DATE:	٩/١/٢٠١٤	TERM: FIRST	TOTAL ASSESSMENT MARKS: 210	COURSE CODE: 101 TIME ALLOWED: 2

Analytical Chemistry

The Exam consists of three questions in (8) pages :

Q1:You MUST select The Letter Of ONE Best Answer In The Following Answer She

(160 points)

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1)Potassium ion contains equal number of protons and electrons

a-true b-false

2)The electrons determine the chemical properties of an element

a-true b-false

3)In hydrogen gas the two hydrogen atoms joined together by

a-ionic bond b- electrovalent bond

c-covalent bond d- none of them

4)hydrogen isotopes have different number of

a-protons b-electrons

c- neutrons d-none of them

5)The bond produced by sharing of electrons between two atoms is called

a-covalent bond b-coordinate bond

c-ionic bond d-none of them

6)The most important factor affect the the partial ionic character is

a- the electronegativity difference b-common ion effect

c- degree of ionization d-none of them

7)In complex formation the ligand acts as

a-Lewis acid b-Lewis base

c-electron donor d- none of them

8)phosphoric acid is

a-diprotic acid b- monoprotic acid

c-triprotic acid d-None of them

9) By addition of ammonium chloride to a solution of ammonium hydroxide; the ionization of ammonium hydroxide will

a-increase b-decrease

c-stop d- unaffected

10) An acid is said to be more acidic than other acid when

a- it has larger ionisation constant b- it has lower ionisation constant

11) NH_4^+ is the conjugate base of ammonia

a-true b-false

12) To write correct ionic equation strong electrolyte should be written in

a-Ionized form b-Unionized form

c-Either one d-Neither one

13)The rate of chemical reaction is inversely proportional to product of the molar concentration of reacting substances

a-true b-false

14)K in the final chemical equilibrium mixture is affected by

a-The catalyst b- the conc. of reacting substances

c-the temperature d-all of them

15) Solubility of Ag(CN) increases

a-by addition of HNO_3 b- by addition of excess cyanide

c-a or b d-none of them

16) Solubility product constant of $Fe(OH)_3$ equals

a-$[Fe^{3+}][OH^-]^3$ b-$[Fe^{3+}] + [OH^-]^3$

c-$[Fe]^{+3}[OH^-]$ d-none of them

17)Lime water test is used to differentiate between CO_3^{2-}, and SO_3^{2-} after addition of HCl

a-True b-false

18) Strong oxidizing agents such as $KMnO_4$& $K_2Cr_2O_7$ oxidize $S_2O_3^{2-}$ into

a-Sulfate
b-tetrathionate
c-sulfite
d-none of them

19)SO_2 and H_2S gas have the same effect

a-on lime water
b- on $K_2Cr_2O_7$ solution
c-on $KMnO_4$ solution
d- (b),(c)

20)The reason for the answer in the former point is that

a-H_2S has reducing action
b- both gases have reducing action
c-SO_2 is oxidizing agent
d- H_2S is oxidizing agent

21)The action of dil $H_2SO_4$is the same as dil HCl on $CaCO_3$

a-true
b-false

22)Borax test is specific test for

a-NO_2^-
b-SO_4^{2-}
c-$S_2O_3^{2-}$
d- None of them

23)SO_2 gas is produced with precipitation of elemental sulfur upon addition of HCl to

a-Na_2SO_4
b-$Na_2S_2O_3$
c-Na_2S
d-Na_2SO_3

24) Thiosulfate solution form purple complex which disappears after short time with

a- $FeCl_3$ solution
b-$BaCl_2$ solution
c-$AgNO_3$ solution
d- none of them

25)thiosulfate decolorize iodine solution according to the following equation

a- $I_2+2S_2O_3^{2-}= 2I^- +S_4O_6^{2-}$
b-$I_2+S_2O_3^{2-}+H_2O= 2SO_4^{2-}+2HI$
c-$I_2+ SO_3^{2-} +H_2O=2HI +SO_4^{2-}$
d-None of them

26)By boiling thiosulfate solution with CN^- in alkaline medium; the product gives

a-red color with Fe^{3+}
b-blue color with Fe^{2+}
c-purple color with Fe^{3+}
d-none of them

