**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
2. Pink
3. Yellow
4. Colourless
5. Orange

**Answer: c. Colourless**

1. The equivalent weight of Sodium Carbonate [Na2CO3] is
2. 40
3. 53
4. 55.85
5. 63

**Answer: b. 53**

1. When basic solution is titrated against HCl in the burette with Methyl orange indicator, the end point is the color change from
2. Yellow to Violet
3. Orange to Yellow
4. Appearance of Pink color
5. Yellow to Orange

**Answer: Yellow to Orange**

1. Methyl orange is
2. Pink in acidic medium, yellow in basic medium
3. Yellow in acidic medium, pink in basic medium
4. Colourless in acidic medium, pink in basic medium
5. Pink in acidic medium, colourless in basic medium.

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

1. Phenolphthalein color in basic medium is
2. Pink
3. Orange
4. Yellow
5. Colourless

**Answer: a. Pink**

1. When mixture of sodium carbonate and sodium hydroxide solution is titrated against HCl solution, the Phenolphthalein end point correspond to
2. Neutralization of OH- ions and CO32- ions
3. Neutralization of OH- ions only
4. Neutralization of CO32- ions only
5. Neutralization of OH- ions and half of CO32- ions

**Answer: d. Neutralization of OH- ions and half of CO32- ions**

1. A neutralization reaction is a --------- reaction taking place between the acids and the bases.
2. double displacement
3. Displacement
4. Substitution
5. Addition

**Answer: a. double displacement**

1. A precipitation reaction is a double displacement reaction taking place between
2. Acids and bases
3. two aqueous ionic compounds
4. two bases
5. two acids

**Answer: b. two aqueous ionic compounds**

1. In determination of mixture of bases by titration method, the amount of Sodium Hydroxide is calculated as---.
2. N x Equivalent mass ofSodium Carbonate / 10
3. N [OH and CO32- portion] x Equivalent mass of Sodium Hydroxide and Sodium carbonate / 10
4. N [OH portion] x Equivalent mass ofSodium Hydroxide / 10
5. N [CO32- portion] x Equivalent mass of Sodium carbonate /10

**Answer: c. N [OH portion] x Equivalent mass ofSodium Hydroxide / 10**

1. When pH is below 8.5 the indicator ---- is colourless.
2. EBT
3. Methyl orange
4. Phenolphthalein
5. K2CrO4

**Answer: c. Phenolphthalein**

1. What is the indicator used for estimation of hardness?
2. Phenolphthalein
3. Methyl orange
4. Eriochrome Black – T
5. Potassium dichromate

Answer: c. **Eriochrome Black – T**

1. Hardness of water is conventionally expressed in terms of equivalent amount of \_\_\_\_\_\_\_\_\_\_\_\_.  
   a) H2CO3  
   b) MgCO3  
   **c)** CaCO3  
   d) Na2CO3

**Answer: c. CaCO3**13. One ppm is equal to \_\_\_\_\_\_\_\_\_.

1. 100 mg / L
2. 10 mg / L
3. 1000 mg / L
4. 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 ----------🡪

1. Appearance of wine-red colour
2. Appearance of steel blue colour
3. Formation of weak complex
4. 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 \_\_\_\_\_\_\_\_.

1. to maintain the pH of 6-8 range
2. to maintain the pH of 8-10 range
3. to maintain the pH of 4-6 range
4. 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

1. calcium hydrogen carbonates only
2. magnesium hydrogen carbonates only
3. Sulphates and chlorides of calcium or magnesium
4. 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

1. Adding soda
2. Adding lime soda
3. Distillation
4. 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) K2Cr2O7

**Answer: d.** **K2Cr2O7**

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?

* 1. Methyl orange
  2. Potassium Chromate
  3. Eriochrome Black T (EBT)
  4. 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.

1. Platinum electrode and Standard Calomel Electrode
2. **Standard Calomel Electrode and Platinum electrode**
3. Standard Calomel Electrode and Glass electrode
4. Glass electrode and Platinum electrode

**Answer: b.** **Standard Calomel Electrode and Platinum electrode**

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

1. Redox
2. Acid-base
3. Precipitation
4. Complexometric

**Answer: a.** **Redox**

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

1. (+VII) and (+II)
2. (+V) and (+II)
3. (+VI) and (+III)
4. (+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?

