DBT Star scheme quiz exam 2021
Udai Pratap College Varanasi

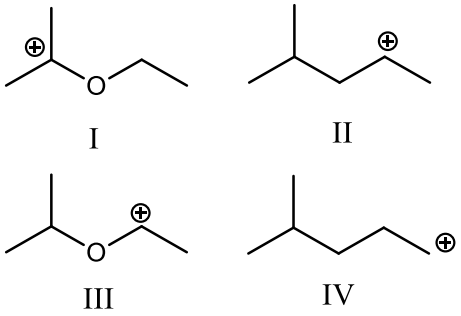
Subject: Chemistry Class: BSc II
Time: 1.5 hrs. MM: 100

Name of Candidate:

Students Id:

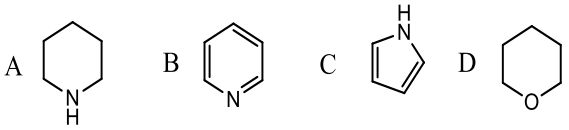
Write the correct answer in the given box, provided in answer key page. Each questions carry equal marks.

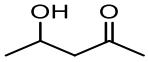
1. The correct stability order for the following species is



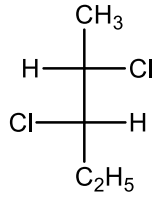
A II > IV > I > III
B I > II > III > IV
C II > I > IV > III
D I > III > II > IV

2. Strongest base is



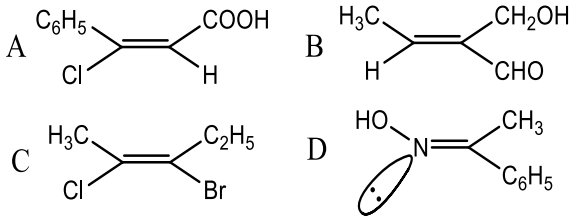
3. The IUPAC name of  is
A 2-hydroxy-4-pentanone
B 4-hydroxy-2-pentanone
C 2-oxo-4-pentanol
D 4-keto-2-pentanol

4. The absolute configuration of the following:

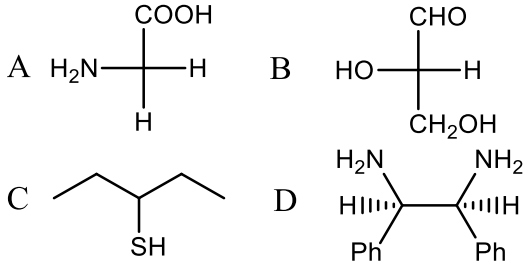


5.
A 2S, 3R B 2S, 3S
C 2R, 3S D 2R, 3R

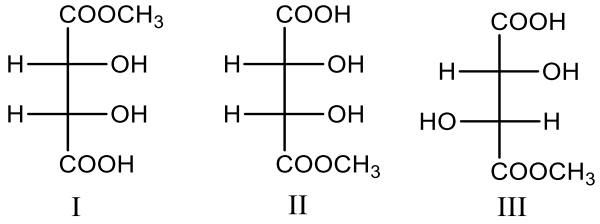
6. The Z isomer among the following is



7. Which of the following molecules is expected to rotate the plane of polarized light?

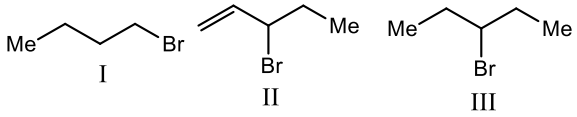


8. The correct statement about the compounds I, II and III is:



A I and II are identical
B I and II are diastereomers
C I and III are enantiomers
D I and II are enantiomers

9. Consider the following bromides:

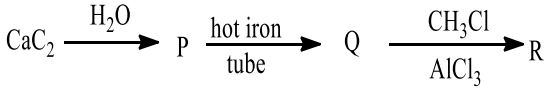


10. The correct order of SN^1 reactivity is:
A I > II > III B II > III > I
C II > I > III D III > II > I

11. The unpaired electron of free radicals resides in
A p_z orbital (unhybridized)
B sp^2 orbital (hybridized)
C p_z orbital (hybridized)
D All of these

12. Hyperconjugation involves overlap of the following orbitals:
A $\sigma - \sigma$ B $p - p$
C $\sigma - p$ D $\pi - \pi$

13. One mole of alkene on ozonolysis gives 2 moles of butanone. The alkene is:
    A 3, 4-dimethyl hex-2-ene
    B 2, 3-dimethyl hex-3-ene
    C 3, 4-dimethyl hex-3-ene
    D 2, 3-dimethyl hex-2-ene
14. In the following reaction, the product R is:



    A Benzene B Ethyl benzene
    C propyl benzene D Toluene
15. Which of the following alkyne does not show acidic character?
    A $Ph-C\equiv C-H$ B $H_3C-C\equiv C-H$
    C $Ph-C\equiv C-CH_2CH_3$ D $H-C\equiv C-CH_2CH_3$
16. Which of the following reagents can be used to distinguish between propene and propyne?
    A Schiff's reagent
    B Lucas reagent
    C O_3/Me_2S
    D Ammonical $AgNO_3$
17. Which of the following has minimum flocculation value?
    A Pb^{2+} B Pb^{4+} C Sr^{2+} D Na^{+}
18. If both dispersed phase and dispersion medium are liquid then it is known as
    A Sol B Gel
    C Aerosol D Emulsion
19. The gold numbers of some colloidal solutions are given below:

