
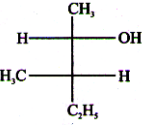
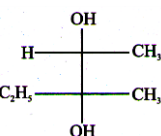
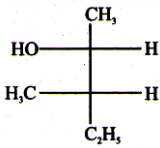
### SECTION - A

51. Which of the following is the example of  $S_N2$  reaction?  
 (a)  $\text{CH}_3\text{Br} + \text{OH}^- \rightarrow \text{CH}_3\text{OH} + \text{Br}^-$   
 (b)  $\text{CH}_3\text{CHBrCH}_3 + \text{OH}^- \rightarrow \text{CH}_3\text{CHOHCH}_3 + \text{Br}^-$   
 (c)  $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{-\text{H}_2\text{O}} \text{CH}_2 = \text{CH}_2$   
 (d)  $\text{CH}_3 - \underset{\text{Br}}{\overset{\text{CH}_3}{\text{C}}} - \text{CH}_3 + \text{OH}^- \rightarrow \text{CH}_3 - \underset{\text{H}}{\overset{\text{CH}_3}{\text{C}}} - \text{O} - \text{CH}_3 + \text{Br}^-$
52. What will be the increasing order towards nucleophilic substitution :
- (i)  (ii)  (iii) 
- (a) (i) < (ii) < (iii) (b) (i) < (iii) < (ii)  
 (c) (iii) < (ii) < (i) (d) (ii) < (iii) < (i)
53. A mixture of two organic chlorine compounds was treated with sodium metal in ether solution. Isobutane was obtained as a product. The two chlorine compounds are  
 (a) Methyl chloride and propyl chloride  
 (b) Methyl chloride and ethyl chloride  
 (c) Isopropyl chloride and methyl chloride  
 (d) Isopropyl chloride and ethyl chloride

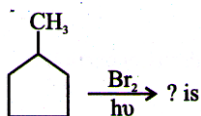
54. Which of the following alcohols will yield the corresponding alkyl chloride on reaction with concentrated HCl at room temperature ?
- (a)  $\text{CH}_3\text{CH}_2-\text{CH}_2-\text{OH}$   
 (b)  $\text{CH}_3\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{OH}$   
 (c)  $\text{CH}_3\text{CH}_2-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2\text{OH}$   
 (d)  $\text{CH}_3\text{CH}_2-\underset{\text{CH}_3}{\text{C}}-\text{OH}$
55.  $\text{C}_6\text{H}_5\text{CH}_3$  reacts with a halogen group like Cl, Br in the presence of  $\text{FeCl}_3$  to give o- and p- halo compounds. The reaction is :
- (a) Electrophilic elimination reaction  
 (b) Electrophilic substitution reaction  
 (c) Free radical addition reaction  
 (d) Elimination reaction
56. The structure of 'Z' in the following reaction ?
- 
- (a)   
 (b)   
 (c)   
 (d) 
57. In the compound  $\text{CH}_3\text{CH}=\text{CHC}(\text{Br})(\text{CH}_3)_2$  the position of Br can be classified as :
- (a) Allyl (b) Aryl (c) Vinyl (d) Tertiary
58. Chlorobenzene is formed by reaction of chlorine with benzene in the presence of  $\text{AlCl}_3$ . Among the given species, which one attacks the benzene ring in this reaction ?
- (a)  $\text{Cl}^-$  (b)  $\text{Cl}^+$  (c)  $\text{AlCl}_6$  (d)  $[\text{AlCl}_4]^-$
59. A compound of molecular formula  $\text{C}_7\text{H}_{16}$  shows optical isomerism, compound will be:
- (a) 2, 3-Dimethyl pentane  
 (b) 2, 2-Dimethyl butane  
 (c) 2-Methyl hexane  
 (d) None of above
60. Wurtz reaction of methyl iodide yields an organic compound X. Which one of the following reactions also yields X
- (a)  $\text{C}_2\text{H}_5\text{Cl} + \text{Mg} \xrightarrow{\text{dry ether}}$   
 (b)  $\text{C}_2\text{H}_5\text{Cl} + \text{LiAlH}_4 \rightarrow$   
 (c)  $\text{C}_2\text{H}_5\text{Cl} + \text{C}_2\text{H}_5\text{ONa} \rightarrow$   
 (d)  $\text{CHCl}_3 \xrightarrow[\Delta]{\text{Ag powder}}$
61. Identify X and Y in the following sequence  
 $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{X}} \text{Product} \xrightarrow{\text{Y}} \text{C}_3\text{H}_7\text{NH}_2$
- (a) X = KCN, Y =  $\text{LiAlH}_4$   
 (b) X = KCN, Y =  $\text{H}_3\text{O}^+$   
 (c) X =  $\text{CH}_3\text{Cl}$ , Y =  $\text{AlCl}_3/\text{HCl}$   
 (d) X =  $\text{CH}_3\text{NH}_2$ , Y =  $\text{HNO}_2$
62. Reactivity order of halides for dehydrohalogenation is :
- (a)  $\text{R-F} > \text{R-Cl} > \text{R-Br} > \text{R-I}$   
 (b)  $\text{R-I} > \text{R-Br} > \text{R-Cl} > \text{R-F}$   
 (c)  $\text{R-I} > \text{R-Cl} > \text{R-Br} > \text{R-F}$   
 (d)  $\text{R-F} > \text{R-I} > \text{R-Br} > \text{R-Cl}$
63. Consider the given reaction,
- 
- $\text{CH}_3-\text{C}\equiv\text{C}-\text{C}\equiv\text{C}-\text{CH}_3$   
 The value of x + y is :  
 (a) 2 (b) 8 (c) 4 (d) 5
64. Which of the following is the major product obtained from the following reaction ?
- 
- (a)   
 (b)   
 (c)   
 (d) 
65. An unknown alkyl halide (X) on reaction with alcoholic KOH produce a hydrocarbon ( $\text{C}_4\text{H}_8$ ). Ozonolysis of the hydrocarbon affords one mole of propionaldehyde and one mole of formaldehyde. Which of the following structures is the correct structure of the above alkyl halide (X) ?
- (a)  $\text{CH}_3(\text{CH}_2)_3\text{Br}$  (b)  $\text{Br}(\text{CH}_2)_6$   
 (c)  $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{CH}_3$  (d)  $\text{Br}(\text{CH}_2)_4\text{Br}$

