MCH–001

P.G. DIPLOMA IN ANALYTICAL CHEMISTRY

Term-End Examination

December, 2010

00842

MCH–001 : BASIC ANALYTICAL CHEMISTRY

Time : 3 hours   *Maximum Marks : 75*

Note :   *Answer **any five** questions. All questions carry **equal** marks.*

1.   (a)   Name the different types of electro analytical   5
            techniques and describe any one in brief.

     (b)   Write the various ways of exposure to   5
            chemicals and describe any one in detail.

     (c)   Write the chemical equations for   5

           (i)   The leveling effect of $HClO_4$, HCl and
                  HNO_3 in methanol and

           (ii)   The auto dissociation of the
                  amphiprotic solvents $HCOOH$ and
                  C_6H_5OH.

2.   (a)   " Iodine can be used for the determination   5
            of oxidising as well as reducing agents".
            Justify the above statement with suitable
            examples.

     (b)   What do you mean by post precipitation   4
            pertaining to gravimetric analysis?

(c) Give the general classification of kinetic methods. 6

3. (a) Write the considerations applied while selecting an indicator for a given titration. 5

(b) Describe the Arrhenius theory of acid base reactions in aqueous medium with the help of a suitable example. 6

(c) How does the use of blanks minimise errors caused due to certain sources such as reagents, vessels etc ? 4

4. (a) Calculate the median for the data : 5

15.1, 14.8, 15.3, 14.6, 14.4, & 14.5

(b) What are the characteristics to be present in a wash solution during washing of the precipitate in gravimetric analysis. 5

(c) A replicate analysis of blood serum yielded concentration of K^+ in mg/100ml as follows : 5

15.30, 15.85, 15.55, and 16.30

Calculate the 90% confidence interval for the set. Assume the value of C_n for four observations at 90% level = 0.53

5. Write short notes on the following : 5x3=15

(a) Preservation of samples.

(b) Principle of complexometric titrations.

(c) Modern Quinoid Theory of Indicators.

6.   (a)   What are the advantages of using organic   6
precipitants in inorganic gravimetric
analysis ?

     (b)   What is Fazan's method ? With the help of   5
an appropriate example describe the
functioning of adsorption indicators in this
method.

     (c)   What are modifiers in catalysed reactions?   4

7.   (a)   Describe in brief the sampling methods for   5
food materials.

     (b)   What are the factors which affect the   5
sharpness of end point in precipitation
titrations ? Illustrate the effect of these
factors on the shape of the titration curves.

     (c)   What are indeterminate errors ? Can they   5
be prevented or eliminated ?

8.   (a)   What is the effect of dilution on the pH of a   5
buffer solution ?

     (b)   Taking a suitable example, give the   6
application of potentiometric titrations for
the detection of accurate equivalence point.

     (c)   What are the uses of a flame photometer ?   4

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