Colloidal solution	Gold Number
20. a	0.01
21. b	2.5
22. c	20

    The protective powers of these colloidal solutions follow the order:
    A c > b > a B a > b > c
    C a = b = c D b > a > c
23. Half-life of a reaction becomes half when initial concentrations of reactants are made double. The order of the reaction will be
    A 1 B 2 C 0 D 3
24. If we plot a graph between log k and 1/T by Arrhenius equation, the slope is:
    A –Ea/R B +Ea/R
    C $-\frac{Ea}{2.303}$ D $+\frac{Ea}{2.303}$
25. The rate of the first order reaction, A $\longrightarrow$ P, is 7.5×10^{-4}mol L^{-1} s^{-1}, when the concentration of A is 0.2 mol L-1. The rate constant of the reaction is:
    A 2.5×10^{-5} s^{-1}
    B 8.0×10^{-4} s^{-1}
    C 6.0×10^{-4} s^{-1}
    D 3.75×10^{-3} s^{-1}
26. The maximum number of molecules is present in:
    A 15 L of H_2 gas at STP
    B 5 L of N_2 gas at STP
    C 0.5 g of H_2 gas
    D 10 g of O_2 gas
27. Cl−O bond order in perchlorate ion is:
    A 1.33 B 1.50 C 1.75 D 1.90
28. Among the following, the maximum covalent character is shown by the compound:
    A $FeCl_3$ B $SnCl_2$
    C $AlCl_3$ D $MgCl_2$
29. Among the following, the pair in which the two species are not iso structural is:
    A IO_3^- and XeO_3 B PF_6^- and SF_6
    C BH_4^- and NH_4^+ D CO_3^{2-} and NO_2^-
30. The correct order of size of orbital is:
    A $s > sp^2 > sp^3 > sp$
    B $p > sp^3 > sp^2 > sp > s$
    C $p > s > sp^2 > sp^3 > sp$
    D All of these
31. Using MO theory predict which of the following species has the shortest bond length?
    A O_2^{2+} B O_2^{+} C O_2^{-} D O_2^{2-}
32. Which of the following is planar?
    A XeF_4 B XeO_3F
    C XeO_2F_2 D XeF_2
33. Among the following compounds the one that is polar and has the central atom with sp^2 hybridization is:
    A H_2CO_3 B SiF_4 C BF_3 D $HClO_2$
34. Which of the following hybridization results in non-planar orbitals?
    A sp^2 B dsp^2 C dsp^3 D All of these
35. Which of the following has lowest ionisation energy?
    A O B N C F D S

36. The correct sequence which shows decreasing order of the ionic radii of the element is:
A $O^{2-} > F^{-} > Na^{+} > Al^{3+}$
B $F^{-} > O^{2-} > Na^{+} < Al^{3+}$
C $O^{2-} < F^{-} < Na^{+} < Al^{3+}$
D $Al^{3+} > O^{2-} > Na^{+} < F^{-}$

37. The diagonal partner of element B is:
A Li B Al C Si D Mg

38. The correct order of increasing electron affinity of halogens is:
A F < Cl < Br < I
B I < Br < F <Cl
C I < Br < Cl <F
D Br < I < F <Cl

39. The correct order of increasing metallic character is:
A B < Al < Mg < K
B B < Mg < Al < K
C Mg < B < Al < K
D K < Mg < Al < B

40. The most stable alkaline earth metal carbonate is:
A $BeCO_3$ B $MgCO_3$
C $SrCO_3$ D $BaCO_3$

41. Select the crystal system which has no symmetry
A Triclinic B Monoclinic
C Orthorhombic D Tetragonal

42. Which of the following compound is known as inorganic benzene?
A B_6H_6 B $C_3N_3H_3$
C $B_3N_3H_6$ D $P_3N_3Cl_6$

43. The most stable dihalide is:
A SnX_2 B PbX_2 C GeX_2 D SiX_2

44. Which of the following gives cross linked silicone polymer?
A R_3SiCl B R_4Si
C $RSiCl_3$ D R_2SiCl_2

45. The percentage of p-character in the orbitals forming P-P bond in P_4 is:
A 25 B 33 C 50 D 75

46. The number of chlorine to oxygen bonds in Cl_2O_7 is:
A 8 B 7 C 6 D 10

47. Three point is the point where
A Three components are in equilibrium
B F (Degree of freedom) is three
C F (Degree of freedom) is Zero
D Three solids make three phases

48. Water ice, water and water vapour coexist in equilibrium
A Vapour pressure of water is zero
B Vapour pressure of water is 1 atm
C Vapour pressure of water is 4.58 Torr
D None of the above

49. The efficiency of a cell is given by:
A $\frac{\Delta G}{\Delta S}$ B $\frac{\Delta G}{\Delta H}$ C $\frac{\Delta S}{\Delta G}$ D $\frac{\Delta H}{\Delta G}$

50. Which of the following pairs constitutes a buffer?
A HNO_2, $NaNO_2$ B NaOH, NaCl
C HNO_3, NH_4NO_3 D HCl, NaOH

51. In the equation $\Lambda_m = \Lambda_m^o + B\sqrt{C}$, the constant B depends upon
A $\sqrt{C}$
B Stoichiometry of the electrolyte
C Resistance
D Conductivity

52. The ionic mobility of an alkali metal ion in aqueous solutions is minimum for
A Li^+ B Na^+ C Rb^+ D Cs^+

53. Transport number of Cl^- ion will be minimum in which of the following electrolytes
A NaCl B KCl C RbCl D HCl

54. Which of the following expression gives the value of Λ_m^o for an electrolyte $Ca_3(PO4)_2$
A $3\lambda^o_{Ca^{2+}} + 2\lambda^o_{PO_4^{3-}}$ B $\lambda^o_{Ca^{2+}} + \lambda^o_{PO_4^{3-}}$
C $2\lambda^o_{Ca^{2+}} + 3\lambda^o_{PO_4^{3-}}$ D $\lambda^o_{Ca^{2+}} - \lambda^o_{PO_4^{3-}}$

55. Huckel rule predicts aromaticity for a conjugated ring with_____ π-electrons?
A One B three C four D six

56. Conjugated dienes contains
A only two double bond
B Two double bonds connected to the same carbon
C Alternating single and double bonds
D two double bonds separated by two single bonds

57. Electron delocalization makes a molecule
A less stable B ionic
C stable D radioactive

58. Which of the following is a terminal alkyne?
A 1-Hexyne B 2-hexyne
C 3-hexyne D 4-hexyne

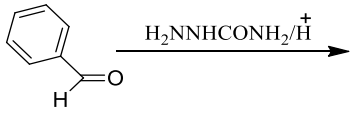
59. Which type of reactant shoes the greater reactivity in an SN^2 reaction?
A Secondary alkyl halide
B Tertiary alkyl halide
C Primary alkyl halide
D CH_3

60. In Wittig reaction, which of thefollowing intermediate is formed?
A Carbene
B Nitrene
C Oxaphosphtane
D Eschenmoser salt

