UNIFIED COUNCIL

An ISO 9001:2008 Certified Organisation

nstse

Test • Assess • Achieve

NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Paper Code: UN423 (UPDATED)

Solutions for Class : 12 (PCB)

Biology

1. **(B)** n = no. of seeds.

$$n + \frac{n}{4} \qquad n = 4$$

$$40 + \frac{\cancel{40}^{10}}{\cancel{4}} = 50$$

In female no. of seeds = No. of meiotic division = 40.

In male, 1 pollen mother cell gives 4 pollen grains. 1 seed requires 1 pollen grain.

2. **(D)** The development of testis from an indifferent gonad is dependent on the presence of the testis determining factor (TDF), a gene present on the short arm of the Y-chromosome.

3. **(D)** Fallopian tube, named after the Italian anatomist Gabriele Fallopio, serves as a passage through which an ovum is carried to uterus and through which spermatozoa move out towards the ovary.

4. **(C)** Inversion type of mutation is shown in the given figure.

5. **(C)** Notochord is mesodermal in origin.

6. **(C)** A sigmoidal growth curve is also applicable for the growth of population.

7. **(C)** With advancing age, calcium ions are found to accumulate in the peripheral cytoplasm of animal and plant cells. This is caused by changes in the permeability of cell membrane.

8. **(B,C)** Sponge and planaria has the greatest regenerating capacity.

9. **(A)** Uracil is found in RNA.

10. **(D)** HIV attaches to CD4 receptor site of helper T-cells with the help of GP120 on the protein coat of the virus.

11. **(C)** Mendel's laws of inheritance (1866), Chromosome theory of inheritance (1902), DNA, hereditary material experiments (1944, 52).

12. **(C)** Pomato was produced by fusion of potato and tomato protoplasts through somatic hybridization technique.

13. **(B)** Phenotypic ratio of a dihybrid cross.

14. **(A)** Foetus is the unborn offspring of a viviparous animal after it has attained the particular form of the species.

15. **(C)** Deoxyribose is the sugar found in the backbone of DNA. C_1 of this sugar is linked to the N_1 of a pyrimidine or the N_9 of a purine base by a β -N-glycosidic linkage.

16. **(B)** Cytosine, thymine and uracil are pyrimidines.

17. **(D)** UGG codes for the amino acid tryptophan.

18. **(B)** ATP is required for the esterification of amino acids to their corresponding t-RNAs. Since ATP is hydrolyzed to AMP and PPi during the reaction, the equivalent of two-high energy phosphate bonds is utilized.

19. **(B)** Drosophilia is the working model for the study of developmental mutants.

20. **(B)** The spermatids are formed after the completion of maturation division during spermatogenesis, hence contain n number of chromosomes. i.e., 23.

21. **(B)** Each delivery is an independent event, probability of male or female child will be 50-50%.

22. **(B)** Because group O is the universal donor.

23. **(C)** Homologous organs perform different functions but have similar embryonic origin.

24. **(C)** Syphilis – Treponema pallidum.

25. **(B)** Five major classes of immunoglobulins are IgA, IgD, IgE, IgG and IgM.

26. **(D)** All cyanobacteria are not associated with nitrogen fixation. Only the heterocystous (those producing heterocysts) forms have the ability of fixing atmospheric nitrogen. Oscillatoria, Lyngbya. Phormidium, Arthospira, Spirulina, Gloeocapsa, Gloeotheca, like non-heterocystous forms do not fix atmospheric nitrogen.

27. **(D)** In human, no new ova are formed after birth. At the time of birth, there are two million ova but 50% of these are atretic.

28. **(C)** Browning of cauliflower is a physiological symptom which develops due to deficiency of Boron.

29. **(D)** Gram +ve bacteria differ from Gram –ve forms in having excess of peptidoglycan in their cell wall which retains Gram staining even after thorough washing with alcohol. Gram –ve forms are often found associated with diseases (they are pathogenic in nature).

30. **(A)** Micropropagation is now used for producing numerous plants from a small piece of tissue (may be a root tip or a shoot tip or even protoplasts) with the help of suitable culture medium. It is based on the concept of cellular totipotency indicating that each and every cell of an organism has the potentiality of producing complete plant when allowed to grow on suitable culture medium. Clones are obtained using micropropagation technique. The seeds of orchids have very poor viability and thus do not grow under normal conditions. The shoot tip or root tip of a particular variety of orchids can produce clones within a very short duration (2-3 months), using micropropagation technique.

