



ARMY WELFARE EDUCATION SOCIETY
WRITTEN TEST PAPER FOR TEACHERS SELECTION: 09 DEC 2012
PART-'B' : Chemistry (PGT) : SUBJECT CODE : (P33)
GENERAL INSTRUCTIONS

1. DO NOT open this booklet until you are asked to do so.
2. FILL SCHOOL CODE, REGN NUMBER ON OMR ANSWER SHEET CAREFULLY AND SIGN ON THE RIGHT BOTTOM CORNER OF OMR SHEET.
3. Total duration of the test is 2 Hours and Maximum Marks are 120.
4. There are total 100 questions. All questions are objective type-multiple choices. All questions carrying equal marks.
5. DO NOT write anything on this question booklet.
6. After the test, please return this booklet along with OMR-Answer sheet to the invigilator.
7. You are not allowed to leave the examination hall before 1300h.

Instructions for filling the OMR Sheet

8. Read instructions printed on the OMR Sheet carefully before answering. Each item has four choices; A, B, C and D. Each choice is denoted by a circle. Shade the appropriate circle using Blue/Black Pen. Be absolutely sure of your option before shading the circle since you are not permitted to erase your response once shaded. More than one response will make your answer invalid. There is NEGATIVE MARKING for wrong answer.

Rough Work

9. For any rough work use the separate sheet provided along with the text booklet. DO NOT do any rough work on the answer sheet or any other paper.

PAPER - B
WRITTEN TEST PAPER FOR SELECTION OF TEACHERS : CSB 2013
CHEMISTRY(PGT) : SUBJECT CODE : P33

- Out of Cu_2S , HgS , Ag_2S and ZnS roasting will convert the minerals into metal in case of
 (A) Cu_2S , ZnS (B) HgS , ZnS
 (C) Cu_2S , Ag_2S (D) HgS
- Carbon cannot be used in the reduction of Al_2O_3 because
 (A) it is expensive
 (B) the enthalpy of formation of CO_2 is more than that of Al_2O_3
 (C) pure carbon is not easily available
 (D) the enthalpy of formation of Al_2O_3 is too high
- In the following compounds H is covalently bonded in the case of
 (A) BaH_2 (B) CaH_2
 (C) SiH_4 (D) NaH
- Which one of the following factors may be regarded as the main cause of Lanthanide contraction?
 (A) Greater shielding of 5d electron by 4f electrons
 (B) Poorer shielding of 5d electron by 4f electrons
 (C) Effective shielding of one 4f electron by another in the subshell
 (D) Poorer shielding of one 4f electron by another in the subshell
- Amongst the following identify the species with an atom in the +6 oxidation state
 (A) MnO_4^- (B) $\text{Cr}(\text{CN})_6^{3-}$
 (C) NiF_6^{2-} (D) CrO_2Cl_2
- In the reduction of dichromate by Fe (II), the number of electrons involved per chromium atom is
 (A) 2 (B) 3
 (C) 4 (D) 1
- Which alloy contains Cu, Sn and Zn?
 (A) Gun metal (B) solder
 (C) Type metal (D) Bronze
- Cuprous ion is colourless while cupric ion is coloured because
