TECHNO INDIA GROUP OF PUBLIC SCHOOLS

NEET (XII)

Monthly Mock Test - 4 (October-2025)

Time Allowed: **3 hours**   Maximum Marks: **720**

General Instructions:

1. This test will be a 3 hours Test, Maximum Marks 720.

2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt. MCQ (one correct answer).

3. Each question is of 4 marks.

4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).

5. There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattempted question.

6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.

7. All calculations / written work should be done in the rough sheet provided.

PHYSICS

1. Effective capacitance of series combination of two capacitors C_1 and C_2 is 4 F. When these capacitors are individually connected to a voltage source of 1 V, the energy stored in the capacitor C_2 is 4 times that of C_1. If these capacitors are connected in parallel, their effective capacitance will be

   ① 10 μF ② 15 μF ③ 20 μF ④ 25 μF

2. In the given circuit diagram, the potential drop across 6 Ω resistance is
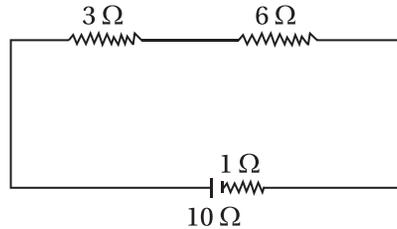
   ① 4 V ② 5 V ③ 6 V ④ 8 V

3. A galvanometer having a coil resistance 1 Ω gives a full scale deflection when a current of 1 mA is passed through it. To convert this galvanometer into a voltmeter giving full scale deflection for a potential difference of 1 V, the required resistance is

   ① 9 Ω ② 99 Ω ③ 999 Ω ④ 9999 Ω

4. A long, straight wire of radius 2r carries a current distributed uniformly over its cross-section. The ratio of the magnetic fields due to the wire at distance r and 3r, respectively from the axis of the wire is

   ① $\dfrac{3}{2}$ ② 2 ③ $\dfrac{2}{3}$ ④ $\dfrac{3}{4}$

5. In a region a loop of area 2 m^2 is so placed that magnetic lines are perpendicular to the plane of the loop. If magnetic field is given by $B = 2 + 3t^2$ where B and t are in tesla and second respectively then at t = 1 sec, emf induced in the loop will be

   ① 6 V ② 3 V ③ 12 V ④ 9 V

6. In an A.C circuit, voltage and current are given by $V = 100 \sin\left(100\pi t - \dfrac{\pi}{3}\right)$ and $I = 50 \sin(100\pi t)$ where V, t and I are in volt, second and ampere respectively. Power consumed in the circuit is

   ① 1.25 kW ② 5 kW ③ 2.5 kW ④ 5 W

7. For a wavelength, the medium has relative permittivity 3 and relative permeability $\dfrac{2}{3}$. The critical angle in the medium for the wavelength will be

   ① 15° ② 30° ③ 45° ④ 60°

8. The magnifying power of a telescope with tube length 60 cm is 9. The focal length of its eye piece is

   ① 6 cm ② 54 cm ③ 5 cm ④ 55 cm

9. The radius of curvature of the curved surface of a plano-convex lens is 30 cm and the refractive index of the lens material is 1.5, then the focal length of the lens is

   ① 30 cm ② 40 cm ③ 50 cm ④ 60 cm

10. An electron of mass m and magnitude of charge |e| initially at rest gets accelerated by a constant electric field E. The rate of change of de-Broglie wavelength of this electron at time t ignoring relativistic effects is

① $\dfrac{-h}{|e|Et}$ ② $\dfrac{|e|Et}{h}$ ③ $-\dfrac{h}{|e|Et}$ ④ $\dfrac{h}{|e|E\sqrt{t}}$

11. If $E_1 = 1V$, $E_2 = 3V$, $C_1 = 1\mu F$, $C_2 = 3\,\mu F$ and $C_3 = 6\,\mu F$, then charge stored in C_3 will be Q μC, where Q is
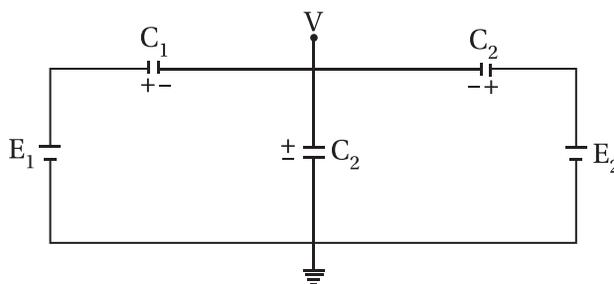
① 3   ② 4   ③ 5   ④ 6

12. An electric dipole is placed at origin keeping the dipole moment along x-axis. A charge experiences a force of magnitude F_1 at point (r, 0) and F_2 at point (0, r). Then $F_1 : F_2$ is

① 1 : 1   ② 1 : 2   ③ 2 : 1   ④ 4 : 1

13. In a large building, there are 25 bulbs of 40 W, 5 bulbs of 100 W, 5 fans of 80 W and 1 heater of 1 kW. The voltage of electric mains in 220 V. The minimum capacity of the main fuse of the building will be
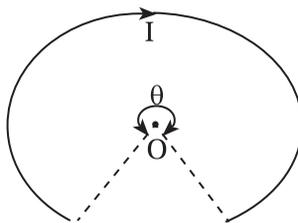
① 12 A   ② 14 A   ③ 10 A   ④ 8 A

14. In the given circuit diagram when the current reaches steady state in the circuit, the charge on the capacitor of capacitance C will be
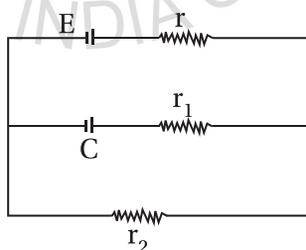
① $CE\times\dfrac{r_2}{(r+r_2)}$ ② $CE\times\dfrac{r_1}{(r_1+r)}$ ③ CE   ④ $CE\times\dfrac{r_1}{(r_2+r)}$

15. A current of I flows in a wire forming a circular arc of radius r subtending an angle θ radian at the centre as shown. The magnetic field at the centre O is

① $\dfrac{\mu_0 I\theta}{4\pi r}$ ② $\dfrac{\mu_0 I\theta}{2\pi r}$ ③ $\dfrac{\mu_0 I\theta}{2r}$ ④ $\dfrac{\mu_0 I\theta}{4r}$

