

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO
TEST BOOKLET

Sl. No. : **1187**

Subject : **CHEMISTRY**

Post : **Lab. Asst.-cum-Storekeepers**

**WRITTEN EXAMINATION FOR RECRUITMENT OF NON-TEACHING POSTS
(JUNIOR ASSISTANTS, PHYSICAL EDUCATION TEACHERS(P.E.Ts) AND
LABORATORY ASSISTANT-CUM-STOREKEEPERS) IN GOVT. DEGREE
COLLEGES, ODISHA**

Time Allowed : 2 Hours

Maximum Marks: 150

: INSTRUCTIONS TO CANDIDATES :

1. **IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET CONTAINS 20 PAGES AND DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.**
2. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. **DO NOT** write anything else on the Test Booklet.

--	--	--	--	--	--	--	--	--	--
3. The Test Booklet contains **100** questions. Each question comprises four options. You have to select the correct answer which you want to mark (darken) on the OMR Answer Sheet. In any case, choose **ONLY ONE** answer for each question. If more than one answer is darkened, it will be considered wrong.
4. You have to mark (darken) all your answers only on the **OMR Answer Sheet using BLACK BALL POINT PEN** provided by the State Selection Board. You have to do rough work only in the space provided at the end of the Test Booklet. See instructions in the OMR Answer Sheet.
5. All questions carry equal marks. While **1.5** marks will be awarded for each correct answer, each wrong answer will result in negative marking of **0.50** mark.
6. Before you proceed to mark (darken) the answers in the OMR Answer Sheet to the questions in the Test Booklet, you have to fill in some particulars in the OMR Answer Sheet as per the instructions in your Admit Card.
7. On completion of the Examination, you should hand over the **original copy of OMR Answer Sheet** issued to you to the Invigilator before leaving the Examination Hall. You are allowed to take with you the candidate's copy (second copy) of the OMR Answer Sheet along with the Test Booklet for your reference.

Candidate's full signature

Invigilator's signature

P.T.O.

SEAL

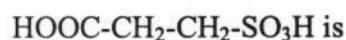
1. Real gases behave ideally over a whole range of pressures at _____ temperature.
(a) Boyle
(b) Kelvin
(c) Freezing
(d) Critical
2. Real gases approach ideal behavior at
(a) Low temperature low pressure
(b) Low temperature high pressure
(c) High temperature low pressure
(d) High temperature high pressure
3. The radius of second Bohr's orbit for H-atom is
(a) 21.16 nm
(b) 211.6 pm
(c) 21.16 Å
(d) 0.2116 Å
4. The Compton shift in the scattered radiation $\Delta\lambda$ is given by
(a) $2h/mc \cos^2 \theta/2$
(b) $2h/mc \sin^2 \theta/2$
(c) $2h/mc \tan^2 \theta/2$
(d) $2h/mc \cot^2 \theta/2$
5. The amount of energy emitted by a perfectly blackbody per unit area per unit time is directly proportional to
(a) T
(b) T^2
(c) T^3
(d) T^4
6. The $t_{1/2}$ of a radioactive element X is 3 min, calculate the amount left after 12 min of the initial amount if the initial amount was 3.2×10^{-2} kg.
(a) 0.1 kg
(b) 0.2×10^{-2} kg
(c) 0.8 kg
(d) 1.6 kg
7. Which of the following uranium isotope undergoes fission when bombarded with slow neutrons?
(a) U^{235}
(b) U^{238}
(c) U^{235} and U^{238}
(d) U^{234}

Chemistry (Lab. Assist)

8. The IUPAC name of isoprene is

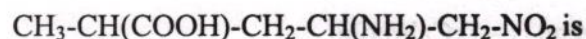
- (a) Methylbuta-1,3-diene
- (b) 2-methylbuta-1,3-diene
- (c) 1-methylbuta-1,3-diene
- (d) 2-Methylbutadiene

9. The IUPAC name of the following compound



- (a) 2-sulphoproanoic acid
- (b) 1-sulphopropanoic acid
- (c) 2-thiosulphopropanoic acid
- (d) 1-sulphonic propanoic acid