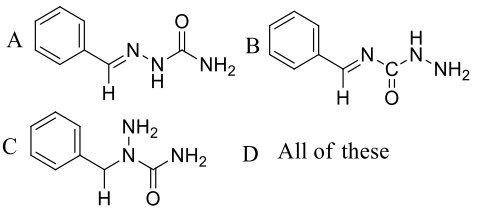
61. Which of the following compounds forms stable hydrate?
A Chloral B Formaldehyde
C Acetaldehyde D Acetone

62. Which of the following reaction involves in the conversion of cyclic ketones into lactones in presence of peracids?
A Oppenauer oxidation
B HVZ reactions
C Beckmann reactions
D Baeyer-Villiger oxidations

63. In the following reaction,



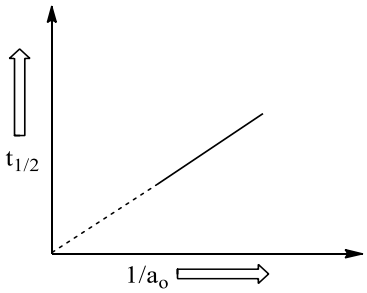
The correct product is



D All of these

64. β-hydroxy ester prepared by the following reaction is
A Reformatsky reaction
B Hoffmann bromides reactions
C Cross aldol condensation
D Claisen condensations

65. The following graph shows how to $t_{1/2}$ of a reactant R changes with the initial reactant concentration a_o



The order of the reaction will be
A 0 B 1 C 2 D 3

66. The conjugate base of NH3 is
A NH_4^+ B NH_2^- C NH_4Cl D All of these

67. A hypothetical reaction, $A_2 + B_2 \longrightarrow 2AB$, follows the mechanism as given below:
$A_2 \rightleftharpoons A + A$ fast
$A + B_2 \longrightarrow 2AB + B$ slow
$A + B \longrightarrow 2AB$ fast
The overall order of reaction is
A 0 B 1 C $1\frac{1}{2}$ D 2

68. Three elements A, B and C crystallize into a cubic solid lattice. Atoms A occupy the corners, B atoms the cube centers and atoms C the edges. The formula of the compound is
A ABC B ABC_2 C ABC_3 D ABC_4

69. Which of the following defects is also known as dislocation defects?
A Frenkel defect
B Schottky defect
C Non-stoichiometric defect
D Simple interstitial defect

70. The total number of tetrahedral voids in the face centred unit cell is
A 6 B 8 C 10 D 12

71. Which of the following FCC structure contains cations in alternate tetrahedral voids?

A NaCl B ZnS C Na_2O D CaF_2

72. The number of octahedral sites per sphere in fcc structure is-
A 8 B 4 C 2 D 1

73. If pressure is very high then compressibility factor Z is equal to
A $1+\frac{Pb}{RT}$ B $1-\frac{Pb}{RT}$ C $1-\frac{PV}{RT}$ D All of these

74. The unit of Vander Waal constant a is
A L mol^{-1} B atm L^2 mol^{-2}
C atm L^2 mol^2 D L mol^{-2}

75. The ratio of most probable velocity to the average velocity is
A $\pi/2$ B $2/\pi$ C $\sqrt{\pi}/2$ D $2/\sqrt{\pi}$

76. Thermodynamically, the most stable form of carbon is
A Diamond B Fullerenes
C Graphite D Coal

77. A reaction occurs spontaneously if
A $T\Delta S > \Delta H$ and ΔH is + ve and ΔS is – ve
B $T\Delta S < \Delta H$ and both ΔH and ΔS are +ve
C $T\Delta S = \Delta H$ and both ΔH and ΔS are +ve
D $T\Delta S > \Delta H$ and both ΔH and ΔS are +ve

78. The standard free energy change, ΔG° is related to equilibrium constant K_p as
A $K_p = -RTln\Delta G^\circ$
B $K_p = \left(\frac{e}{RT}\right)^{\Delta G^\circ}$
C $K_p = -\frac{\Delta G^\circ}{RT}$
D $K_p = e^{-\Delta G^\circ/RT}$

79. Which of the following thermodynamic relation is correct?
A $dG = VdP - SdT$
B $dE = PdV + TdS$
C $dH = -VdP + TdS$
D $dG = VdP + SdT$

80. K_p/K_c for the reaction CO(g) + $\frac{1}{2}O_2$(g) $\rightleftharpoons$ CO_2(g) is
A 1 B RT C $(RT)^2$ D $1/\sqrt{RT}$

81. The (111) plane is parallel to
A xy plane B yz plane
C xz plane D none of these

82. Which one of the following conversion involves change in both hybridization and shape?
A $CH_4 \rightarrow C_2H_6$
B $NH_3 \rightarrow NH_4^+$
C $BF_3 \rightarrow BF_4^-$
D $H_2O \rightarrow H_3O^+$

83. The hydrogen bond is shortest in
A S——H----S C N——H----O
B F——H----O D F——H----F

84. The maximum number of hydrogen bonds that a water molecule can form is
A 1 B 2 C 3 D 4

85. Which of the following orbitals will have zero probability of finding the electron in the yz plane?
A p_x B p_y C p_z D dyz

86. Among the following which is gerade
A σ-antibonding B σ-bonding
C π-bonding D All of these

87. Which ligand is useful for removal of the toxic effect of lead metal from the body in chelate therapy treatment?
A EDTA B oxalate C Acetate D bpy

88. The hybridization of Fe in $K_4[Fe(CN)_6]$ is
A dsp^2 B sp^3 C d^2sp^3 D sp^3d^2

89. Fac-Mer isomerism is associated with which one of the following complexes?
A $[M(AA)_2]$ B $[MA_3B_3]$
C $[M(AA)_3]$ D All of these

90. The ligand $N(CH_2CH_2NH_2)_3$ is
A tridentate B pentadentate
C bidentate D tetradentate

91. The complex which has the highest magnetic moment among the following is
A $[CoF_6]^{3-}$ B $[Co(NH_3)_6]^{3+}$
C $[Fe(CN)_6]^{4-}$ D $[Ni(CN)_4]^{2-}$

92. The oxidation state of Fe in the brown ring complex $[Fe(H_2O)_5NO]SO_4$ is
A +3 B +2 C +4 D +1

93. Which of the following is not a d-block element?
A Hg B Eu C Ni D W

94. There are 14 elements in actinoid series. Which of the following elements does not belongs to this series?
A U B Np C Tm D Fm