27)H_2SO_4 acid should be poured into water for dilution this is due to its

a-oxidizing properties
b- dehydrating properties
c- acidity
d- none of them

28) All these factors increase solubility except

a-heating
b-diverse ions
c-common ions
d-complex ions

29)SO_3^{2-} can be separated from SO_4^{2-} by addition of

a-$BaCl_2$
b-$AgNO_3$
C-$(CH_3COO)_2pb$
d- none of them

30)S^{2-} can be separated from its mixture with $S_2O_3^{2-}$ by addition of

a-$AgNO_3$
b-$(CH_3COO)_2pb$
c-$CdCO_3$
d-none of them

31)The following acid has corrosive action on glass producing oily appearance

a-HCl
b-HF
c-HBr
d-H_2SO_4

32)HCl gas gives white fumes with glass rod moistened with

a-NaOH
b-NH_4OH
c-KOH
d-none of them

33) Cl_2 gas is produced upon heating Cl^- salt

a- with concentrated sulfuric and MnO_2
b- with concentrated sulfuric
c-a or b
d- none of them

34)HCl has more reducing power than HBr

a-true
b-false

35)Potassium iodide starch paper turns blue by exposure to Cl_2 gas because it is

a- reducing agent
b- oxidizing agent
c-complexing agent
d-none of them

36)All the following statements are false concerned to chlorine water test except

a-It is specific test for chloride
b-It is a wet test
c-gives no result with iodide
d- gives no result with bromide

37)By carrying out chlorine water test for chloride

a-chloroform layer turns violet then brown
b- chloroform layer turns violet
c- chloroform layer turns brown then violet
d- no color in chloroform layer

38) To analyze a mixture of chlorine and chloride; chlorine should be removed by addition of

a-metallic iron
b-Cu wire
c-metallic mercury
d-none of them

39)AgI is soluble in

a- dilute NH_4OH
b-concentrated NH_4OH
c-HCl
d-none of them

40) Acidified nitrite solution can oxidize

a- Br^- into bromine
b- I^- into iodine
c-both of them
d- none of them

41) Both NO_2^- and NO_3^- give brown fumes of NO_2 with dil HCl

a-true
b-false

42) NH_3 will be evolved by boiling zinc dust and NaOH with a solution of

a-NO_2^-
b-NO_3^-
c-CN^-
d-all of them

43)NO_2^- acts as

a-oxidizing agent
b-reducing agent
c-both of them
d-none of them

44)Nitrite can be removed from its mixture with nitrate by treating with

a-Ag_2SO_4
b-urea
c-NH_4Cl
d-b or c

45)Silver group precipitated by addition of

a-dil HCl
b-conc.HCl
c-HNO_3
d-H_2SO_4

46)Both Hg_2Cl_2&$PbCl_2$ are soluble in hot water

a-true
b-false

47)precipitation of copper-arsenic group is carried out by

a-H_2S in acidic medium
b-H_2S in alkaline medium
c-thioacetamide in alkaline medium
d-none of them

48)The solubility product of CuS is higher than that of COS

a-true
b-false

49) CdS is more electronegative than Sb_2S_3

a-true
b-false

50)As_2S_3 is soluble in

a-Na_2S
b-KOH
c-$(NH_4)_2S$
d-all of them

51)HgS is soluble in

a-HNO_3
b-HCl
c-aqua regia
d-none of them

52)pb^{2+} is separated from other cations of copper gp as
a-chloride
b-sulfate
c-nitrate
d-none of them
53) bismuth, copper and cadmium form soluble complexes with ammonia
a- true
b- false
54) $SnCl_2$ can be used to detect the presence of
a- Fe^{3+}
b- Hg^{2+}
c- Cu^{2+}
d-none of them
55) $SnCl_2$ in the former reaction act as
a-oxidizing agent
b-reducing agent
c-complexing agent
d-none of them
56)KCN forms more stable complex with Cd^{2+} than with Cu^{2+}
a-true
b-false
57)One of these cations gives blue solution with ammonia
a-Cu^{2+}
b-Bi^{3+}
c-Mg^{2+}
d-None of them
58)Acidification is necessary for reprecipitation of arsenic group using
a-HCl
b-Acetic acid
c-HNO_3
d-a or b
59)To separate As_2S_3 from Sb_2S_3 we add
a-conc HCl
b-Acetic acid
c-aqua regia
d-none of them
60)The solubility of As_2S_3 in HNO_3 is a type of
a-oxidation reduction reaction
b-complex formation reaction
c-ionic transfer reaction
d-none of them
61)Magnesia mixture consists of

