UNIVERSITY OF HYDERABAD
ENTRANCE EXAMINATION – Chemistry Model Questions
M. Sc. Chemistry

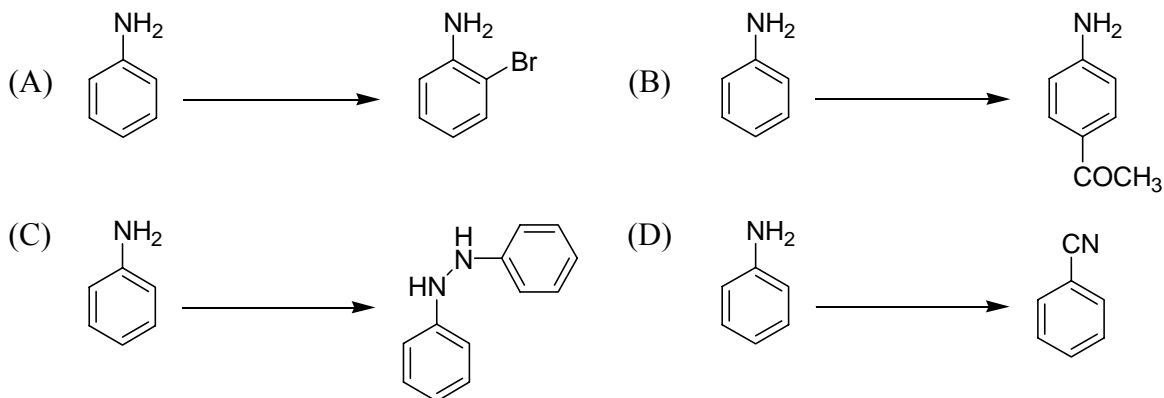**TIME: 2 HOURS**   **MAXIMUM MARKS: 100**

Useful Constants:

Rydberg constant = 109737 cm^{-1}; Faraday constant = 96500 C; Planck constant = 6.625×10^{-34} J s; Speed of light = 2.998×10^8 m s^{-1}; Boltzmann constant = 1.380×10^{-23} J K^{-1}; Gas constant = 8.314 J K^{-1}mol^{-1}; Mass of electron = 9.109×10^{-31} kg; Mass of proton = 1.672×10^{-27} kg; Charge of electron = 1.6×10^{-19} C

PART - A

1. The reaction of 10.23 g of Fe_2O_3 with excess carbon, $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$ yields 8.94 g of Fe. What is the percentage of yield? (At. wts: Fe = 55.05, C = 12.01, O = 16.00)

    (A) 78%   (B) 84%   (C) 80 %   (D) 76%

2. A normal to the surface $x^2 yz + 3y^2 - 2xz^2 + 8z = 0$ at the point (1, 2, −1) is

    (A) $i + 2j - k$ (B) $-6i + 11j + 14k$

    (C) $3i + 11j + 14k$ (D) $11i - 6j + 14k$

3. How many electrons are transferred in the following reaction?

    $2Zn(s) + Ag_2O_2(s) + 2H_2O(l) + 4OH^-(aq) \longrightarrow 2Ag(s) + 2Zn(OH)_4^{2-}(aq)$

    (A) 4   (B) 6   (C) 2   (D) 3

4. The difference in energy between the axial and the equatorial conformations of

    t-butylcyclohexane is

    (A) 1 kcal/mol   (B) 20 kcal/mol   (C) 15 kcal/mol   (D) 6 kcal/mol

5. The maximum number of phases that can coexist in equilibrium in a binary system is

    (A) 4   (B) 3   (C) 2   (D) 0

6. The points A $(1, -1)$, B $(3, 2)$ and C $(7, 8)$ form

    (A) An equilateral triangle   (B) An isosceles triangle

    (C) A curve   (D) A straight line

7. A hydrate of nickel bromide has the formula $NiBr_2 \cdot xH_2O$. 18.2 g of a sample of this hydrate is heated to a constant weight of 14.6 g. The value of x is (At. wts: Ni = 58.7, Br = 79.9, O = 16.0, H = 1.0)

    (A) 6   (B) 3   (C) 1   (D) 4

8. The enol content of $CH_3COCH_2CO_2Et$ in hexane is 46% and that in water is 0.4%. The reason for the above observation is as follows:

    (A) Intermolecular hydrogen bonding is stabilized by hexane.

    (B) Intramolecular hydrogen bonding is stabilized by water.

    (C) Intramolecular hydrogen bonding is destabilized by water.

    (D) $CH_3COCH_2CO_2Et$ dissolves in hexane completely.

9. A three-fold increase of the pressure affects the yield of the following reaction

    N_2 (g) + 3 H_2 (g) $\rightleftharpoons$ 2 NH_3 (g)   at equilibrium by a

    (A) nine-fold increase.   (B) six-fold increase.

    (C) nine-fold decrease.   (D) three-fold increase.

