INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF SCIENCE AND TECHNOLOGY

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BSEM

YEAR/SEM: YEAR 3/SEMESTER 2

COURSE CODE: BSE 3206

NAME: ENVIRONMENTAL BIOTECHNOLOGY

DATE: 2025-04-14

TIME: 2:00-5:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully
2. The time allowed for this examination is STRICTLY three hours
3. Read each question carefully before you attempt and allocate your time equally between all the Sections
4. Write clearly and legibly. Illegible handwriting cannot be marked
5. Number the questions you have attempted
6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks
7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Attempt all questions by circling the most correct answer

Question 1:

ï»¿1.Fungi are ecologically important asâ?¦â?¦â?¦â?¦â?¦â?¦ (4Marks)
A.Primary producers
B.Decomposers
C.Parasites only
D.Nitrogen fixers
2.Which microorganism is known for degrading heavy metals waste?(4Marks)
A.Staphylococcus sp
B.Aspergillus niger
C.Nitrosomonas europaea
D.Lactobacillus acidophilus
3.A key limitation of bioremediation isâ?¦â?¦â?¦â?¦â?¦..(4Marks)
A.High cost compared to physical methods
B.Inability to work in extreme temperatures
C.Requirement for long-term monitoring
D.Only effective for inorganic pollutants
4.The cell wall of fungi is primarily composed ofâ?¦â?¦â?¦â?¦â?¦â?¦.(4Marks)
A.Cellulose
B.Chitin
C.Peptidoglycan
D.Starch
5.Which process involves plants releasing pollutants into the atmosphere as gases? (4Marks)
A.Phytodegradation
B.Phytovolatilization
C.Phytoextraction
D.Phytostimulation
6.Yeasts belong to which kingdom? (4Marks)
A.Plantae
B.Animalia
C.Fungi
D.Protista
7.Which organelle is responsible for photosynthesis? (4Marks)
A.Mitochondria
B.Chloroplast
C.Ribosome
D.Endoplasmic reticulum
8.What is in situ bioremediation? (4Marks)
A.Treating contaminated soil in a laboratory
B.Removing pollutants by excavating the site
C.Remediating contamination at the site itself
D.Using genetically modified plants
9.Which process is beneficial for iron or sulfur pollutants removal? (4Marks)
A.Bioleaching
B.Bioaugmentation
C.Biostimulation
D.Biosorption
10.A limitation of biosensors in environmental monitoring is: (4Marks)
A.High specificity for target analytes
B.Short shelf-life of biological components
C.Inability to detect low concentrations
D.Dependence on external power sources

Section B Choose any 3 questions

Question 1:

ï»¿6. a) Explain the different types of cells (10Marks)
b) What are the differences between haploid and diploid cells (10Marks)

Question 2:

ï»¿9a) What characteristics should be possessed by organisms used as bioindicators? (10marks)
b) Explain the different applications of bioindicators? (10marks)

Question 3:

ï»¿5. Using an illustration explain the sexual and asexual reproduction process in fungi (20marks)

Question 4:

ï»¿11. Explain the processes involved in mitosis cell division (20marks)

Question 5:

ï»¿3.a) Discuss the characteristics of fungi (10marks)
b) Explain the characteristics of biosensors that make them valuable tools for their applications (10marks)

Question 6:

10. Discuss the in situ microbial bioremediation techniques. (20marks)