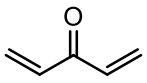
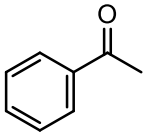
95. Which of the following oxidation state is common for all lanthanoids?
A +2 B +4 C +6 D +3

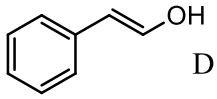
96. Among the following which is not extensive properties
A Melting point B Entropy
C Internal energy D Gibb's free energy

97. Carbon monoxide is allowed to expand isothermally and reversibly from 10 m^3 to 20 m^3 at 300K and work obtained is 4.754 kJ. The number of moles of CO is
A 2.75 B 1.75 C 2.0 D 1

98. Useful work is
A Helmholtz free energy
B Gibb's free energy
C Internal energy
D All of these

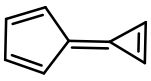
99. Which compound shows cross conjugation?

A  B 

C  D Both B & C

100. Among the following which is aromatic compound?

A  B 

C  D 

For Rough work

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Udai Pratap College Varanasi

Subject: Chemistry Class: BSc III
Time: 1.5 hrs. MM: 100

Name of Candidate:

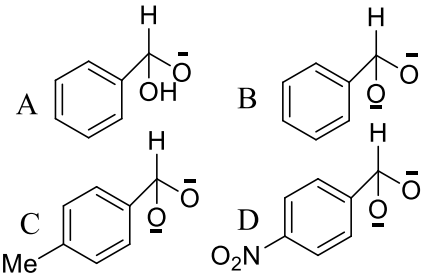
Students Id:

Write the correct answer in the given box, provided in answer key page. Each questions carry equal marks.

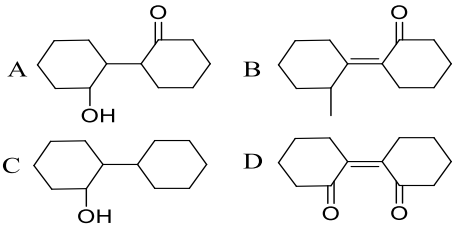
1. The normal mode of vibration in C_2H_2 and SO_2 molecules, respectively are:
   A 6 and 4 B 7 and 3
   C 7 and 4 D 6 and 3
2. Which of the following does not show spectrum?
   A Rotational transition
   B Vibrational transition
   C Translational transition
   D Electronic transition
3. On the absorption of beam of light, the continuous ejection of electrons from the metal surface is called:
   A Photoelectric effect
   B Compton Effect
   C Stark effect
   D Stefan Boltzmann's law
4. The correct mathematical expression for Heisenberg uncertainty principle is:
   A $\Delta p \Delta x = \frac{\hbar}{2}$
   B $\Delta \phi \Delta \theta = \frac{h}{4\pi}$
   C $\Delta E \Delta t = \frac{h}{4\pi}$
   D All of these
5. Which of the following molecule obey Clausius-Mosotti equation?
   A NH_3 B CCl_4 C HCl D H_2O
6. The correct Eigen value of $-5e^{-3ax}$ for operator $\frac{d}{dx}$ is
   A 15a B -15a C -5 D $-5e^{-3ax}$
7. The quantized energy of particle in one-dimensional box can be calculated by following expression:
   A $\frac{h^2}{8ma^2}$ B $\frac{k^2h^2}{8ma^2}$
   C $\frac{n^2h^2}{8ma^2}$ D $\frac{h^2}{8\pi ma^2}$
8. The correct wave functions for the two sp hybrid orbitals are:
   A $\psi_1 = \frac{1}{\sqrt{2}}(\psi_s + \psi_p), \psi_2 = \frac{1}{\sqrt{2}}(\psi_s + \psi_p)$
   B $\psi_1 = (\psi_s + \psi_p), \psi_2 = (\psi_s - \psi_p)$
   C $\psi_1 = \frac{1}{\sqrt{3}}(\psi_s + \psi_p), \psi_2 = \frac{1}{\sqrt{3}}(\psi_s - \psi_p)$
   D $\psi_1 = \frac{1}{\sqrt{2}}(\psi_s - \psi_p), \psi_2 = \frac{1}{\sqrt{2}}(\psi_s + \psi_p)$
9. The correct wave function for bonding molecular orbital is
   A $\psi_{BMO} = \frac{1}{\sqrt{2}}(\psi_A + \psi_B)$
   B $\psi_{BMO} = \frac{1}{\sqrt{2}}(\psi_A - \psi_B)$
   C $\psi_{BMO} = \frac{1}{\sqrt{2+2S}}(\psi_A + \psi_B)$
   D $\psi_{BMO} = \frac{1}{\sqrt{2-2S}}(\psi_A + \psi_B)$
10. The vibrational frequency ν is related to the force constant k through
    A $\nu = \frac{1}{2\pi}\sqrt{\frac{k}{\mu}}$ B $\nu = \frac{1}{2\pi c}\sqrt{\frac{km}{\mu}}$
    C $\nu = \frac{1}{2\pi}\sqrt{\frac{\mu}{\kappa}}$ D All of these
11. The rotational constant of diatomic molecule calculated using following formula:
    A $\frac{h}{4\pi^2 Ic}$ B $\frac{h^2}{8\pi^2 I}$
    C $\frac{h}{8\pi^2 I}$ D $\frac{h}{8\pi^2 Ic}$
12. Nuclei being much more massive than electrons, Movement of nuclei is negligible during the time taken by an electronic transition. It is called:
    A Lambert Beer Law
    B Born-Oppenheimer approximation
    C Franck Condon Principle
    D None of these
13. Raman scattering observed in the region is:
    A UV-visible B Microwave
    C Infra-red D Radiowave
14. Which of the following molecules are exhibit rotational spectra?
    A CO_2 B C_2H_2 C H_2 D OCS
15. At absolute zero when all translational and rotational motion ceases in a crystal, only vibrational motion persists. This is implies that
    A Zero point energy
    B Dissociation energy
    C Equilibrium energy
    D Rotational energy
16. For photochemical reactions, the activation energy is acquired by:
    A Absorption of photons
    B Inter-molecular collisions