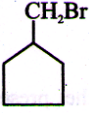
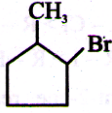
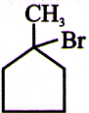
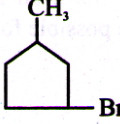
66. The most probable product obtained in the following reaction will be :



- (a)  (b) 
- (c)  (d) 

67. The major product obtained in the reaction :



- (a)  (b) 
- (c)  (d) 

68. Ethanol on reaction with  $\text{PCl}_5$  produced X,  $\text{POCl}_3$  and  $\text{HCl}$ . X reacts with silver nitrite to form Y (major product) and  $\text{AgCl}$ . X and Y are respectively.

- (a)  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{CH}_3\text{Cl}$  (b)  $\text{C}_2\text{H}_6$ ,  $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$   
 (c)  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{ONO}$  (d)  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$

69. In the esterification reaction, the correct order of reactivity of alcohols is :

- (a)  $\text{CH}_3\text{OH} > \text{CH}_3\text{CH}_2\text{OH} > (\text{CH}_3)_2\text{CHOH}$   
 (b)  $\text{CH}_3\text{OH} > (\text{CH}_3)_2\text{CHOH} > \text{CH}_3\text{CH}_2\text{OH}$   
 (c)  $\text{CH}_3\text{CH}_2\text{OH} > (\text{CH}_3)_2\text{CHOH} > \text{CH}_3\text{OH}$   
 (d)  $(\text{CH}_3)_2\text{CHOH} > \text{CH}_3\text{OH}_2\text{OH} > \text{CH}_3\text{OH}$

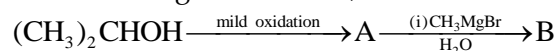
70. In the commercial manufacture of ethyl alcohol from starchy substances by fermentation method, which enzymes stepwise complete the fermentation reaction

- (a) Diastase, maltase and zymase  
 (b) Maltase, Zymase and invertase  
 (c) Diastase, zymase and lactase  
 (d) Diastase, invertase and zymase

71. In Williamson's synthesis, ethoxyethane is prepared by

- (a) passing ethanol over heated alumina  
 (b) Sodium ethoxide with ethyl bromide  
 (c) Ethyl alcohol with sulphuric  
 (d) Ethyl iodine and dry silver oxide

72. Consider the given reaction,



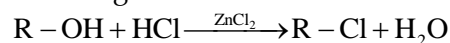
Here 'B' is :

- (a) Iso butyl alcohol (b) Sec. Pentyl alcohol  
 (c) Sec. Butyl alcohol (d) Tert. Butyl alcohol

73. A compound X with molecular formula  $\text{C}_3\text{H}_8\text{O}$  can be oxidised to a compound Y with the molecular formula oxidised to a compound Y with then molecular formula  $\text{C}_3\text{H}_6\text{O}_2$ . X is most likely to be

- (a) Primary alcohol (b) Secondary alcohol  
 (c) Aldehyde (d) Ketone

74. The correct order of reactivity of alcohols in the following reaction is :

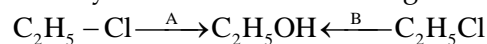


- (a)  $1^\circ > 2^\circ > 3^\circ$  (b)  $1^\circ < 2^\circ > 3^\circ$   
 (c)  $3^\circ > 2^\circ > 1^\circ$  (d)  $2^\circ < 1^\circ > 3^\circ$

75. The strongest acid among the following aromatic compounds is :

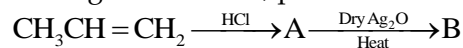
- (a) *Ortho*-nitrophenol (b) *Para*-chlorophenol  
 (c) *Para*-nitrophenol (d) *Meta*-nitrophenol

76. Identify A and B in the following reaction :



- (a) A = aqueous KOH; B = moist  $\text{Ag}_2\text{O}$   
 (b) A = alcoholic KOH; B = aqueous NaOH  
 (c) A = aqueous NaOH; B =  $\text{AgNO}_2$   
 (d) A =  $\text{AgNO}_2$ ; B =  $\text{KNO}_2$

77. In the given reaction, product B is :



- (a) Di isopropyl ether  
 (b) Di n-propyl ether  
 (c) 3-Propanone  
 (d) 1, 2-Epoxypropane

78. Hydration of alkene in a acidic medium is proceed through

- (a) Carbocation (b) Carbanion  
 (c) Carbene (d) None of these

79. Two organic compounds A and B react with sodium metal and release H<sub>2</sub> gas. A and B react with each other to give ethyl acetate. Then A and B are :

- (a) CH<sub>3</sub>COOH and C<sub>2</sub>H<sub>5</sub>OH  
 (b) HCOOH and C<sub>2</sub>H<sub>5</sub>OH  
 (c) CH<sub>3</sub>COOH and CH<sub>3</sub>OH  
 (d) CH<sub>3</sub>COOH and HCOOH

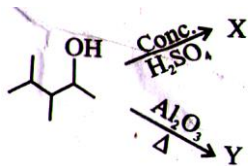
80. Compound A reacts with Na metal to give B. A also reacts with PCl<sub>5</sub> to give C. B and C reacts with each other to give dimethyl ether. Then A, B C respectively are :

- (a) CH<sub>3</sub>OH, CH<sub>3</sub>ONa, CH<sub>3</sub>COCl  
 (b) CH<sub>3</sub>OH, CH<sub>4</sub>CH<sub>3</sub>Cl  
 (c) CH<sub>3</sub>OH, CH<sub>3</sub>ONa, CH<sub>3</sub>Cl  
 (d) CH<sub>3</sub>Cl, CH<sub>4</sub>, CH<sub>3</sub>OH

81. The correct order of boiling point for primary (1°), secondary (2°) and tertiary (3°) alcohols is

- (a) 1° > 2° > 3°                      (b) 3° > 2° > 1°  
 (c) 2° > 1° > 3°                      (d) 2° > 3° > 1°

82.



