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Your Roll No.....

247

**B.Sc. (Prog.) II**

**C**

AC-202 : Quantitative Methods of Analysis

(Admissions of 2005 and onwards)

Time : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt six questions in all.

Q. No. 1 is compulsory.

I. Explain the following in brief : 5×3

- (a) Differentiate between galvanic and electrolytic cells.
- (b) What is conductivity of water and how is it prepared ?
- (c) What do you understand by the term Liquid Junction Potential ?
- (d) What are primary standards in volumetric titrations and how are they different from secondary standards ?

P.T.O.

(e) What is the difference between equivalence point and end point ?

2. (a) The indicator phenolphthalein is a weak acid; it is colourless in acidic solution and pink in alkaline solution.

Explain the change in colour with pH in the light of ionic theory of indicators. 6

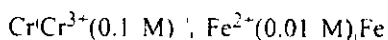
(b) Calculate the pH of a solution prepared by mixing 2.0 ml of a strong acid solution of pH 3 and 3.0 ml of a strong base of pH 10. 3

(c) Why should the indicator concentration be kept low ? 3

3. (a) Outline the method of titrating Mohr's salt with Cerium (IV) ammonium nitrate. 4
- (b) What is the indicator used in the above titration ? 4
- (c) Differentiate between Iodometry and Iodimetry. 4
4. (a) State and describe the conditions for the determination of silver by Mohr's method. 4
- (b) Explain the role of solubility product in the titration of mixture of halides ( $\text{Cl}^-$ ,  $\text{Br}^-$  and  $\text{I}^-$ ) with aq.  $\text{AgNO}_3$  solution. 4
- (c) Find the percentage of silver in an alloy, if the solution formed by dissolving 0.500 g of the alloy in

$\text{HNO}_3$  was neutralised by 25.0 ml of 0.1 M  $\text{NH}_4\text{SCN}$  solution. 4

5. (a) Calculate the e.m.f. of the cell and write the cell reaction for the following cell : 4



Given :

$$E^\circ_{\text{Cr}^{3+}/\text{Cr}} = -0.75 \text{ V}$$

$$E^\circ_{\text{Fe}^{2+}/\text{Fe}} = -0.45 \text{ V}$$

- (b) What are indicator electrodes ? Explain their importance by giving an appropriate example. 4
- (c) Discuss the potentiometric curve obtained for the titration of dibasic acid with NaOH. 4

6. (a) What is cell constant ? How is it measured ? 4
- (b) 0.5 N solution of a salt placed between two platinum electrodes 2.0 cm apart and of area of cross-section 4.0 sq.cm has a resistance of 25  $\Omega$  (ohms). Calculate the equivalent conductivity of solution. 4
- (c) Draw and explain the conductometric titration curve between a mixture of strong acid and weak acid Vs strong base. 4
7. (a) Outline the method for the gravimetric estimation of  $Ba^{2+}$  ions in the solution of  $BaCl_2 \cdot 2H_2O$ . 6
- (b) Explain why the precipitation in the above estimation is not done in the presence of dilute  $HNO_3$ . 3
- (c) Give any *three* advantages of Gravimetric analysis. 3

8. Write short notes on any *three* : 3×4

(a) Co-precipitation:

(b) Advantages of conductometric titrations;

(c) Standard hydrogen electrode (S.H.E.):

(d) Electro-gravimetry.