C Supplied heat
D Both B and C

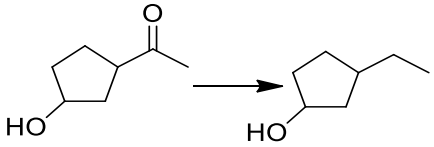
17. For photochemical reaction A → B, 6.02 × 10^{18} molecules of B were formed on absorption of 1.2 × 10^{19} quanta energy. The quantum efficiency is:
A 5.0 B 6.0
C 0.5 D 1.0
18. The emission of light by glow-warms (fire-flies) is called as
A Fluorescence
B Phosphorescence
C Both A and B
D Chemiluminescence
19. Radiative transitions phosphorescence is represented as:
A $S_1 \rightarrow S_0 + h\nu$ B $T_1 \rightarrow S_0 + h\nu$
C $T_2 \rightarrow S_0 + h\nu$ D $T_2 \rightarrow T_1 + h\nu$
20. In an absorption cell, the transmittance of 0.1 M solution of a substance X is 50% and that of 0.1 M solution of another substance Y is 25% at given wavelength. The transmittance (%) of a solution that is simultaneously 0.1 M in X and 0.1 M in Y is: (Given that: antilog of 0.9030 is 7.998)
A 12.5 B 0.125
C 125 D 6.25
21. The mole fraction of a given sample of I_2 in C_6H_6 is 0.2. The molality of I_2 in C_6H_6 is:
A 0.32 B 3.2
C 0.032 D 0.48
22. For an ideal solution obeying Raoult's law:
A $\frac{p_A}{P_A^\circ} = x_A$ B $p_A x_A = P_A^\circ$
C $p_A = \frac{x_A}{P_A^\circ}$ D none is true
23. The vapour pressure of a liquid in a closed container depends on:
A Temperature of liquid
B Quantity of liquid
C Surface area of the liquid
D None of these
24. Van't Hoff factor of Hg_2Cl_2 in its aqueous solution will be ($Hg_2Cl_2$is 80% ionized in the solution):
A 1.6 B 2.6
C 3.6 D 4.6
25. Which of the following solutions will exhibit highest boiling point?
A 0.01M Na_2SO_4 B 0.01M KNO_3
C 0.01 M Urea D 0.01M Glucose
26. In a Cannizzaro's reaction, the intermediate that will be the best hydride donor is



27. What is the product formed when cyclohexanone undergoes aldol condensation followed by heating?



28. The appropriate reagent for the following transformation

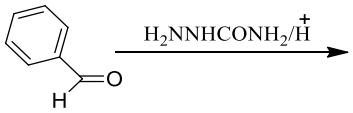


A Zn(Hg), HCl B $NH_2NH_2,\bar{O}H$
C H_2/Ni D $NaBH_4$

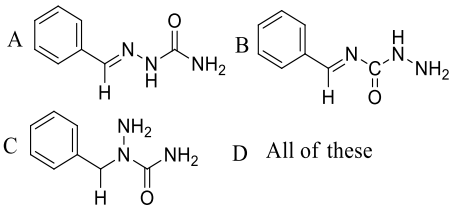
29. When two moles of benzaldehyde was condensed in presence of KCN, the product is
A Benzal B Dibenzal
C Benzoin D Furoin
30. Which of the following reaction gives one aromatic acid as well one aliphatic acid?
A Perkins reaction
B Knoevenagel reactions
C Dieckmann condensations
D Claisen-Schmidt condensations
31. In Wittig reaction, which of the following intermediate is formed
A Carbene
B Nitrene
C Oxaphosphtane
D Eschenmoser salt
32. Which of the following reaction involves in the conversion of cyclic ketones into lactones in presence of peracids?
A Oppenauer oxidation
B HVZ reactions
C Beckmann reactions

D Baeyer-Villiger oxidations

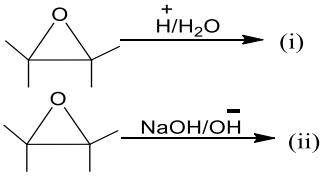
33. In the following reaction,



The correct product is



34. In the following epoxide ring opening,



The product trans 1, 2-diol is formed in

A i only B ii only
C both i and ii D None of these

35. Which of the following compounds cannot prepare by Williamson's synthesis?

A $H_3C-O-CH_3$
B $H_3C-O-CH_2CH_2CH_3$
C $H_3CH_2C-O-CH_2CH_2CH_3$
D $(CH_3)_3C-O-C(CH_3)_3$

36. In [18]-Crown-6, the number of oxygen atom is

A 18 B 6 C 12 D 24

37. The hybrid state of central oxygen atom and C-O-C bond angle, respectively is

A sp^2 & 110° B sp^3 & 105°
C sp & 180° D sp^3d & 90°

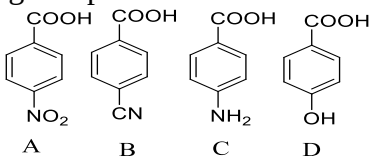
38. Which of the following does not react with sodium metal?

A $(CH_3)_2O$ B C_2H_5OH
C CH_3COOH D C_6H_5OH

39. In the preparation of Grignard reagents, which of the following solvent is used

A Benzene B Alcohol
C Ether D Ketone

40. The correct decreasing order of acidity of following compounds is:



A A > B > C > D B A> B > D > C
C B> A > C > D D D > C > B > A

41. Which of the following more acidic compound is:

A $F_3C-COOH$ B $R_2N-COOH$
C $O_2N-COOH$ D

42. Which of the following reaction the Bromobenzene is obtained on treatment with silver salt of carboxylic acid and bromine in CCl_4

A HVZ reaction
B Hundsdiecker reactions
C Kolbe's electrolysis
D none of these

43. Among the following, which one of the reaction does not involve formation of Nitrene intermediate?

A Hoffmann degradation
B Curtius reaction
C Schmidt reaction
D Schotten Baumann reaction

44. Among the following, The more basic compound is

A 2, 4, 6-trinitroaniline
B N,N dimethyl 2, 4, 6-trinitroaniline
C 1 & 2 are equally basic
D Not determined

45. Gabriel's phthalimide reaction gives

ATertiary amine B Secondary amine
C Primary amine D All of these

46. Lanthanides and Actinides resembles in

A Electronic configuration
B Oxidation state
C Ionisation energy
D Formation of complexes

47. Bond energies in NO, NO^+, NO^- are such as:

A $NO^- > NO > NO^+$
B $NO^+ > NO > NO^-$
C $NO > NO^- > NO^+$
D $NO^+ > NO^- > NO$

48. The outer electronic configuration of Gd (At. no. 64) is:

A $4f^35d^36s^2$ B $f^85d^36s^2$
C $4f^45d^46s^2$ D $4f^75d^16s^2$

49. Which of the following pairs has the same size?

A Zr^{4+}, Hf^{4+} B Ce^{4+}, Hf^{4+}
C Zr^{4+}, Ti^{4+} D All of these

50. Consider the following statements:

i $La(OH)_3$ is the least basis among hydroxides of Lanthanides [$Ln(OH)_3$]

ii Zr^{4+} *and* Hf^{4+}possess almost the same ionic radii.

iii Ce^{4+}can act as oxidising agent.