What is correct for major products X & Y ?

- (a) X is & Y is   
 (b) X is & Y is   
 (c) Both X & Y are   
 (d) None of these

83. Which of the following statements is correct regarding ease of dehydration in alcohols ?

- (a) Primary > Secondary  
 (b) Secondary > Tertiary  
 (c) Tertiary > Primary  
 (d) None of these

84. Which of the following molecule cannot be oxidised by PCC ?

- (a)                      (b)   
 (c)                      (d) Both (b) and (c)

85. Distinction between primary, secondary and tertiary alcohol is done by

- (a) Oxidation method    (b) Lucas test  
 (c) Victor Meyer method    (d) All of these

### SECTION -B

86. Among the given four compounds.

- (A) Phenol                      (B) Para-nitrophenol  
 (C) Meta nitrophenol    (D) Methyl phenol

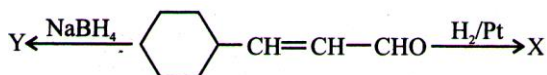
The correct acidity order for given compounds is :

- (a) 2 > 3 > 1 > 4                      (b) 3 > 4 > 1 > 2  
 (c) 3 > 1 > 4 > 2                      (d) 2 > 1 > 4 > 3

87. Among the given compounds, which compound will be most readily dehydrated ?

- (a)                      (b)   
 (c)                      (d) None of these

88.



X and Y in the above reaction are, respectively-

- (a) CH<sub>3</sub>CH<sub>2</sub>OH -CH=CH-Cl  
 (b) -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH,  
        -CH=CH-CH<sub>2</sub>OH  
 (c) -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH in both cases  
 (d) -CH=CH-CH<sub>2</sub>OH in both cases

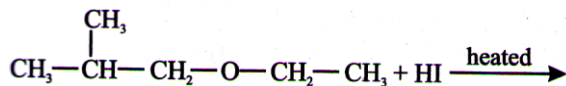
89. In the reaction,  $\xrightarrow{\text{HBr}}$  ?

The products obtained in the above reaction are :

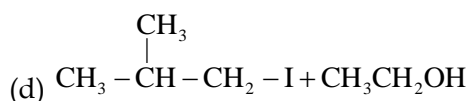
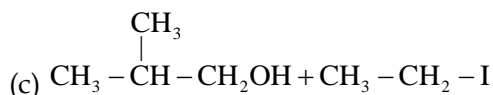
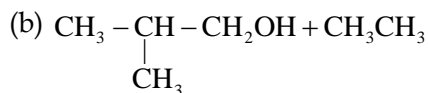
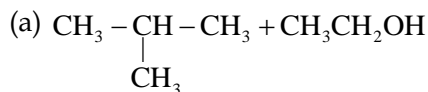
- (a) and H<sub>3</sub>  
 (b) -Br and CH<sub>3</sub>Br  
 (c) CH<sub>3</sub>Br and CH<sub>3</sub>CH<sub>2</sub>OH  
 (d) -OH and CH<sub>3</sub>Br



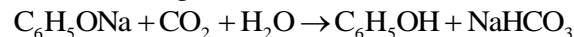
90. In the reaction :



Which of the following compounds will be formed ?



91. Consider the given reaction :



Above reaction suggests that :

- (a) Phenol is a stronger acid than carbonic acid  
 (b) Carbonic acid is a stronger acid than phenol  
 (c) Phenol is weaker acid than water  
 (d) None of the above

92. From amongst the following alcohols, the one that would react fastest with conc. HCl and anhydrous  $\text{ZnCl}_2$  is

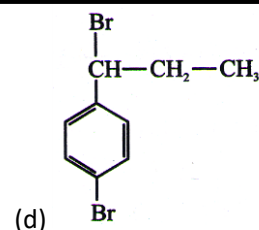
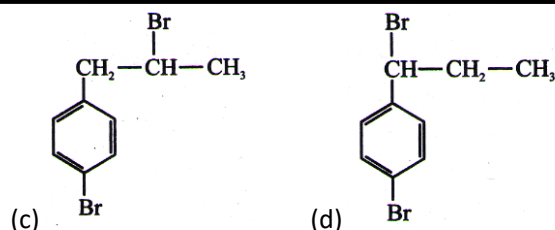
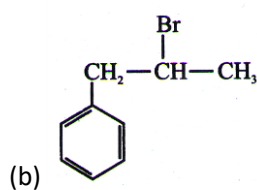
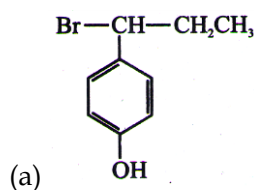
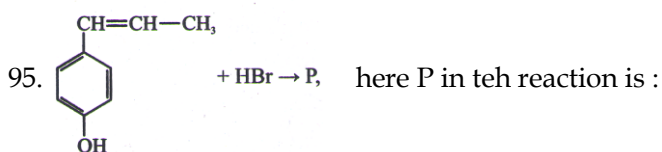
- (a) Butanol (b) Propene  
 (c) Methylpropan-2-ol (d) Methylpropanol-1