 (A) both have half filled *p* and *d* orbitals
 (B) both have unpaired electrons in the *d* orbitals
 (C) cuprous ion has incomplete *d* orbitals and cupric ion has complete *d* orbital
 (D) cuprous ion has complete *d* orbitals and cupric ion has incomplete *d* orbital
- The diamagnetic species is
 (A) $[\text{Ni}(\text{CN})_4]^{2-}$ (B) $[\text{NiCl}_4]^{2-}$
 (C) $[\text{CoCl}_4]^{2-}$ (D) $[\text{CoF}_6]^{2-}$
- Out of SiCl_4 , TiCl_4 , PO_4^{3-} , SO_4^{2-} , CrO_4^{2-} , CCl_4
 (A) SiCl_4 , TiCl_4 (B) SO_4^{2-} , CrO_4^{2-}
 (C) both (A) and (B) (D) none of these
- To neutralize completely 20 mL of 0.1 M aqueous solution of Sulphuric acid the volume of 0.1 M aqueous KOH solution required is
 (A) 10 mL (B) 60 mL
 (C) 40 mL (D) 20 mL
- Standard reduction electrode potential of Zn^{2+}/Zn is - 0.76V. This means
 (A) ZnO is reduced to Zn by H_2
 (B) Zn liberates H_2 with concentrated acids
 (C) Zn is generally the anode in the electrochemical cell
 (D) Zn is generally the cathode in the electrochemical cell
- Assuming complete dissociation, the Van't Hoff factor for a dilute solution of Sodium Chloride is ?
 (A) zero (B) 1.0
 (C) 1.5 (D) 2.0
- Density of a 2.05 M solution of Acetic acid in water is 1.20 g/mL. The molarity of the solution is
 (A) 3.28 mol/kg (B) 2.28 mol/kg
 (C) 0.44 mol/kg (D) 2.14 mol/kg
- The number of coulombs required for the deposition of 107.870g of silver is
 (A) 96500 (B) 48250
 (C) 19300 (D) 10000
- If *x* is the fraction of molecules having energy greater than the activation energy, E_a then
 (A) $x = -E_a/RT$ (B) $x = e^{-E_a/RT}$
 (C) $\log x = -E_a/2.303RT$ (D) $x = 10^{-E_a/RT}$
- Which of the following is an example of associated colloid?
 (A) protein + water (B) soap + water
 (C) rubber + benzene (D) $\text{As}_2\text{O}_3 + \text{Fe}(\text{OH})_3$
- The units of concentration independent of temperature would be
 (A) Normality (B) mass volume percent
 (C) molality (D) Molarity
- How many layers are adsorbed in a chemical adsorption?
 (A) One (B) Two
 (C) many (D) zero
- Which one of the following forms protective and non corrosive oxide layer?
 (A) Cr (B) Ni
 (C) Zn (D) Cu
- H_2O is a liquid while H_2S is a gas due to
 (A) covalent bonding (B) molecular attraction
 (C) H-bonding (D) both H-bonding and molecular attraction
- Which of the following is not obtained by direct reaction of the constituent elements ?
 (A) XeF_2 (B) XeF_4
 (C) XeO_3 (D) XeF_6
- The number of P-O-P bonds in a cyclic metaphosphoric acid is
 (A) zero (B) two
 (C) three (D) four
- H_3BO_3 is
 (A) monobasic acid and a weak Lewis acid
 (B) monobasic acid and a weak Bronsted acid
 (C) monobasic acid and a strong Lewis acid
 (D) Tribasic and weak Bronsted acid