Which of the following statement is/are true?

A (i) and (iii) B (ii) and (iii)

C (i) and (ii) D (iii) Only

51. Which of the following is not an Arrhenius acid?

A HCl B CO_2 C HNO_3 D H_2SO_4

52. Which of the following is not Lewis acid?

A NH_3 B BF_3 C Na^+ D CO_2

53. Which of the orders of acidic strength of oxoacids is not correct?

A $HClO_4 > HClO_3 > HClO_2 > HClO$

B $HClO_3 > HBrO_3 > HIO_3$

C HOCl > HOBr > HOI

D HOI > HOBr > HOCl

54. Phosphoric acid is a tribasic acid. It dissociates in three stages, as shown

$H_3PO_4 + H_2O \rightleftharpoons H_3O^+ + H_2PO_4^-$

$Ka_1 = 7.52 \times 10^{-3}$

$H_2PO_4^- + H_2O \rightleftharpoons H_3O^+ + HPO_4^{2-}$

$Ka_2 = 6.23 \times 10^{-8}$

$HPO_4^{2-} + H_2O \rightleftharpoons H_3O^+ + PO_4^{3-}$

$Ka_3 = 4.80\times 10^{-13}$.

The correct order of dissociation constant is:

A $Ka_1 = Ka_2 = Ka_3$

B $Ka_1 > Ka_2 > Ka_3$

C $Ka_1 < Ka_2 < Ka_3$

D $Ka_1 = Ka_2 < Ka_3$

55. In the following compounds, a = CaO b = PbO c = SO_3 which can accept oxide ions

A a B b C c D a & b

56. The stronger conjugate base is

A CH_3^- B I^- C Cl^- D NH_2^-

57. The alkali metal gives blue colour in Liquid ammonia due to the formation of

A Ammoniated electron

B Ammoniated cation

C Ammono base

D Adduct

58. By use of the following Latimer diagram

$ClO^- \xrightarrow{0.42V} Cl_2 \xrightarrow{1.36V} Cl^-$

The E° value for the reduction of ClO^- to Cl^- in aqueous basic medium is

A 78V B 0.89V

C 0.94V D None of these

59. When the side-chains or groups are oriented alternately above and below the plane of the carbon chain. The polymer is known as-

A Isotactic Polymer

B Syndiotactic Polymer

C Atactic Polymer

D Stereoregular Polymer

60. Dacron is a polycondensation product of-

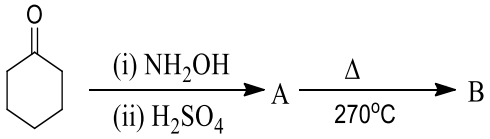
A Phenol & Formaldehyde

B Adipic acid & $H_2N(CH_2)_6NH_2$

C Glycol & Dimethyl terephthalate

D None of these

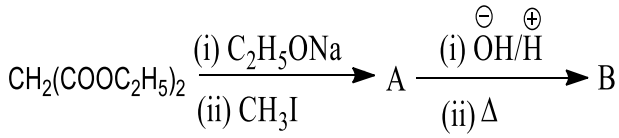
61. The final product of following reaction is-



A Nylon 6 B Nylon 6, 10

C Nylon 6, 6 D Polyamide

62. In the Following reaction series



The final product B is

A Acetic acid

B Propionic acid

C Propane dicarboxylic acid

D Butanoic acid

63. Two mole of ethyl acetate reacts in presence of sodium ethoxide to form ethyl acetoacetate. The name reaction is-

A Claisen-schmidt reaction

B Cannizzaro reaction

C Claisen condensation

D Deckmann condensation

64. The term dye derived from Greek word is

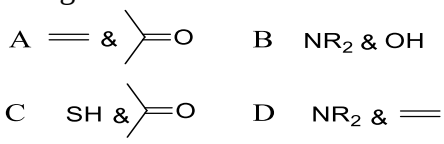
A Chromogen + auxochrome

B Chromophore + auxochromophore

C Chromogen + Chromophore

D None of these

65. Choose the correct auxochrome groups in the following

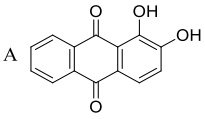
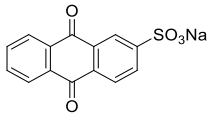
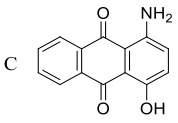
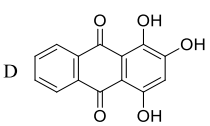


66. The correct increasing order of energy of these transitions a: $\sigma \rightarrow \sigma^*$ b: n $\rightarrow \sigma^*$ c: $\pi \rightarrow \pi^*$ d: n $\rightarrow \pi^*$ are-

A a > b > c > d B a > c > b > d

C a > d > b > c D a > d > c > b

67. The correct structure of alizarin is-

A 
B 
C 
D 

68. Two mole of resorcinol reacts with phthalic anhydride in presence of concentrate sulphuric acid, the product is-
A Uranine
B Phenolphthalein
C Rosaniline
D Fluorescein