10. The graph of $4x^2 - 9y^2 - 16x + 18y - 29 = 0$ represents

    (A) a parabola   (B) a hyperbola   (C) an ellipse   (D) a circle

11. Structure of carbon suboxide (C_3O_2) is

    (A) tetrahedron   (B) bent   (C) trigonal pyramid   (D) linear

12. Identify Sandmeyer reaction from the following

2

(A) aniline (NH_2) → 2-bromoaniline (NH_2, Br)

(B) aniline (NH_2) → 4-acetylaniline (NH_2, $COCH_3$)

(C) aniline (NH_2) → 1,2-diphenylhydrazine (HN–N(H)–phenyl)

(D) aniline (NH_2) → benzonitrile (CN)

13. The nearest cation-anion distance in a crystal which adopts the NaCl (rocksalt) structure is 2.5 Å. The nearest cation-cation distance is

(A) equal to the nearest anion-anion distance.

(B) 3.54 Å.

(C) $\dfrac{a}{\sqrt{2}}$ where 'a' is the unit cell length.

(D) all of the above.

14. $\displaystyle\lim_{x \to \infty} \dfrac{7x^9 - 4x^5 + 2x - 13}{-3x^9 + x^8 - 5x^2 + 2x} =$

(A) $-7/3$ (B) 0 (C) ∞ (D) $-13/2$

15. High thermal stabilities of transition metal carbonyls is due to

(A) non availability of d-orbital on carbon.

(B) formation of ionic bond between CO and metal.

(C) interaction of filled metal d-orbital with the empty antibonding π^* orbital of CO.

(D) covalent bonds of oxygen in CO with antibonding π^* orbital of metals.

16. The intermediate involved in the identification of glucose in Molisch test is

(A) furan-2-carbaldehyde (O ring with CHO)

(B) furan-2,5-dicarbaldehyde (OHC, O ring, CHO)

(C) 2,5-bis(hydroxymethyl)furan (HO–CH$_2$, O ring, CH$_2$–OH)

(D) 5-(hydroxymethyl)furfural (HO–CH$_2$, O ring, CHO)

3

17. Which is the thermodynamically most stable allotrope (or polymorph) of carbon?

    (A) Diamond   (B) Hexagonal diamond

    (C) Buckminsterfullerene or C_{60} (D) Graphite

18. The global maximum of the function, $f(x) = e^{-x^2} \cdot \cos x$, occurs at x =

    (A) 3π (B) π (C) 2π (D) 0

19. The photosynthetic process in green plants consists of

    (A) splitting of elements of water, followed by oxidation of oxygen to ozone.

    (B) splitting of elements of water, followed by reduction of carbon dioxide.

    (C) reaction of water with carbon dioxide.

    (D) reaction of water with oxygen.

20. The sp hybridized carbocation among the following is

21. 20 mL of 0.2 M hydrochloric acid is added to 5 mL of 0.1 M sodium carbonate. The resultant solution is then titrated against 0.2 M sodium hydroxide. What will be the titre value?

    (A) 15 mL   (B) 10 mL   (C) 5 mL   (D) 20 mL

22. If $f(x) = \dfrac{2}{1-x}$, n^{th} derivative of $f(x)$ is

    (A) $2(n)(1-x)^{-(n+1)}$ (B) $2(n!)(1-x)^{(n+1)}$

    (C) $2(\sqrt{n})(1-x)^{(n+1)}$ (D) $2(n!)(1-x)^{-(n+1)}$

23. The number of lone pair(s) in $XeOF_4$ is/are

    (A) 0   (B) 3   (C) 2   (D) 1

24. Nef reaction is the conversion of

    (A) (isopropyl NO_2) $\longrightarrow$ (N-OH oxime)   (B) (isopropyl NO_2) $\longrightarrow$ (isopropyl NH_2)

    (C) (isopropyl NO_2) $\longrightarrow$ (isopropyl OH)   (D) (isopropyl NO_2) $\longrightarrow$ (acetone, C=O)
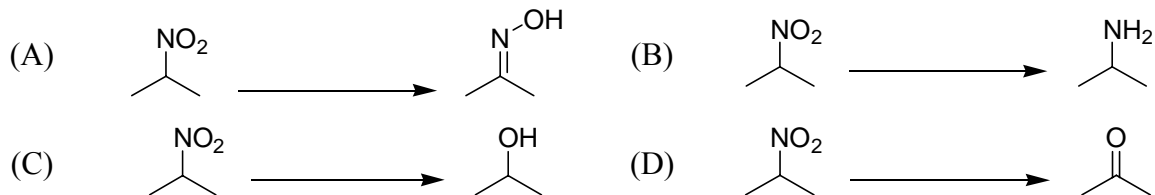
25. The second ionization potential of three successive elements in the periodic table are 2856, 3388 and 3374 kJ/mole, respectively. These elements are likely to be

    (A) C, N, O   (B) O, F, Ne

    (C) N, O, F   (D) F, Ne, Na

PART - B

26. $\displaystyle\int_{-\infty}^{\infty}\frac{dx}{1+4x^2} =$

    (A) π (B) $\dfrac{3\pi}{2}$ (C) $\dfrac{\pi}{2}$ (D) $\dfrac{\pi}{4}$

27. Neil Bartlett's motivation to study Xe compounds (Noble gases) came from one of the following observation.

    (A) Ability of O_2 to react with metals to form dioxygen complexes.

