DEPARTMENT OF CHEMISTRY

CET, KATTANKULATHUR

MULTIPLE CHOICE QUESTIONS

PROGRAM : B.Tech [Common] **Sem: I and II**

SUBJECT/ CODE: CHEMISTRY PRACTICAL/18CYB101J

1. The color of phenolphthalein indicator in acid solution is

a. Pink

b. Yellow

c. Colourless

d. Orange

Answer: c. Colourless

2. The equivalent weight of Sodium Carbonate [Na_2CO_3] is

a. 40

b. 53

c. 55.85

d. 63

Answer: b. 53

3. When basic solution is titrated against HCl in the burette with Methyl orange indicator, the end point is the color change from

a. Yellow to Violet

b. Orange to Yellow

c. Appearance of Pink color

d. Yellow to Orange

Answer: Yellow to Orange

4. Methyl orange is

a. Pink in acidic medium, yellow in basic medium

b. Yellow in acidic medium, pink in basic medium

c. Colourless in acidic medium, pink in basic medium

d. Pink in acidic medium, colourless in basic medium.

Answer: a. Pink in acidic medium, yellow in basic medium

5. Phenolphthalein color in basic medium is

a. Pink

b. Orange

c. Yellow

d. Colourless

Answer: a. Pink

6. When mixture of sodium carbonate and sodium hydroxide solution is titrated against HCl solution, the Phenolphthalein end point correspond to

a. Neutralization of OH^- ions and CO_3^{2-} ions

b. Neutralization of OH^- ions only

c. Neutralization of CO_3^{2-} ions only

d. Neutralization of OH^- ions and half of CO_3^{2-} ions

Answer: d. Neutralization of OH^- ions and half of CO_3^{2-} ions

7. A neutralization reaction is a --------- reaction taking place between the acids and the bases.

a. double displacement

b. Displacement

c. Substitution

d. Addition

Answer: a. double displacement

8. A precipitation reaction is a double displacement reaction taking place between

a. Acids and bases

b. two aqueous ionic compounds

c. two bases

d. two acids

Answer: b. two aqueous ionic compounds

9. In determination of mixture of bases by titration method, the amount of Sodium Hydroxide is calculated as---.

a. N x Equivalent mass of Sodium Carbonate / 10

b. N [OH and CO_3^{2-} portion] x Equivalent mass of Sodium Hydroxide and Sodium carbonate / 10

