Duration: 3 Hrs **Total marks: 75**

N.B.: 1. All questions are compulsory
2. Figures to right indicate full marks

Q. I Choose appropriate option for the following multiple choice-based questions. 20

1 10 grams of sodium hydroxide dissolved in 1 litre of solution gives a ____ M solution of NaOH.
   a. 0.10
   b. 0.25
   c. 0.50
   d. 1.00

2 Failure to calibrate pH meter before recording pH of a solution may result in _____ error.
   a. Personal Error
   b. Random Error
   c. Reagent Error
   d. Instrumental Error

3 The purpose of limit test is to _____ in a substance.
   a. Determine chemical structure of impurity
   b. Quantify impurities at or below specified levels
   c. Assess colour and odour of the impurity
   d. Check Compatibility of impurity with the drug

4 The strength of 1 M iodine solution is equal to _____ solution.
   a. 0.1 N
   b. 0.5 N
   c. 1.0 N
   d. 2.0 N

5 _____ is an indicator used in the non-aqueous titration of a weak acid.
   a. Phenolphthalein
   b. Mordant Black
   c. Crystal violet
   d. Starch

6 _____ is reference electrode.
   a. Standard Hydrogen electrode
   b. Glass electrode
   c. Rotating Platinum Electrode
   d. Dropping Mercury Electrode

7 According to resonance theory, the quinonoid form of phenolphthalein is _____.
   a. Yellow
   b. Orange
   c. Colorless
   d. Pink

8 In direct iodimetry, iodine acts as a mild _____.
   a. Oxidizing agent
   b. Reducing agent
   c. Complexing agent
   d. Neutralizing agent

9 All the following are the ideal requirements of a primary standard, except
   a. Non hygroscopic
   b. Readily soluble
   c. Low molecular mass
   d. Known impurities

10 _____ solvents exert a 'levelling effect' on bases
   a. Protophilic
   b. Protogenic
   c. Amphiprotic
   d. Aprotic

11 Adsorption indicators are used in ____.
   a. Mohr's method
   b. Volhard's method
   c. Modified Volhard's method
   d. Fajan's method

12 Identify the correct combination of titrant and indicator.
   a. Perchloric acid and phenolphthalein
   b. Sodium thiosulphate and phenol red
   c. Disodium edetate and mordant black II
   d. Sodium chloride and murexide

13 _____ is the product of specific conductance and volume of electrolyte.
   a. Conductivity
   b. Conductance enhance
   c. Molar conductance
   d. Specific resistance

14 Which of the following analyte can be analysed by direct complexometric titration?
   a. Magnesium hydroxide
   b. Sodium chloride
   c. Ammonium chloride
   d. Sodium hydroxide

15 The pH at the equivalence point of a titration of weak base with strong acid is usually _____.
   a. 5.5
   b. 7.0
   c. 8.5
   d. 11.0

16 In Mohr's method, which is the titrant used to determine chloride ions?
   a. Silver chloride
   b. Silver nitrate
   c. Sodium chloride
   d. Sodium nitrate

17 pM indicators are used in _____.
   a. Precipitation titrations
   b. Acid base titrations
   c. Redox titrations
   d. Complexometric titrations

18 _____ is often used as the indicator in cerimetric titrations.
   a. Ferrous sulphate
   b. Ferroin
   c. Potassium dichromate
   d. Chromic acid

19 ____ is an aprotic solvent used in non-aqueous titrations.
   a. Chloroform
   b. Sulfuric acid
   c. Pyridine
   d. Acetic acid

20 How many significant figures are there in the measurement 2.004 g?
   a. One
   b. Two
   c. Three
   d. Four

Q. II Answer any two questions. (Any 2) **20**

1 Explain the neutralization curve for titration of Strong base and weak acid. What is the need for non-aqueous titrations? State the principle, reaction and factor used in estimation of Sodium benzoate by non-aqueous titration. **10**

2 Explain following terms: Molality, Accuracy, Primary Standard. Explain the various types of errors encountered in quantitative analysis with suitable example. **10**

3 What are redox titrations? Give the difference between iodimetry and iodometry. Give the principle and reaction involved in dichrometry. **10**

Q. III Answer any seven questions (Any Seven) **35**

1	What are argentometric titrations? Differentiate between Mohr's method and Volhard's method.	**5**
2	Define metal ion indicator. Discuss the principle involved in the assay of Calcium Gluconate.	**5**
3	Explain the following terms with suitable example: Chelating agent, Masking agent, Ligand. Enlist the steps involved in gravimetric analysis	**5**
4	How will you overcome the problems encountered during Volhard's method? State the indicator used in diazotization titration.	**5**
5	Explain the principle of conductometric titrations. Give any two applications of conductometry.	**5**
6	Enlist various electrodes used in potentiometry. Give construction and working of glass electrode.	**5**
7	Write in detail about the construction, working, advantages and disadvantages of DME.	**5**
8	Enlist the electroanalytical techniques and give their advantages over volumetric analysis? What are the sources of impurities in a drug.	**5**
9	What volume of 0.1M HCl solution would be required to neutralize 50 ml of 0.1M NaOH? Calculate pH at the start of titration and after adding 10 ml, 25 ml, and 60 ml of titrant.	**5**