    (B) PtF_6 can oxidize O_2 to form a crystalline orange-red solid.

    (C) Ability of O_2 to react with halogens to form halogen oxides.

    (D) The abundance of O_2 on earth's crust.

28. The major product obtained upon epoxidation of the triene with *m*-chloroperbenzoic acid is

triene

(A)   (B)

(C)   (D)
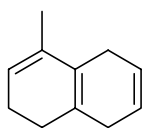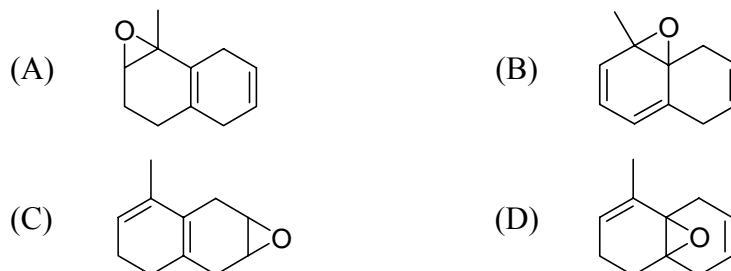
29. The (100) plane of a simple cubic crystal diffracts at $60°$. The angle at which the (111) plane would diffract is

(A) $75°$ (B) $45°$ (C) $60°$ (D) $30°$

30. Number of ways a committee consisting of 2 mathematicians and 3 chemists can be formed out of total 5 mathematicians and 7 chemists is

(A) 530   (B) 350   (C) 450   (D) 540

31. Which sulphide is not precipitated from acidified aqueous solutions by hydrogen sulphide?

(A) MnS   (B) PbS   (C) CuS   (D) AgS

32. Which one of the following reagents reacts with an aldehyde and produces a *trans* olefin as a major isomer?

(A) $Ph_3P=CH_2$ (B) $Ph_3P=CHOCH_3$ (C) $Ph_3P=CHCO_2CH_3$ (D) $Ph_3P=CHCH_3$

33. 20 mL each of 0.3 M NaOH and 0.1 M HCl are mixed together. The pH of the resulting solution is

(A) 14   (B) 0   (C) 1   (D) 13

34. The diagonals are perpendicular bisectors to each other for

    (A) rhombus and square only.

    (B) parallelogram and rectangle only.

    (C) parallelogram, rectangle, rhombus and square.

    (D) rectangle and square only.

35. In an oxide of element E, two-thirds of E is in +3 oxidation state and the remaining in +2 oxidation state. What would be the formula of this oxide?

    (A) EO   (B) E_2O_5 (C) E_3O_4 (D) E_2O_3

36. The enthalpy change associated with the following hydrogenation is

$$CH_3CH=CHCH_3 \quad + \quad H_2 \longrightarrow CH_3CH_2CH_2CH_3$$
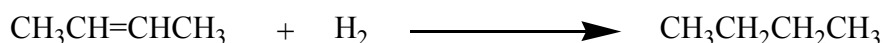
    (Given data: C–H $=$ 98.2 kcal/mol; C–C $=$ 80.5 kcal/mol; H–H $=$ 103.2 kcal/mol

                  C=C $=$ 142 kcal/mol)

    (A) 28.7 kcal/mol   (B) –28.7 kcal/mol   (C) 157.7 kcal/mol   (D) –157.7 kcal/mol

37. 0.53 g of anhydrous sodium carbonate was dissolved in a concentrated HCl solution in an open container. The work done by the released carbon dioxide is

    (A) 1.1 lit. atm.   (B) 0.23 lit. atm.   (C) 0.11 lit. atm.   (D) 2.3 lit. atm.

38. In the following right angled triangle the distances CD (x) and AC (y) are
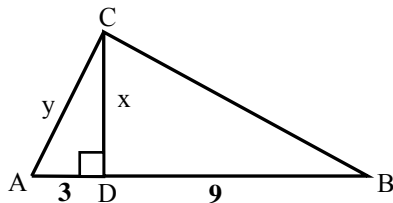
    (A) x = 6, y = 9   (B) x = $3\sqrt{3}$, y = 6

    (C) x = 9, y = $3\sqrt{3}$ (D) x = $3\sqrt{3}$, y = 9

39. Which of the following compounds is most reactive with ozone?

    (A) carbon dioxide   (B) sulphur dioxide   (C) nitrogen   (D) hydrogen fluoride

40. The most appropriate product in the following reaction is

$$\underset{H_3C}{\overset{H_3C}{>}}C=C\underset{CH_3}{\overset{CH_3}{<}} \quad + \quad B_2H_6 \quad \longrightarrow \quad ?$$

