Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Pharm/SEM-1/PT-101/2009-10

2009
PHARMACEUTICAL ANALYSIS

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) Sodium ethionaite is the salt of a

      a) strong acid and strong base

      b) strong acid and weak base

      c) weak acid and strong base

      d) weak acid and weak base.

   ii) pH is defined as

      a) $ln\left[H^+\right]$ b) $-ln\left[H^+\right]$

      c) $\log\left[H^+\right]$ d) $-\log\left[H^+\right]$.

iii) The solvents which are acidic in nature and readily donate proton are

a) protogenic solvents b) aprotic solvents

c) protophilic solvents d) amphiprotic solvents.

iv) Ascorbic acid can be assayed by

a) iodometric method

b) using 2, 6 – dichlorophenol indophenol

c) both (a) (b)

d) none of these.

v) 0·0035 contains

a) two significant figure

b) five significant figure

c) four significant figure

d) three significant figure.

vi) Which of the following is independent of temperature ?

a) molarity b) normality

c) molality d) all of these.

vii) The titration of ammonium thiocyanate $[NH_4SCN]$ *vs* silver nitrate $[AgNO_3]$ is commonly termed as

a) Volhard's method b) Mohr's method

c) Fajan's method d) None of these.

viii) In redox titrations which of the following acts as a self-indicator ?

a) potassium permanganate

b) potassium dichromate

c) potassium dimanganate

d) potassium monochromate.

ix) Which one of the following is *not* a polyprotic acid ?

a) H_2SO_4 b) H_3BO_3

c) H_3PO_4 d) HCl.

x) Which of the following is a primary standard ?

a) Na_2CO_3 b) Oxalic acid

c) H_2SO_4 d) both (a) & (b).

xi) In alkaline solution the colour of the phenolpthalein is

a) colourless b) yellow

c) red d) blue.

xii) The molarity of a solution containing 6 gm of NaCl in 200 ml of solution is

a) 0·02 b) 0·513

c) 1·95 d) 0·125.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain any *two* of the following terms : $2 \times 2\frac{1}{2}$

   a) Buffer action

   b) Levelling effect

   c) Equiibrium constant.

3. Classify the different types of errors. Differentiate between precision and accuracy with suitable examples. 2 + 3

4. What are molarity and normality ? Concentrated H_2SO_4 (M.W — 98) has a density 1·84 gm/ml and is 98% by weight. Calculate the normality and molarity. 1 + 4

5. Calculate the equivalent weight of $KMnO_4$ in acidic medium & neutral medium. What is the difference between iodometry and iodimetry ? Define Redox indicators. 1 + 1 + 2 + 1

6. Define Argentometric titration. Explain Volhard's method of Argentometric titration in brief. The solubility AgCl in water at 25° C is 0·00179 gm/lt. Calculate the solubility product of silver chloride. $\frac{1}{2} + 3 + 1\frac{1}{2}$

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Why is $KMnO_4$ not a primary standard ?

   b) Prove that equilibrium constant, $K = 3 \times 10^{63}$ during the oxidation of ferrous sulphate with potassium permanganate.

   c) Why does diphenylamine act as redox indicator ?

   d) Write down the chemical structure of diphenyl benzidine.

   e) What is the role of phosphoric acid in the titration of ferrous ion by potassium dichromate using diphenyl amine as indicator ? 3 + 5 + 3 + 2 + 2

8. a) Describe the different types of crucibles and importance of using crucible.

   b) Describe the criteria of washing solution for the precipitate.

   c) Define thermogravimetry curve. Discuss the T.G. curve for calcium oxallate monohydrate. 5 + 3 + 7

9. a) What do you mean by the term "Buffer Solution".

   b) Calculate the pH of 0·001 N acetic acid, if it is 10% ionized.

   c) Define the term "Titration Curve". Describe the titration curve of Strong acid with Strong base & Weak base.

   d) Discuss "law of mass action" & "polyprotic system". What is the relationship between strength & concentration ? Write down the importance of Buffer in pharmaceutical fields. 1 + 2 + 1 + 4 + 4 + 1 + 2

10. a) What is the significance of qualitative analysis in Quality control ?

   b) What do you mean by the term "Standard Deviation" ?

   c) The normality as a solution Sodium Hydroxide as determined by an 'Analysis' by Eight different titrations are found to be 0·5038; 0·5049; 0·5139; 0·5042; 0·5039; 0·5010; 0·5021 and 0·5093. Calculate the mean, average or mean deviation relative mean deviation, average deviation of the mean & standard deviation.

   d) Write down the various methods of minimizing systematic errors. 4 + 2 + 5 + 4

11. a) Explain the effect of temperature & solvent upon the solubility of precipitate.

b) Compare & contrast Mohr's method & Volhard's method in Argentometric titration.

c) Write down the qualities of a good adsorption indicator used in Fajan's method of titration.

d) The solubility product of AgCl in water is $1{\cdot}5 \times 10^{10}$. Calculate its solubility in 0·01 M NaCl aqueous solution.

e) Explain the role of solubility product in Argentometry.

$(2 \times 2) + 4 + 2 + 2 + 3$