

KATHMANDU UNIVERSITY  
End Semester Examination  
March/ April, 2017

Marks Scored:

Level : B. Tech.

Year : II

Exam Roll No. :

Time: 30 mins.

Course : BIOT 201

Semester : I

F. M. : 20

Registration No.:

Date : MAR 27 2017

SECTION "A"  
[10 Q × 1 = 10 marks]

- A. Choose the most appropriate answer.
- The distinction between a Gram-negative and Gram-positive bacterium is based on...  
 nucleoid       flagella       cell wall       glycocalyx
  - Long, thin extensions that allow some bacteria to move about freely in aqueous environments are called ...  
 sexpili       flagella       fimbriae       slime layer
  - Francis Griffith did experiments with *Streptococcus pneumoniae* and discovered:  
 Transcription       transduction       transformation       conjugation
  - What is an inoculum?  
 The sterile medium to which bacteria will be transferred.  
 The bacteria that are undesired within a culture.  
 The bacteria transferred to a new medium.  
 The inoculating instrument used to transfer bacteria.
  - An interrelationship between two or more free-living organisms that is beneficial to both but not necessary for the survival of either?  
 Synergism       Mutualism       Commensalism       Antagonism
  - AIDS is an example of:  
 noninfectious immunodeficiency       acquired immunodeficiency  
 inherited immunodeficiency       autoimmune disease
  - A mycelium occurs in molds and is a  
 type of reproductive spore       structure of the cell wall  
 mass of branching filaments       structure for motility
  - Continuous feed during fermentation is used to maintain  
 water level       product concentration  
 substrate concentration       cell number
  - Those infections that come on rapidly and are accompanied by severe symptoms are described as  
 chronic       opportunistic       acute       asymptomatic
  - IgE is well known for its participation in the  
 phagocytic reaction       passive immunity reaction  
 allergic reaction       reticuloendothelial reaction

SECTION "B"  
[10 Q × 1 = 10 marks]

- B. Fill in the blanks.
11. The identical progeny of the original cell is called \_\_\_\_\_.
  12. The transfer of genetic material between bacteria in direct physical contact is called \_\_\_\_\_.
  13. The class of immunoglobulin that is produced in the secondary humoral response is \_\_\_\_\_.
  14. An \_\_\_\_\_ is anything that ELICITS the formation of a specific immune response.
  15. A complete viral particle ( capsid + nucleic acid + envelope if it is present) is called a \_\_\_\_\_.
  16. A bacterial cell that is able to take up naked DNA is said to be \_\_\_\_\_.
  17. The term \_\_\_\_\_ refers to a kind of micro-organism whose presence in water is evidence of the water polluted with fecal materials.
  18. \_\_\_\_\_ 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.
  19. The growth rate is maximal and constant in \_\_\_\_\_ phase of the typical growth curve in a closed system of microbial cultivation.
  20. Fermenter is equipped with \_\_\_\_\_ to prevent vortex and to improve aeration efficiency.

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Year : II  
Time : 2 hrs. 30 mins.

Course : BIOT 201  
Semester : I  
F. M. : 55

SECTION "C"

(Long answer questions)

[4Q × 7 = 28 marks]

Attempt *ANY FOUR* questions.

1. Describe the similarities and differences between the cell walls of Gram-positive and Gram-negative bacteria with figure.
2. Explain bacterial transduction with emphasis on Zinder and Lederberg's experiment.
3. What is grow curve? Compare and contrast the growth curve of batch culture and continuous culture.
4. Define immunity. Explain different types of non-specific defense mechanism of our body.

**OR**

What is immune response? Describe the types of immunity with suitable examples.

SECTION "D"

(Short answer questions)

5. Briefly describe the nature and function of pili. [3]
6. Define the given media with their uses: basal media, transport media and differential media. Give example of each. [3]
7. Draw graphs showing the relationship between temperature and growth rate for each of the following types of bacteria: psychrophile, mesophile, thermophile. [3]
8. Illustrate the possible outcomes of mating between the following strains of *E. coli*. [2 × 2 = 4]
  - a. Hfr X F<sup>-</sup>
  - b. F<sup>+</sup> X F<sup>-</sup>
9. Distinguish between : [2 × 2 = 4]
  - a. Exotoxin and endotoxin
  - b. Thermal death time and thermal death point
10. Draw a schematic diagram for the component parts of a fermentation process. [3]
11. You make 1/100,000 dilutions of an unknown concentration. If you spread 1/5 ml of the dilution onto a plate, and 96 colonies grow after incubation. What was the original concentration of bacteria? [3]
12. Short notes on: (*ANY TWO*) [2 × 2 = 4]
  - a. Virulence factor
  - b. Fermenter
  - c. Autoclave