69. Which one of the following has no unpaired electron?
A O_2 B O_2^- C O_2^+ D O_2^{2-}

70. Which has maximum covalent character?
A NaCl B $SiCl_4$ C $AlCl_3$ D $MgCl_2$

71. Which of the following compound is hypervalent?
A CO_2 B HF C PF_6^- D $SiCl_4$

72. Which one of the following has a magnetic moment of 1.75 B.M.?
A Ti^{3+} B V^{3+} C Cr^{3+} D Fe^{3+}

73. The complexes $[Co(NH_3)_6]$ $[Cr(CN)_6]$ and $[Cr(NH_3)_6]$ $[Co(CN)_6]$ are the examples of which type of isomerism?
A Linkage isomerism
B Ionisation isomerism
C Coordination isomerism
D Geometrical isomerism

74. Which of the following complex has zero magnetic moment?
A $[Co(NH_3)_6]^{3+}$ B $[Co(NH_3)_6]^{2+}$
C $[Cr(NH_3)_6]^{3+}$ D $[NiCl_4]^{2-}$

75. Which of the following has a square planar geometry?
A $[FeCl_4]^{2-}$ B $[CoCl_4]^{2-}$
C $[NiCl_4]^{2-}$ D $[PtCl_4]^{2-}$

76. The EAN of cobalt in the complex ion $[Co(en)_2Cl_2]^+$ is:
A 27 B 36 C 33 D 35

77. Which of the following has the highest molar conductivity in solution?
A $[Pt(NH_3)_6]Cl_4$ B $[Pt(NH_3)_5Cl]Cl_3$
C $[Pt(NH_3)_4Cl_2]Cl_2$ D $[Pt(NH_3)_3Cl_3]Cl$

78. The IUPAC name for the complex $[Co(NH3)_5(NO_2)]Cl_2$ is:
A nitrito-N-pentaammine cobalt(III)chloride
B nitrito-N-pentaammine cobalt(III)chloride
C pentaammine nitrito-N-cobalt(II)chloride
D pentaammine nitrito-N-cobalt(III)chloride

79. Among the following which is not bidentate ligand
A en B bpy C EDTA D ox

80. Which of the following is heteroleptic complex?
A $[Co(NH_3)_6]^{3+}$ B $[Pt(NH_3)_4Cl_2]Cl_2$
C $[Co(en)_2Cl_2]^+$ D $[Co(NH_3)_3Br_3]$

81. Which of the following are helpful in ^1H NMR spectra to determine the structure of an organic compound?
A Number of signals
B Intensities of signals
C Splitting of the signals
D All of these

82. NMR spectroscopy observed in region of
A γ-ray B Microwave
C Radio wave D UV-visible

83. In $(CH_3)_2CHCl$, the number of NMR signal observed is:
A 2 B 3 C 4 D none of these

84. The fingerprint region in the IR spectrum is
A 900-1400 cm^{-1} B 600- 4000 cm^{-1}
C 660-50 cm^{-1} D 12500-400 cm^{-1}

85. Among the following the maximum IR stretching frequency is:
A C-C B C-H C O-H D C-N

86. Which of the following compounds show maximum λ_{max}
A Ethylene B Butadiene
C Ethane D Hexatriene

87. Which types of transitions are normally exhibited by carbonyl compound?
A $\sigma \rightarrow \sigma^*$ B $n \rightarrow \pi^*$
C $\pi \rightarrow \sigma^*$ D All of these

88. A chemical reaction will be spontaneous if:
A E°_{cell} = + ve B ΔG° = + ve
C E°_{cell} = - ve D ΔG° = - ve

89. The molar conductivities of Λ°_{NaOAc} and Λ°_{HCl} at infinite dilution in water at 25°C are 91 and 426.2 S cm^2 mol^{-1} respectively. To calculate, the additional value required is
A $\Lambda^\circ_{H_2O}$ B Λ°_{KCl} C Λ°_{NaOH} D Λ°_{NaCl}

90. The emf of the cell $Ni|Ni^{2+}(1.0M)||Au^{3+}(1.0M)|Au$ is ($E^\circ$for $Ni^{2+}|Ni$ = -0.25V; $E^\circ$for $Au^{3+}|Au$ = 1.5V):
A +1.25V B +1.75V C -1.25V D -1.75V

91. The emf of the cell in which of the following reaction
$Zn(s) + Ni^{2+}(0.1M) \longrightarrow Zn^{2+}(1.0M) + Ni(s)$ occurs, is found to 0.5105 V at 298K. The standard emf of the cell is:
A 0.48V B 0.54V C 0.57V D -0.51V

92. Consider the reaction, $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$ carried out at constant temperature and pressure. For above reaction which of the following expressions is true?
A $\Delta H = 0$ B $\Delta H = \Delta U$
C $\Delta H < \Delta U$ D $\Delta H > \Delta U$

93. The bond dissociation energies for single covalent bonds formed between carbon and P, Q, R & S atoms are

Bond	Bond energy (kcal mol^{-1})
C−P	240
C−Q	382
C−R	276
C−S	486

This indicates that the smallest atom is:
A P B S C Q D R

94. At constant pressure the $(\delta G/\delta T)_P$ is equal to
A V B 0 C –S D None of these

95. Which of the following law consider temperature?
A First Law of thermodynamics
B Second Law of thermodynamics
C Both A and B
D Third Law of thermodynamics

96. The carboxylic functional group (-COOH) is present in:
A Picric acid B Barbituric acid
C Ascorbic acid D Aspirin

97. The first discovered antibiotic is
A Penicillin B Streptomycin
C Chloramphenicol D Tetracyclin

98. Vitamin B_{12} contains:
A Fe B Mg C Co D Zn

99. Which is not formed osazone?
A Glucose B Sucrose
C Fructose D Galactose

100. Raffinose on hydrolysis yield
A Glucose B Galactose
C Fructose D All of these

For Rough work

Department of Chemistry

Udai Pratap College Varanasi (An Autonomous Institution)

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Class: BSc III			
S. No.	**Name of Candidates**	**Student Id**	**Marks Obtained out of 100**
1	Suhani Singh (MC)	UGM/19/132	48
2	Suraj Chaubey (PC)	UGM/19/008 [O]	48
3	Abhishek Vishwakarma (BC)	UGB/19/017	46
4	Mudit Pandey (PC)	UGM/19/330	46
5	Surabhi Jaiswal (ZC)	UGB/19/032	46
6	Anjali Pandey (ZC)	UGB/19/013	44

