



**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF MICROBIOLOGY**

FIRST SEMESTER EXAMINATION 2013/2014 SESSION

COURSE CODE: MCB413 (3 CREDITS)

COURSE TITLE: INDUSTRIAL MICROBIOLOGY

CLASS: 400 LEVEL

TIME ALLOWED: 2hrs. 30min

INSTRUCTION: Answer any **five** questions.

1.
 - a). Distinguish between a primary and a secondary metabolite with an example each
 - b). Outline three types of damage that may be inflicted by microorganisms during biodeterioration.
 - c). Define bioconversion with a named example.
2.
 - a). Distinguish between 'shotgun' and 'objective' approach in the isolation of microorganisms for man's benefit
 - b). Describe the submerged fermentation for citric acid fermentation
 - c). Why is it essential to remove some metal ions and phosphates from medium used in citric acid fermentation
3.
 - a). In the course of beer fermentation, the boiling stage was inadvertently omitted. What does boiling do in the process?
 - b). Enumerate the possible causes of non-biological haze in beer
 - c). Outline the effects of hops in beer
4.
 - a). Describe decoction as a method of mashing
 - b). Enumerate the options open to an industrial microbiologist who seeks to edge his competitors
 - c). What characteristics distinguish top fermenting yeast from bottom fermenting type
5.
 - a). What are auxotrophic mutants?
 - b). Discuss a known method for the isolation of an auxotrophic mutant from a mixed population
6.
 - a). Distinguish between batch and continuous culture.
 - b). In fermentation for penicillin, rapid production of cells instead of the drug can occur when high levels of glucose is used. Discuss
 - c). Enumerate the four phases of biogas production
7.
 - a). What factors influence spoilage of wine by bacteria and yeasts?
 - b). List the six classes of enzymes produced by microorganisms and the reaction they catalyze
 - c). Certain characteristics are imparted upon cosmetics and pharmaceutical products by microorganisms to render them un-saleable. Enumerate these characteristics.