93. Which of the following is obtained as the major product on interaction of phenol with NaOH and  $\text{CO}_2$  ?

- (a) Ethanoic acid (b) Salicydehyde  
 (c) Salicyclic acid (d) Benzoic acid

94. Which among the given is known as wood spirit?

- (a) Ethanol (b) Ethanone  
 (c) Methanol (d) Methanal



96. When alkyl halide reacts with moist  $\text{Ag}_2\text{O}$  gives :

- (a) Alcohol (b) Ether  
 (c) Alkane (d) Alkene

97. Which compound from the following is used for metal cleaning and finishing ?

- (a)  $\text{CHCl}_3$  (b)  $\text{CHI}_3$   
 (c)  $\text{CH}_2\text{Cl}_2$  (d)  $\text{C}_6\text{H}_6\text{Br}$

98. What will be the following reaction called,  
 $\text{C}_2\text{H}_5\text{Br} + \text{NaI} \xrightarrow[\Delta]{\text{Acetone}} \text{C}_2\text{H}_5\text{I} + \text{NaBr}$

- (a) Hunsdiecker's reaction  
 (b) Finkelstein reaction  
 (c) Wurtz reaction  
 (d) Swartz reaction

99. Which one is most reactive towards  $\text{S}_{\text{N}}1$  reaction ?

- (a)  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$  (b)  $\text{C}_6\text{H}_5\text{CH}(\text{C}_6\text{H}_5)\text{Br}$   
 (c)  $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Br}$  (d)  $\text{C}_6\text{H}_5\text{C}(\text{CH}_3)(\text{C}_6\text{H}_5)\text{Br}$

100. Which is more reactive towards  $\text{S}_{\text{N}}1$

- (a)  $\text{CH}_3\text{CH}_2\text{Br}$  (b)  $\text{PhBr}$   
 (c)  $\text{PhCH}_2\text{CH}_2\text{Br}$  (d)  $\text{PhCH}_2\text{Br}$

## BOTANY

### SECTION - A

101. The anther wall layers (s) that perform(s) the function of protection is/are

- A. Epidermis B. Endothecium  
 C. Middle layers D. Tapetum  
 (a) Only A (b) Only A and C  
 (c) All except C (d) All except D

102. Vegetative cell of pollen grain differs from its generative cell as the former

- (a) Is bigger in size and has abundant food reserve  
 (b) Has a small irregularly shaped nucleus  
 (c) Is smaller in size and has dense cytoplasm  
 (d) Has spindle shaped nucleus

103. As the anther matures and dehydrates, the microspore tetrad dissociate and release

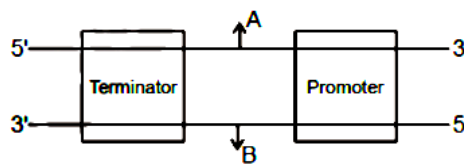
- (a) Pollen sacs (b) Ovules  
 (c) Pollen grains (d) Male gametes

104. The coconut water

- (a) Is free nuclear endosperm  
 (b) Contains only one nucleus  
 (c) Does not contain any nucleus  
 (d) Is cellular endosperm

105. Transfer of pollen grains from anther to the stigma of the flower of different plant of the same species is called  
 (a) Geitonogamy (b) Xenogamy  
 (c) Autogamy (d) Cleistogamy
106. Seeds that retain a part of endosperm as it is not completely used up during embryo development are found in all, **except**  
 (a) Wheat and maize  
 (b) Wheat and castor  
 (c) Maize and castor  
 (d) Pea and groundnut
107. What would be the number of chromosomes in the cells of scutellum and aleurone layer respectively of a maize seed, if it has eight chromosomes in its antipodal cells?  
 (a) 32 and 16 (b) 16 and 24  
 (c) 8 and 16 (d) 24 and 8
108. Parthenocarpy and apomixis are similar in lacking  
 (a) Fertilization (b) Embryo formation  
 (c) Fruit formation (d) Seed formation
109. Choose the statement which is correct about the post pollination events after the compatible pollination.  
 (a) Pollen grains germinate to produce pollen tube through one of its germ pores in anther  
 (b) If pollen grains are shed at three-celled stage, pollen tube carries two male gametes from the beginning  
 (c) Self incompatibility is necessary for self cross  
 (d) Generative cell divides through meiosis to form male gametes during the growth of pollen tube
110. Choose the correct match  
 (a) Coleoptile - Encloses radical and root cap  
 (b) Coleorhiza - Encloses epicotyl  
 (c) Aleurone layer - Proteinaceous in nature  
 (d) Scutellum - Part of embryonal axis
111. Which of the following devices prevents autogamy as well as geitonogamy?  
 (a) Homogamy  
 (b) Dioecious condition  
 (c) Monoecious condition  
 (d) Cleistogamy
112. Mendel experimented on garden pea for  
 (a) Six years  
 (b) Fourteen years  
 (c) Ten years  
 (d) Seven years
113. Graphical representation to calculate the probability of all possible genotypes of offsprings in a genetic cross was given by  
 (a) R.C. Punnett (b) G.J. Mendel  
 (c) Bateson (d) Johannsen
114. Most frequent skin colour seen in a human population is  
 (a) Dark  
 (b) Fairly light  
 (c) Very light  
 (d) Intermediate colour
115. What percentage of offspring would have genotype AabbCcDd if parents are AaBbccDd and AAAbbCcDD?  
 (a) 25 (b) 6.25 (c) 12.5 (d) 0.625
116. Term recombination was proposed by  
 (a) Morgan (b) Sturtevant  
 (c) Mendel (d) Hugo de Vries
117. Total number of different phenotypes in F<sub>2</sub> generation in a typical Mendelian dihybrid cross is  
 (a) 8 (b) 16 (c) 3 (d) 4
118. Which of the following traits is expressed only in homozygous condition in pea plant?  
 (a) Tall height  
 (b) Violet flower  
 (c) Green pod  
 (d) Terminal flower position
119. One of the reasons for adopting garden pea for experiment by Mendel was  
 (a) Flowers show cross pollination naturally  
 (b) It is a leguminous plant  
 (c) It is a dicot plant  
 (d) It has many distinct alternative traits
120. How many different types of gametes will be produced by the organism with genotype PpQqRrSsTt?  
 (a) 8 (b) 4 (c) 32 (d) 9
121. Nucleoside in DNA can be represented as  
 (a) Adenine + ribose sugar  
 (b) Thymine + pentose sugar  
 (c) Uracil + Pentose sugar  
 (d) Guanine + ribose sugar
122. N - glycosidic linkages in a polynucleotide chain join  
 (a) A nitrogenous base to a pentose sugar  
 (b) A nucleotide to a ribose sugar  
 (c) A nucleoside to a pentose sugar  
 (d) A phosphate group to a nucleoside

