



**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY**

FIRST SEMESTER EXAMINATION 2015/2016 SESSION

COURSE CODE: MCB 413

COURSE TITLE: INDUSTRIAL MICROBIOLOGY (3 UNITS)

CLASS: 400 LEVEL

TIME: 2 HOURS

Instruction: Answer any 4 questions

1. (a) What are keratinolytic bacteria? Outline the procedure for their isolation from any keratin dump site.
(b) Discuss the method of culture preservation under a cryogenic condition.
2. Write short note on the following:
 - a) Up-stream process
 - b) Down-stream process
 - c) Optimization of fermentation process
3. (a) Discuss briefly the importance of microorganisms in the development of national economy
(b) Explain corn steep liquor?
4. (a) Why is it essential to remove some metal ions and phosphates from medium used in citric acid fermentation
(b) i. What are auxotrophic mutants?
ii. Describe a known method for the isolation of an auxotrophic mutant from a mixed population
(c) Describe the four phases of biogas production
5. (a) Enumerate the possible causes of non-biological haze in beer.
(b) Outline the effects of hops in beer
(c) What characteristics distinguish top fermenting yeasts from bottom fermenting types
6. (a) Distinguish between primary and secondary metabolites with an example each
(b) Contrast between 'Shotgun' and 'Objective' approach in the isolation of microorganisms for man's benefit
(c) Describe bioconversion with a named example.