(A) $\underset{H_3C}{\overset{H_3C}{>}}CH-CH\underset{CH_3}{\overset{CH_3}{<}}$

(B) $\left(\underset{H_3C}{\overset{H_3C}{>}}C-C\underset{CH_3}{\overset{CH_3}{<}}\right)_3 B$

(C) $\underset{H_3C}{\overset{CH_3\ H_3C}{>}} ... \text{(structure)}$

(D) $\underset{H_3C}{\overset{H_3C}{>}}C-C\underset{CH_3}{\overset{CH_3}{<}} BH_2$
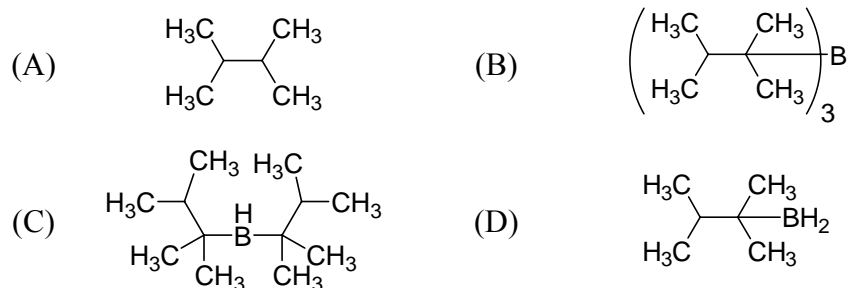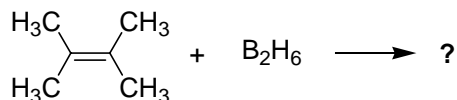
41. The gas with the largest van der Waals 'a' coefficient among the following is

(A) CH_4 (B) NH_3 (C) H_2O (D) BH_3

42. What is the second derivative of $x + \dfrac{x^2}{2}$?

(A) x   (B) 1   (C) x + 1   (D) 0

43. Which of the following radicals causes depletion of ozone and oxygen in the stratosphere?

(A) NO_2 (B) ClO   (C) NO   (D) CO

44. The reagent(s) required for the following transformation is

$$Ph-\!\!\equiv\!\!-D \longrightarrow \underset{Ph\quad\ H}{\overset{H\quad\ D}{>\!\!=\!\!<}}$$
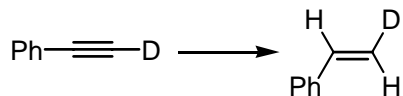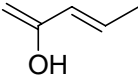
(A) H_2, Pd/BaSO$_4$ (B) H_2, Pd/C   (C) Na/liq. NH$_3$ (D) NaBH$_4$

45. The molecular formula of glucose is $C_6H_{12}O_6$. The chemical composition of glucose is

(A) 39.99 % C, 6.71 % H, 53.27 % O   (B) 40.99 % C, 6.71 % H, 53.27 % O

(C) 39.99 % C, 7.71 % H, 54.27 % O   (D) 29.99 % C, 7.71 % H, 53.00 % O

8

46. The determinant of the matrix $\begin{pmatrix} x-1 & 1 \\ -1 & x+1 \end{pmatrix}$ is

   (A) 1   (B) x   (C) x^3 (D) x^2

47. Which of the following ions present in NaCl, KCl and CaCl$_2$ has a larger ionic radius compared to the corresponding neutral atom?

   (A) Cl^- (B) Ca^{2+} (C) K^+ (D) Na^+

48. The most appropriate reagent required for the Michael addition to cyclohex-2-enone is

   (A) MeLi   (B) MeMgBr   (C) Me$_2$CuLi   (D) MeMgCl

49. A mercury filled manometer is connected to a gas cylinder with the other end open to the atmosphere. If the level of mercury in the arm connected to the cylinder is 24.7 cm higher than that in the open arm and the atmospheric pressure is 0.975 atm, the pressure (in atm) in the gas cylinder is

   (A) 0.45   (B) 1.65   (C) 0.65   (D) 0.25

50. Given that A and B are two sets; the correct statement among the following is

   (A) $A \cap B \subset A \cup B$ (B) $A \cup B \subset A \cap B$

   (C) $A - (A \cap B) \subset A \cap B$ (D) $(A - B) \subset A \cap B$

51. Which of the following is not true for superacids?

   (A) They are considerably more basic than normal concentrated acids.

   (B) They possess highly negative pH.

   (C) They are non-aqueous acids.

   (D) They are aqueous acids.

52. The keto form of the following enol is

   (A) 1-Penten-3-one   (B) (Z)-2-Penten-4-one

   (C) (E)-3-Penten-2-one   (D) (E)-2-Penten-4-one

53. Gases W, X, Y and Z obey van der Waals gas equation with 'a' and 'b' (in suitable units) values as given in the table below

	W	X	Y	Z
a	6	6	20	0.05
b	0.025	0.15	0.10	0.02

Which of the gases have (i) the highest critical temperature, (ii) the largest molecular volume and (iii) the most ideal behavior at STP?
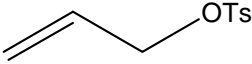
   (A) W, X and Z respectively   (B) W, X and Y respectively

   (C) Y, Z and W respectively   (D) W, Z and X respectively

54. What could be the Cartesian coordinates of the point which when joined to the origin will give a line lying on the xy plane?