31. **(D)** Restriction endonucleus cuts DNA at specific DNA sequence.

32. **(B)** Very little yolk in oligolecithal egg facilitates total holoblastic cleavage.

33. **(B)** Haemophilia is a genetically linked disease. Dysentery (bacterial), plague and tuberculosis are bacterial diseases, not linked genetically.

34. **(C)** Because their wings are analogous organs.

35. **(C)** Precambrain, Palaeozoic, Mesozoic, Cenozoic

36. **(A)** Reserpine is a naturally occurring drug that has been used for centuries in ancient India. It is extracted from the root of Rauwolfia vomitoria, plants found extensively in Africa. In traditional herbal medicine, the root was brewed as a tea and used in humans to treat hypertension, insanity, snakebite and cholera. The purified alkaloid, reserpine, was isolated in 1952 and is considered the first modern drug for the treatment of hypertension. Reserpine irreversibly binds to the storage vesicles of neurotransmitters, particularly norepinephrine, serotonin and dopamine. Eventually, catecholamine depletion occurs because of the body's inability to store these neurotransmitters.

37. **(C)** Hay fever is also known as allergic rhinitis results from the reaction of air borne allergens with sensitized mast cells in conjunctiva and nasal mucosa. The symptoms include watery exudation of the conjunctiva, nasal mucosa and upper respiratory tract, as well as sneezing and coughing.

38. **(B)** Some of the fertilizers, when applied into soil, alter soil pH and this may leads to conversion of fertile land to non-fertile land. On the other hand, no such effect could ever be reported in using biofertilizers. Thus excessive use of fertilizers is non-ecofriendly as compared to use of biofertilizers.

39. **(B)** Normally the strand of DNA transcribing m-RNA is called sense strand but if transcription occurs on strand complementary to sense strand, it is called anti-sense transcription. In biotechnology, some unique characters in flower petals have been developed by inducing anti-sense transcription.

40. **(C)** Meningitis is caused by a bacteria called Neisseria.

Physics

41. **(C)** **In air:** β = 2.0 mm = 2.0×10^{-3} m;

λ = 6000 Å = 6×10^{-7} m;

Now, $\beta = \frac{D\lambda}{d}$

or $\frac{D}{d} = \frac{\beta}{\lambda} = \frac{2.0 \times 10^{-3}}{6 \times 10^{-7}}$

In liquid: Let λ' be the wavelength of light in liquid and β' be the corresponding fringe width. Then,

$\lambda' = \frac{\lambda}{\mu} = \frac{6 \times 10^{-7}}{1.33}$

Now,

$\beta' = \frac{D\lambda'}{d} = \frac{2.0 \times 10^{-3}}{6 \times 10^{-7}} \times \frac{6 \times 10^{-7}}{1.33}$

$= 1.5 \times 10^{-3}$ m

= 1.5 mm.

42. **(C)** Frequency of emitted radiation $v \propto Z^2$

$\therefore \frac{V_H}{V_{Li}} = \left(\frac{Z_H}{Z_{Li}}\right)^2$

$= \left(\frac{1}{3}\right)^2$

$\therefore v_{Li} = 9v_H$

$= 9v_0$

43. **(A)** $v = L\frac{di}{dt} \quad \Rightarrow 4t = L\frac{di}{dt}$

$\frac{1}{L}\int_0^4 4t\, dt = \int_0^i di \Rightarrow i = 32A$

Energy stored, $U = \frac{1}{2}Li^2 = \frac{1}{2} \times 1 \times 32^2$

= 512 J

44. **(C)** Maximum magnetic field is at the surface and is given by

$B = \frac{\mu_0}{2\pi}\frac{i}{R}, \quad \therefore i = \frac{BR}{(\mu_0 / 2\pi)}$

$= \frac{(5 \times 10^{-3})\left(\frac{1.6}{2} \times 10^{-3}\right)}{2 \times 10^{-7}}$

= 20 A

45. **(A)** Dipole moment = $p = 2l$ q = $1 \times 10^{-2} \times 2 \times 10^{-6} = 2 \times 10^{-8}$ cm.