c. N [OH portion] x Equivalent mass of Sodium Hydroxide / 10

d. N [CO_3^{2-} portion] x Equivalent mass of Sodium carbonate /10

Answer: c. N [OH portion] x Equivalent mass of Sodium Hydroxide / 10

10. When pH is below 8.5 the indicator ---- is colourless.

a. EBT

b. Methyl orange

c. Phenolphthalein

d. K_2CrO_4

Answer: c. Phenolphthalein

11. What is the indicator used for estimation of hardness?

a) Phenolphthalein

b) Methyl orange

c) Eriochrome Black – T

d) Potassium dichromate

Answer: c. **Eriochrome Black – T**

12. Hardness of water is conventionally expressed in terms of equivalent amount of _____.

a) H_2CO_3

b) $MgCO_3$

c) $CaCO_3$

d) Na_2CO_3

Answer: c. $CaCO_3$

13. One ppm is equal to _____.

a) 100 mg / L

b) 10 mg / L

c) 1000 mg / L

d) 500 mg / L

Answer: c. 1000 mg / L

14. Which of the following does not cause the permanent hardness in water?

a) Nitrates

b) Sulphates

c) Chlorides

d) Bicarbonates

Answer: d. Bicarbonates

15. Soft water + Buffer + EBT ----------

a. Appearance of wine-red colour

b. Appearance of steel blue colour

c. Formation of weak complex

d. Formation of brown precipitate

Answer: b. Appearance of steel blue colour

16. Temporary hardness in water can be removed by:

a) adding soda

b) distillation

c) boiling

d) adding lime-soda

Answer: c. boiling

17. In EDTA method, the purpose of adding buffer is _____.

a) to maintain the pH of 6-8 range

b) to maintain the pH of 8-10 range

c) to maintain the pH of 4-6 range

d) to maintain the conc. of the reagent

Answer: b. to maintain the pH of 8-10 range

18. Which of the following is not a unit of hardness?

a) Parts per million

b) Degree centigrade

c) Degree clarke

d) Degree French

Answer: b. Degree centigrade

19. Temporary hardness of water is caused due to the presence of dissolved

a) calcium hydrogen carbonates only

b) magnesium hydrogen carbonates only

c) Sulphates and chlorides of calcium or magnesium

d) calcium hydrogen carbonates and magnesium hydrogen carbonates

Answer: d. calcium hydrogen carbonates and magnesium hydrogen carbonates

20. Permanent hardness of water cannot be removed by

a) Adding soda

b) Adding lime soda

c) Distillation

d) Boiling

Answer: d. Boiling

21. When sodium hydroxide is added to HCl, the H^+ ions are replaced by

a) slow moving Na^+ ions

b) fast moving Na^+ ions

c) slow moving OH^- ions

d) fast moving OH^- ions

Answer: a. slow moving Na^+ ions

22. When a strong base is added to a strong acid after the neutralization point

a) conductance decreases

b) conductance increases

c) conductance remains constant

d)conductance decreases initially and then increases gradually

Answer: b. conductance increases

23. Conductance of a solution depends upon

a) mobility of ions

b) charge of the ions

c) size of the ions

d) colour of the ions

Answer: a. mobility of ions

24. The end point in the conductometric titration of strong acid Vs strong base can be determined by plotting

a) Conductance Vs Volume of acid

b) Conductance Vs Volume of base

c) pH Vs volume of acid

d) pH Vs volume of base

Answer: b. Conductance Vs Volume of base

25. Which among the following reagents is NOT required in conductometric titration of strong acid Vs strong base

a) HCl

b) NaOH

c) distilled water

d) $K_2Cr_2O_7$

Answer: d. $K_2Cr_2O_7$

26. Which among the following apparatus is NOT used in conductometric titration

a) conductivity meter

b) conductivity cell

c) beaker

d) pH meter

Answer: d. pH meter

27. In order to get accurate values in titration of HCL Vs NaOH, the NaOH is added in increments of

a)2ml near and beyond the end point

b) 1 ml near and beyond the end point

c) 0.2 ml near and beyond the end point

d)0.5ml near and beyond the end point

Answer: c. 0.2 ml near and beyond the end point

28. When NaOH is added to HCl after the neutralization point the conductance increases rapidly

a) because of fast moving OH^- ions

b) because of fast moving H^+ ions

c) Because of fast moving Na^+ ions

d) because of fast moving Cl^- ions

Answer: a. because of fast moving OH^- ions

29. In the pilot titration of NaOH Vs HCl by condcutometry, the base is added in increments of

a) 0.1ml

b) 0.2ml

c)1ml

d)2ml

Answer: c. 1ml

30. Conductance is measured in the unit

a. ohm

b. mho

c. volts

d. ml

Answer: b. mho

31. Which indicator is used in potentiometric titration?

a. Methyl orange
b. Potassium Chromate
c. Eriochrome Black T (EBT)
d. No indicator is used.

Answer: d. No indicator is used

32. Name the reference electrode and working electrode used in the estimation of Fe(II) ions by potentiometry.

a. Platinum electrode and Standard Calomel Electrode
b. **Standard Calomel Electrode and Platinum electrode**
c. Standard Calomel Electrode and Glass electrode
d. Glass electrode and Platinum electrode

Answer: b. Standard Calomel Electrode and Platinum electrode

33. Estimation of Fe(II) ions by potentiometry is titration**.**

a. Redox
b. Acid-base
c. Precipitation
d. Complexometric

Answer: a. Redox

34. Oxidation states of Cr in Potassium Dichromate and Fe in FAS are respectively**.**

a. (+VII) and (+II)
b. (+V) and (+II)
c. (+VI) and (+III)
d. (+VII) and (+III)

Answer: a. **(+VII) and (+II)**

35. Which of the following chemical agent is added during the estimation of Fe(II) ions by potentiometry to avoid the hydrolysis reaction during the titration?

a. FAS
b. Phenolphthalein
c. dil. H_2SO_4
d. dil. HCl

Answer: c. dil. H_2SO_4

36. In the experiment, "Estimation of Fe(II) ions by potentiometry", $K_2Cr_2O_7$ acts as **---.**

a. Reducing agent
b. Oxidizing agent
c. Indicator
d. Catalyst

Answer: b. Oxidizing agent

37. Which of the following represents the equivalence point in the graph of EMF vs volume of titrant?

a. Point at the highest EMF
b. Point at the lowest EMF
c. Point at the greatest magnitude of the slope of the curve

d. Point at the least magnitude of the slope of the curve

Answer: c. Point at the greatest magnitude of the slope of the curve

38. All of the following statements are correct regarding potentiometric titration except

a. They are suitable for colored or turbid solutions
b. The EMF of the cell is zero at the equivalence point
c. The results obtained are accurate
d. Acid base titration can also be carried out by potentiometry