   (A) (1,1,1)   (B) (1,1,0)   (C) (0,0,1)   (D) (0,1,1)

55. Chlorophyll contains the following metal ion:

   (A) Ni^{2+} (B) Co^{2+} (C) Fe^{2+} (D) Mg^{2+}

56. Identify the α-D-glucose from the following:

   (A)

   (B)

   (C)

   (D)
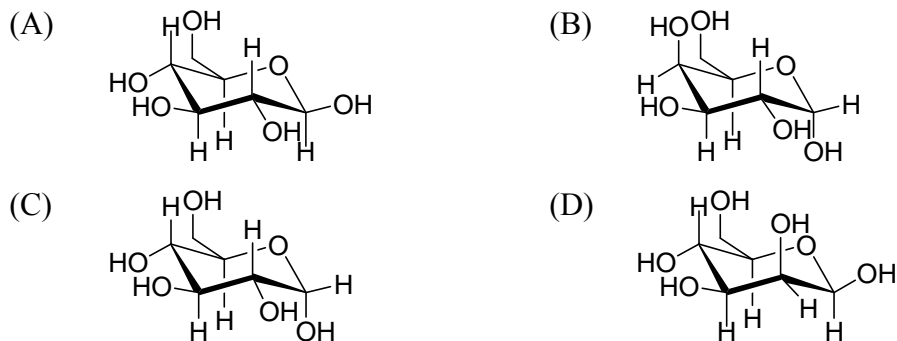
57. Blood is said to be isotonic with 0.85% (w/v) NaCl solution at $40°C$. Assuming the complete dissociation of NaCl what will be the freezing point of blood? [K_f (water) = 1.86]

(A) $-0.054°C$ (B) $-0.54°C$ (C) $0.54°C$ (D) $-0.154°C$

58. The monotonically increasing function among the following is

(A) tanhx   (B) sinhx   (C) tan x   (D) sin x

59. Which of the following contains metal-metal bond?

(A) Na_2SO_4 (B) $Al_2(SO_4)_3$ (C) Hg_2SO_4 (D) $Fe_2(SO_4)_3$

60. The rate of $S_N{}^1$ reaction (in ethanol) of the following substrates decreases in the order of

PhCH$_2$OTs   OTs   CH$_3$OTs   EtOTs

   I   II   III   IV

(A)   III > IV > I > II   (B)   II > I > IV > III

(C)   IV > III > II > I   (D)   I > II > IV > III

61. A spectrophotometer cell when filled with liquid 'X' transmits 50% and when filled with another liquid 'Y' transmits only 25% of the incident light of a certain wavelength. What would be the optical density at this wavelength when the same cell is filled with a mixture of equal volumes of the two liquids?

(A) 0.60   (B) 0.45   (C) 0.30   (D) 1.00

62. A particle of unit mass experiences a force of $10e^{-2t}$. The velocity of the particle after infinitely long time would be

(A) 5   (B) 20   (C) 10   (D) ∞

63. A mixture of three volumes of conc. HCl and one volume of conc. HNO_3 is known as aqua regia. It contains

(A) free NO_3^- and $HClO_4$ and hence is a powerful oxidizing agent.

(B) free Cl_2 and ClNO and hence is a powerful reducing agent.

(C) free Cl_2 and ClNO and hence is a powerful oxidizing agent.

(D) free NO_3^- and $HClO_4$ and hence is a powerful reducing agent.

64. The isoprene rule may be used to derive the bio-synthetic pathway for the natural product

   (A) D-Glucose   (B) Caffeine   (C) Atropine   (D) Geraniol

65. Calculate E^0 for the process $M \rightarrow M^{3+} + 3e$. Given $E^0 = 0.44$ V for $M \rightarrow M^{2+} + 2e$ and $E^0 = -0.77$ V for $M^{2+} \rightarrow M^{3+} + e$.

   (A) 0.037 V   (B) 0.563 V   (C) 0.850 V   (D) 0.331 V

66. The minimum and maximum number of points at which a pair of straight lines and an ellipse intersect in a plane would be respectively

   (A) 0, 2   (B) 0, 4   (C) 2, 2   (D) 2, 4

67. Cooling a solution of sodium in ethyl amine in the presence of 2,2,2-crypt, results in the formation of

   (A) $NaNH_2$ complex with 2,2,2-crypt   (B) $NaNH_2$
   (C) $Na(HNCH_2CH_3)$ (D) $[Na(2,2,2\text{-crypt})]^+Na^-$

