



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

**FIRST SEMESTER EXAMINATION, 2018/2019 SESSION
INTRODUCTION TO BIOTECHNOLOGY (MCB 516), 2 UNITS**

INSTRUCTIONS: Answer **THREE** Questions in All; **AT LEAST ONE** from each **Section.**

.Time Allowed: 1¹/₂ Hours

SECTION A

- 1(a). Is the separation of solids from liquids always necessary before extraction of fermentation products?
 - 1(b). Summarize four (4) methods of mechanical disruption of cells to harvest intracellular products.
 - 1(c). Outline six (6) factors that will influence your decision in recommending methods of extraction of fermented products.
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- 2(a). How will you subculture animal cell culture?
 - 2(b). What is the difference between transformed, secondary and primary cell culture?

SECTION B

- 3(a). Define 'enzyme immobilization'.
 - 3(b). What are the techniques involved in the immobilization of enzymes?
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- 4(a). What is microbial metabolism?
 - 4(b). Write short notes on **any two** of the following:
 - i. Applications of microbial metabolism.
 - ii. Solid state fermentation.
 - iii. Kreb's cycle.

SECTION C

- 5(a). Define 'biotechnology'
- 5(b). Write short notes on the following:
 - (i). Blue biotechnology.
 - (ii). Green biotechnology.