16. The Fraunhoffer 'diffraction' pattern of a single slit is formed in the focal plane of a lens of focal length 1 m. The width of slit is 0.3 mm. If third minimum is formed at a distance of 5 mm from central maximum, then wavelength of light will be

① 5000 A ② 2500 A ③ 7500 A ④ 8500 A

17. Two wires of the same material having lengths in the ratio of 1 : 2 and diameters in the ratio 2 : 1 are connected in series with a cell of 6 volt and internal resistance 1Ω. The ratio of the potential drop across the two wires will be

① 1 : 2 ② 2 : 1 ③ 1 : 8 ④ 8 : 1

18. For a thin prism of refracting angle A, the variation of minimum deviation δ with refractive index (μ) is shown. Then from graph we can conclude that
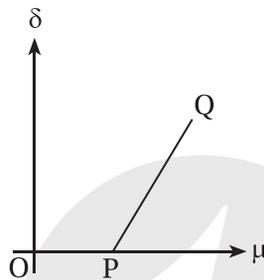
① Point P corresponds to μ = 1 ② Point P is corresponds to μ = 2

③ Slope of straight line is $\dfrac{A}{2}$ ④ Slope of straight line is 2A

19. The sky appears blue because of

① interference ② diffraction ③ scattering ④ refraction

20. Electric potential in a region is given by V = 6x . The magnitude of electric force acting on a 2 C charge placed at origin is (where x, y and z are in meter and V is in volt)

① zero ② 12 N ③ 6 N ④ 8 N

**21.** In given circuit current related 2Ω resistance is]
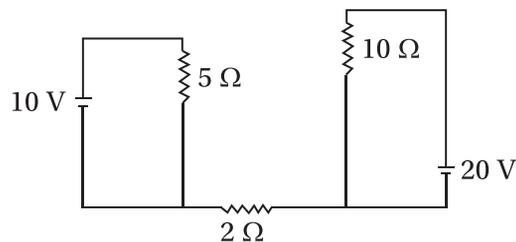
① 5A ② 2A ③ zero ④ 4A

22. An electric dipole of dipole moment $\vec{P}$ is placed in a uniform electric field of intensity $\vec{E}$ To change the angle between $\vec{P}$ and $\vec{E}$ from θ_1 to θ_2 ,the work done by the field is

① $P\,E\,(\cos\theta_1 - \cos\theta_2)$ ② $P\,E\,(\cos\theta_2 - \cos\theta_1)$ ③ $P\,E\,(\sin\theta_1 - \sin\theta_2)$ ④ $P\,E\,(\sin\theta_2 - \sin\theta_1)$

23. In photoelectric effect variation of stopping potential (V_s) with frequency (ν) of photon incident on a matel is shown in the graph given below. Which of the followings is true?
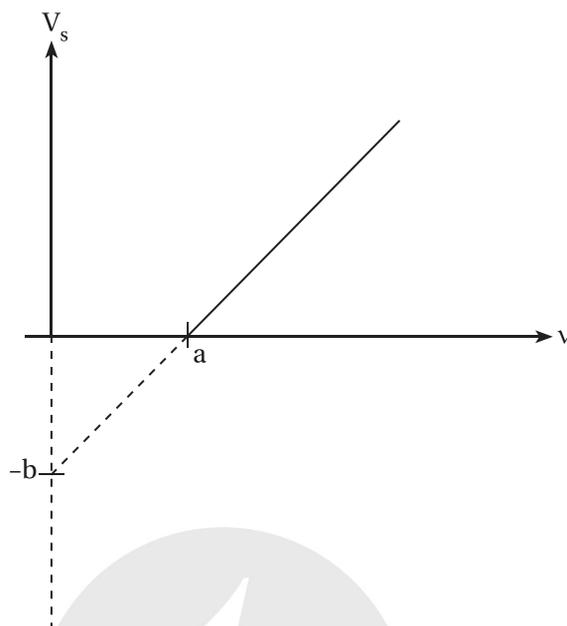
① The gradient of the graph is h/e

② The threshold frequency of the metal is a

③ The work function of the metal is be

④ All of the above

24. A monochromatic light of wavelength 600 nm in air enters in glass of refractive index 1.5. In glass on the path of a ray two points are at a distance 600 nm. The phase difference between the two points is

① 0　　　　② π　　　　③ $\pi/2$　　　　④ $2\pi/3$

25. The electric field concerned with an e.m.w. propagating in a medium is given by
$\overline{E} = \left(2\times10^5\,\text{NC}^{-1}\right)\sin\left(2\pi\times10^8\times t - \pi x\right)\hat{j}$, where t is in sec and x is in meter. Then

① The speed of the wave in the medium is 2 × 108 m/s

② The frequency of the wave is 10^8 Hz

③ Tha magnetic field concerned with the wave is $\overline{B} = \left(10^{-3}\,\text{T}\right)\sin\left(2\pi\times10^8\times t - \pi x\right)\hat{k}$

④ All of the above

26. A magnetic needle is placed in a uniform magnetic field and is aligned with the field. The needle is now rotated by an angle 37° and the work done is W joule. The torque required to keep the needle at this position is

① W N.m　　　② 2W N.m　　　③ 3W N.m　　　④ 0.6W N.m

27. The magnetic flux linked with a coil satisfies the relation $\varphi = (t^3 + t^2 + 2)$Wb , where t is second. The e.m.f. induced in the coil at t = 2 sec is

① 16 V　　　② 12 V　　　③ 10 V　　　④ 8 V

28. Monochromatic light of wavelength 667 nm is produced by a helium neon laser. The power emitted is 9 mW. The number of photons emitted per second is

① 10^{16}　　　② 2×10^{16}　　　③ 3×10^{16}　　　④ 4×10^{16}

29. In the combination of capacitors shown in figure,if $C_1 = 1\ \mu F$, $C_2 = 2\ \mu F$, $C_3 = 1\ \mu F$ and $C_4 = 1\ \mu F$ then the potential difference across the plates of the capacitor C4 will be
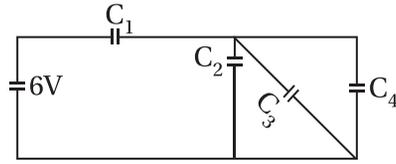

① 4.8 V   ② 1.2 V   ③ 2.4 V   ④ 3.6 V

30. To make a solenoid, a long thin uniform wire (coated with insulator) of length L and radius r is wound closely on the whole length of an iron cylinder (coated with insulator) of length l and radius R. If total number of turns of the solenoid is N, perm ability of vacuum is μ_0 and relative permeability of iron is μ_r then the self inductance of the solenoid is