Electric intensity, E = 10^3 NC^{-1}

$\theta = 30°$

Torque, $\tau = pE \sin \theta = 2 \times 10^{-8} \times 10^3 \sin 30°$

$= 2 \times 10^{-8} \times 10^3 \times \frac{1}{2} = 10^{-5}$ Nm

46. **(B)** Here, E = 10 V; r = 3 Ω; I = 0.5 A

Let R be the resistance of the resistor. Then,

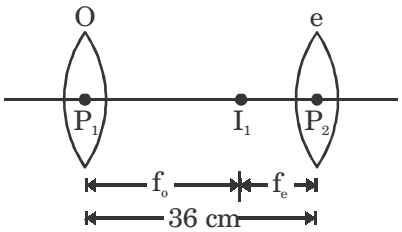
$I = \frac{E}{R + r}$

or $R = \frac{E}{I} - r - \frac{10}{0.5} - 3 = 17\Omega$

Now, the terminal voltage of the battery = potential difference across R

= IR = 0.5 × 17 = 8.5 V

47. **(D)** Image formed by objective (I_1) is at second focus of it because objective is focussed for distant objects. Therefore,



Further I_1 should lie at first focus of eyepiece because final image is formed at infinity.

$\therefore P_2I_1 = f_e$

Given P_1P_2 = 36 cm

$\therefore f_0 + f_e = 36$ ..... (1)

Further angular magnification is given as 5. Therefore,

$\frac{f_0}{f_e} = 5$ ..... (2)

Solving Eqs. (1) and (2), we get

f_0 = 30 cm and f_e = 6 cm.

48. **(A)** The energy of a photon of wavelength 500 nm is

$\frac{hc}{\lambda} = \frac{1242 \text{ eV} - \text{nm}}{500 \text{ nm}} = 2.48 \text{ eV}$

The energy of a photon of wavelength 700 nm is

$\frac{hc}{\lambda} = \frac{1242 \text{ eV} - \text{nm}}{700 \text{ nm}} = 1.77 \text{ eV}$

The energy difference between the states involved in the transition should, therefore, be between 1.77 eV and 2.48 eV.

———— n = 4, E = – 0.85 eV

———— n = 3, E = – 1.5 eV

———— n = 2, E = – 3.4 eV

———— n = 1, E = – 13.6 eV

The given figure shows some of the energies of hydrogen states. It is clear that only those transitions which end at n = 2 may emit photons of energy between 1.77 eV and 2.48 eV. Out of these only n = 3 $\rightarrow$ n = 2 falls in the proper range. The energy of the photon emitted in the transition n = 3 to n = 2 is ΔE = (3.4 – 1.5) eV = 1.9 eV. The wavelength is

$$\lambda = \frac{hc}{\Delta E}$$

$$= \frac{1242 \text{ eV} - \text{nm}}{1.9 \text{ eV}} = 654 \text{ nm}.$$

49. **(C)** Here, R = 30 ohm; X_L = 40 ohm

Therefore, impedance of the LR-circuit,

$$Z = \sqrt{R^2 + X_L^2} = \sqrt{(30)^2 + (40)^2}$$

$$= \sqrt{900 + 1600}$$

$$= \sqrt{2500} = 50 \text{ ohm}$$

Power factor, $\cos\phi = \frac{R}{Z} = \frac{30}{50} = 0.6$

Now, E_0 = 220 volt; I_0 = 1 ampere

$\therefore P_{av} = E_v I_v \cos\phi$

$$= \frac{E_0}{\sqrt{2}} \times \frac{I_0}{\sqrt{2}} \cos\phi = \frac{220 \times 1 \times 0.6}{\sqrt{2} \times \sqrt{2}} = 66 \text{ watt}$$

50. **(D)** The energy density is

$u_{av} = \frac{1}{2}\varepsilon_0 E_0^2 = \frac{1}{2} \times (8.85 \times 10^{-12} \text{ C}^2/\text{N–m}^2) \times$ $(50 \text{ N/C})^2$

$= 1.1 \times 10^{-8} \text{ J/m}^3$

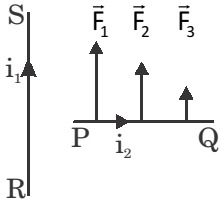
The volume of the cylinder is V = 10 cm^2 × 50 cm = 5×10^{-4} m^3.

The energy contained in this volume is

U = $(1.1 \times 10^{-8} \text{ J/m}^3) \times (5 \times 10^{-4} \text{m}^3)$

= 5.5×10^{-12} J.

51. **(C)** Every current carrying loop is a magnetic dipole. If it lies in the plane of paper and current in it is in clockwise direction magnetic field at all points lying within the loop is perpendicular to paper inwards and at points outside the loop magnetic field is perpendicular to paper in outward direction. For $\theta < 180°$, the centre O lies outside the loop and current is clockwise. Therefore, magnetic field is perpendicular to paper in outward direction.