68. The order of decreasing basicity of the following compounds is
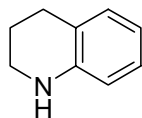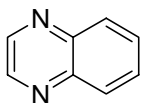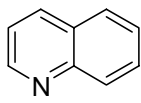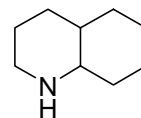
   I   II   III   IV

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

69. Given that $K_b = 1.8 \times 10^{-5}$ M, the pH of a 0.1 M NH_3 solution is closest to

   (A) 9   (B) 11   (C) 13   (D) 10

70. The sum of the cubes of the first 'n' natural numbers is

   (A) $\dfrac{n^3(n^3+1)}{3}$ (B) $\dfrac{n^3(n+1)^3}{8}$ (C) $\dfrac{n^2(n+1)^2}{4}$ (D) $\dfrac{n^2(n^2+1)}{4}$

71. Which of the following is an example of an organometallic compound?

(A) CH_3MgBr 　　(B) Na_2CO_3 　　(C) $NaOOC-COONa$ 　　(D) $(CH_3)_2-C=C-(CH_3)_2$

72. The most favorable product obtained in the following reaction is

(A) 　　(B)

(C) 　　(D)
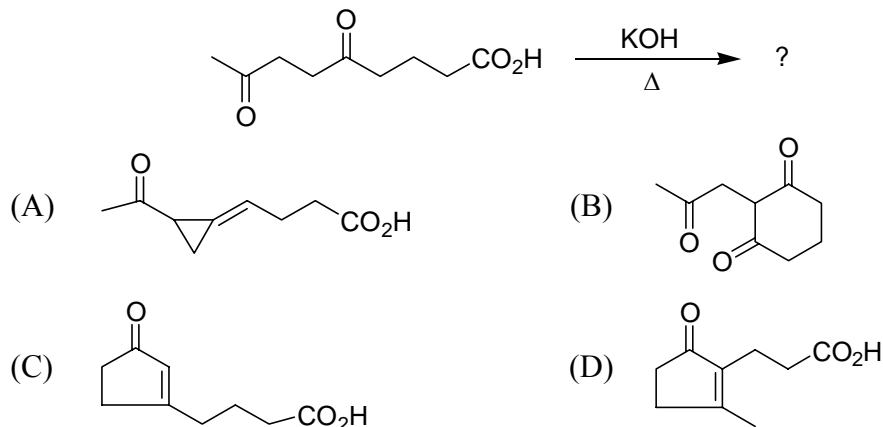
73. The concentration of Ag^+ ion in a saturated solution of $Ag_2C_2O_4$ is 2.3×10^{-4} mol/L. The solubility product of $Ag_2C_2O_4$ is

(A) ~5.29×10^{-8} 　　　　(B) ~6.00×10^{-12}

(C) ~12.17×10^{-12} 　　　(D) ~1.15×10^{-4}

74. If $x^y = $ constant, $\dfrac{dy}{dx} =$

(A) 0 　　(B) $-\dfrac{y}{x}$ 　　(C) $-\dfrac{y}{x \ln x}$ 　　(D) yx^{y-1}

75. Which of the following contains a three-centre two electron bond?

(A) B_2H_6 　　(B) N_2H_4 　　(C) C_2H_6 　　(D) O_2F_2

76. The most appropriate reagent(s) for the following conversion is
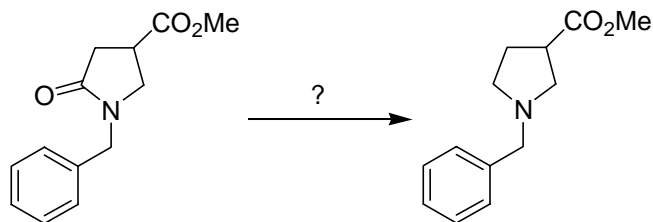
(A) $LiAlH_4$ 　　(B) $NaBH_4$ 　　(C) $Zn(Hg)/HCl$ 　　(D) $BH_3·THF$

77. Consider a crystal having face centered cubic lattice structure made up of atoms having a radius of 1.414 Å. Assuming that 4×10^6 atoms form a spherical crystalline particle, the radius of the particle in Å is

(A) 112   (B) 248   (C) 224   (D) 312

78. A segment of a circle is shown below with some of the lengths marked on it. The radius of the circle is
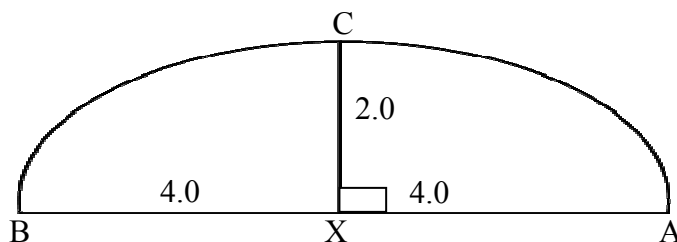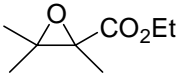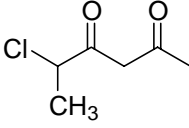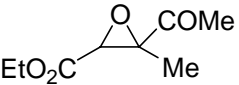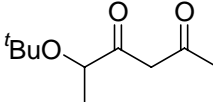
(A) 6.0   (B) 5.5   (C) 5.0   (D) 4.0