10. The IUPAC name of the following compound



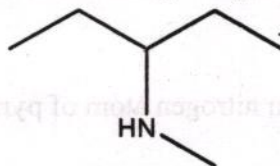
- (a) 2-amino-4-methyl-5-nitropentanoic acid
- (b) 4-amino-2-methyl-5-nitropentanoic acid
- (c) 2-amino-1-methyl-5-nitropentanoic acid
- (d) 2-amino-4-methyl-nitropentanoic acid

11. The IUPAC name of the following compound is



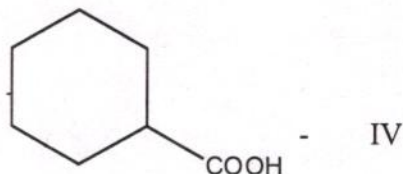
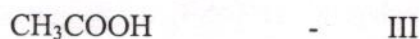
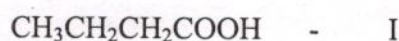
- (a) 2,5-dioxohexane
- (b) 2,4-dioxohexane
- (c) 1,2-diethoxyethane
- (d) 2,4-dioxohexane

12. The IUPAC name of the following compound is



- (a) N-methylpentane-3-amine
- (b) 3-aminomethyl pentane
- (c) N-methyl-3-amine pentane
- (d) Methyl-iso-amino pentane

13. Arrange the compounds in order of increasing solubility in water (least soluble first).



- (a) II, III, I, IV
- (b) IV, I, III, II
- (c) I, IV, II, III
- (d) II, III, I, IV

14. The empirical resonance energy of benzene is----kCal/mole.

- (a) 150
- (b) 36
- (c) 85
- (d) 49

15. What is the structural relationship between the osazones of D-glucose and D-fructose?

- (a) They are epimers
- (b) They are enantiomers
- (c) They are anomers
- (d) They are identical

16. Which of the following molecules is not aromatic?

- (a) Pyrrole
- (b) Thiophene
- (c) Furan
- (d) Cyclobutadiene

17. In which orbital are the lone pair electrons on nitrogen atom of pyrrole?

- (a) sp^2
- (b) sp
- (c) sp^3
- (d) P

18. Which of the followings is not an electrophile?

- (a) NH_3
- (b) Br^+
- (c) AlCl_3
- (d) NO_2^+

19. Which of the following reactions is good method for preparing an aldehyde?

- (a) Jones reagent and *p*-alcohol
- (b) Jones reagent and *sec*-alcohol
- (c) PCC and *p*-alcohol
- (d) H_2SO_4 , *p*-alcohol and heat

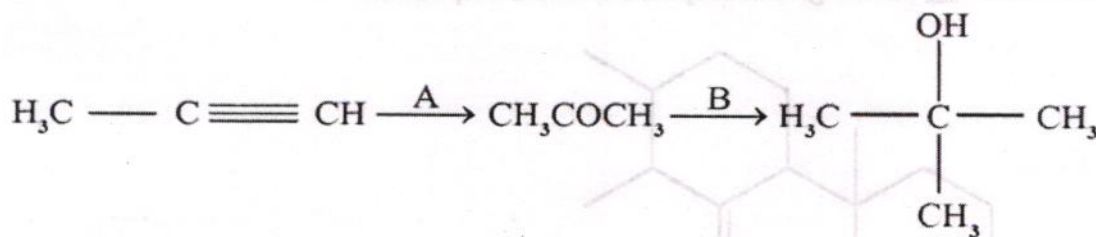
20. Which alkyl free radical is the most stable?