① $\dfrac{\mu_0 \mu_r N^2 A}{L}$, where $A = \pi r^2$ ② $\dfrac{\mu_0 \mu_r N^2 A}{L}$, where $A = \pi R^2$

③ $\dfrac{\mu_0 \mu_r N^2 A}{l}$, where $A = \pi r^2$ ④ $\dfrac{\mu_0 \mu_r N^2 A}{l}$, where $A = \pi R^2$

31. The near point and far point of a man are 0.5 m and 5 m respectively. The powers of the lenses used in his spectacle (i) for reading purpose and (ii) to see the distant objects are P_1 and P_2 respectively. Then $P_1 + P_2$ is

① 2.2 D   ② 1.8 D   ③ 2.5 D   ④ 1.5 D

32. A point charge q is placed at the center of one circular face of right circular cylinder of height 4 cm and radius 3 cm. The electric flux across the cylindrical surface is $\dfrac{q}{20\epsilon_0} \times n$. The value of 'n' is

① 5   ② 6   ③ 8   ④ 10

33. In an LCR series circuit, L is 1 H, C is $\dfrac{1}{3600}$ F , R is 22 Ω and applied voltage $V = \{220 \sin(\omega t)\}$ volt . If the power in the circuit is 550 W then ω has

① Only one value 60 Hz   ② Two values 50 Hz and 72 Hz

③ Two values 50 Hz and 70 Hz   ④ Two values 48 Hz and 72 Hz

34. A charged particle moving in a crossed electric and magnetic fields E and B respectively, moves undeviated. The speed of the charged particle is

① $\dfrac{E}{B}$ ② $\dfrac{B}{E}$ ③ $\sqrt{E^2 + b^2}$ ④ $(E + B)$

35. Two waves emitted from two coherent sources interfere. The ratio of the maximum and minimum intensities of interfering fringes is 25:1. The ratio of the intensities of two interfering waves is

① 1 : 5   ② 2 : 3   ③ 9 : 4   ④ 4 : 5

36. A cell of emf E is connected across the ends of a resistance R. The potential difference between the terminals of the cell is found to

① $\dfrac{(V - E)R}{E}$ ② $\dfrac{(E - V)}{V} R$ ③ $\dfrac{(E - V)R}{E}$ ④ $\dfrac{ER}{V}$

37. If two bodies are rubbed with each other, one of them acquires q_1 charge and another acquires q_2 charge. If $q_1 = 6\ \mu C$ then $q_2 =$

① 6 μC   ② 3 μC   ③ – 6 μC   ④ – 3 μC

38. Force acting on a moving charged particle in a region of electric and magnetic fields is called

① Lorentz force   ② Ampere's force   ③ Biot-Savart's force   ④ Maxwell's force

39. The plates of a parallel plate capacitor are separated by a distance d with air as the medium between the plates. In order to increase the capacity to $\frac{5}{3}$ times of initial, a dielectric slab of dielectric constant 5 is introduced between the plates. What is the thickness of the dielectric slab ?

① $\frac{d}{4}$ ② $\frac{d}{2}$ ③ $\frac{5d}{8}$ ④ d

40. An infinitely long rod lies along the axis of concave mirror of focal length f. The near end of the rod is at a distance x > f from the mirror. Then, the length of the image of the rod is

① $\frac{f^2}{x+f}$ ② $\frac{f^2}{x}$ ③ $\frac{xf}{x-f}$ ④ $\frac{f^2}{(x-f)}$

41. Refractive index of glass is 1.5. The speed of light in glass is

① 3×10^8 m/s   ② 2×10^8 m/s   ③ 1×10^8 m/s   ④ 4×10^8 m/s

42. An electron is moving with an initial velocity $\vec{V} = V_0 \hat{i}$ and is in a magnetic field $\vec{B} = B_0 \hat{j}$ Then, its de Broglie wavelength

① remains constant   ② increases with time

③ decreases with time   ④ first increases then decreases

43. A prism of refractive index $\frac{3}{2}$ is placed in water of refractive index $\frac{4}{3}$ If the angle of prism is 4º, calculate the angle of minimum deviation in water.

① 0.5°   ② 1°   ③ 1.5°   ④ 2°

44. The magnetic flux ϕ_B through a metal ring varies with time t according to $\phi_B = 3 (at^3 - bt^2)$ with a = 2 Tm² s⁻³ and b = 6 Tm² s⁻². The resistance of the ring is 3 Ω. Determine the maximum current induced in the ring during the interval from t = 0 to t = 2 s.

① 10A   ② 6A   ③ 5A   ④ 11A

45. In a single slit diffraction experiment first minimum for λ_1 = 660 nm coincides with first maxima for wavelength λ_2. Calculate λ_2.

① 440 nm   ② 220 nm   ③ 110 nm   ④ 550 nm

CHEMISTRY

**46.** Which one is the most acidic compound?
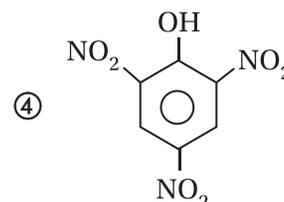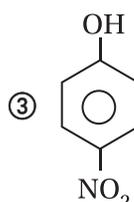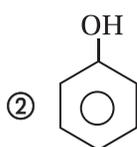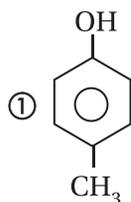
47. Ethyl chloride is converted into diethyl ether by :

① Perkins reaction   ② Grignard's reaction   ③ Wurtz's reaction   ④ Wiliamsion's synthesis

48. The heating of phenyl-methyl ethers with HI produces :

① ethyl chlorides ② iodobenzene ③ phenol ④ benzene

49. The compound that is most difficult to protonate is :

① ph—O—H ② H—O—H ③ H_3C—O—H ④ H_3C—O—CH_3
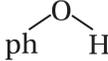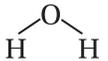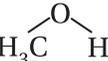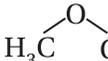
**50.** How many isomers of $C_5H_{11}OH$ will be primary alcohols?

① 5 ② 4 ③ 2 ④ 3

51. Propene, $CH_3 — CH = CH_2$ can be converted into 1-propanol by oxidation. Indicate which set of reagents amongst the following is ideal to affect the above conversion?

