M 2/166

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B. Pharm 1st Semester Examination

Pharmaceutical Analysis I – Theory

Course Code: BP102T

Full Marks – 75 **Time – 3 hours**

The figure in the margin indicates full marks for the questions.

1. Multiple choice questions (MCQ) (Answer all questions): (20×1 = 20)

i. Non-aqueous titrations are based on
a) Lewis theory b) Arrhenius theory
c) Bronsted-Lowry theory d) All of the above

ii. The straight line in the polarography curve in known as
a) Migration current b) Residual current
c) Limiting current d) Additional current

iii. Indicators used in complexometric titrations are called as
a) Metal ion indicators b) Metallochromic indicators
c) pM indicators d) All of the above

iv. An example of primary reference electrode _____.
a) Standard Hydrogen Electrode b) Calomel
c) Mercury-Mercury sulphate electrode d) All of the above

v. In an electrochemical cell, _____ occurs at the anode.
a) Oxidation b) Reduction c) Hydrolysis d) Redox

vi. Weakly acidic and weakly basic substances are titrated by ____ titration
a) Aqueous b) Precipitation c) Non-aqueous d) Complexometric

vii. Electrons are generated from _____ in a galvanic cell.
a) Redox reactions b) External electrical energy
c) Salt bridge d) Anode and cathode

viii. In Fajan's method, pink colour is observed at the end point as ____ of indicator forms a 2° layer on AgCl precipitate
a) Cation b) Anion c) Precipitation d) Complex

ix. How many significant figures are there in 0.02300?
a) 5 b) 2 c) 6 d) 4

x. In the limit test of iron, purple colour is observed only in _____ medium
a) Soluble b) Acidic c) Basic d) Neutral

xi. Reaction of _____ with mercuric chloride paper gives a yellow stain.
a) Arsenic b) Arsenious acid c) Arsenic acid d) Arsine gas

xii. Diffusion current can be correlated with different conditions in polarography by
a) Nernst equation b) Bragg's equation
c) Illkovic's equation d) Beer's equation

xiii. SHE consists of ____ solution
a) I. 0.1M HCl b) 0.1M HgCl c) 1M HCl d) 1M HgCl

xiv. The oxidation number of Cr in $K_2Cr_2O_7$ is
a) +7 b) +6 c) +4 d) +5

xv. The closeness of agreement between a series of measurement obtained from multiple sampling of the homogenous sample is?
a) Accuracy b) Ruggedness c) Precision d) Robustness

xvi. How do you prepare 0.1 M solution of hydrochloric acid?
a) 85 ml/1000 ml H_20 b) 0.85/1000 ml H_20
c) 0.085/1000 ml H_20 d) 8.5/1000 ml H_20

xvii. The conjugate base of an acid is produced by
a) Adding a proton to the acid b) Adding an electron to the acid
c) Removing a proton from the acid d) Removing an electron from the acid

xviii. Standardization of Iodine is carried out using _____.
a) Sodium thiosulphate b) Perchloric acid c) Oxalic acid d) None

xix. The titration carried out between KCl and $AgNO_3$ is termed as _____ titration.
a) Aqueous b) Redox c) Precipitation d) Complexometric

xx. The ratio of number of gm-mole of a component to total number of gm-mole in mixture or solution is known as
a) Molarity b) Molality c) Normality d) Mole fraction

2. Short answers (Answer **seven**) (Max 700 words) (7×5 = 35)

1. Describe different methods of expressing concentration of solutions.
2. Explain the theories of acid base indicators with examples.
3. Describe the principle and procedure involved in Volhard's method.
4. Explain the principle, steps, and procedure involved in gravimetric analysis.
5. Discuss the characteristics of primary standard and secondary standard substances.
6. Explain the estimation procedure of 0.1 M Perchloric acid.
7. Differentiate between iodimetry and iodometry w.r.t the principle of these titrations.
8. Describe the principle of complexometric titrations. What are masking and demasking agents?
9. Illustrate and describe the components of an electrochemical cell.

3. Long answers (Answer **any two**) (Max 1500 words) (2×10 = 20)

1. Explain the principle of aqueous titrations and describe the neutralization curves. (2+8=10)

2. Explain the Principle and applications of any three types of redox titrations. (5+5=10)

3. Explain the principle and construction of: **(Any two)** (5+5=10)

   a) Dropping mercury electrode b) Calomel electrode

   b) Standard hydrogen electrode