25. On dissolving sodium metal in liquid Ammonia at a low temp, which of the following does not occur
 (A) Blue color solution is formed
 (B) Na^+ ions are formed in the solution
 (C) Liquid ammonia becomes a good conductor of electricity
 (D) liquid ammonia remains diamagnetic
26. The element used for dating the ancient remains is
 (A) Ni (B) C-14
 (C) C-12 (D) Rd
27. Be in BeCl_2 undergoes
 (A) linear hybridization (B) trigonal hybridization
 (C) tetrahedral hybridization (D) no hybridization
28. Water glass is
 (A) glass made of water (B) Ammonium benzoate
 (C) sodium silicate and calcium silicate (D) barium silicate
29. The one that has most negative electron affinity is
 (A) Br (B) Sn
 (C) Ba (D) Li
30. Which one the following does not have sp^2 hybridized carbon?
 (A) Acetone (B) Acetamide
 (C) Acetonitrile (D) Acetic acid
31. Which base is present in RNA but not in DNA?
 (A) Uracil (B) Thymine
 (C) Guanine (D) Cytosine
32. Which of the following has the maximum number of unpaired electrons?
 (A) Mg^{2+} (B) Ti^{3+} (C) V^{3+} (D) Fe^{2+}
33. Which of the following is planar?
 (A) XeF_4 (B) XeO_4 (C) XeO_3F (D) XeO_3F_2
34. Nitrogen forms N_2 but phosphorus forms P_4 the reason is
 (A) triple bond present between phosphorus
 (B) $p_\pi - p_x$ bonding in N_2 is weak
 (C) $p_\pi - p_x$ bonding in N_2 is strong
 (D) none of the above
35. The complex ion which has no d electrons in the central metal atom is
 (A) $[\text{MnO}_4]^-$ (B) $[\text{Co}(\text{NH}_3)_6]^{3+}$
 (C) $[\text{Fe}(\text{CN})_6]^{3-}$ (D) $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
36. ligand $[\text{EDTA}]^{4-}$ is a
 (A) monodentate (B) bidentate
 (C) quadridentate (D) hexadentate
37. The IUPAC name of $\text{Ni}(\text{CO})_4$ is
 (A) tetra carbonyl nickelate (0)
 (B) tetro carbonyl nickel(II)
 (C) tetra carbonyl nickel (0)
 (D) tetra carbonyl nickelate(II)
38. Which of the following has a square planar geometry ?
 (A) $[\text{CoCl}_4]^{2-}$ (B) $[\text{FeCl}_4]^{2-}$ (C) $[\text{NiCl}_4]^{2-}$ (D) $[\text{PtCl}_4]^{2-}$
39. If 50% of a radioactive substance dissociates in 15 min then the time taken by a substance to dissociate 99% will be
 (A) 50 min (B) 100 min
 (C) 99 min (D) 150 min
40. The treatment of cancerous tumors is done using radio isotope
 (A) U-235 (B) Co-60
 (C) Th-231 (D) Pu-239
41. An element Y emits one alpha and two beta particles to give X. X and Y are
 (A) isotones (B) isobars
 (C) isotopes (D) isoelectronics
42. $\text{MnO}_2 + 4\text{HCl} \longrightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
 The equivalent weight of MnO_2 (87 g/mol) in the reaction is
 (A) 3.4 (B) 33.6
 (C) 43.5 (D) 53.6
43. Volume of 18M H_2SO_4 required to prepare 1.0 L of 0.9 M solution of H_2SO_4 solution is
 (A) 50 mL (B) 10 mL
 (C) 500 mL (D) 5.0 mL
44. 1 mol of ferric oxalate is oxidized by x mol of MnO_4^- . Thus x is
 (A) 1.2 (B) 2.1
 (C) 3.1 (D) 1.3
45. 0.024 g of Mg on burning in oxygen gave 0.04g of MgO. What is the equivalent mass of Mg ?
 (A) 10 g /equiv (B) 20 g /equiv
 (C) 12g/equiv (D) 1.2 g equiv
46. Volume of oxygen gas occupied by one equivalent at STP is
 (A) 22.4 L (B) 11.2 L
 (C) 5.6 L (D) 44.8 L
47. Mole fraction of glucose in aqueous solution is 0.5. Hence molality of glucose solution is
 (A) 55.55 (B) 1.0
 (C) 0.055 (D) 90.0
48. Which of the following oxy acids of chlorine is the least oxidizing in nature?
 (A) HOCl (B) HClO_2 (C) HClO_3 (D) HClO_4
49. The oxidation number of P in KH_2PO_2 is
 (A) +5 (B) -3
 (C) +3 (D) +1
50. Which one of the following cannot be a reducing agent?
 (A) CO_2 (B) SO_2 (C) NO_2 (D) ClO_2
51. Which of the following is the anhydride of HNO_3
 (A) N_2O (B) NO_3^- (C) NO (D) N_2O_5
52. One mole of SO_2Cl_2 is dissolved in water and $\text{Ca}(\text{OH})_2$ is added to neutralize acidic solution. Moles of $\text{Ca}(\text{OH})_2$ required are
 (A) 2 (B) 3
 (C) 4 (D) 5
53. The number of atoms in 4.25 g of NH_3 is approximately
 (A) 1.5×10^{23} (B) 2×10^{23}
 (C) 4×10^{23} (D) 6×10^{23}
54. Ionic mass of X^{3-} is 17. If it has 10 electrons then the number of neutrons are
 (A) 10 (B) 13 (C) 7 (D) 17
55. Azo group is present in
 (A) Phenolphthalein (B) Indigo
 (C) Alizarin (D) Congo red
56. Dettol is a mixture of
 (A) Chloroxylenol and terpenol
 (B) Phenol and chlorophenol
 (C) Phenol and chloroxylenol
 (D) Chlorophenol and chloroxylenol

