



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCE
Department of Biological Sciences
2023_1 POP EXAMINATION

COURSE CODE: BIO416

COURSE TITLE: INDUSTRIAL MICROBIOLOGY

CREDIT: 3 UNITS

TIME ALLOWED: 2½ HOURS

INSTRUCTION: ANSWER NUMBER ONE (1) AND ANY OTHER THREE (3) QUESTIONS

- 1a. What is a fermenter? **(2 marks)**
- b. Give three (3) benefits of using glass in constructing a fermenter. **(3 marks)**
- c. Describe protoplast fusion. **(6 marks)**
- d. Discuss how aseptic conditions can be achieved and maintained during fermentation. **(6 marks)**
- e. Enumerate any (8) factors that should be considered when designing and constructing a fermenter. **(8 marks)**

- 2a. Outline the required criteria for media selected for industrial processes **(3 marks)**
- b. List the four properties of Antifoams **(4 marks)**
- c. Mention and explain the peculiar nature of industrial microbiology **(8 marks)**

- 3a. With a table distinguish between top fermented beer and bottom fermented beer mentioning the key organisms **(6 marks)**
- b. You have just been employed by a Brewing industry with good quality control laboratory as a Laboratory Technologist. Explain in details what your roles should be in the industry. **(9 marks)**

- 4a. Give a detailed description of the technology for producing a genetically engineered bacterium **(7 marks)**
- b. Write short notes on the following stages of viral replication:
 - i. Production of hybrid DNA molecule **(4 marks)**
 - ii. Incorporation of hybrid DNA into host cell **(4 marks)**

- 5a. Define Industrial Microbiology **(1 mark)**
- b. In a tabular form, describe the seven (7) methods used to preserve cultures of interest for Industrial Microbiology and Biotechnology **(14 marks)**

- 6a. Enumerate the health benefits of probiotics. **(4 marks)**
- b. Outline any four (4) steps in production of Spirit. **(4 marks)**
- c. Account for the process of production of cheese. **(7 marks)**