① $KMnO_4$ (alkaline) ② Osmium tetroxide ($Os\ O_4 / CH_2\ Cl_2$)

③ B_2H_6 & alkaline H_2O_2 ④ O_3 / Zn

52. For the reaction, $2N_2O_5 \longrightarrow 4NO_2 + O_2$, rate and rate constant are 1.02×10^{-4} and $3.4 \times 10^{-5}\ S^{-1}$ respectively, then concentration of N_2O_5 at that time will be :

① 1.7 32 ② 3 ③ 1.02×10^{-4} ④ 3.4×10^{-5}

53. Which plot of lnk Vs $\dfrac{1}{T}$ is consistent with arrhenius equation ?

① lnk vs $\dfrac{1}{T}$ ② lnk vs $\dfrac{1}{T}$ ③ lnk vs $\dfrac{1}{T}$ ④ lnk vs $-\dfrac{1}{T}$
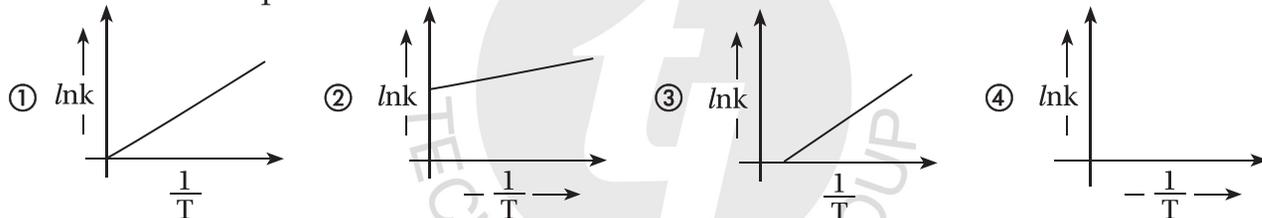
54. A chemical reaction is catalysed by a catalyst 'X'. Hence, x

① reduces enthalpy of the reaction

② decreases rate constant of the reaction

③ increases activation energy of the reaction

④ does not affect equilibrium constant of the reaction

55. Which one of the following salts will have the same value of Van't Hoff's factor (i) as that of $K_4[Fe(CN)_6]$, (if all are 100% ionised)

① $Al_2(SO_4)_3$ ② NaCl ③ $Al(NO_3)_3$ ④ Na_2SO_4

56. The mixture which shows positive deviation from Raoult's Law is :

① benzene + Tolune ② Acetone + chloroform

③ Chloroethane + bromoethane ④ ethanol + water

**57.** The mixture that forms maximum boiling azeotrope is :

① ethanol + water ② acetone + carbondisulphide

③ heptane + octane ④ water + nitric acid.

58. Isotonic solutions have same :

① vapour pressure ② freezing temperature ③ osmotic pressure ④ boiling temperature

59. A 5A current is passed through a solution of Zinc sulphate for 40 mins. The amount of zinc deposited at the cathode is :

① 40.65 g ② 0.4065 g ③ 4.065 g ④ 65.04 g

60. Standard electrode potential of three metals X, Y and Z are – 1.2 v & –3.0 v respectively. The reducing power of these metals will be :

① Y > X > Z ② Z > X > Y ③ X > Y > Z ④ Y > Z > X.

61. Standard electrode potential for $Sn^{4+}/_{Sn^{2+}}$ couple is + 0.15 v and that for the Cr^{3+}/Cr couple is –0.74. These two couples in their standard state are connected to make a cell. The cell potential will be :

① + 0.89 v ② + 0.18 v ③ + 1.83 v ④ + 1.199 v.

62. For a cell involving one electrons E°_{Cell} = 0.59 v at 298 k, the equilibrium constant for the cell reaction is :

[Given that $\dfrac{2.303\ RT}{F}$ = 0.059 v at T = 298 k]

① 1×10^{2} ② 1.0×10^{5} ③ 1×10^{10} ④ 1×10^{30}

63. A device that converts energy of combustion of fuels like hydrogen and methane directly into electrical energy is known as :

① fuel cell ② electrolytic cell ③ dyanamo ④ Ni-cd cell

64. The efficiency of fuel cell is given by :

① $\dfrac{\Delta G}{\Delta S}$ ② $\Delta G/_{\Delta H}$ ③ $\Delta S/_{\Delta G}$ ④ $\Delta H/_{\Delta G}$

65. The calculated spin only magnetic moment of Cr^{2+} ion is :

① 4.90 BM ② 5.92BM ③ 2.84 BM ④ 3.87 BM

66. Which one of the following characteristics of the transition metals is associated with their catalytic activity ?

① Colour of hydrated ion ② variable oxidation state

③ High enthalpy of atomisation ④ Para magnetic behaviour

67. Which of the following has more unpaired d-electrons ?

① Zn^{+} ② Fe^{++} ③ N^{3+} ④ Cu^{+}

68. The number of completely hydrogen bonded water molecule(s) associated with $CuSO_4 . 5H_2O$ is :

① 3 ② 1 ③ 2 ④ 5

69. $HgCl_2$ and I_2 both when dissolved in water containing $I^{\ominus}$ ions the pair of species formed is :

① $Hg I_2, I_3^{\ominus}$ ② $Hg I_2, I^{\ominus}$ ③ $Hg I_4, I_3^{\ominus}$ ④ $Hg_2 I_2, I^{\ominus}$

70. In acidic medium, H_2O_2 changes $Cr_2O_7^{2-}$ to CrO_5 which has two (–0 – 0 –) bonds. Oxidation state of Cr in CrO_5 is :

① + 5 ② + 3 ③ + 6 ④ – 10

71. Which of the following is absolute configuration of carbon 2 and 3 respectively ?

$$\begin{array}{c} CHO \\ H\!-\!\!\!-\!\!\!-\!\!\!-OH \\ H\!-\!\!\!-\!\!\!-\!\!\!-OH \\ CH_2OH \end{array}$$
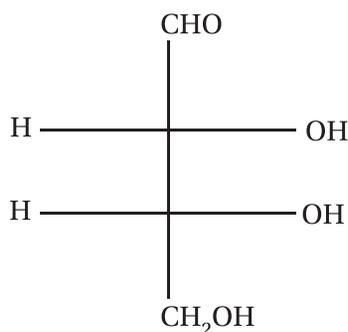
① 2R, 3R   ② 2S, 3S   ③ 2R, 3S   ④ 3S, 2R