123. Methylated form of uracil  
 (a) Is a purine base  
 (b) Is present in DNA  
 (c) Is present in mRNA  
 (d) Has four N - atoms
124. The unequivocal proof that DNA is the genetic material came from the experiment  
 (a) Performed by Avery, MacLeod and McCarty  
 (b) Performed by Alfred Hershey and Martha Chase  
 (c) That used heavy isotope of nitrogen  
 (d) In which radioactive thymidine was used
125. If the proportion of thymine in dsDNA of all the bases is 43%, then what will be the proportion of bicyclic nitrogenous - base in this DNA?  
 (a) 43% (b) 7% (c) 14% (d) 50%
126. In Griffith's experiments, mice died when injected with  
 (a) Heat killed R - strain bacteria  
 (b) Live R - strain bacteria  
 (c) Heat killed S - strain combined with live R strain bacteria  
 (d) Only heat killed S - strain bacteria
127. DNA is preferred over RNA as genetic material due to many reasons. One of them is  
 (a) It can directly code for protein synthesis  
 (b) Thymine in DNA confers for additional stability  
 (c) DNA is able to mutate at faster rate  
 (d) It has reactive 2' - OH group in nucleotide
128. By performing a series of experiments that showed the effect of R and S strains of *Streptococcus pneumoniae* on mice, Griffith concluded that  
 (a) Protein digesting enzyme does not affect transformation  
 (b) DNA is more stable genetic material than RNA  
 (c) DNA can be synthesised from RNA  
 (d) Non - virulent bacteria were transformed by heat killed virulent bacteria
129. Which of the following features is/are associated with heterochromatin?  
 (i) Light stained region  
 (ii) Densely packed  
 (iii) Transcriptionally inactive  
 (a) (i) and (ii) (b) (ii) and (iii)  
 (c) Only (ii) (d) (i) and (iii)
130. Select incorrect statement w.r.t. human genome.  
 (a) Smallest known human gene is dystrophin with only 2400 bases  
 (b) Human genome contains 3164.7 million nucleotide bases  
 (c) Less than 2 percent of genome codes for protein  
 (d) The sequence of chromosome 1 was completed in May 2006
131. Number of genes associated with chromosome 1 in human beings is  
 (a) 14 (b) 2968 (c) 3000 (d) 231
132. The formation of peptide bond between two amino acids during translation in *E. coli* bacterium is catalysed by.  
 (a) 18 S rRNA (b) 23S rRNA  
 (c) 16S rRNA (d) 28S rRNA
133. Tailing of hnRNA is the addition of \_\_\_\_ (A) \_\_\_\_ residues with the help of \_\_\_\_ (B) \_\_\_\_  
 (a) (A) 200 - 300 adenylate, (B) Poly A polymerase  
 (b) (A) 100 - 200 adenylate, (B) Guanyl transferase  
 (c) (A) 200 - 300 adenylate, (B) Guanyl transferase  
 (d) (A) 100 - 200 adenylate, (B) Poly T polymerase
134. Choose correct option for A and B w.r.t. schematic representation of a transcription unit given in figure



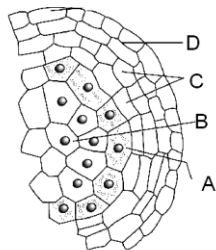
(a)	A - non - template strand	B - Coding strand
(b)	A - Coding strand	B - Non - template strand
(c)	A - Template strand	B - Coding strand
(d)	A - Sense strand	B - Antisense strand

135. In prokaryotic DNA replication  
 (a) DNA polymerase II is the main polymerizing enzyme  
 (b) Deoxyribonucleoside triphosphates provide energy for polymerisation  
 (c) Only DNA polymerases are required  
 (d) Five types of RNA polymerases are used

**SECTION – B**

136. Which of the given is largest cell of embryo sac?  
 (a) Synergid (b) Egg  
 (c) Antipodal cells (d) Central cell

137. Which of the following parts of a typical anther is correctly matched with its functional or structural aspect ?



- (a) D-site of microsporogenesis  
 (b) B-Ephemeral layer  
 (c) C-Polyploid and secretory layer  
 (d) A-Nutritive layer

138. Pollen allergy is/occurs  
 (a) Due to pollen grains of many hydrophilous plants  
 (b) Not associated with any kind of respiratory disorders  
 (c) Due to pollen grains of carrot grass, *Amaranthus* etc.  
 (d) Due to megaspores

139. Endosperm is a product of A and develops from B of embryo sac.  
 Select the option which correctly fills A and B.  
 (a) A-Syngamy, B-Central cell  
 (b) A-Triple fusion, B-Nucellus  
 (c) A-Syngamy, B-Nucellus  
 (d) A-Triple fusion, B-central cell

140. Identify the incorrect statement  
 (a) In aquatic plants such as water lily, the flowers are pollinated by insects  
 (b) Hydrophily takes place in *Salvia* and water hyacinth  
 (c) Sticky pollen grains and presence of nectaries are characteristics of the entomophilous plants  
 (d) Larger animals like lemur and tree dwelling rodents are reported as pollinator in some species

141. In garden pea, gene controlling starch synthesis is related to all of the given phenomenon, except  
 (a) Pleiotropy  
 (b) Incomplete dominance  
 (c) Codominance  
 (d) Complete dominance

142. Which one is a test cross?  
 (a) TT × TT (b) tt × tt  
 (c) Tt × TT (d) Tt × tt

143. Mark the statement incorrect for chromosomal theory of inheritance.  
 (a) Both chromosomes and genes retain their number and individuality throughout the life of an organism  
 (b) Chromosomes are carries of Mendelian factors which segregate and assort independently during meiosis  
 (c) The two alleles of a gene pair are located on homologous sites of non - homologous chromosomes  
 (d) A gamete carries only one chromosome of a type and one of two alleles of a gene

144. A woman has AB blood group. She marries to a man with blood group B whose mother has blood group O. Calculate the probability of their child to be with blood group AB.