- (a) Methyl
- (b) Primary
- (c) Secondary
- (d) Tertiary

21. Which of the following compounds is not aromatic?

- (a) Naphthalene
- (b) Cyclopropene
- (c) Furan
- (d) Pyridine

22. Identify **A** and **B** in the following transformation.

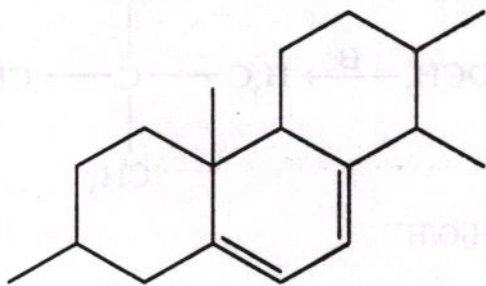


- (a) $\text{A} = \text{H}_2\text{O}/\text{H}_2\text{SO}_4$, HgSO_4 and $\text{B} = \text{CH}_3\text{MgI}$, $\text{H}_2\text{O}/\text{H}^+$
- (b) $\text{A} = \text{HgSO}_4$ and $\text{B} = \text{CH}_3\text{MgI}$, $\text{H}_2\text{O}/\text{H}^+$
- (c) $\text{A} = \text{H}_2\text{O}/\text{HgSO}_4$ and $\text{B} = \text{CH}_3\text{MgI}$, $\text{H}_2\text{O}/\text{H}^+$
- (d) $\text{A} = \text{H}_2\text{O}/\text{H}_2\text{SO}_4$, HgSO_4 and $\text{B} = \text{CH}_3\text{MgI}$, H_2O

23. In NO_2^- , nitrogen is ____ hybridized and the shape of the molecule is ____?

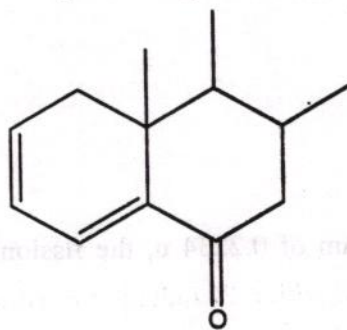
- (a) Sp , linear
- (b) sp^2 , triangular
- (c) sp^2 , V-shaped
- (d) sp^3 , V-shaped

24. Among *ortho*-, *meta*- and *para*-isomers of dichlorobenzene, which one has highest dipole moment?
- ortho*-isomer
 - para*-isomer
 - meta*-isomer
 - All isomers have equal values
25. The frequency and wavenumber associated with a IR radiation having wavelength of $10\ \mu\text{m}$ is
- $3 \times 10^{13}\ \text{s}^{-1}$ and $10^{-5}\ \text{m}^{-1}$
 - $3 \times 10^{12}\ \text{s}^{-1}$ and $10^{-1}\ \text{m}^{-1}$
 - $1 \times 10^{13}\ \text{s}^{-1}$ and $10^{-5}\ \text{m}^{-1}$
 - $1 \times 10^{12}\ \text{s}^{-1}$ and $10^{-1}\ \text{m}^{-1}$
26. Which of the following radiations can cause changes in electronic energy levels within molecules
- Infrared
 - Ultraviolet
 - Microwaves
 - Ultraviolet-visible
27. Predict the λ_{max} for the given compound in the UV-spectrum.



- 263 nm
- 237 nm
- 273 nm
- 253 nm

28. Predict the $\lambda_{\max}$ for the given compound in the UV-spectrum.



- (a) 317 nm
 (b) 307 nm
 (c) 312 nm
 (d) 287 nm
29. Cumulative double bonds $C=C=C$ shows typical strong absorption band around
 (a) $3000-3100\text{ cm}^{-1}$
 (b) $1900-2000\text{ cm}^{-1}$
 (c) $1600-1700\text{ cm}^{-1}$
 (d) 1650 cm^{-1}
30. The selection rule of observing nuclear spin energy level transition is
 (a) $\Delta m_s = \pm 1$
 (b) $\Delta m_l = 0$
 (c) $\Delta m_s = 0$
 (d) $\Delta m_l = \pm 1$
31. Tropylium cation shows a mass peak at $m/e = \text{-----}$ in mass spectra.
 (a) 79
 (b) 89
 (c) 91
 (d) 78
32. The J_{H-H} among ortho-, para- and meta- protons in benzene are in the order _____.
 (a) $J_{\text{ortho}} > J_{\text{meta}} > J_{\text{para}}$
 (b) $J_{\text{ortho}} = J_{\text{meta}} = J_{\text{para}}$
 (c) $J_{\text{para}} > J_{\text{meta}} > J_{\text{ortho}}$
 (d) $J_{\text{ortho}} > J_{\text{meta}} = J_{\text{para}}$
33. Which of the following amines do not absorb in $3500-3300\text{ cm}^{-1}$ region?
 (a) Primary amines
 (b) Secondary amines
 (c) Tertiary amines
 (d) All amines