57. Hybrid rocket propellant has
 (A) poly butadiene and ammonium perchlorate
 (B) Nitroglycerine and nitrocellulose
 (C) liquid N_2O_4 and acrylic rubber
 (D) liquid O_2 and alcohol
58. The process of transport across the cell membrane which costs biochemical energy is
 (A) simple diffusion (B) facilitated diffusion
 (C) active transport (D) osmosis
59. All the following examples of fibrous proteins except
 (A) wool (B) fingernails
 (C) skin (D) insulin
60. All of the following can denature proteins without hydrolysis except
 (A) heat (B) mechanical stress
 (C) enzyme treatment (D) lowering of pH.
61. Glucose reacts with X number of molecules of phenylhydrazine to yield osazone. The value of X is
 (A) four (B) one
 (C) two (D) three
62. The angle strain in cyclohexane is larger than that of cyclopentane but it is thermally stable.
 (A) it exists in a more stable boat form
 (B) it exists in a more stable chair form
 (C) it exists in a more stable skew form
 (D) it exists in the cis and trans forms.
63. Diels –Alder reaction is the type
 (A) electro cyclic reaction (B) cyclo addition reaction
 (C) both (A) and (B) (D) none of these
64. When salicylic acid is treated with Bromine water it gives
 (A) 2,3,4- tri bromo phenol
 (B) 3,4,5- tribromo salicylic acid.
 (C) 3,6- dibromo salicylic acid
 (D) 2,4,6- tri bromo phenol
65. DDT is prepared by reacting chlorobenzene with the following compound in the presence of conc sulphuric acid.
 (A) trichloro ethane (B) dichloro acetone
 (C) dichloro acetaldehyde (D) trichloro acetaldehyde.
66. The reagent used in the Gatterman–Koch reaction is
 (A) $Pd/BaSO_4$ (B) alkaline $KMnO_4$
 (C) acidic $KMnO_4$ (D) $CO + HCl$
67. Aniline reacts with chloroform in the presence of alcoholic KOH to produce a bad smelling compound. The compound produced is
 (A) C_6H_5NC (B) C_6H_5CN (C) C_6H_5Cl (D) $C_6H_5NHC_6H_5$
68. Identify the organic compound which on heating with a strong solution of NaOH, partly converts into an acid salt and partly into alcohol
 (A) benzyl alcohol (B) acetaldehyde
 (C) acetone (D) benzaldehyde
69. A compound X with the molecular formula C_7H_7NO on treatment with Br_2 and KOH gives an amine Y. The latter gives the carbylamine test. Y upon diazotization and coupling with phenol gives an azo dye. Thus X is
 (A) $C_6H_5CH_2NO$ (B) $C_6H_5C(OH)=NH$
 (C) $C_6H_5CONH_2$ (D) none of these
70. The least water soluble compound amongst the following is
 (A) acetone (B) acetaldehyde
 (C) acetic acid (D) benzophenone
71. Phenol does not react with
 (A) NaOH (B) KOH
 (C) Na (D) Na_2CO_3
72. The best method of preparing 1° Amines from alkyl halide is by
 (A) Hofmann Bromamide reaction
 (B) Reaction with NH_3
 (C) Gabriel phthalamide reaction
 (D) Sandmeyer reaction
73. Dipole moment of $CH_3CH_2CH_3$, CH_3CH_2OH , $CH_3CH_2NH_2$ will be in the order
 (A) $I < II < III$ (B) $III < II < I$
 (C) $I < III < II$ (D) $II < III < I$
74. Mixture of 1° 2° 3° amines can be separated by
 (A) Hinsberg's method (B) Hofmann's method
 (C) distillation (D) all of these
75. C_3H_9N cannot represent the following
 (A) Primary Amine (B) Secondary Amine
 (C) Tertiary Amine (D) Quaternary Ammonium Salt
76. The weakest base among the following is
 (A) $C_6H_5CH_2NH_2$ (B) $C_6H_5CH_2NHCH_3$
 (C) $O_2NCH_2NH_2$ (D) CH_3NHCHO
77. Grignards reagent is a source of
 (A) carbocation (B) carboanion
 (C) both of these (D) none of these
78. When acetic acid reacts with ketene the product formed is
 (A) ethyl acetate (B) aceto-acetic ester
 (C) acetic anhydride (D) no reaction
79. The acid which does not contain –COOH group is
 (A) ethanoic acid (B) picric acid
 (C) lactic acid (D) palmitic acid
80. Compound X reacts with PCl_5 to produce Y which on treatment with KCN followed by hydrolysis produces propionic acid. Compound X is
 (A) C_2H_5Cl (B) C_2H_6 (C) C_3H_8 (D) C_2H_5OH
81. Carboxylic acid undergoes ionization due to
 (A) Hydrogen bonding
 (B) resonance stabilization of the carboxylate ion.
 (C) high reactivity of alpha hydrogen
 (D) absence of alpha hydrogen
82. The auto condensation of acetone in the presence of concentrated sulphuric acid gives an aromatic compound
 (A) mesitylene (B) mesityl oxide
 (C) trioxan (D) phorone
83. The Iodoform test is given by the following
 (A) CH_3COCH_3 (B) $CH_3COC_2H_5$
 (C) CH_3CHO (D) all of these
84. Grignards reagent reacts with HCHO to produce
 (A) secondary alcohol (B) anhydride
 (C) an acid (D) primary alcohol
85. Nucleophilic attack on carbonyl carbon changes its hybridization from
 (A) sp to sp^2 (B) sp^2 to sp^3
 (C) sp^3 to sp^2 (D) sp to sp^3