- (a)  $\frac{1}{2}$  (b)  $\frac{1}{4}$  (c)  $\frac{1}{8}$  (d)  $\frac{1}{16}$

145. Select the odd one w.r.t. dominant traits of pea.  
 (a) Green pod colour  
 (b) Green seed colour  
 (c) Inflated pod shape  
 (d) Round seed shape

146. In prokaryotes, RNA polymerase binds to a region of DNA which is recognized by  
 (a) ρ factor (b) tRNA  
 (c) σ factor (d) Core enzyme

147. Which of the following is wrong polymerase enzyme is bacteria?  
 (a) It facilitates opening of the DNA helix  
 (b) Needs RNA primer to initiate transcription  
 (c) It is a holoenzyme  
 (d) Catalyses polymerization in 5' → 3' direction

148. What would be the number amino acids in the polypeptide coded by mRNA with given nucleotide sequence if the 15<sup>th</sup> nucleotide from 5' end is deleted?

5'-AUGGUGUUUUGUUGGACC UAA-3'

- (a) 4 (b) 5 (c) 6 (d) 3

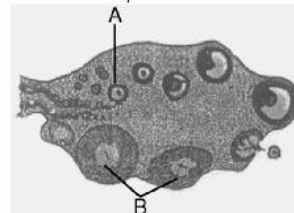
149. In the synthesis of which of the following, DNA is not directly involved?  
 (a) mRNA (b) rRNA  
 (c) Polypeptide chain (d) tRNA

150. All the termination codons of universal genetic codes begin with a particular nitrogenous base, that is  
 (a) Adenine (b) Cytosine  
 (c) Uracil (d) Thymine

**ZOOLOGY**  
**SECTION - A**

151. Which of the following is considered a hot-spot of biodiversity in India ?  
 (a) Indo-Gangetic Plain  
 (b) Eastern Ghats  
 (c) Aravalli Hills  
 (d) Western Ghats
152. Measuring Biochemical Oxygen Demand (BOD) is a method used for  
 (a) estimating the amount of organic matter in sewage water.  
 (b) working out the efficiency of oil driven automobile engines.  
 (c) measuring the activity of *Saccharomyces cerevisiae* in producing curd on a commercial scale.  
 (d) working out the efficiency of RBCs about their capacity to carry oxygen.
153. Which one of the following ecosystem types has the highest annual net primary productivity?  
 (a) Tropical deciduous forest  
 (b) Temperate evergreen forest  
 (c) Temperate deciduous forest  
 (d) Tropical rain forest
154. What will happen if decomposers are removed from the ecosystem?  
 (a) Energy cycle is stopped  
 (b) Mineral cycle is stopped  
 (c) Consumers cannot absorb solar energy  
 (d) Rate of decomposition of mineral increases
155. The formula for exponential population growth is  
 (a)  $dN/rN = dt$                       (b)  $rN / dN = dt$   
 (c)  $dN / dt = rN$                       (d)  $dt / dN = Rn$
156. Which one of the following statements about Human sperm is correct?  
 (a) Acrosome has a conical pointed structure used for piercing and penetrating the egg, resulting in fertilisation.  
 (b) The sperm lysins in the acrosome dissolve the egg envelope facilitating fertilisation.  
 (c) Acrosome serves as a sensory structure leading the sperm towards the ovum.  
 (d) Acrosome serves no particular function.
157. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct?  
 (a) Yeast - Statins  
 (b) *Acetobacter aceti* - Acetic acid  
 (c) *Clostridium butylicum* - Lactic acid  
 (d) *Aspergillus niger* - Citric acid
158. Select the correct statement from the ones given below.  
 (a) Barbiturates when given to criminals make them tell the truth.  
 (b) Morphine is often given as a pain killer to persons who have undergone surgery.  
 (c) Chewing tobacco lowers blood pressure and heart rate.  
 (d) Cocaine is given to patients after surgery as it stimulates recovery.
159. Which of the following is a pair of viral diseases?  
 (a) Common cold, AIDS  
 (b) Dysentery, Common cold  
 (c) Typhoid, Tuberculosis  
 (d) Ringworm, AIDS
160. Haemophilia is more commonly seen in human males than in human females because  
 (a) a greater proportion of girls die in infancy.  
 (b) this disease is due to a Y-linked recessive mutation.  
 (c) this disease is due to an X-linked recessive mutation.  
 (d) this disease is due to an X-linked dominant mutation.
161. The following graph is of relative concentrations of the four hormones present in the blood plasma of a woman during her menstrual cycle. Identify the hormones.
- 
- |     | A   | B            | C   | D            |
|-----|-----|--------------|-----|--------------|
| (a) | FSH | Progesterone | LH  | Oestrogen    |
| (b) | LH  | Progesterone | FSH | Oestrogen    |
| (c) | FSH | Oestrogen    | LH  | Progesterone |
| (d) | LH  | Oestrogen    | FSH | Progesterone |
162. The technique called Gamete Intrafallopian Transfer (GIFT) is recommended for those females  
 (a) who cannot produce an ovum.  
 (b) who cannot retain the foetus inside uterus.  
 (c) whose cervical canal is too narrow to allow passage for the sperms.  
 (d) who cannot provide suitable environment for fertilisation.