72. Strongest nucleophile among the following is :

① $OH^{\ominus}$ ② H_2O ③ NH_3 ④ $\overset{\ominus}{O}R$

73. The order of reactivities of the following alkyl halides for SN_2 reaction is :

① R – F > R – Cl > R – Br > R – I

② R – F > R – Br > R – Cl > R – I

③ R – Cl > R – Br > R – F > R – I

④ R – I > R – Br > R – Cl > R – F

74. Arrange in increasing order of reactivity in SN_1, reaction :
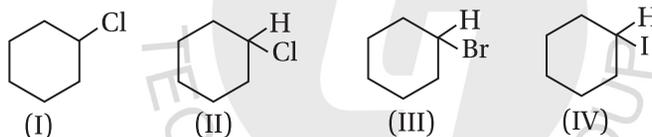
(I)   (II)   (III)   (IV)

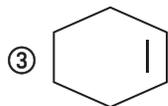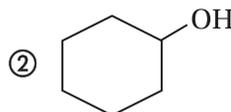① I < II < III < IV   ② I < II < IV < III   ③ IV < II < III < I   ④ I < III < II < IV
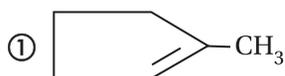
75.

$\xrightarrow{\text{aq . AgNO}_3}$ 'X' (Major Product) :
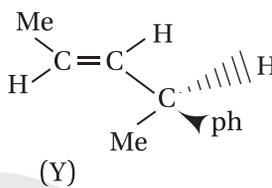
①   ②   ③   ④

76.

$\xrightarrow{\text{NaOH (excess) . CH}_2I_2}$ 'p' (product) is :

①   ②

③   ④

77. CH_2OH $\xrightarrow{H^+/\Delta}$ 'P' (Major Product) : The product (P) is :

① CH_3

② OH

③

④

78. How many stereoisomers are possible for the compounds 'Z' and 'Y' respectively ?

(X) (Y)
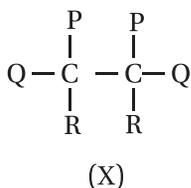
① 2, 3 　　 ② 4, 4 　　 ③ 3, 4 　　 ④ 4, 3

79. The following method can not be considered suitable for the preparation of alkyl halide.

① Halogenation of alkane 　　　　 ② $ROH + PX_3$

③ $ROH + HX$ / Anhy. $ZnCl_2$ 　　　　 ④ Alkene and Hx

80. When silver propionate is treated with Br_2 in CCl_4 as solvent, the product is :

① 1 – Bromopropane 　　　　 ② 2 – Bromopropane

③ 1m 2 – Dibromoethane 　　　　 ④ Bromoethane

81. The order of reactivities among the following halides :
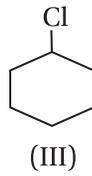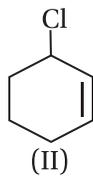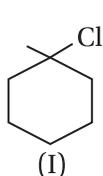
(I)　　(II)　　(III)

towards conversion into alcohols through SN_1 reaction is :

① III < II < I 　　 ② I < II < III 　　 ③ III < I < II 　　 ④ I < III < II

82. The correct order of reactivity of following compounds in nucleophilic substitution is :

C_2H_5Br　C_2H_5Cl
(A)　　　(A)

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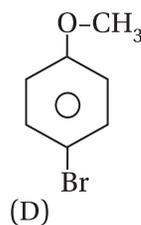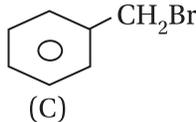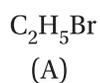
① A > B > C > D 　　 ② D > C > B > A 　　 ③ C > A > D > B 　　 ④ C > A > B > D

83. Which of the following is major product (P) in the given reaction ?

$$CH_3-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-Br + KOH \xrightarrow[\text{reflux}]{\text{ethanol}} : \begin{array}{c} 'P' \\ \text{(Major Product)} \end{array}$$
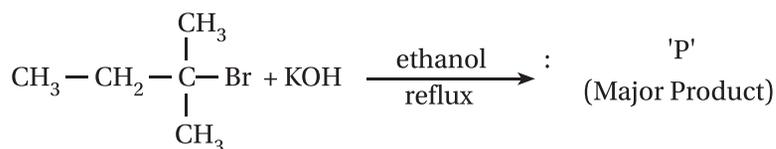
① $CH_3-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-OH$

② $CH_3-\overset{\overset{CH_3}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3$

③ $CH_3-CH_2-\underset{\underset{CH_3}{|}}{C}=CH_2$

④ $CH_3-CH=\underset{\underset{CH_3}{|}}{C}-CH_3$

84. Aryl halides are less reactive than alkyl halides towards nucleophilic substitution reaction due to

① The formation of more stable carbonisation

② the presence of partial double bond character between c-x bond.

③ Longer carbon halogen bond

④ Inductive effect.

85. Which of the following compound undergoes replacement of –Cl by –OH group by merely warming the compound?

① (Cl, CH$_3$, CH$_3$ substituted benzene)   ② (Cl, NO$_2$ substituted benzene)   ③ (Cl, NO$_2$ substituted benzene)   ④ (Cl, O$_2$N, NO$_2$, NO$_2$ substituted benzene)
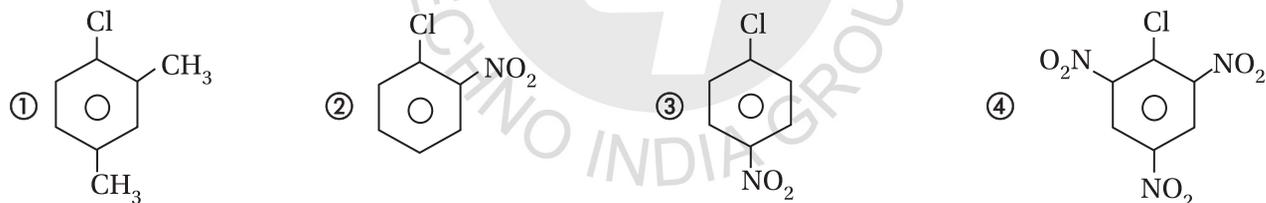
86. How many chiral carbons are present in the following structure ?