86. Silver mirror test is not positive with
 (A) benzaldehyde (B) acetaldehyde
 (C) acetone (D) fructose
87. Diethyl ether can be isomeric with
 (A) 1-butanol (B) 2-butanol
 (C) 2-methyl-2-propanol (D) all of them
88. Primary secondary and tertiary alcohol are distinguished by
 (A) oxidation method (B) lucas test
 (C) Victor meyer method (D) all of the above
89. Williamson's synthesis is used for preparation of
 (A) bakelite (B) PVC
 (C) acetone (D) diethyl ether.
90. Boiling point of alcohol is comparatively higher than that of the corresponding alkane due to
 (A) inter molecular H-bonding
 (B) intra molecular H- bonding
 (C) volatile nature
 (D) none of the above
91. Identify the wrong statement in the following:
 (A) Greenhouse effect is responsible for global warming
 (B) Ozone layer does not permit infrared radiations from the sun to reach the earth
 (C) Acid rain is mostly because of oxides of nitrogen and sulphur
 (D) Chlorofluorocarbons are responsible for ozone layer depletion
92. The substance which gives apple green coloured flame when introduced into bunsen flame is?
 (A) Calcium chloride (B) Barium chloride
 (C) Copper nitrate (D) Ammonium chloride
93. The best reagent to convert an alcohol to an alkyl halide is
 (A) SOCl_2 (B) PCl_3 (C) PCl_5 (D) HCl
94. The order of reactivities of methyl halides in the formation of Grignard's reagent is
 (A) $\text{CH}_3\text{I} > \text{CH}_3\text{Br} > \text{CH}_3\text{Cl}$ (B) $\text{CH}_3\text{Cl} > \text{CH}_3\text{Br} > \text{CH}_3\text{I}$
 (C) $\text{CH}_3\text{Br} > \text{CH}_3\text{Cl} > \text{CH}_3\text{I}$ (D) $\text{CH}_3\text{Br} > \text{CH}_3\text{I} > \text{CH}_3\text{Cl}$
95. When HBr is adds to 1-butyne in the presence of peroxide
 (A) anti -Markownikoff rule is followed
 (B) free radical is the intermediate
 (C) both (A) and (B) are correct
 (D) none of the above is correct
96. C_2H_4 and C_2H_2 can be distinguished by
 (A) Conc H_2SO_4 (B) Cl_2 in CCl_4
 (C) Ammoniacal Cu_2Cl_2 (D) dilute alkaline KMnO_4
97. Increasing order of the following alkyl halides for SN_1 reaction is CH_3Cl (I), $\text{CH}_3\text{CH}(\text{Cl})\text{CH}_3$ (II), $(\text{CH}_3)_3\text{CCl}$ (III)
 (A) $\text{I} < \text{II} < \text{III}$ (B) $\text{II} < \text{I} < \text{III}$
 (C) $\text{III} < \text{I} < \text{II}$ (D) $\text{I} < \text{III} < \text{II}$
98. If a be the edge length of the unit cell and r be the radius of an atom, then for fcc arrangement, the correct relation is
 (A) $4a = \sqrt{3} r$ (B) $4r = \sqrt{3} a$
 (C) $4r = \sqrt{2} a$ (D) $4r = a/\sqrt{2}$
99. A compound formed by elements M and N crystallizes in a cubic structure where M atoms are in the corners of a cube and N atoms are in the face centre. The formula of the compound is
 (A) MN_3 (B) M_2N
 (C) MN_2 (D) M_2N_3
100. If an aqueous solution of glucose is allowed to freeze, then crystals of which will separate out first?
 (A) glucose (B) water
 (C) both of these (D) none of these