52. **(D)** Let the potential be zero at the point *P*, at a distance *x* from the charge q_1.

$q_1 = -4\mu C = -4 \times 10^{-6}$ C, $q_2 = 2 \times 10^{-6}$ C

Ap = x, PB = (1 – x)m

Potential due to q_1 at P is $V_A = \frac{1}{4\pi\varepsilon_0} \cdot \frac{q_1}{x}$

Potential due to q_2 at *P* is

$$V_B = \frac{1}{4\pi\varepsilon_0} \cdot \frac{q_2}{(1-x)}$$

Total potential at *P* is zero

$$\frac{1}{4\pi\varepsilon_0} \cdot \frac{q_1}{x} + \frac{1}{4\pi\varepsilon_0} \cdot \frac{q_2}{(1-x)} = 0$$

$$\frac{q_1}{x} = -\frac{q_2}{(1-x)}$$

$$\frac{-4 \times 10^{-6}}{x} = \frac{-2 \times 10^{-6}}{1-x}$$

$2(1 – x) = x$

$2 – 2x = x$

$3x = 2$

$x = \frac{2}{3}$ = 0.667 m

The electric potential is zero at a point distance 0.667 m from the – 4 μC charge.

53. **(B)** Amount left after 10 years

$$A = A_0 \left(\frac{1}{2}\right)^{t/T_{1/2}}$$

$$= A_0 \left(\frac{1}{2}\right)^{10/5}$$

$$= A_0 \left(\frac{1}{2}\right)^2 = \frac{A_0}{4}$$

Probability of decay = $\frac{A_0 - A_0/4}{A_0} \times 100\%$

$$= \frac{3}{4} \times 100 = 75\%$$

54. **(A)** When current flows in any of the coils, the flux linked with the other coil will be maximum in the first case. Therefore, mutual inductance will be maximum in case (a).

55. **(A)** For real image

$u = -u_1$, $v = -2u_1$, $f = -20$ cm

Substituting in $\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$

We get $\frac{1}{-2u_1}-\frac{1}{u_1}=-\frac{1}{20}$

or $u_1 = 30$ cm

For vitual image $u = -u_2$, $v = 2u_2$, $f = -20$ cm

$\therefore \frac{1}{2u_2}-\frac{1}{u_2}=-\frac{1}{20}$

or $u_2 = 10$ cm

$\therefore$ Distance between two positions of the object are $u_1 - u_2$

or 30 cm – 10 cm = 20 cm.

56. **(A)** The energy of the photon is $E = \frac{hc}{\lambda}$

$= \frac{1242 \text{ eV} - \text{nm}}{589 \text{ nm}} = 2.1$ eV.

Hence, the minimum energy required to create a hole-electron pair is 2.1 eV.

57. **(D)** Total magnetic flux passing through whole of the X-Y plane will be zero, because magnetic lines form a closed loop. So as many lines will move in –Z direction and same will return to +Z direction from the X-Y plane.

58. **(B)** Radius of the loop = $r = \frac{20}{2} = 10$ cm

= 0.10 m

Total flux = $\phi = 1.3 \times 10^5$ Nm²/C

But $\phi = E.\pi r^2$

$$E = \frac{\phi}{\pi r^2} = \frac{1.3\times10^5}{3.14\times(0.10)^2} = 4.14\times10^6 \text{ N/C}$$

59. **(B)** Here, work function,

$\omega = 1.2$ eV $= 1.2\times1.6 \times 10^{-19} = 1.92 \times 10^{-19}$ J

Wavelength of the incident radiation,

$\lambda = 5000$ Å $= 5000 \times 10^{-10}$ m

If photoelectrons are emitted with maximum velocity v_{max}, then

$$\frac{1}{2}mv_{max}^2 = hv - \omega = \frac{hc}{\lambda} - \omega$$

$$= \frac{6.62\times10^{-34}\times3\times10^8}{5000\times10^{-10}} - 1.92\times10^{-19}$$

$= 3.97 \times 10^{-19} - 1.92 \times 10^{-19} = 2.05 \times 10^{-19}$ J

If e is the charge on electron and V_0 is the stopping potential, then $e V_0 = \frac{1}{2}mv_{max}^2 =$ 2.05×10^{-19} J

or $V_0 = \frac{2.05\times10^{-19}}{e}$

$$= \frac{2.05\times10^{-19}}{1.6\times10^{-19}} = 1.28 \text{ V}$$

60. **(C)** Here, $I_v = 1.5$ mA $= 1.5 \times 10^{-3}$ A, $\omega = 300$ rad s^{-1},