(decalin structure with CH_3 and OH)
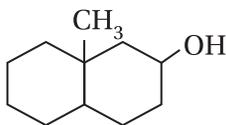
① 1   ② 2   ③ 3   ④ 4

87. The compound C_2(F) (Cl) (Br) (I) has :

① 4 isomers   ② 2 – optical isomers

③ 2-geometrical isomers   ④ 6–geometrical isomers

88. Which of the following compound will be most reactive for SN_1 reaction ?

① (cyclohexane with Cl)   ② (cyclohexene with Cl)   ③ (cyclohexane with Cl, CH$_3$)   ④ (cyclohexene with Cl, CH$_3$)

89. Given below are two statements :

Statement I : Both $[Co(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$ complexes are octahedral but differ in their magnetic behaviour

Statement II : $[Co(NH_3)_6]^{3+}$ is diamagnetic whereas $[CoF_6]^{3-}$ is paramagnetic. In the light of the above statements, choose the correct answer from the option given below :

① Both statement I & Statement II are true

② Both statement I & Statement II are false

③ Statement I is true but& Statement II is false

④ Statement I is false but& Statement II is true

90.
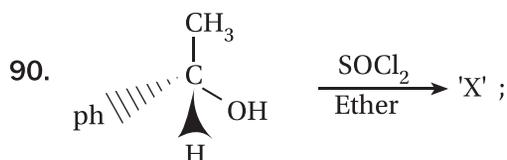
Compound 'X' is obtained with :

① Retaintion of configuration

② Inversion of configuration

③ Racemic mixture

④ All of these

Biology

91. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?

① Retrovirus ② λ phage ③ Ti plasmid ④ pBR 322

92. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?

① The smaller the fragment size, the farther it moves

② The larger the fragment size, the farther it moves

③ Depends on which organism the DNA is isolated from

④ None of the above

93. The process of separation and purification of expressed proteins before marketing it is called –

① Upstream processing

② Downstream processing

③ Bioprocessing

④ Post production processing

94. A gene whose expression helps to identify transformed cells is called :

① Vector ② Selectable marker ③ Plasmid ④ Structural gene

95. The DNA fragments, separated on an agarose gel, can be visualised after staining with :

① Bromophenol blue ② Acetocarmine ③ Aniline blue ④ Ethidium bromide

96. Restriction endonucleases are :

① Used in genetic engineering for ligating two DNA molecules

② Used for invitro DNA synthesis

③ Synthesised by bacteria as a part of their defence mechanism

④ Present in mammalian cell for degradation of DNA when the cell dies.

97. Which of the following is not a component of downstream processing ?

① Preservation   ② Expression   ③ Separation   ④ Purification

98. A foreign DNA and plasmid, cut by the same restriction endonucleaase, can be joined to form a recombinant plasmid, using :

① Polymerase–III   ② Ligase   ③ *Eco* RI   ④ *Taq* polymerase

99. Which of the following is a restriction endonuclease?

① *Hind* II   ② Protease   ③ DNase I   ④ RNase

100. Which of the following is wrong with regards to plasmids?

① Independent replication   ② Circular structure

③ Single stranded   ④ None of the above

101. The cutting of DNA at specific locations became possible with the discovery of :

① Probes   ② Selectable markers

③ Ligase   ④ Restriction enzymes

102. DNA fragments, generated by the restriction enzymes, can be separated by

① Restriction mapping   ② Centrifugation   ③ PCR   ④ Electrophoresis

103. Biolistics (gene gun) is suitable for :

① Disarming pathogen vectors   ② Transformation of plant cells

③ Constructing recombinant DNA by joining vectors   ④ DNA fingerprinting

104. For tranasformation, microparticles coated with DNA, to be bombarded with gene gun, are made up of :

① Gold or Tungsten   ② Silver or Platinum   ③ Platinum or zinc   ④ Silicon or Platinum

105. PCR and Restriction Fragment Length Polymorphism are methods for :

① Genetic Fingerprinting   ② Study of enzymes

③ Genetic Transformation   ④ DNA sequencing

106. The figure below is the diagrammatic representation of the *E. coli* vector pBR 322. Which one of the given options correctly indicates some of its components ?
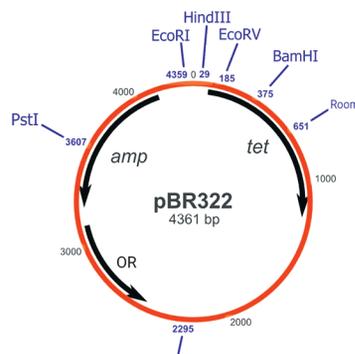
Pic: of pBR 322

① ampᴿ, tet^R – antibiotic resistance genes

② ori – original restriction enzyme

③ rop – reduced osmotic pressure

④ *Hind* III, *Eco*RI – selectable markers

107. Genetically engineering living organisms is possible due to :

① heavy isotope labelling

② Hybridisation

③ Recombinant DNA techniques

④ X-ray diffraction studies

108. Agarose, from sea weeds, is used in :

① gel electrophoresis   ② Spectrophotometry   ③ Tissue culture   ④ PCR

109. Which one of the following is not a biofertilizer?

① *Mycorrhiza*   ② *Agrobacterium*   ③ *Rhizobium*   ④ *Nostoc*

110. DNA or RNA segmentt, tagged with a radioactive molecule

① Probe   ② Clone   ③ Plasmid   ④ Vector

111. Which can be used as vector for transfer of DNA segment?

I. Bacterium   II. Plasmid   III. *Plasmodium*   IV. Bacteriophage

① I, II and IV   ② I only   ③ I and III   ④ II and IV only

112. Transgenic plants are the ones

① grown on artificial medium after hybridizaion in the field

② produced after protoplast fusion in artificial medium

③ produced by somatic embryo on artificial medium

④ generated by introducing foreign DNA into a cell and regenerating plant from that cell

113. Change in sequence of nucleotide in DNA is called :

① Mutagen   ② Mutation   ③ Recombination   ④ Translation

114. A mutant strain of T4 – bacteriophage, R-II, fails to lyse the *E. coli*, but when two strains R–II^x and R-II^y are mixed, then they lyse the *E. coli*. What may be the possible reason?

① Bacteriophage transforms in wild

② It is not mutated

③ Both strains have similar cistrons

④ Both strains have different cistrons.