Class: BSc II			
S. No.	**Name of Candidates**	**Student Id**	**Marks Obtained out of 95**
1	Sakshi Singh	UGB/20/002	56
2	Ashutosh Maurya	UGM/20/001	48
3	Ashish Kumar Yadav	UGM/20/118	44

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DBT Star Scheme quiz Answer Key 04-12-2021

Department of Chemistry
Udai Pratap College Varanasi
Class: B.Sc. III

1	B	21	B	41	D	61	A	81	D
2	C	22	A	42	B	62	B	82	C
3	A	23	A	43	D	63	C	83	A
4	D	24	B	44	B	64	C	84	A
5	B	25	A	45	C	65	B	85	C
6	A	26	C	46	B	66	A	86	D
7	C	27	B	47	B	67	A	87	B
8	D	28	A	48	D	68	D	88	A
9	C	29	C	49	A	69	D	89	D
10	A	30	A	50	B	70	B	90	B
11	D	31	C	51	B	71	C	91	B
12	B	32	D	52	A	72	A	92	D
13	A	33	A	53	D	73	C	93	B
14	D	34	C	54	B	74	B	94	C
15	A	35	D	55	A	75	D	95	D
16	A	36	B	56	A	76	B	96	C
17	C	37	B	57	A	77	A	97	A
18	D	38	A	58	B	78	D	98	C
19	B	39	C	59	B	79	C	99	B
20	A	40	B	60	C	80	A	100	D

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DBT Star Scheme Quiz Result 04-12- 2021

Department of Chemistry
Udai Pratap College Varanasi
Class: BSc III

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6	Anjali Pandey (ZC)	UGB/19/013	44
7	Abhishek Singh (PC)	UGM/19/036	43
8	Anchal Gupta (BC)	UGB/19/006	42
9	Nishi Dubey (BC)	UGB/19/157 [O]	42
10	Ayush Kumar Singh (ZC)	UGB/19/165	42
11	Priyanshu Singh (PC)	UGM/19/006	42
12	Uttkarsh Mishra (PC)	UGM/19/128	41
13	Sachin Kumar Patel (PC)	UGM/19/187	40
14	Varun Pratap Singh (PC)	UGM/19/018	40
15	Anushka Patel (ZC)	UGB/19/253 [O]	40
16	Dinesh Kumar Maurya (MC)	UGM/19/176 [O]	39
17	Abhishek Srivastava (PC)	UGM/19/035	39
18	Piyush Mishra (PC)	UGM/19/009	39
19	Bhawana Singh (PC)	UGM/19/153	39
20	Vishwajeet Mishra (PC)	UGM/19/022[O]	38
21	Rinki Maurya (ZC)	UGB/19/081 [O]	38
22	Shekhar Srivastav (PC)	UGM/19/017	37
23	Shreyas Singh (ZC)	UGB/19/166 [O]	37
24	Ruchi Singh (ZC)	UGB/19/016	37
25	Shivani Singh (ZC)	UGB/19/052	37
26	Pragya Pandey (BC)	UGB/19/113	37
27	Rakesh Patel (PC)	UGM/19/016[O]	36
28	Khushi Srivastava (BC)	UGB/19/207 [O]	36
29	Priya Yadav (MC)	UGM/19/086	36
30	Vishal Kumar Patel (MC)	UGM/19/042	36
31	Amar Prakash (PC)	UGM/19/188	36
32	Shubham Singh Patel (ZC)	UGB/19/036	35
33	Vivek Dubey (PC)	UGM/19/040	35
34	Kalash Srivastava (PC)	UGM/19/004[O]	34
35	Sushma Maurya (ZC)	UGB/19/213 [O]	34
36	Garima Singh (BC)	UGB/19/062 [O]	34
37	Suraj Kumar Patel (PC)	UGM/19/044 [O]	34
38	Shaili Maurya (BC)	UGB/19/043 [O]	34
39	Manish Singh (ZC)	UGB/19/147	33

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Udai Pratap College Varanasi
Class: BSc III

40	Neha Sahu (ZC)	UGB/19/098[O]	32
41	Saurabh Tripathi (PC)	UGM/19/319 [O]	32
42	Rohan Gupta (PC)	UGM/19/240	32
43	Vaishnavi Trivedi (ZC)	UGB/19/115 [O]	32
44	Astha Singh (BC)	UGB/19/049 [O]	32
45	Vimla Kumari (ZC)	UGB/19/179 [O]	31
46	Shiv Babu Sonkar (MC)	UGM/17/112 [O]	31
47	Aishwarya Yadav (ZC)	UGB/19/073 [O]	30
48	Chanchal Singh (BC)	UGB/19/155	30
49	Vivek Kumar Mishra (MC)	UGM/19/276	30
50	Abhishek Kushwaha (MC)	UGM/19/190 [O]	30
51	Supriya Maurya (BC)	UGB/19/051 [O]	30
52	Anjali Chaubey (BC)	UGB/18/163	30
53	Arshlad (ZC)	UGB/18/100 [O]	29
54	Parul Shukla (ZC)	UGB/19/125 [O]	29
55	Ragini Verma (BC)	UGB/19/215 [O]	29
56	Yograj Pratap Singh (PC)	UGM/19/131	28
57	Tripti Dubey (ZC)	UGB/19/103 [O]	27
58	Akanksha Singh (ZC)	UGB/18/239	27
59	Sudhanshu Singh (PC)	UGM/19/050	27
60	Sudha Gupta (ZC)	UGB/19/044	26
61	Krishna Kumar Yadav (BC)	UGB/19/171	25
62	Shivangi Singh (BC)	UGB/19/188 [O]	25
63	Anchal Singh (BC)	UGB/19/223	24
64	Akash kumar Mishra (MC)	UGM/19/256	23
65	Shreya Seth (ZC)	UGB/19/099 [O]	23
66	Manish Kumar Patel (ZC)	UGB/19/014	22
67	Aman Singh (BC)	UGB/19/034	22
68	Jay Pratap Mishra (ZC)	UGB/18/261	20
69	Anupriya Saras (BC)	UGB/19/010	20
70	Divyanshi Verma (ZC)	UGB/18/198	20
71	Akash Kumar Singh (ZC)	UGB/19/229	18
72	Swati Singh (BC)	UGB/19/018	18

Abhishek Singh.

[Dr. Abhishek Singh]
Coordinator
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Head
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