R = 10 kΩ $= 10^4$ Ω and C = 0.5 μF = 0.5 $\times 10^{-6}$ F

Now,

X_C = know $\frac{1}{\omega C} = \frac{1}{300\times0.5\times10^{-6}}$

$= 6.667\times10^3\Omega$

Therefore, r.m.s. voltage across the capacitor,

$V_C = I_v \times X_C = 1.5\times10^{-3} \times 6.667 \times 10^3 = 10$ V

Also, $Z = \sqrt{R^2 + X_C^2} = \sqrt{(10^4)^2 + (6.667\times10^3)^2}$

$= 1.2\times10^4\ \Omega$

61. **(C)** For a given length and area of cross-section, the resistance of a material is directly proportional to its specific resistance. Since, the specific resistance is least for silver, it is the best conductor of the three given materials.

62. **(C)** In any nuclear reaction mass number and atomic number should remain conserved. Reaction (C) satisfies this condition. Also for $^{239}_{93}$Np, neutron to proton ratio is greater than 1.52 which makes it unstable.

63. **(A)** $l = 1$ m, m = 0.2 Kg, I = 10 A

(a) The tension in the wire is zero when the magnetic force on the wire BIl is equal and opposite to its weight mg.

$$B = \frac{mg}{Il} = \frac{0.2\times9.8}{10\times1} = 0.196\text{T}$$

(b) When the current is reversed, the magnetic force BIl and mg act vertically downwards. The tension in the wire.

= T = BIl +mg = 2mg = 2 × 0.2 × 9.8

= 3.92 N.

64. **(D)** $\lambda = 6000$ Å $= 6000 \times 10^{-10}$ m, D = 1 m, β = 0.5 mm $= 0.5 \times 10^{-3}$ m

$$d = \frac{\lambda D}{\beta} = \frac{6000\times10^{-10}}{0.5\times10^{-3}} = 1.2\times10^{-3}\text{m}.$$

65. **(C)** $C_1 = 3\ \mu F =, C_2 = 5\ \mu F, C_3 = 7\ \mu F$

(i) The effective capacitance when connected in series = C_s = ?

$$\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} = \frac{1}{3} + \frac{1}{5} + \frac{1}{7} = 0.676$$

$$C_s = \frac{1}{0.676} = 1.48\ \mu F$$

(ii) The effective capacitance when connected in parallel = C_p = ?

$C_p = C_1 + C_2 + C_3 = 3 + 5 + 7 = 15\ \mu F$

Chemistry

66. **(A)** $Al^{3+} + 3e^- \rightarrow Al.$

One mole requires 3×96500 C

$\therefore$ One millimole requires = 3×96.5 C

= 9.65 A × time in sec

$$\therefore \text{Time} = \frac{3 \times 96.5}{9.65} = 30\ s$$

67. **(A)** The decreasing order of the boiling points of given hydrides is

$SbH_3 > NH_3 > AsH_3 > PH_3$

68. **(A)** The coordination number of the central atom or ion is determined by the number of sigma bonds between the ligands and the central atom/ion.

69. **(A)**

$$\underset{\text{Ethyl isocyanide}}{C_2H_5N \rightleftarrows C} + H_2O \xrightarrow{H} \underset{\text{Ethylamine}}{C_2H_5NH_2} + \underset{\text{Methanoic acid}}{HCOOH}$$

70. **(B)** $CH_3CH_2CH_2COOH > CH_3CH_2CH_2CH_2OH > CH_3CH_2CH_2CHO$

(a) The – OH group of the – COOH group in an acid is more strongly polarized due to the presence of carbonyl oxygen adjacent to it.

(b) Alcohol molecules can form H-bonds through their –OH groups. The presence of carbonyl group in acids permits the formation of H-bonds through –OH and the carbonyl oxygen. Thus, a carboxylic acid molecule can enter into hydrogen bonding at two different points.

71. **(D)** The helical structure of proteins is stabilized by NH ---- C=O hydrogen bonds.