115. Hybridoma is :

① Collection of DNA from DNA

② Collectiion of RNA from DNA

③ A fusion of tumour sex cell with non tumour sex cell

④ A fusion of tumour somatic cell with non tumour somatic cell

116. Which body of the Govt. of India regulates GM research and safety of introducing GM organisms for public services ?

① Research Committee on Genetic Manipulation

② Biosafety Committee

③ Genetic Engineering Appraisal Committee

④ Indian Council of Agricultural Research

117. Use of bioresources by multinational companies and organisations, without authorisation from the concerned country and its people is called –

① Biopiracy   ② Bioinfringement   ③ Biodegradation   ④ Bioexploitation

118. Which technique helps to indentify a bacterial or viral pathogen in a human body, even when its concentration is very low and clinical symptoms are not yet visible ?

① Differential leucocyte count   ② Total leucocyte count

③ ELISA   ④ PCR

119. In gene therapy, to treat adenosine deaminase deficiency disorder, which of the cells of the patient's blood are used ?

① Thrombocytes   ② Erythrocytes   ③ Lymphocytes   ④ Both B and C

120. What does Bt in Bt cotton stand for ?

① Cotton seeds carrying an endotoxin gene from *Bacillus thuringiensis* against pink boll worm

② Baculovirus treated cotton seeds against pink boll worm

③ Bigger thread of disease resistant cotton with better tensile strength

④ Cotton produced by Biotechnology using restriction enzyme and ligases to resist.

121. Which part of the tobacco plant is infected by *Meloidogyne incognita* ?

① Flower   ② Leaf   ③ Stem   ④ Root

122. The two polypeptides of human insulin are linked together by :

① Hydrogen bonds   ② Phosphodiester bond   ③ Covalent bond   ④ Disulphide bridges

123. The introduction of t-DNA into plants involves :

① Altering the pH of the soil, then heat shocking the plants

② Exposing the plants to cold for a brief period

③ Allowing the plant roots to stand in water

④ Infection of the plant by *Agrobacterium tumefaciens*

124. ADA is an enzyme which is deficient in a genetic disorder, SCID. What is he full form of ADA ?

① Adenosine Deoxy Aminase   ② Adenosine Deaminase

③ Aspartate Deaminase   ④ Arginine Deaminase

125. Invitro clonal propagation in plants is characterised by :

① Microscopy   ② PCR & RAPD

③ Northern blotting   ④ Electrophoresis and HPLC

126. The first human hormone produced by recombinant DNA technology is :

① Progesterone   ② Insulin   ③ Estrogen   ④ Thyroxin

127. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin A deficiency?

① Bt brinjal   ② Flavr Savr' tomato   ③ Carolla   ④ Golden rice

128. Which one of he following is an example of carrying out biological conrol of pests / diseases using microbes?

① Lady bird bettle against aphids in mustard

② *Tricholderma* sp. against certain plant pathogens

③ Nucleopolyhedro virus against white rust in *Brassica*

④ Bt cotton to increase cotton yield.

129. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein. This protein :

① is activated by acid pH of the foregut of the insect pest

② does not kill the carrier bacterium which is itself resistant to this toxin.

③ binds with epithelial cells of midgut of the insect pest, ultimately killing it.

④ is coded by several genes, including the gene, cry.

130. Read the following four statements (A–D) about certain mistakes in two of them.

(a) The first transgenic buffalo, Rosie, produced milk which was human alpha-lactalbumin enriched.

(b) Restriction enzymes are used in isolation of DNA from other macromolecules.

(c) Downstream processing is one of the steps of R-DNA technology.

(d) Disarmed pathogen vectors are also used in transfer of R-DNA into the host.

Which are the two statements having mistake ?

① (a) and (c)   ② (a) andn (b)   ③ (b) and (c)   ④ (c) and (d)

131. Silencing of mRNA has been used in producing transgenic plants resistant to :

① White rusts   ② Bacterial blights   ③ Bollworms   ④ Nematodes

132. The process of RNA interference has been used in the development of plants resistant to :

① Insects   ② Nematodes   ③ Fungi   ④ Viruses

133. Some of the characteristics of Bt cotton are :

① Medium yield, long fibre and resistance to beetle pests

② High yield and production of toxic protein crystals which kill dipteran pests.

③ High yield and resistance to bollworms

④ Long fibre and resistance to aphids.

134. GM brinjal has been developed in India for :

① Enhancing shelf life   ② Enhancing mineral content

③ Drought resistance   ④ Insect resistance

135. An improved variety of transgenic basmati rice :

① gives high yield and is rich in Vitamin A

② Is complely resistant to all insect pests and diseases of paddy

③ gives high yield but has no characteristic aroma

④ does not require chemical fertilizers and growth hormone.

136. The genetic defect, ADA deficiency, may be cured permanently by :

① Introducing bone marrow cells producing ADA into cells at early embryonic stages.

② Administering adenosine deaminase activators

③ Periodic infusion of genetically engineered lymphocytes, having functional ADAcDNA.

④ Enzyme replacement therapy

137. Genetically engineered micro organism used in bioremediation of oil spills is –

① *Trichoderma*   ② *Xanthomonas*   ③ *Bacillus*   ④ *Pseudomonas*

138. Main objective of production of herbicide resistant GM crops is to :

① Encourage ecofriendly herbicides

② Reduce herbicide accumulation in food articles for health safety

③ Eliminate weeds from fields without the use of manual labour

④ Eliminate weeds from fields without the use of manual herbicides

139. Which of the following is used in the production of insulin by genetic engineering ?

① *Rhizobium*   ② *Saccharomyces*   ③ *Mycobacterium*   ④ *Escherichia*

140. The most likely reason for the development of resistance against pesticides in insects damaging a crop is :

① genetic recombination   ② directed mutations

③ acquired heritable changes   ④ random mutations

141. Which part of poppy plant is used to obtain the drug 'smack' ?

① Flowers   ② Latex   ③ Roots   ④ Leaves

142. MALT constitutes about _____ percent of the lymphoid tissue in humans.

① 50 %   ② 20 %   ③ 70 %   ④ 10 %

143. Transplantation of tissues /organs fails often due to non acceptance by the patient's body. Which type of immune response is responsible for such rejections ?

① Autoimmune response   ② Cell-mediated immune response

③ Hormonal immune response   ④ Physiological immune response

144. Which of the following statements is correct?

① AIDS is caused by rhinovirus   ② Acquired immunity is pathogen specific

③ The exaggerated response of the immune system to certain antigens present in the environment is called autoimmunity.

④ Bone marrow acts as a filter of the blood by trapping blood borne microorganisms.

145. Which of the following is correct regarding AIDS causitive agent, HIV ?

① HIV is undeveloped retrovirus.