79. Identify the metal containing pigment in the prosthetic group of hemoglobin.

(A) Iron porphyrin   (B) Zinc porphyrin

(C) Copper porphyrin   (D) Cobalt porphyrin

80. The product obtained in the following reaction is
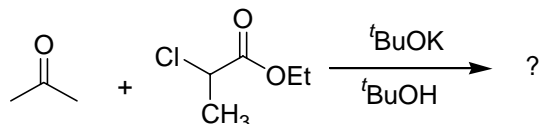
(A)

(B)

(C)

(D)

81. The conformations obtained by rotation about the carbon-carbon single bond in ethane can be distinguished by the angle, θ shown in the figure below. For which value of θ, will the structure be chiral?

(A) 120   (B) 60   (C) 90   (D) 0

14
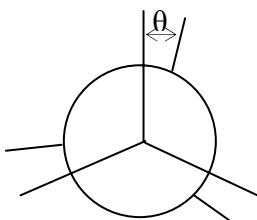
82. The faces of a cube are painted with three colors red, green and blue so that the opposite faces have the same color. If three such cubes are rolled what is the probability of getting three different colors on the top faces?

(A) 5/36   (B) 6/27   (C) 1/8   (D) 1/9

83. A mixture of $Al(OH)_3$ and $Fe(OH)_3$ can be separated by treatment with a solution of

(A) HCl   (B) CH_3COOH (C) CH_3OH (D) NaOH

84. The infrared absorption most affected by intra-molecular hydrogen bonding in 2-hydroxy acetophenone is

(A) methyl group C–H stretching.   (B) hydroxyl group O–H stretching.

(C) aromatic ring C–H bending.   (D) aromatic ring C–C stretching.

85. 12.8 g of an ideal gas occupies 10 L at a pressure of 750 mm of Hg and at $27^{\circ}C$. The molecular weight of the gas is

(A) 33.2   (B) 30.3   (C) 31.9   (D) 34.7

86. According to valence bond theory the hybridization and the number of unpaired electrons in octahedral $[Mn(CN)_6]^{4-}$ are

(A) d^2sp^3 and one unpaired electron.

(B) d^2sp^3 and zero unpaired electron.

(C) sp^3d^2 and five unpaired electrons.

(D) sp^3d^2 and zero unpaired electron

87. The major product obtained in the following reaction is

(A)   (B)

(C)   (D)
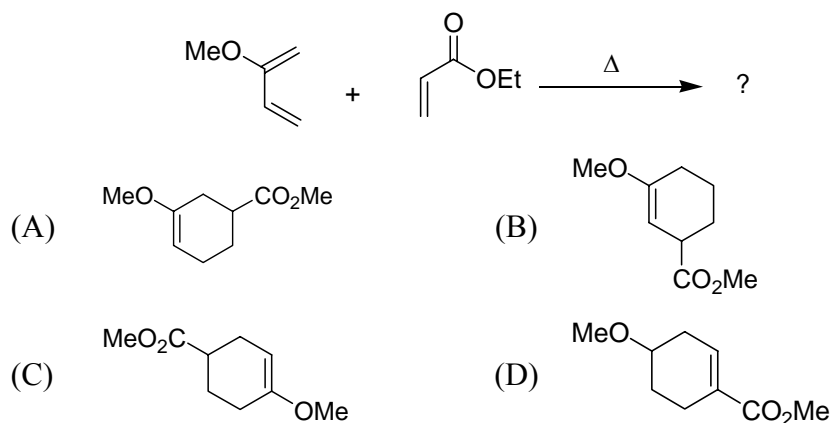
88. The average kinetic energy of a molecule of H_2 at $0°C$ is

(A) 5.7×10^{-14} ergs (B) 3.4×10^{10} ergs

(C) 4.8×10^{-10} ergs (D) 2.3×10^{-14} ergs

89. The element having the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$ is

(A) Sc (B) Ti (C) Cr (D) V

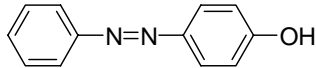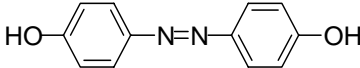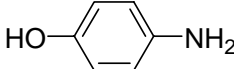90. The major product obtained in the following reaction is

1) LDA, THF, -78 °C

2) Ph-CHO

(A)   (B)