34. Evidence in favour of H-bonding can be obtained from

- (a) X-ray diffraction
- (b) IR absorption
- (c) Electron diffraction
- (d) All

35. A nuclear fission is associated with a Δm of 0.2234 u, the fission energy has a value of _____ MeV.

- (a) 208
- (b) 931
- (c) 936
- (d) 4167

36. Arrange the followings in order of ascending values of their osmotic pressure.

0.1M Na_3PO_4 , 0.1 M KCl , 0.1 M BaCl_2 , 0.1 M sugar

- (a) 0.1 M Na_3PO_4 = 0.1 M KCl = 0.1 M BaCl_2 = 0.1 M sugar
- (b) 0.1 M Na_3PO_4 > 0.1 M KCl = 0.1 M BaCl_2 > 0.1 M sugar
- (c) 0.1 M sugar < 0.1 M KCl < 0.1 M BaCl_2 < 0.1 M Na_3PO_4
- (d) 0.1 M sugar < 0.1 M BaCl_2 < 0.1 M KCl < 0.1 M Na_3PO_4

37. In which of the following cases does the reaction go farthest for completion?

- (a) $K=10$
- (b) $K=1$
- (c) $K=1000$
- (d) $K=0.01$

38. Critical temperature means above this temperature at any pressure, any gas can be

- (a) Liquefied
- (b) Not liquefied
- (c) Solidified
- (d) None

39. Which of the following oxides of nitrogen will be the most stable one?

- (a) $2\text{NO}_2 (\text{g}) \leftrightarrow \text{N}_2 (\text{g}) + 2\text{O}_2 (\text{g})$
- (b) $2\text{N}_2\text{O}_5 (\text{g}) \leftrightarrow 2\text{N}_2 (\text{g}) + 5\text{O}_2 (\text{g})$
- (c) $2\text{N}_2\text{O} (\text{g}) \leftrightarrow 2\text{N}_2 (\text{g}) + \text{O}_2 (\text{g})$
- (d) $2\text{NO} (\text{g}) \leftrightarrow \text{N}_2 (\text{g}) + \text{O}_2 (\text{g})$

40. At 490°C the equilibrium constant for the synthesis of HI is 50, the value of K for the dissociation of HI will be

- (a) 2.0
- (b) 20.0
- (c) 0.002
- (d) 0.02

41. The condition of applicability of Nerst's distribution is for

- (a) Dilute and ideal solutions
- (b) Two solvents must be partially miscible
- (c) The distribution is independent of temperature
- (d) The solute may be distributed in different molecular form in both the solvents

42. The distribution of I_2 in following solvents holds good for distribution law

- (a) Between benzene and toluene
- (b) Between carbon disulphide and water
- (c) Between carbon tetrachloride and water
- (d) Both (b) and (c)

43. The solubility of a solvent is three times high in ether as in water. Compare the amount extracted for 100 mL of aq. solution by 100 mL of ether in one step.

- (a) 33.3 mL
- (b) 90 mL
- (c) 75 mL
- (d) 50 mL

44. Kinetics of a inversion of cane sugar can be followed by

- (a) Polarimeter
- (b) Visible Spectrophotometer
- (c) Conductivity meter
- (d) Potentiometer

45. For acid catalysed hydrolysis of methyl acetate the rate constant can be determined by plotting, where the terms have their usual meanings.