② HIV does not escape but attacks the acquired immune response

③ HIV is enveloped virus containing one molecule of single stranded RNA and one molecule of reverse transcriptase

④ HIV is enveloped virus that contains two identical molecules of single stranded RNA and two molecules of reverse transcriptase.

146. Which of the following statements is not true for cancer cells, with respect to mutations ?

   ① Mutations in protooncogenes accelerate the cell cycle

   ② Mutations destroy telomerase inhibitor

   ③ Mutations inactivate the cell control

   ④ Mutations inhibit production of telomerase.

147. Antivenom injections contain preformed antibodies, while polio drops, that are administered into the body, contain :

   ① activated pathogens   ② harvested antibodies

   ③ gamma globulin   ④ attenuated pathogens

148. In higher vertebrates, the immune system can distinguish self cells and non-self. If this property is lost due to genetic abnormality and it attacks self, then it leads to :

   ① Allergic response   ② Graft rejection   ③ Auto immune disease   ④ Active immunity

149. Which of the following viruses is not transferred through the semen of an infected male ?

   ① Chikungunya virus   ② Ebola virus   ③ Hepatitis B virus   ④ HIV

150. Cornea transplant is seldom rejected because :

   ① It has no blood supply   ② It is composed of enucleated cells

   ③ It is a non living layer   ④ Its cells are least penetrable by bacteria.

151. Increased asthmatic attack in certain seasons are due to :

   ① Inhalation of seasonal pollen   ② Heat and humidity

   ③ Low temperature   ④ Eating preserved fruits.

152. A person showing unpredictable moods, outbursts of emotions, quarrelsome behaviour and conflicts with others, is suffering from :

   ① Addictive disorders   ② Schizophrenia

   ③ Borderline personality disorder   ④ Mood disorder

153. Antibiotics are complex _____

   ① lipoproteins   ② steroids   ③ prostaglandins   ④ glycoproteins

154. Damage to thymus in a child would lead to

   ① Loss of cell mediated immunity   ② Loss of antibody mediated immunity

   ③ A reduction in stem cell production   ④ Reduction in haemoglobin content of blood

155. Cancer cells are more easily damaged by radiation than normal cells because they are :

   ① Undergoing rapid division   ② Different in structure

   ③ Non-dividing   ④ Starved of mutation

156. Which one of the following is not correctly matched ?

   ① *Culex pipians* – Filariasis   ② *Aedes aegypti* – Yellow fever

   ③ *Anopheles culicifacies* – Leishmaniasis   ④ *Glossina palpalis* – Sleeping sickness

157. The bacteria generally used for genetic engineering is

① *Agrobacterium* ② *Bacillus* ③ *Pseudomonas* ④ *Clostridium*

158. *E. coli* are used in production of :

① Rifampicin ② LH ③ Ecdyson ④ Inerferon

159. Plasmids have been used as a vector because :

① It is circular DNA which has the capacity to join to eukaryotic DNA.

② It can move between prokaryotic and eukaryoic cells

③ Both ends show replication

④ It has antibiotic resistance gene.

160. Which one of the following is used as a vector for cloning into higher organisms?

① *Salmonella typhimurium* ② *Rhizopus nigricans*

③ Retrovirus ④ Baculovirus

161. The active forms of *Entamoeba histolytica* feeds upon :

① Food in intestine ② Blood

③ RBC, mucosa and submucosa of colon ④ Mucosa and submucosa of colon

162. HIV, that causes AIDS, first starts destroying :

① Helper T-lymphocytes ② Thrombocytes ③ B-Lymphocytes ④ Leucocytes

163. Grafted kidney may be rejected in a patient due to :

① Cell mediated immune response ② Passive immune response

③ Innate immune response ④ Humoral immune response

164. Which of the following immunoglobulins is found in the largest percentage in human milk?

① IgM ② IgA ③ IgG ④ IgD

165. What is true about T-lymphocytes in mammals?

① There are 3 main types – cytotoxic T-cells, helper T-cells and suppressor T-cells.

② These originate in lymphoid tissues

③ They scavenge damaged cells and cellular debris

④ These are produced in thyroid

166. Which one of the following conditions, though harmful in ifself, is also a potential saviour from a mosquito borne infectious disease ?

① Thalassemia ② Sickle cell anaemia ③ Pernicious anaemia ④ Leukaemia

167. Christmas disease is another name for :

① Haemophilia B ② Hepatis B ③ Down's syndrome ④ Sleeping sickness

168. Which of the following is used in the treatment of thyroid cancer ?

① I^{131} ② U^{238} ③ Ra^{224} ④ C^{14}

169. Stool of a person contain whitish grey colour due to malfunction of which organ ?

① Pancreas   ② Spleen   ③ Kidney   ④ Liver

170. During viral infection, the protein formed in host cells for resistance, is :

① Antitoxin   ② Interferon   ③ Antibody   ④ Histone

171. Which of the following is the pair of biofertilizer ?

① *Azolla* and BGA   ② *Nostoc* and legume

③ *Rhizobium* and grasses   ④ *Salmonella* and *E. coli*

172. L. S. D is :

① Hallucinogenic   ② Sedative   ③ Stimulant   ④ Tranquiliser

173. Which of the following is used to manufacture ethanol from starch?

① *Penicillin*   ② *Saccharomyces*   ③ *Azotobacter*   ④ *Lactobacillus*

174. Most stable pesticide :

① Organophosphates   ② Organochlorines   ③ Bordeaux mix   ④ Azadirachtin

175. *Anabaena* is associated with _____ of *Azolla.*

① Stem   ② Leaves   ③ Roots   ④ Flowers

176. Which of the following yields citric acid ?

① *Penicillium citricum*   ② *Aspergillus niger*   ③ *Saccharomyces*   ④ *Azospirillum*

177. Botulism affects :

① Digestive system   ② Blood vascular system   ③ Nervous system   ④ Respiratory system

178. Gobar gas mainly contains :

① $CO_2 + H_2$ ② $CO_2 + H_2O$ ③ CH_4 only   ④ $CH_4 + CO_2$

179. Cochineal insects have proved very useful for :

① Cactus prevention   ② *Eicchornia* prevention   ③ Weeds control   ④ *Parthenium* control

180. In cheese manufacture, the microorganisms are important for :

① Ripening only   ② The souring of milk only

③ The development of resistance to spoilage only   ④ Both the souring and ripening processes.