a- $MgCl_2$ +NH_4Cl + NH_4OH
b- $MnCl_2$ +NH_4Cl + NH_4OH
c- $MgCl_2$ +NH_4HCO_3 + NH_4OH
d- none of these
62)To test for Sb^{3+} in presence of Sn^{4+} using H_2S we should previously add
a-iron metal
b-oxalic acid
c-HCl
d-None of them
63)By addition of iron metal to Sb^{3+}
a-it is reduced to metallic Sb
b-it is reduced to sb^{2+}
c-it is oxidized to Sb^{5+}
d-none of them
64)group III precipitated as hydroxides using
a-NH_4OH/NH_4Cl
b-NaOH
c-NH_4OH
d-none of them
65)Solubility product of $Cr(OH)_3$ is higher than $Mg(OH)_2$
a-true
b-false
66)For complete precipitation of $Cr(OH)_3$
a-excess ammonia is avoided
b-HNO_3 should be added
c-boiling is required
d-a&C
67)Both $Cr(OH)_3$ and $Fe(OH)_3$ are amphoteric
a-true
b-false
68)In group III before testing for CrO_4^{2-} by lead acetate
a- solution is acidified by HCl
b- solution is alkalinized by excess NaOH
c- solution is acidified by acetic
d-none of them

69)Precipitation of zinc group is made in

a-acidic medium b-alkaline medium

c-pH is unimportant d-none of them

70) both MnS and ZnS are soluble in HCl

a-true b-false

71) $Mn(OH)_2$ can be separated from $Zn(OH)_2$ by $NaOH/H_2O_2$ because

a-$Mn(OH)_2$ is oxidized to MnO_4^- b-$Mn(OH)_2$ is soluble in NaOH

c-$Zn(OH)_2$) is amphoteric d-none of them

72) Alkaline earth group is precipitated as carbonate by

a-Na_2CO_3 b-$(NH_4)_2CO_3/NH_4OH$

c-$(NH_4)_2CO_3/NH_4OH/NH_4Cl$ d-None of them

73)$CaCO_3$ and $SrCO_3$ are soluble in acetic acid

a-true b-false

74)Red lead oxide is used to test for

a-Mg^{2+} b-Mn^{2+}

c-Co^{2+} d-none of them

75)The test in (74) the medium should be

a- acidic using HCl b- acidic using HNO_3

c-alkaline using NaOH d-none of them

76) The acidic character of As_2S_3 is higher, than Sb_2S_3 and SnS.

a-true b-false

77)sodium thiosulfate give orange precipitate with

a-tin b-arsenic

c-antimony d-none of them

78)All those hydroxides are soluble in $NaOH/H_2O_2$ except

a-$Fe(OH)_3$ b-$Cr(OH)_3$

c-$Al(OH)_3$ d-$Zn(OH)_2$

79) $K_4Fe(CN)_6$ gives a blue precipitate or color (Prussian blue) with.

a-Cu^{2+} b-Zn^{2+}

c-Fe^{3+} d-none of them

80) SCN^- gives blue color with

a-Co^{2+} b-Ni^{2+}

c-Fe^{3+} d-none of them

Q2: Complete the following statements, write the answer in the table:(30points)

1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10		15	

1. .....is a substance used to detect the presence of Ag^{+}.
2. .....is a substance used to test for pb^{2+}.
3. .....is a substance used to detect presence of Bismuth ion
4. .....is a substance used to detect the presence of cobalt
5. .....is a reagent gives a rose chelate with Nickel .
6. .....is a substance used as masking agent for calcium.
7. .....is a reagent gives orange precipitate with NH_4^{+}
8. A filter paper impregnated in ..... converted into black with ammonia
9. .....is a substance used to detect the presence of K^{+}
10. .....is a substance used to detect the presence of Na^{+}
11. The cation should be detected at first in the original solution is.....
12. Barium separated fromCa^{2+}&Sr^{2+} as .....
13. Flame test gives brick red color with.....
14. Aluminon reagent gives red precipitate with.....
15. .....gives yellow precipitate with arsenic.

Q.3:Illustrate with chemical equations four only of the following: (20points)

1) Disproportionation reaction

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2)Perchromic acid test

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3)Brown ring test for nitrate

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4)Hepar's test

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5) Chromyl chloride test

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6) Lime water test

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Good luck