(C)   (D)
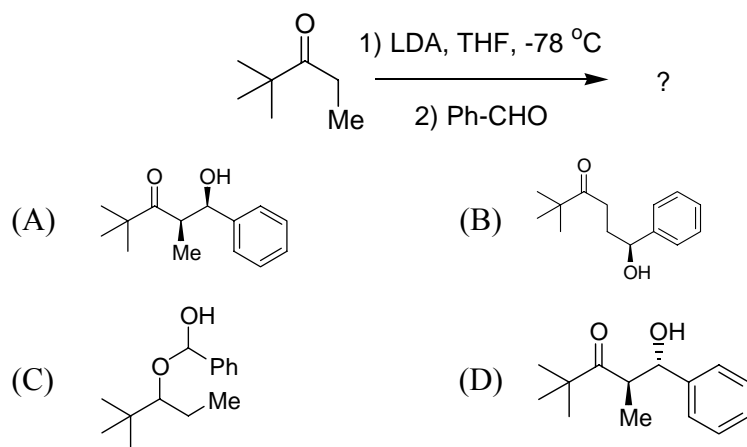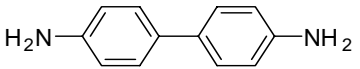
91. The rate constant of a first order reaction is 3.83×10^{-3} s^{-1}. If the initial concentration of the reactant is 0.60 M, what will be the concentration after 142 s?

(A) 0.463 M (B) 0.432 M (C) 0.348 M (D) 0.400 M

16

92. Electrolysis of brine produces

   (A) hydrogen and chlorine.

   (B) sodium hydroxide, hydrogen and chlorine.

   (C) sodium, hydrogen and chlorine.

   (D) sodium hydroxide and chlorine.

93. The final product obtained in the following transformation is
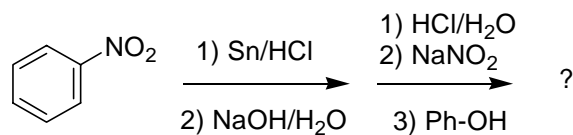
   (A)   (B)

   (C)   (D)

94. In thermodynamics, which of the following terms stands for the heat absorbed by a system held at constant pressure?

      (A) Enthalpy   (B) Entropy

      (C) Free energy   (D) Heat capacity

95. Which among the following three isobars $^{114}_{48}Cd$, $^{114}_{49}In$ and $^{114}_{50}Sn$ is/are likely to be radioactive?

   (A) $^{114}_{48}Cd$ (B) $^{114}_{50}Sn$ and $^{114}_{49}In$ (C) $^{114}_{50}Sn$ (D) $^{114}_{49}In$

96. The best method for the preparation of $(CH_3)_3C\text{-}O\text{-}CH_3$ is

   (A) $(CH_3)_3C\text{-}OH + CH_3I$ catalyzed by H_2SO_4 (B) $(CH_3)_3C\text{-}OK + CH_3I$

   (C) $(CH_3)_3C\text{-}H + CH_3OH$ catalyzed by H_2SO_4 (D) $(CH_3)_3C\text{-}Cl + NaOCH_3$

97. The compounds H_3PO_2, $H_4P_2O_7$, HPO_3 and H_3PO_4 are respectively

    (A) hypo, pyro, meta and ortho acids.

    (B) meta, pyro, hypo and ortho acids.

    (C) ortho, pyro, meta and hypo acids.

    (D) hypo, ortho, meta and pyro acids.

98. The product obtained in the following transformation is

    (A)   (B)

    (C)   (D)
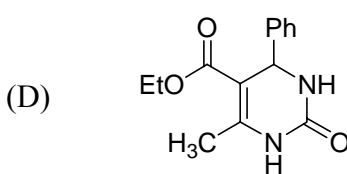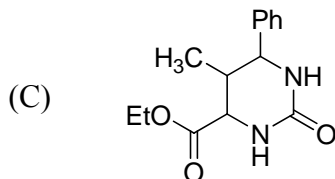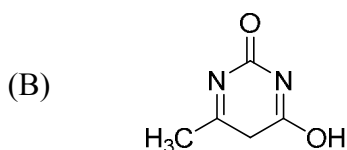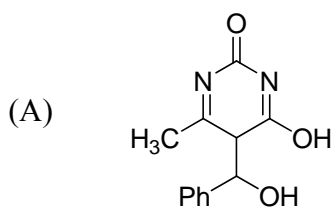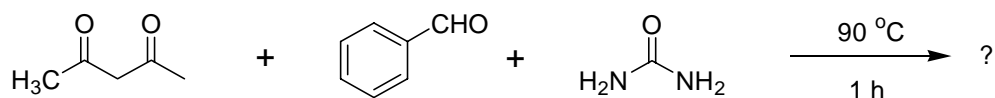
99. The absolute configuration of the chiral centers 1 and 2 in the following molecule are
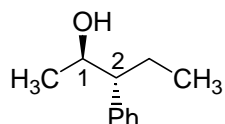
    (A) (1S, 2S)   (B) (1S, 2R)   (C) (1R, 2R)   (D) (1R, 2S)

100. Given that the pure gold is 24 Karat, the composition of the alloy Cu_3Au in Karat is

    [At. Wts.: Cu ~64, Au ~197]

    (A) ~12   (B) ~22   (C) ~18   (D) ~20

<u>Rough Work</u>

<u>Rough Work</u>

Rough Work

Rough Work