GUJARAT TECHNOLOGICAL UNIVERSITY

B. Pharm-Semester-III May-2012 Examination

Subject code:230004

Subject Name: Pharmaceutical Analysis-I

Time: 2:30pm to 5:30pm   Date: 11-05-2012

                                                          Total Marks: 80

Instructions:
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Derive the pH equation for the following: **06**
            (i) Salts formed from weak acid and strong base.
            (ii) Weak acid like acetic acid.
            (iii) Salts formed from weak base and strong acid.

   (b) Define the following terms with suitable examples.   **05**
            (i) Autoprotolysis
            (ii) Levelling effect
            (iii) Monoprotic acid
            (iv) Reserve acidity
            (v) Buffer capacity

   (c) Borax-boric acid mixture weighing 1 gm was dissolved in 10 ml of water.   **05**
            Methyl orange 1-2 drops was added to this and titrated to methyl orange end
            point with 0.095 N HCl. Then 10 ml of glycerol was added and titrated
            further with 0.095 N NaOH using phenolphthalein indicator. The first
            titration required 5.5 ml of 0.095 N HCl and second titration required 18 ml
            of 0.095 N NaOH. Calculate %w/w of borax and boric acid in the initial
            mixture.(Atomic weight of Na= 23, H= 1, B= 10.81, O=16)

Q.2 **(a)** Describe common ion effect. State the advantages of common ion effect in   **06**
            pharmaceutical analysis.

   (b) 0.1 M acetic acid and 0.1 M Sodium acetate is used to prepare a buffer   **05**
            solution. Ka= 1 x 10^{-5}. Calculate
            (i) pH of original buffer solution.
            (ii) pH after addition of 0.01 M HCl to 1 litre of buffer solution.
            (iii) pH after addition of 0.01 M NaOH to 1 litre of same solution.

   (c) What is Vanslake's equation? Write the application of Vanslake's equation. **05**
            Describe the limitations of this equation.

Q.3 **(a)** Enlist different methods for chloride estimation. Describe any one method in **06**
            detail.

   (b) What are the different types of EDTA titrations? Describe any one in detail. **05**
   (c) Describe the theory of indicators.   **05**

Q.4 **(a)** What is extraction? How will you prove that multiple extraction is better   **06**
            than single extraction.
   (b) Draw a neat and labeled diagram of soxhlet extractor.   **05**

(c) What is partition co-efficient? 1 gm of benzoic acid is distributed between **05** equal volume of benzene and water. 0.035 gms of benzoic acid was distributed in water. Calculate the partition co-efficient of benzoic acid.

Q.5 **(a)** Enlist the different types of redox titrations. Discuss in detail about the nitrite **06** titrations.
(b) Describe the different validation parameters of analytical methods. **05**
(c) What are the different types of errors? Describe the techniques to minimize **05** the errors.

Q.6 **(a)** What is non-aqueous titration? Describe the titrant, indicators and **06** advantages of non-aqueous titration.
(b) Write a note on Karl fisher titration **05**
(c) Describe different sampling techniques in formulation analysis. How **05** sampling error can be minimized.

Q.7 **(a)** Write a note on gravimetric method of analysis. **06**
(b) Discuss the principle involved in the assay of magnesium sulphate IP'96. **05**
(c) Describe in detail the oxygen combustion flask method. **05**

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