Answer: b. The EMF of the cell is zero at the equivalence point

39. Basically, potentiometer is a device for ---.

a. Comparing two voltages
b. Measuring a current
c. Comparing two currents
d. Measuring a voltage

Answer: a. Comparing two voltages

40. The significance of first derivative and second derivative plot in potentiometric titration is -.

a. To get additional information about the redox reaction
b. To get the voltage of reference electrode
c. To get the value of standard electrode potential
d. To get more accurate equivalence point in case of colored and dilute solutions

Answer: d. To get more accurate equivalence point in case of colored and dilute solutions

41. What is the working principle of conductometry?

a. measurement of potential.
b. measurement of conductivity of solution.
c. measurement of emf.
d. measurements of pH

Answer: b. measurement of conductivity of solution

42. Among the following applications for which the conductometry titration is not used?

a. To determine of moisture

b. Purity of water

c. Ionic product of water.

d. Precipitation titration

Answer: a. To determine of moisture

43. If the ion size decreases in solutions then

a. conductance decreases

b. conductance increases

c. does not affect the conductance

d. first decreases and then increases

Answer: b. conductance increases

44. Conductivity cell is made up of…

a. Two silver rods

b. Two parallel sheets of platinum

c. Glass membrane of Ag/AgCl

d. Sb-Sb_2O_3

Answer: b. Two parallel sheets of platinum

45. The units for specific conductance is…

a. Ohms

b. Ohms.cm

c. Mhos

d. Mhos.cm

Answer: b. Ohms.cm

46. Conductivity of a solution is directly proportional to

a. dilution

b. current density

c. number of ions

d. volume of the solution

Answer: c. number of ions

47. In conductometric titration, after both the acids are consumed, there is a steep increase in conductivity due to…

a. increase in total volume of solution

b. increase in temperature

c. increase in OH^- ions

d. increase in H^+ ions

Answer: c. increase in OH^- ions

48. At the same concentration and temperature, dilute aqueous solution of strong acid will conduct electricity….

a. better than dilute aqueous solution of weak acid

b. as much as dilute aqueous solution of weak acid

c. lower than the dilute aqueous solution of weak acid

d. two-fold higher than the weak acid

Answer: a. better than dilute aqueous solution of weak acid

49. In condutometric titration when KOH is titrated against mixture of H_2SO_4 and malonic acid, which one will be reacting first?

a. Malonic acid

b. Sodium malonate

c. Disodium malonate

d. H_2SO_4

Answer: d. H_2SO_4

50. If 20 g of NaOH is dissolved in 1 L distilled water, then what is the concentration of the solution?

a. 1 N

b. 2 N

c. 0.5 N

d. 0.05 N

Answer: c. 0.5 N

51. A pH value less than 7.0 means that the solution is

a) Conductive

b) Caustic

c) Alkaline

d) Acidic

Answer: d. Acidic

52. Which of the following is the formula for pH calculation?

a) $\log_{10}[H^+]$

b) $-\log_{10}[H^+]$

c) $\log 2[H^+]$

d) $-\log 2[H^+]$

Answer: b. $-\log_{10}[H^+]$

53. The pH meter is a

a) Ammeter

b) Voltmeter

c) Potentiostat

d) Spectrophotometer

Answer: b. Voltmeter

54. What is the pH value of pure water?

a) Less than 7

b) Greater than 7

c) Equal to 7

d) Greater than 14

Answer: c. Equal to 7

55. How we will come to know that a given solution is acidic?

a) If its pH value is less than 7

b) If its pH value is greater than 7

c) If its pH value is less than 5

d) If its pH value is 5

Answer: a. if its pH value is less than 7

56. What happens when a base is added to an acid?

a) the pH value increases

b) the pH value decreases

c) no change in pH

d) the pH value becomes zero

Answer: a. the pH value increases

57. A buffer solution is used with pH measuring instruments to

a) protect the equipment

b) standardize the equipment

c) clean the electrodes

d) plantinize the reference electrode

Answer: b. standardize the equipment

58. The pH of a liquid solution is a measure of

a) dissolved salt content

b) hydrogen ion activity

c) hydroxyl ion molarity

d) electrical conductivity

Answer: b. hydrogen ion activity

59.The electrolyte solution within the glass electrode (reference) of the pH meter is

a) saturated KCl

b) concentrated HCl

c) dilute HCl

d) dilute NaCl

Answer: a. saturated KCl

60. A buffer solution comprises which of the following?

a) a weak acid in solution

b) a strong acid in solution

c) a weak base in solution

d) a weak acid and its conjugate base in solution

Answer: d. a weak acid and its conjugate base in solution

61. Which one of the following methods is not related to calculate the molecular weight of a polymer?

a) Number average molecular weight,
b) Weight average molecular weight,
c) Gel permeation chromatography,
d) High performance liquid chromatography

