# ELIZADE UNIVERSITY, ILARA-MOKIN, ONDO STATE, NIGERIA

## FACULTY OF BASIC & APPLIED SCIENCES
## DEPARTMENT OF BIOLOGICAL SCIENCES
## SECOND SEMESTER EXAMINATION
## 2016/2017 ACADEMIC SESSION

COURSE CODE:  BTH 416

COURSE TITLE:  FOOD BIOTECHNOLOGY

DURATION: 2HOURS

HOD'S SIGNATURE

NAME:..........................................................................MAT.No:.........................................

INSTRUCTIONS:  ANSWER THREE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

1. Solid state and liquid state fermentations are the two main examples of fermentation process.
   i. In a tabular form, compare and contrast the characteristics of these fermentation processes.
   ii. In your own opinion, which fermentation process is fit for production in Nigeria? Give two reasons for your answer.
2. Describe in detail the steps involved in a typical solid-state fermentation process.
   i. What are the factors involved in a fermentation process?
   ii. List the influence of each mentioned factor on the success and flexibility of a fermentation process.
3. List three examples of fermented food and the processes leading to their production.
   i. What are the advantages of fermented foods over other processed foods?
   ii. Give three examples of microbes of importance in Food Biotechnology and the food they helped in producing on a large scale.
4. Enzymes are biological catalysts that helped in the production of new products.
   i. What are their distinct advantages over conventional chemical catalysts?
   ii. Describe sources of food enzymes and their main use.
   iii. Why enzymes from microbial origin are mostly produced in the industry?
5. Food spoilage is a major issue in the food production and processing value chain.
   i. What are the major sources of spoilage of fermented and non-fermented foods?
   ii. Give two examples of microorganisms responsible for spoilage of:
       a. Meat
       b. Poultry
       c. Egg
       d. Fish

**Question 4**

(a) Express $\frac{3+2i}{(4-5i)(2+i)}$ in the form $a + ib$ (5Marks)

(b) Find the modulus and argument of $(2 + 6i)(3 - 7i)$ (4Marks)

(c) The 3rd and 7th terms of an AP are respectively -1 and 11. Find the nth term and the

number of terms which must be taken to get a sum of 430. (6Marks)

**Question 5**

(a) Prove the following (i) $\frac{2cos^3\theta - cos\theta}{sin\theta cos^2\theta - sin^3\theta} = Cot\theta$ (3Marks)

(ii) $\left[\frac{1+Sin\theta}{1+Cos\theta}\right]\left[\frac{1+Sec\theta}{1+Cosec\theta}\right] = Tan\theta$ (3Marks)

(b) Assume that
$\sin\alpha = \frac{2}{3}$, $\sin\beta = \frac{1}{3}$ and that $\alpha$ and $\beta$ are between $0$ and $\frac{\pi}{2}$ then evaluate $\sin(\alpha + \beta)$

$(3\frac{1}{2}Marks)$

(c) Find the exact value of $\tan 15^0$. Show that $t = tan67\frac{1}{2}^o$ satisfies the quadratic equation

$t^2 - 2t - 1 = 0$ and hence find its exact value. $(5\frac{1}{2}\ Marks)$

**Question 6**

(a) The roots of the quadratic equation $2x^2 + 6x - 5 = 0$ are $\alpha$ and $\beta$ ,

Find the value $\alpha^2 + \beta^2$ (6Marks)

Hence, find the new quadratic equation whose roots are $\alpha^3$ and $\beta^3$.

(b) Prove that $(a^2 + b^2)x^2 - 3(a - b)x + \frac{9}{2} = 0$ has no real roots, if $a^2 + b^2 \neq 0$

(4Marks)

(c) Find the First 4 terms in ascending powers of $x$ for $(1 + x)^{10}$ (5Marks)