- (a) $\text{Log } (V_{\infty} - V)$ vs Δt
- (b) $\text{Log } (V_{\infty} - V)$ vs time (t)
- (c) $\text{Log } V_{\infty}$ vs time
- (d) $\text{Log } V_t$ vs time

46. Pure ethanol shall show the proton coupling in ^1H NMR

- (a) A triplet, a quartet and a broad singlet
- (b) A triplet, an octet and a triplet
- (c) A triplet, an octet and a singlet
- (d) A triplet, a quartet and a triplet

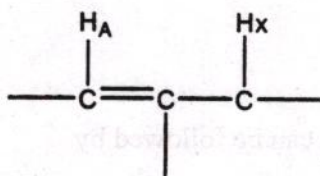
47. A proton in presence of a magnetic field of 1 tesla strength, at room temperature shall resonate at ____ MHz.

- (a) 42.6
- (b) 41.6
- (c) 10.7
- (d) 60.0

48. The characteristics of a ^1H NMR spectrum most strongly suggests the presence of an carboxylic acid

- (a) Absorption at $\delta = 10$ to 13 ppm
- (b) An singlet
- (c) Absorption upfield at $\delta = 1$ ppm
- (d) A singlet peak with a relative area corresponding to a single proton

49. The coupling constant J_{AX} is typically of the value



- (a) 10-18 Hz
- (b) 6-8 Hz
- (c) 0-2 Hz
- (d) 0-8 Hz

50. N-propyl benzene shows a McLafferty rearrangement to show peaks at m/e values of ____.
- (a) 92
 - (b) 78
 - (c) 91
 - (d) 58
51. 4-heptanone yields which of the following peaks in Mass spectra?
- (a) 86
 - (b) 58
 - (c) 86 and 58
 - (d) 92
52. Which is not a correct source of ionization used in Mass spectroscopy?
- (a) Electron impact ionization
 - (b) Chemical ionization
 - (c) Thermal ionization
 - (d) Photochemical ionization
53. Metastable peak in mass spectroscopy is characterized by
- (a) Metastable peak necessarily appears at integral m/e values
 - (b) They are sharper like other peaks
 - (c) These peaks are of relatively less abundant
 - (d) Metastable peak can be a base peak
54. The most common carrier gas used in gas chromatography is
- (a) Nitrogen
 - (b) Argon
 - (c) Helium
 - (d) Hydrogen
55. Which of the following can be employed as a stationary phase in thin layer chromatography?
- (a) Cellulose powder
 - (b) ZrO_2 powder
 - (c) TiO_2 powder
 - (d) MgO powder

56. The decreasing order of ionic radii of Sm^{3+} , Pr^{3+} and La^{3+} follow the order
- $\text{La}^{3+} > \text{Pr}^{3+} > \text{Sm}^{3+}$
 - $\text{La}^{3+} > \text{Sm}^{3+} > \text{Pr}^{3+}$
 - $\text{Pr}^{3+} > \text{La}^{3+} > \text{Sm}^{3+}$
 - $\text{Sm}^{3+} > \text{La}^{3+} > \text{Pr}^{3+}$
57. The half life period of a reaction is independent of initial concentration of the reactants, the order of the reaction is
- Zero
 - Third
 - First
 - Second
58. The rate of a reaction is $\frac{dx}{dt} = k [\text{A}]^a [\text{B}]^b$, for which the order of the reaction is
- a
 - a-b
 - b
 - a+b
59. Which of the followings is used as a catalyst to decompose KClO_3
- MnO_2
 - V_2O_5
 - Fe
 - Pt/SiO_2
60. Deficiency of ____ in humans cause Keshan disease?
- Cobalt
 - Zinc
 - Selenium
 - Manganese
61. Which of the followings is no CFSE in octahedral field?
- Fe^{3+} high spin
 - Co^{3+} low spin
 - Fe^{3+} low spin
 - Cr^{3+} high spin
62. Monazite, a widespread mineral is source of lanthanides, chiefly it contains ____ salt of lanthanides?
- Chloride
 - Sulphide
 - Sulphate
 - Phosphat

