



Name :

Roll No. :

Invigilator's Signature :

CS/B.Pharm(NEW)/SEM-1/PT-101/2010-11

2010-11

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) Value of ionic product of water (K_w)
 - a) varies with temperature
 - b) always remain constant
 - c) varies with pressure
 - d) varies on dilution.
 - ii) Ammonium chloride is a salt of
 - a) strong acid and strong base
 - b) strong acid and weak base
 - c) weak acid and strong base
 - d) weak acid and weak base.

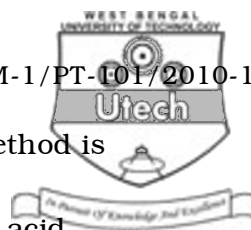
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- iii) The equivalent weight of oxalic acid is
- a) 63.0 b) 73.0
c) 83.0 d) 53.0
- iv) What is the range of colour change of methyl orange ?
- a) 4.2 — 6.3 b) 8.3 — 10
c) 2.9 — 4.6 d) none of these.
- v) The pH of a 2.0×10^{-5} M solution of HCl will be
- a) 4.70 b) 6.0
c) 3.79 d) 2.70
- vi) A measure of how closely a measured quantity agrees with the true value is
- a) absolute error b) precision
c) accuracy d) variance.
- vii) Molality is expressed as
- a) number of moles of solutes in 1000 g of solvent
b) number of moles of solutes in 1000 g of solution
c) number of eq. weight of solutes in 1000 g of solvent
d) none of these.



- viii) The precaution taken for Volhard's method is
- HNO_3 must be free from HNO_2 acid
 - temperature in between $0^\circ\text{C} - 5^\circ\text{C}$
 - both (a) and (b)
 - none of these.
- ix) An oxidation - reduction indicator is
- 1, 10 phenanthroline
 - phenolphthalein
 - ferroin
 - thymol blue.
- x) Which one of the following is an example of mixed indicator ?
- Neutral red and methylene blue
 - Methyl orange and phenolphthalein
 - Neutral red and methyl orange
 - Both (a) and (c).

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xi) Mephenesin can be assayed by

- a) bromatometry b) iodometry
c) iodimetry d) all of these.

xii) Which one is not a protogenic solvent ?

- a) Water b) Hydrochloric acid
c) Ethanoic acid d) Sulphur dioxide.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 ∞ 5 = 15

2. With one example, give how are equivalent weights of oxidizing and reducing agents determined ?

Define iodometry. Explain why sulphuric acid solution of ceric sulphate is stable over HCl or HNO₃ . 2 + 1 + 2

3. Write down the various methods of minimizing systematic errors.

4. Describe the theory of indicator behaviour with the example of phenolphthalein.



5. Describe the effect of —

- a) temperature
- b) pH

upon the 'completeness of precipitation' in carrying out the gravimetric analysis.

6. Explain Fajan's method of argentometric titration in brief.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 7. a) What is common ion effect ? 3
- b) What are the limitations of Mohr's method ? 3
- c) Describe Volhard's method. 5
- d) Write a short note on turbidity method by Gay - Lussac's method. 4
- 8. a) Elaborate explicitly the importance of solubility product (K_w) on the precipitation titrations. Give the suitable example.



- b) Describe the influence of —
- i) pH
 - ii) stoichiometry
 - iii) stability and
 - iv) common ion effect upon the overall solubility of precipitate.
- c) How would you carry out the precipitations involving Silver nitrate. 4 + 8 + 3

9. Write down some advantages of Gravimetric analysis.

Why is sintered glass crucible used over silica crucible ?

Define Liphobic and Lyophilic colloids.

What are Peptization and digestion ?

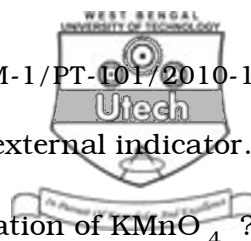
What are factors affecting thermogravimetry ?

$$3 + 4 + (2 + 2) + (1 + 1) + 2$$

10. a) What do you understand by primary and secondary standards ? Explain with appropriate examples.

b) Explain the following terminologies :

- i) Mean (average) deviation
- ii) Standard deviation
- iii) Statistical validation
- iv) Minimum number of samples. 7 + 8



11. a) Name one internal indicator and one external indicator.
- b) Why is HCl unsuitable for the acidification of KMnO_4 ?
- c) The solubility product of $\text{Mg}(\text{OH})_2$ at 25°C is 1.4×10^{-11} . Calculate the solubility of $\text{Mg}(\text{OH})_2$ in gm/lit. [Molecular weight of $\text{Mg}(\text{OH})_2 = 58$] .
- d) Explain Arrhenius acid-base (Classical concept) concept with one example.
- e) Calculate the pH of a tea solution when the solution contain the $[\text{H}_3\text{O}^+]$ ion is 1.5×10^{-5} M and also show that the solution is either acidic or basic in nature.
- f) Prove that $\text{pH} = \frac{1}{2} (\text{pK}_w + \log C + \text{pK}_a)$.

$$2 + 2 + 3 + 2 + (2 + 1) + 3$$

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