Answer: d. High performance liquid chromatography

62. Measurement of solution viscosity offers a simple and convenient method for molecular weight determination if

a) Polymer is insoluble in solvent
b) Polymer is soluble in solvent
c) Polymer is sparingly soluble in solvent
d) Polymer is used as neat

Answer: b. Polymer is soluble in solvent

63. The Staudinger – Mark-Houwink equation is

a) $\eta_i = K (M)^a$
b) $l = \eta / p$
c) $E = mc^2$

d) $E = \eta u$

Answer: a. $\eta_i = K (M)^a$

64. Viscosity is due to one of the following

a) Potential energy stored in fluid

b) Resistance to fluid motion

c) Roughness of the surface

d) The pressure difference between the two fluids

Answer: b. Resistance to fluid motion

65. What is the SI unit of viscosity?

a) Candela

b) Poiseiulle

c) Newton/m

d) No units

Answer: b. Poiseiulle

66. Which of these fluids has the highest viscosity?

a) Water

b) Honey

c) petrol

d) brine solution

Answer: b. Honey

67. Which one of the following equations is used to calculate the relative viscosity?

a) $\eta / \eta_0 = t/t_o$

b) $\eta_{sp} = \eta / \eta_0 - 1$

c) $\eta_{red} = \eta_{sp}/C \times 100$

d) $\eta_i = K (M)^a$

e) **Answer: a. $\eta / \eta_0 = t/t_o$**

68. On increasing the temperature, the viscosity of the fluid _____

a) Decreases

b) Increases

c) Initially decreases then increases

d) Neither decrease nor increase

Answer: a. Decreases

69. A plot of h_{sp} / C (reduced viscosity) vs C is a ……. for dilute polymer solutions

a) "S" shape curve
b) Triangle
c) Straight line
d) "V" shape curve

Answer: c. Straight line

70. Volume of different concentrations of polymer solution used (0.1, 0.2, 0.3 , 0.4 and 0.5 %) for each viscosity measurement

a) Varies with respect to concentration
b) Varies with respect to the size of the Ostwald viscometer
c) Varies with respect to polymer used
d) Remains fixed

Answer: d. Remains fixed

71. To prepare 25 ml of 0.2 % diluted solution from a 1% solution, we need

a) 2.5 ml of 1 % solution
b) 5 ml of 1 % solution
c) 7.5 ml of 1 % solution
d) 10 ml of 1 % solution

Answer: b. 5 ml of 1 % solution

72. What is the role of chromate ions in chloride estimation?

a. It acts as a reducing agent
b. It acts as a buffer
c. It acts as an indicator
d. It acts as an oxidizing agent

Answer: c. It acts as an indicator

73. What is the pH range in which chloride determination using Mohr's method is conducted?

a. < 3
b. 5
c. > 12
d. 6 -9

Answer: d. 6 -9

74. Which of the following is not a primary standard?

a. NaCl

b. Anhydrous Na2CO3

c. $AgNO_3$

d. Oxalic acid

Answer: c. $AgNO_3$

75. Which indicator is used in Mohr's method?

a. Potassium Chromate

b. Silver Nitrate

c. Potassium dichromate

d. Silver Chromate

Answer: a. Potassium Chromate

76. Estimation of chloride reaction is

a. Redox reaction

b. Equlibrium reaction

c. Precipitation reaction

d. Catalytic reaction

Answer: c. Precipitation reaction

77. Which type of reaction occurs in the following reaction $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$?

a. Displacement reaction

b. Single replacement

c. Decomposition

d. Double displacement reaction

Answer: d. Double displacement reaction

78. Why do we have to standardize $AgNO_3$ solution?

a. To find the normality of NaCl

b. To calculate the normality of AgCl

c. To find the normality of $AgNO_3$

d. To calculate the volume of NaCl

Answer: c. To find the normality of $AgNO_3$

79. What is the oxidation state of Mn in $KMnO_4$?

a. +6

b. +7

c. +9

d. +5

Answer: b. +7

80. What is the advantage of Mohr's method?

a. A Very clear colour change

b. Simple method

c. Capability for different PH

d. Must be 1M nitric acid solution.

Answer: b. Simple method

81. In Mohr's method the solution needs to be near neutral, because

a. Silver chloride forms at high pH,

b. Silver precipitates at low pH

c. Chromate forms H_2CrO_4 at low pH, which delays the formation of the precipitate.

d. Potassium chromate dissolves at high pH.

Answer: c. Chromate forms H_2CrO_4 at low pH, which delays the formation of the precipitate.