163. Which of the following statement(s) is/are correct?  
 (i) Organisms living in oceans, lakes and rivers do not face any water-related problems.  
 (ii) Euryhaline can tolerate a wide range of salinities.  
 (iii) Stenohaline are restricted to a narrow range of salinities.  
 (iv) No fresh water animals cannot live for long in sea water but sea animals can live in fresh water for long time because of osmotic balance  
 (a) All are correct (b) All are false  
 (c) Only (iv) (d) (i), (iii) and (iv)
164. Sacred groves are found in  
 (i) Khasi and Jaintia Hills in Meghalaya  
 (ii) Aravalli Hills of Rajasthan  
 (iii) Western ghat regions of Karnataka and Maharashtra and Sarguja, Chanda and Bastar areas of Madhya Pradesh  
 (iv) None of these  
 (a) (i) and (ii) (b) (i), (ii), and (iii)  
 (c) (ii), (iii) and (iv) (d) Only (iv)
165. Which gas is responsible for the puffed-up appearance of dough?  
 (a) CO<sub>2</sub> (b) O<sub>2</sub> (c) SO<sub>2</sub> (d) NO<sub>2</sub>
166. About which day in a normal human menstrual cycle does rapid secretion of LH (Popularly called LH-surge) normally occurs?  
 (a) 14<sup>th</sup> day (b) 20<sup>th</sup> day  
 (c) 5<sup>th</sup> day (d) 11<sup>th</sup> day
167. The chemical method of contraception includes  
 (a) jellies only  
 (b) creams and foams only  
 (c) oral contraceptives only  
 (d) all of the above
168. Which one of the following is commonly used in transfer of foreign DNA into crop plants?  
 (a) *Meloidogyne incognita*  
 (b) *Agrobacterium tumefaciens*  
 (c) *Penicillium expansum*  
 (d) *Trichoderma harzianum*
169. Which one of the following is an example of Ex-situ conservation?  
 (a) Wildlife sanctuary  
 (b) Seed bank  
 (c) Sacred groves  
 (d) National park
170. Which of the following statements about Restriction enzymes is false?  
 (a) They work on DNA extracted from all types of organisms.  
 (b) They are used to glue together short segments of DNA.  
 (c) They come in many varieties, each with its own DNA target sequence.  
 (d) They are highly specific for their DNA target sequences.
171. Roquefort cheese is produced with the help of  
 (a) Yeast  
 (b) *Rhizopus nigricans*  
 (c) *Aspergillus niger*  
 (d) *Penicillium roquefortii*
172. The figure shows a section of human ovary. Select the option which gives the correct identification of A and B with function/characteristic:

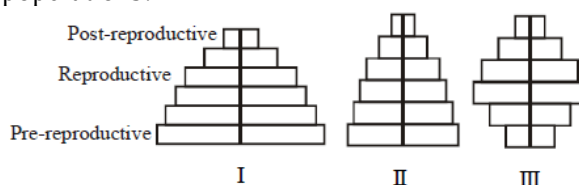


- (a) A - Primary oocyte - it is the prophase - I of the meiotic division  
 (b) B - Corpus luteum - secretes progesterone  
 (c) A - Tertiary follicle - forms Graafian follicle  
 (d) B - Corpus luteum - secretes estrogen

173. The number of chromatids in a chromosome at anaphase is  
 (a) 2 in mitosis and 1 in meiosis  
 (b) 1 in mitosis and 2 in meiosis  
 (c) 2 each in mitosis and meiosis  
 (d) 2 in mitosis and 4 in meiosis

174. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?  
 (a) 50% (b) 25% (c) 100% (d) no chance

175. What does the shape of the given age pyramids (I to III) reflect about the growth status of populations?



	I	II	III
(a)	Declining	Stable	Expanding
(b)	Stable	Expanding	Declining
(c)	Expanding	Stable	Declining
(d)	Declining	Expanding	Stable

176. Which one of the following areas in India, is a hot spot of biodiversity?  
 (a) Eastern Ghats (b) Gangetic Plain  
 (c) Sunderbans (d) Western Ghats

177. If a colour blind woman marries a normal visioned man, their sons will be  
 (a) one-half colour blind and one-half normal  
 (b) three-fourths colour blind and one-fourth normal  
 (c) all colour blind sons  
 (d) all normal visioned

178. Food chains differ from food webs in that  
 (i) food chains are single sequence of who eats whom in a community.  
 (ii) food chains better represent the entire community.  
 (iii) food webs represent the complex interaction among food chains.  
 (iv) food chain is the flow of energy in a population.  
 (a) (i) and (iii) (b) (i) and (iv)  
 (c) (i), (ii) and (iii) (d) N.O.T.

179. Adaptive radiation refers to  
 (a) evolution of different species from a common ancestor  
 (b) migration of members of a species to different geographical areas  
 (c) power of adaptation in an individual to a variety of environments  
 (d) adaptations due to geographical isolation

180. A biologist studied the population of rats in a barn. He found that the average natality was 250, average mortality 240, immigration 20 and emigration 30. The net increase in population is  
 (a) 15 (b) 05 (c) zero (d) 10

181. Which one of the following genes is defective in patients suffering from Severe Combined Immuno-deficiency Syndrome (SCID) ?  
 (a) RNAase  
 (b) ADA  
 (c) Ribonucleotide reductase  
 (d) DNAase

182. Progestasert and LNG-20 are  
 (a) Implants  
 (b) Copper releasing IUDs  
 (c) Non-medicated IUDs  
 (d) Hormone releasing IUDs

183. Match column -I with column - II.

	Column - I		Column - II
A.	Endometrium	I.	Copulation chamber in female
B.	Menopause	II.	Site of implantation of zygote
C.	Fallopian tube	III.	Cessation of menstrual cycle in female
D.	Vagina	IV.	Site of fertilization in female

