



Name :

Roll No. :

Invigilator's Signature :

CS/B.PHARM/SEM-1/PT-101/2011-12

2011

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 × 1 = 10
 - i) Chloroform is a
 - a) amphiprotic solvent
 - b) protogenic solvent
 - c) protophylic solvent
 - d) aprotic solvent.
 - ii) How many significant digits are present in 1.0050 ?
 - a) 2
 - b) 4
 - c) 5
 - d) 6.
 - iii) During iodometric titration in presence of concentrated hydrochloric acid, which of the following will be used as indicator ?
 - a) Starch solution
 - b) Diphenyl amine
 - c) Amaranth dye
 - d) Ferroin.
 - iv) The colour change of Redox indicator is due to
 - a) change in H⁺ ion concentration
 - b) change in OH⁻ ion concentration
 - c) change in potential of solution
 - d) all of these.

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- v) The instrument used to study TGA is
 a) Furnace b) Balance
 c) Thermobalance d) Thermometer.
- vi) For the preparation of 250 ml of a standard 0.1 N succinic acid solution, succinic acid requirement is
 a) 2.42 g b) 1.48 g
 c) 2.6 g d) 1.26 g.
- vii) Substance used as self-indicator is
 a) Cerium (IV) sulphate b) KMnO_4
 c) $\text{K}_2\text{Cr}_2\text{O}_7$ d) both (a) and (b).
- viii) Heterogenous trapping of foreign ions and solvent within the crystal is called
 a) co-precipitation b) digestion
 c) occlusion d) all of these.
- ix) The equivalent weight of Iodine in the following reaction is

$$2\text{S}_2\text{O}_3^{-2} + \text{I}_2 \longrightarrow \text{S}_4\text{O}_6^{-2} + 2\text{I}^-$$
 a) molecular weight b) molecular weight/2
 c) molecular weight/4 d) none of these.
- x) Blank determination is done by omitting
 a) solvent b) reagent
 c) unknown compound d) all of these.
- xi) The expression of solubility product for a non-symmetric salt such as Ag_2CrO_4 is
 a) $K_{\text{sp}} = 2[\text{Ag}^+][\text{CrO}_4^{2-}]$
 b) $K_{\text{sp}} = [\text{Ag}^+]^2[\text{CrO}_4^{2-}]$
 c) $K_{\text{sp}} = [\text{Ag}^+]^2[\text{CrO}_4^{2-}]^2$
 d) $K_{\text{sp}} = 2[\text{Ag}^+] \cdot 2[\text{CrO}_4^{2-}]$.
- xii) The oxidation number of an element in free state is taken as
 a) 1 b) 3
 c) 0 d) 2.



GROUP - B

(Short Answer Type Questions)

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

2. What is post-precipitation ? Explain Volhard's method for estimation of silver. 2 + 3
3. Write a short note on levelling effects.
4. Describe the ways in which the end points of redox titrations may be detected visually.
5. a) Calculate the equivalent weight of KMnO_4 in acidic, neutral and alkaline media ?
b) Why is KMnO_4 acidified with dilute sulphuric acid but not with HCl or HNO_3 ? 3 + 2
6. a) Calculate the volume of HCl (specific gravity = 0.6 & percentage purity = 60.07) required to prepare a litre of 0.1 N HCl acid solution.
b) Define Primary and Secondary standards with examples. 3 + 2

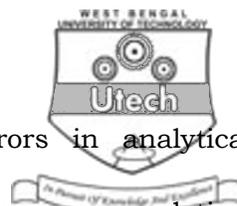
GROUP - C

(Long Answer Type Questions)

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

7. a) Explain Nernst equation for electrode potential.
b) What is standard potential ?
c) What is the function of salt bridge in an electrochemical cell ?
d) Using the given data, calculate the standard potential for the following cell & also write the half-cell reactions.
 $E^0_{\text{Mg}^{+2}/\text{Mg}} = -2.363 \text{ V}; E^0_{\text{Cu}^{+2}/\text{Cu}} = +0.337 \text{ V}$
For $\text{Mg} | \text{Mg}^{+2}(1\text{M}) || \text{Cu}^{+2}(1\text{M}) | \text{Cu}$
e) Write down some common oxidizing agents used in Redox titrations. 3 + 2 + 2 + 5 + 3
8. What is meant by quantitative analysis ? How will you differentiate it from qualitative analysis ? Describe the steps involved in Gravimetric analysis with a suitable example. What is T.G.A. ? 2 + 2 + 10 + 1

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9. a) Describe the various types of Errors in analytical chemistry.
- b) Write down the effect of systemic errors on analytical results.
- c) What are Relative standard deviation and coefficient of variation ? 8 + 5 + 2
10. a) Define Titration curve in Neutralization titration. Discuss titration curves for the neutralization of (any two) :
- i) Strong acid with strong base
- ii) Weak acid with weak base
- iii) Strong acid with weak base
- iv) Weak acid with strong base.
- b) What is the pH of a solution ? Can a solution have zero & negative pH ? Justify your answer.
- c) Calculate the amount of NaOH in 1 litre of solution when the pH of the solution will be 12 ? 1 + (3 × 2) + (1 + 2 + 2) + 3
11. a) What is the difference between iodometry and iodimetry ?
- b) What are the advantages and disadvantages of starch as an indicator ?
- c) What primary standard is used in iodometric titration ?
- d) How do you standardize the iodine solution ?
- e) Define back titration. 3 + 4 + 1 + 5 + 2

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