1. FAS
2. Phenolphthalein
3. dil. H2SO4
4. dil. HCl

**Answer: c.** **dil. H2SO4**

36. In the experiment, “Estimation of Fe(II) ions by potentiometry”, K2Cr2O7 acts as **---.**

1. Reducing agent
2. **Oxidizing agent**
3. Indicator
4. Catalyst

**Answer: b.** **Oxidizing agent**

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

1. Point at the highest EMF
2. Point at the lowest EMF
3. Point at the greatest magnitude of the slope of the curve
4. 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

1. They are suitable for colored or turbid solutions
2. The EMF of the cell is zero at the equivalence point
3. The results obtained are accurate
4. 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 ---.

1. Comparing two voltages
2. Measuring a current
3. Comparing two currents
4. Measuring a voltage

**Answer: a. Comparing two voltages**

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

1. To get additional information about the redox reaction
2. To get the voltage of reference electrode
3. To get the value of standard electrode potential
4. 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-Sb2O3

**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 H2SO4 and malonic acid, which one will be reacting first?

a. Malonic acid

b. Sodium malonate

c. Disodium malonate

d. H2SO4

**Answer: d. H2SO4**

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. A**cidic

52. Which of the following is the formula for pH calculation?  
a) log10[H+]  
b) -log10[H+]  
c) log2[H+]  
d) -log2[H+]

**Answer: b. -log10[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?

1. Number average molecular weight,
2. Weight average molecular weight,
3. Gel permeation chromatography,
4. 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

1. Polymer is insoluble in solvent
2. Polymer is soluble in solvent
3. Polymer is sparingly soluble in solvent
4. Polymer is used as neat

**Answer: b. Polymer is soluble in solvent**

63. The Staudinger – Mark-Houwink equation is

1. η i =K (M)a
2. l = η /p
3. E = mc2
4. E = η u

**Answer: a. η i =K (M)a**

64. Viscosity is due to one of the following

1. Potential energy stored in fluid
2. Resistance to fluid motion
3. Roughness of the surface
4. The pressure difference between the two fluids

**Answer: b. Resistance to fluid motion**

65. What is the SI unit of viscosity?

1. Candela
2. Poiseiulle
3. Newton/m
4. No units

**Answer: b. Poiseiulle**

66. Which of these fluids has the highest viscosity?

1. Water
2. Honey
3. petrol
4. brine solution

**Answer: b. Honey**

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

1. η/ η0 = t/to
2. η sp = η/ η0 -1
3. η red = ηsp/C x 100
4. ηi =K (M)a
5. **Answer: a.** **η/ η0 = t/to**

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 hsp / C (reduced viscosity) vs C is a ………. for dilute polymer solutions

1. “S” shape curve
2. Triangle
3. Straight line
4. “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

1. Varies with respect to concentration
2. Varies with respect to the size of the Ostwald viscometer
3. Varies with respect to polymer used
4. Remains fixed

**Answer: d. Remains fixed**

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

1. 2.5 ml of 1 % solution
2. 5 ml of 1 % solution
3. 7.5 ml of 1 % solution
4. 10 ml of 1 % solution

**Answer: b. 5 ml of 1 % solution**

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

1. It acts as a reducing agent
2. It acts as a buffer
3. It acts as an indicator
4. 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?

1. < 3
2. 5
3. > 12
4. 6 -9

**Answer: d. 6 -9**

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

1. NaCl
2. Anhydrous Na2CO3
3. AgNO3
4. Oxalic acid

**Answer: c. AgNO3**

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

1. Potassium Chromate
2. Silver Nitrate
3. Potassium dichromate
4. Silver Chromate

**Answer: a. Potassium Chromate**

76. Estimation of chloride reaction is

1. Redox reaction
2. Equlibrium reaction
3. Precipitation reaction
4. Catalytic reaction

**Answer: c. Precipitation reaction**

77. Which type of reaction occurs in the following reaction AgNO3 + NaCl → AgCl + NaNO3?

1. Displacement reaction
2. Single replacement
3. Decomposition
4. Double displacement reaction

**Answer: d. Double displacement reaction**

78. Why do we have to standardize AgNO3 solution?

1. To find the normality of NaCl
2. To calculate the normality of AgCl
3. To find the normality of AgNO3
4. To calculate the volume of NaCl

**Answer: c. To find the normality of AgNO3**

79. What is the oxidation state of Mn in KMnO4 ?

1. +6
2. +7
3. +9
4. +5

**Answer: b. +7**

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

1. A Very clear colour change
2. Simple method
3. Capability for different PH
4. Must be 1M nitric acid solution.

**Answer: b. Simple method**

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

1. Silver chloride forms at high pH,
2. Silver precipitates at low pH
3. Chromate forms H2CrO4 at low pH, which delays the formation of the precipitate.
4. Potassium chromate dissolves at high pH.

**Answer: c. Chromate forms H2CrO4 at low pH, which delays the formation of the precipitate.**