# TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Applied and Health Sciences

Pure and Applied Sciences

**UNIVERSITY EXAMINATION FOR:**

Bachelor of Technology in Applied Chemistry (Analytical Option)

ACH 4309 : Drug Analysis.

END OF SEMESTER EXAMINATION

**SERIES:** Second Semester 2016

**TIME:** 2 HOURS

**DATE:** Pick Date Select Month Pick Year

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of five questions. Attempt question one and answer any other two questions

**Do not write on the question paper.**

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**Question ONE**

a) Define the following terms

i) Immunoassay (1 marks)

ii) Non aqueous titration (1 marks)

iii) Gravimetric factor (1 marks)

iv) Radio assay (1 marks)

b) State 2 advantages of non aqueous titration over aqueous titration (2 marks)

c) State 2 advantages of zone velocity centrifugation over differential centrifugation (2 marks)

d) State 3 disadvantages of using gas chromatography in drug analysis (3 marks)

e) What is the relationship between log P and Pka in the extraction of drug components? (2 marks)

f) State the three principles that govern gravimetric analysis (3 marks)
g) Explain the principle of ultrafiltration in drug analysis (3 marks)
h) Describe steps involved in diazotization titration (4 marks)
i) Discuss the two conditions to consider during diazotization titration of pharmaceutical drugs (3 marks)
j) State 4 advantages of HPLC in drug analysis (4 marks)

**Question TWO**

a) State three advantages of gravimetric analysis over titrimetric analysis in analytical analysis of drug (3 marks)
b) Explain why water should be avoided during non aqueous titration of weak bases and acids (4 marks)
c) Explain why we use mercuric acetate in the assay of halogen acid salt of bases? (4 marks)
d) Explain how masking and demasking agents aid in improving selectivity of complexing reagent ethylenediaminetetra-acetic (EDTA). (4 marks)
e) State two advantages of flourenscence polarized immunoassays over enzyme multiplied immunoassays. (2 marks)
f) Briefly outline the procedure of diazotization of sulphuramine drugs (3 marks)

**Question THREE**

a) Briefly discuss the principle of rate zonal centrifugation as used in drug analysis (3 marks)
b) What is the role of:
   i) pKa and pH in extraction process of drug components (2.5 marks)
   ii) log P in the extraction of drug components (2.5 marks)
   iii) common ion effect in gravimetric analysis (3 marks)
c) Briefly describe the method of determining pKa of sample by solubility method (3 marks)
d) State 3 limitations of Karl- Fischer titration. (3 marks)

e) Describe distillation process in Kjeldhal's method of nitrogen determination. (use equations) (3 marks)

**Question FOUR**

a) Using appropriate equations discuss levelling effect in nonaqeuos titration using acetic (3 marks)
b) Discuss the principles of Size exclusion chromatography used in drug analysis (3 marks)
c) Define viscosity. (1 mark)
d) Discuss why viscosity is important in pharmaceutical drug analysis (2 marks)
e) List four factors influencing EDTA reactions in complexometric titations (3 marks)
f) Explain the role of common ion effect in gravimetric analysis of drug samples. (Use equations and examples. (5 marks)

g) What is the relationship between log P and Pka in the extraction of drug components? (3 marks)

**Question FIVE**

a) Define the following terms
   i) Retentate (1 marks)
   ii) centrifugation (1 marks)
   iii) immunoassay (1 marks)
b) Discuss the principle of enzyme multiplied immunoassays (2 marks)
c) Outline the steps involved in Enzyme multiplied immunoassay (5 marks)
d) Discuss the role of HPLC in drug analysis? (5 marks)
e) Briefly discuss the principle of flourencensce polarized immunoassay (5 marks)