63. The most common oxidation state of actinides is
- (a) +II
 - (b) +III
 - (c) +IV
 - (d) +I
64. Choose the correct statement.
- (a) Copper sulphate hydrated solution is colorless.
 - (b) Copper sulphate anhydrous in the solid form is white.
 - (c) Copper sulphate hydrated in the solid form is white solution.
 - (d) Copper sulphate solution is blue in color.
65. In the first transition series the divalent compound having maximum magnetic moment is
- (a) Mn
 - (b) Fe
 - (c) Cu
 - (d) Cr
66. Sodium dicyanoaurate (I) is
- (a) $\text{Na}[\text{Au}(\text{CN})_2]$
 - (b) $\text{Na}[\text{AuCN}]$
 - (c) $\text{Au}[\text{Na}(\text{CN})_2]$
 - (d) $\text{Au}[\text{NaCN}]$
67. $\text{Co}(\text{NH}_3)_5(\text{CO})_3\text{Cl}$ best shows ___ isomerism?
- (a) Linkage
 - (b) Ionization
 - (c) Hydrate
 - (d) Coordination
68. About 2-3 drops of freshly prepared dilute solution of di-sodium pentacyanonitrosyl ferrate was added to 2 ml of the fusion solution and a purple coloration was obtained. This indicates the presence of
- (a) Nitrogen
 - (b) Sulphur
 - (c) Phosphorous
 - (d) Chlorine
69. Carbylamine test is extremely sensitive for detection of
- (a) *p*-amines
 - (b) *sec*-amines
 - (c) *tert*-amines
 - (d) Amides

70. Which of the following tests is not confirmatory test for phenol?
- Reaction with FeCl_3 solution
 - Reaction with Br_2 water
 - Phthalein test
 - Reaction with sodium hydrogen carbonate solution
71. The boiling point of ethanol is ____ °C.
- 78
 - 83
 - 88
 - 73
72. H_2S gas is
- Highly poisonous
 - Colorless and unpleasant in odour
 - Colorless and easy to handle
 - Can be stored in a gas jar
73. A certain element showed yellowish green in flame and appeared to be bluish green through cobalt glass, the element is
- Calcium
 - Barium
 - Magnesium
 - Strontium
74. A group I cation when treated with cold dil HCl resulted in a white precipitate which was soluble in hot water, then the metal ion is
- Hg_2^{2+}
 - Hg_2^+
 - Pb^{2+}
 - Ag^+
75. The third group cations are
- Fe(II) , Al(III) , Cr(III)
 - Fe(II) , Fe(III) , Al(III) , Cr(III) , Cr(V)
 - Fe(III) , Al(III) , Cr(III)
 - Fe(II) , Al(III) , Cr(III) , Cr(V)
76. Cupferron reagent is
- The sodium salt of nitrosophenyl hydroxyl amine
 - The ammonium salt of nitrosophenyl hydroxyl amine
 - The potassium salt of nitrosophenyl hydroxyl amine
 - The copper salt of nitrosophenyl hydroxyl amine

77. Rinmann's green is

- (a) Largely CoZnO_2
- (b) ZnCoO_2
- (c) FeZnO_2
- (d) MnZnO_2

78. A solution of X mixed with ammonium molybdate solution poured slowly down the side of a test tube containing concentrated H_2SO_4 and a blue ring is formed at the junction. Then X is

- (a) Sulphate
- (b) Thiosulphate
- (c) Sulphide
- (d) Thiocyanate

79. Which of the halide ion can etch glass

- (a) Iodide
- (b) Bromide
- (c) Chloride
- (d) Fluoride

80. Which of the following sulphates are soluble in water?

- (a) Mercury
- (b) Bismuth
- (c) Sodium
- (d) Chromium

81. Some of the commonly occurring red oxides are

- (a) HgO , CuO , CrO_3
- (b) HgO , Cu_2O , Pb_3O_4
- (c) PbO_2 , HgO , Cu_2O
- (d) Ni_2O_3 , Co_3O_4 , PbO_2

82. Borax bead test is usually performed to detect _____ salts.

- (a) Sodium, Potassium, Copper
- (b) Potassium, Barium, Iron
- (c) Iron, Copper, Manganese
- (d) Iron, Copper, Magnesium

83. 'Fusion mixture' is combination of sodium and potassium carbonate in the ratios of _____?

