

KATHMANDU UNIVERSITY
End Semester Examination
July/August 2024

Marks Scored:

Level : B.Tech.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : BIOT 201

Semester : I

F. M. : 20

Registration No.:

Date

29 JUL 2024

SECTION "A"

[10Q. × 1 = 10 marks]

Choose and mark [X] encircle the most appropriate option from each set of choices

- The primary use of Koch's postulates is to
 clearly identify and characterize a particular microorganism
 isolate microorganisms from diseased animals.
 demonstrate that a disease is caused by microorganism.
 develop vaccines for specific diseases.
- What approximate magnification can be obtained from a compound microscope with an oil immersion lens (100X, N.A. 0.25) and ocular lens (15X, N.A. 0.25)?
 100X 1000X 1500X 750X
- Endospores:
 represent a dormant cell stage resistant to heat, desiccation, and many chemicals.
 allow cells to divide, produced externally and many in number.
 are made up predominantly of cellulose.
 function in cellular multiplication.
- The 70S prokaryotic ribosome consist of
 Two 40S subunits 50S and 30S subunit
 40S and 30S subunit 50S and 20S subunit
- Which of the following is not the component of Acid fast bacterial cell wall?
 Peptidoglycan polypeptides teichoic acid arabinogalactan
- Addition of blood to a culture medium only allows the hemolytic bacteria that grow on the plate to be picked out. This is an example of a
 Differential media Liquid media
 Selective media Complex media
- Which of the following is the best definition of generation time?
 The length of time it takes for log phase
 The length of time it takes for a population of cells to double
 The difference between final cell count and the initial cell count
 The time it takes for nuclear division
- An experiment began with 4 cells and ended with 32768 cells. How many generations did the cells go through?
 81 32 13 4

9. Which kingdom would an organism with the following characteristics most likely belong: true nucleus, non-photosynthetic, non-motile, absorb nutrients, and reproduce by forming spores?
[] Fungi [] Eubacteria [] Protista [] Plantae
10. An immunoglobulin is a
[] protein [] carbohydrate [] glycoprotein [] fatty acid

SECTION "B"
[10Q. × 1 = 10 marks]

Fill in the blanks with appropriate answer.

11. An organism is completely dependant on atmospheric O₂ for growth is a(n) _____
12. The process of reducing or inhibiting microorganisms on living tissue is termed _____
13. The transfer of genetic material between bacteria by virus is called _____.
14. _____ can best be described as small, circular DNA molecules that can exist independently of chromosomes commonly found in bacteria
15. A bacterial cell that is able to take up naked DNA is termed _____
16. The integrated viral DNA that gets replicated along with the host cell's chromosome and remains latent for many cellular generations is termed _____
17. The concentrations of viral suspensions measured and usually expressed in terms of _____.
18. The term _____ refers to a kind of micro-organism whose presence in water is evidence of the water polluted with fecal materials.
19. _____ is the bacterial culture in which continued growth is ensured by adding fresh medium at the same rate that used cell containing medium is removed.
20. Fermenter is equipped with _____ to prevent vortex and to improve aeration efficiency.

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F. M. : 55

SECTION "C"

[4Q. × 7 = 28 marks]

Attempt *ALL* questions.

1. What is pure culture? How do you isolate a pure culture from a mixed culture? Explain any two methods with significance?
2. What is genetic recombination? How the recombination does occurs in bacteria by transduction.
3. Describe the basic physical conditions required in bacterial growth with their significance.
4. Describe the lytic and lysogenic life cycle of virus with their significance in bacterial recombination.

SECTION "D"

[27 marks]

5. Illustrate the differences between the cell walls of Acid fast and Gram-negative bacteria. [5]
6. If you start out with a population density of 200 CFU/ml of a bacterium that divides every 20 minutes, what will the population density be at the end of two hours, assuming the cells are in the log phase of growth? [2]
7. Comprehend the significance of industrial microbiology. [3]
8. Draw a typical bacterial growth curve. Identify the phases. [3]
9. Give the location, composition and function of the following structures. [4]
 - a. flagella
 - b. cell membrane
10. If you dilute a sample by 10 folds down to 10^6 using sterile distilled water tubes, then plated 0.5 ml to agar plates respectively and got 87 colonies at 10^5 dilution. How many viable bacteria are there in your original sample? [3]
11. Distinguish between: [3]
 - a. Moist heat sterilization and dry heat sterilization
 - b. Active immunity and passive immunity
12. Write a short notes on: (*ANY TWO*) [2×2=4]
 - a. Secondary treatment of water
 - b. Inflammation
 - c. Economic importance of fungi