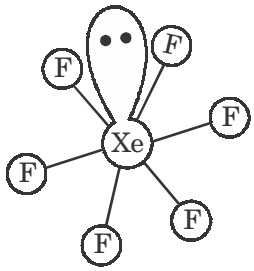
72. **(A)** Amount of NaCl = $\frac{1.00\ g}{58.5\ g/mol}$

No. of unit cells in 1.00 g of NaCl

$$= \frac{6.02 \times 10^{23}\ mol^{-1}}{4} \times \frac{1.00\ g}{58.5\ g\ mol^{-1}}$$

$= 2.57 \times 10^{21}$

73. **(A)** XeF_6 has seven electron pairs (6 bonding pairs and one lone pair) and would, thus, have a distorted octahedral structure as found experimentally in the gas phase.



74. **(C)** Due to stabilization of –COOH by resonance, electrophilicity of C-atom of C = O group of COOH decreases and hence carboxylic acids do not give characteristic reactions (such as cyanohydrin formation, reaction with NH_2OH, etc) of aldehydes/ ketones.

75. **(A)** According to Henry's law for a gas at 2 different concentrations

$$k = \frac{C_1}{P_1}, \quad k = \frac{C_2}{P_2}$$

$$\frac{C_1}{P_1} = \frac{C_2}{P_2}$$

Given that $C_1 = 0.015$ g/L

$P_1 = 580$ torr, $P_2 = 800$ torr, C_2 = ?

$$\text{So, } \frac{0.015}{580} = \frac{C_2}{800}$$

$C_2 = 0.0207$ g/L

76. **(A)** RCl and RBr can be prepared by free radical halogenation of alkanes while RF and RI cannot be prepared. With F_2, the reaction is not only explosive but also brings cleavage of C-C bonds while with I_2 the reaction is too slow to be of any practical value.

77. **(D)** In a bessemer converter, copper pyrites are oxidised to FeO and Cu_2O. FeO is slagged off. Cu_2O reacts with Cu_2S left unoxidised to give Cu.

$2\ Cu_2S + 3\ O_2 \rightarrow 2\ Cu_2O + 2\ SO_2 \uparrow$

$2\ Cu_2O + Cu_2S \rightarrow 6\ Cu + SO_2 \uparrow$

78. **(C)** Zinc ($3d^{10}$) configuration shows only +2 ox. state.

79. **(D)** Ketones are less reactive because of statements (B) and (C).

80. **(B)** Argentite. Ag_2S is concentrated by leaching with NACN solution in the presence of air.

$2\ Ag_2S + 8\ NaCN + O_2 + 2H_2O \rightarrow$

$4\ Na[Ag(CN)_2] + 4\ NaOH + 2S$

81. **(C)** Both optical and geometrical isomerisms are the types of streoisomerism.

82. **(C)** Rate = k $[NO]^2$ $[O_2]$

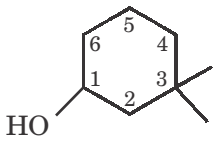
New rate = k $(2[NO])^2$ $(2[O_2])$

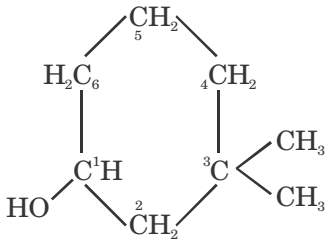
= k $[NO]^2$ $[O_2].8$

New rate = 8 × Rate

83. **(D)** Low temperature and high pressure favours the conversion of SO_2 to SO_3 in contact process for the manufacture of H_2SO_4.

84. **(C)** The IUPAC name of the given compound is 3, 3-dimethyl-1-cyclohexanol.





85. **(C)**

$$C_6H_5NH_2 + CH_3COCl \longrightarrow \underset{\text{Acetanilide}}{C_6H_5NHCOCH_3} + HCl.$$

86. **(A)** The two structures are non-superimposable mirror images of each other and hence are enantiomers.

87. **(B)** As equal number of Na^+ and Cl^- ions are missing from their lattice site, it is Schottky defect.

88. **(C)** Since, compound A undergoes Cannizzaro reaction, it must be formaldehyde. Since, compound B undergoes iodoform test, it must be a methyl ketone, i.e., 2-pentanone.

89. **(B)** Adsorption is an exothermic process. So, it decreases with an increase in temperature.

90. **(C)** In HF, the molecules are associated through hydrogen bonding resulting in increase of b.p. of the liquid.

91. **(A)**

92. **(B)**

93. **(D)**

94. **(A)**

95. **(C)**

96. **(A)**

97. **(C)**

98. **(D)**

99. **(A)**

100. **Del**