- (a) A → (II); B → (III); C → (IV); D → (I)  
 (b) A → (IV); B → (II); C → (III); D → (I)  
 (c) A → (IV); B → (III); C → (II); D → (I)  
 (d) A → (IV); B → (III); C → (I); D → (II)

184. Which of these is not correctly matched ?  
 (a) Gene gun – Biolistic gun  
 (b) Plasmids – Extrachromosomal DNA  
 (c) DNA ligase – Biological scissors  
 (d) Bacteriophages – Viruses

185. A normal- visioned man whose father was colour blind, marries a woman whose father was also colour blind. They have their first child as a daughter. What are the chances that this child would be colour blind ?  
 (a) 100% (b) zero percent  
 (c) 25% (d) 50%

### SECTION - B

186. The impacts of loss of biodiversity include  
 (i) Decrease in plant production.  
 (ii) Lowered resistance to environmental perturbation  
 (iii) Increased variability in ecosystem processes like water use, pest/disease cycle, plants productivity.  
 (iv) None of these  
 (a) (i) and (ii) (b) (i), (ii), and (iii)  
 (c) (ii) and (iii) (d) Only (iv)

187. The age pyramid with broad base indicates  
 (a) High percentage of young individuals  
 (b) Low percentage of young individuals  
 (c) High percentage of old individuals  
 (d) Low percentage of old individuals

188. Which of the following is not a step in understanding Biodiversity ?  
 (a) Naming the species  
 (b) Looking at other related species  
 (c) Assessing the species geographic range  
 (d) Quantifying the species genome

189. A population of organisms has a gene for which there are two alleles, D and d. The allele frequency of D = 0.8. If this population satisfies all five of the Hardy-Weinberg conditions, what are the genotype frequencies that are expected in the next generation?  
 (a) DD = 0.04; Dd = 0.32; dd = 0.64  
 (b) DD = 0.64; Dd = 0.32; dd = 0.64  
 (c) DD = 0.04; Dd = 0.64; dd = 0.32  
 (d) DD = 0.64; Dd = 0.32; dd = 0.04

190. Which one of the following statement is true?  
 (a) The greater the BOD of waste water, more is its polluting potential.  
 (b) The greater the BOD of waste water, less is its polluting potential.  
 (c) The lesser the BOD of waste water, more is its polluting potential.  
 (d) The lesser the BOD of waste water, less is its polluting potential.

191. Find out the pairs which are correctly matched.

	Column - I		Column - II
A.	Primary succession	I.	Autotrophs
B.	Climax community	II.	Community that has completed succession
C.	Consumer	III.	Colonization of new environment
D.	Producer	IV.	Animals

- (a) A → (III); B → (II); C → (IV); D → (I)  
 (b) A → (III); B → (I); C → (IV); D → (II)  
 (c) A → (I); B → (III); C → (II); D → (IV)  
 (d) A → (II); B → (III); C → (IV); D → (I)

192. Parkinson's disease (characterized by tremors and progressive rigidity of limbs) is caused by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter

- (a) acetylcholine                      (b) norepinephrine  
 (c) dopamine                              (d) GABA

193. Which one of the following pairs of items correctly belongs to the category of organs mentioned against it?

- (a) Thorn of Bougainvillea and tendril of Cucurbita - Analogous organs  
 (b) Nictitating membrane and blind spot in human eye - Vestigial organs  
 (c) Nephridia of earthworm and malpighian tubules of Cockroach - Excretory organs  
 (d) Wings of honey bee and wings of crow - Homologous organs

194. Which one of the following processes during decomposition is correctly described?

- (a) Humification-Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate.  
 (b) Catabolism-Last step decomposition under fully anaerobic condition.  
 (c) Leaching-Water soluble inorganic nutrients rise to the top layers of soil.  
 (d) Fragmentation-Carried out by organisms such as earthworm.

195. Find out the pairs, which are correctly matched.

	Column - I		Column - II
A.	PCR	I.	Large scale culture
B.	Bioreactor	II.	To induce alien DNA in host cell
C.	Gene gun	III.	Restriction endonuclease
D.	Eco RI	IV.	Amplification of gene

- (a) A → (IV); B → (I); C → (II); D → (III)  
 (b) A → (II); B → (I); C → (IV); D → (III)  
 (c) A → (IV); B → (I); C → (III); D → (II)  
 (d) A → (I); B → (IV); C → (II); D → (III)

196. At which stage of HIV infection does one usually show symptoms of AIDS?

- (a) When the infecting retrovirus enters host cells.  
 (b) When viral DNA is produced by reverse transcriptase.  
 (c) When HIV replicates rapidly in helper T-lymphocytes and damages large number of these cells.  
 (d) Within 15 day of sexual contact with an infected person

197. Which of the following are necessary for evolution by natural selection to take place?

- (i) Offspring resemble their parents more than other individuals in the population.  
 (ii) Differences among individuals exist and lead to different number of successful offspring being produced.  
 (iii) Individuals adjust their development depending on the environment.  
 (iv) Every individual has a desire to have many offspring.  
 (v) Populations tend to grow faster than their food supplies.  
 (a) (i) and (ii)                              (b) (i) and (v)  
 (c) (ii), (iii) and (iv)                      (d) (iii) and (iv)

198. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?

- (a) 25%                      (b) 100%                      (c) 75%                      (d) 50%

199. Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?

- (a) Luteinizing                      -                      Failure of ovulation  
 (b) Insulin                              -                      Diabetes insipidus  
 (c) Thyroxine                              -                      Tetany  
 (d) Parathyroid                              -                      Diabetes mellitus

200. Industrial melanism as observed in Peppered moth proves that

- (a) the melanic form of the moth has no selective advantage over lighter form in industrial area  
 (b) the lighter-form moth has no selective advantage either in polluted industrial area or non-polluted area  
 (c) melanism is a pollution-generated feature  
 (d) the true black melanic forms arise by a recurring random mutation