- (a) 1:2
- (b) 2:1
- (c) 1:3
- (d) 1:1

84. A pure pink mass remained in the charcoal cavity during cobalt nitrate test indicates presence of ___ oxide.

- (a) Aluminium
- (b) Magnesium
- (c) Zinc
- (d) Barium

85. How many stereoisomers can an pentose have?

- (a) 12
- (b) 8
- (c) 6
- (d) 4

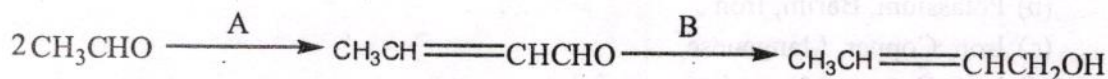
86. Which of the following amines would be best chosen for preparing enamine derivative from cyclohexanone?

- (a) Dimethylamine
- (b) Ethylamine
- (c) Trimethylamine
- (d) Hydroxylamine

87. What are the main components of "synthesis gas"?

- (a) Mixture of CO and H₂O
- (b) Mixture of CO and H₂
- (c) Mixture of CO₂ and H₂
- (d) Mixture of CO₂ and H₂O

88. Predict A and B, in the following transformation.



- (a) A=NaOH/Heat and B=LiAlH₄/heat
- (b) A=NaOH and B=LiAlH₄/heat
- (c) A=NaOH/Heat and B=LiAlH₄
- (d) A=NaOH/Heat and B=LiAlH₄

89. PbI_2 is ____ in color.
- (a) Black
 - (b) White
 - (c) Yellow
 - (d) Grey
90. The ν (O-H) stretching frequency in **enols** typically appears
- (a) 3200 cm^{-1}
 - (b) 3100 cm^{-1}
 - (c) 2800 cm^{-1}
 - (d) 3400 cm^{-1}
91. Nitrate containing salts when treated with concentrated sulphuric acid ____ gas is produced and it is due to ____.
- (a) Brown, nitrogen dioxide
 - (b) Reddish brown, nitrogen dioxide
 - (c) Reddish brown, nitrogen oxide
 - (d) Bluish red, nitrogen dioxide
92. IR bands due to Fermi resonance is usually observed in
- (a) Aldehydes
 - (b) Acids
 - (c) Acid anhydrides
 - (d) Amides
93. The oxidation state and coordination number of metal ion in $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$ is
- (a) 0 and 4
 - (b) 3 and 3
 - (c) 3 and 6
 - (d) 0 and 3
94. The number of ions per mole of $\text{CoCl}_3 \cdot 5\text{NH}_3$ in aqueous solution will be
- (a) Three
 - (b) Four
 - (c) Two
 - (d) Eight
95. Which of the followings is a naturally occurring actinide?
- (a) Cf
 - (b) Pu
 - (c) Th
 - (d) No

96. The Nerst distribution law $K_D = C_1/C_2$ is not applicable if the solute
- (a) Association in one of the solvent
 - (b) Dissociation in one of the solvent
 - (c) Association or dissociation in one of the solvent
 - (d) Complexation with the solvent
97. 36 g of glucose is present in 500 g of water, the molality of the solution is
- (a) 0.2
 - (b) 0.4
 - (c) 0.8
 - (d) 1.0
98. Which of the followings is not an element prepared by artificial radioactivity?
- (a) ^{13}N
 - (b) ^{27}Si
 - (c) ^{30}P
 - (d) ^{13}C
99. The indicator "methyl red" has the chemical name
- (a) 1-carboxybenzeneazodimethyl aniline
 - (b) 1-carboxybenzeneazomethyl aniline
 - (c) 2-carboxybenzeneazodimethyl aniline
 - (d) 2-carboxybenzeneazomethyl aniline
100. A catalyst is a substance which
- (a) Increases the equilibrium concentration of the products
 - (b) Changes the equilibrium constant for the reaction
 - (c) Shortens the time to reach equilibrium
 - (d) Supplies energy to the reaction

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

SEAL