COURSE CODE: MCB 201

COURSE TITLE: GENERAL MICROBIOLOGY I

DURATION: 2 HOURS

HOD's SIGNATURE

NAME:...

MAT. No:...

INSTRUCTIONS

Answer question ONE and any other TWO

1. a) Define the following terms with given examples
   i) Selective culture media ii) Differential media iii) Enrichment media iv) Coliforms
   b) Describe the following methods of isolating microorganisms
   i) Streak plate technique ii) Pour plate technique iii) Spread plate
   c) With appropriate examples, describe the beneficial role of microorganisms in the following areas
   i) Environment ii) Medicine iii) Industrial iv) Agriculture v) Biotechnology
   d) What is the difference between pasteurisation and tyndallisation?
   e) Mention fives (5) ways of microbial control in a medical microbiology laboratory.

2. One ml of a urine sample is added to 9 ml of sterile water. This is mixed well and further diluted by 4 successive 1/10 dilutions. One-tenth of a ml of each dilution is spread on a plate of nutrient agar. After incubation, the following data were obtained:

Dilution used for plating	Amount plated	Colony counts after incubation
First 1/10	1/10 ml	too many to count (TMTC)
Second 1/10	1/10 ml	730
Third 1/10	1/10 ml	67
Fourth 1/10	1/10 ml	5
Fifth 1/10	1/10 ml	0

a) What is the total dilution and dilution factor at the fifth stage?
b) What is the overall dilution factor and dilution at the third stage?
c) What is the number of colony-forming units/ml of the original water sample that was capable of growing on nutrient agar?
d) If the original water sample taken was 10ml and it was added to 90ml of sterile water, what would have been the amount of bacteria in the original sample?
e) Mention 3 ways of enumerating microbial counts.

3. a) Outline and explain Koch's postulates
   b) What are the exceptions to Koch's postulates?
   c) What do you know about pure culture? and explain why it is crucial for the diagnoses of infectious diseases.

4. a) Mention and explain the different stages of the microbial growth curve
   b) Briefly explain the following terms
   i. Obligate anaerobes ii. Facultative anaerobes iii. Aerotolerant anaerobes iv. Microaerophiles
   c) With the aid of a suitable diagram explain the following processes in bacteria
   i. Binary fission, ii. Formation of endospores

5. a) What are viruses?
   b) Describe the process of viral replication
   c) With the aid of a diagram, explain the following;
   i. Lytic cycle, ii. Lysogenic cycle