KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks Scored:

Level : B. Tech.
Year : II

Course : BIOT 201
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date FEB 2 1 2019

SECTION "A"
[10 Q. × 1 = 10 marks]

Choose the most appropriate answer.

1. The maximum resolution of a light microscope is
[ ] 0.2 mm [ ] 0.2 μm [ ] 0.2 nm [ ] 0.2 m

2. Which of the following is not a distinguishing characteristic of prokaryotic cells?
[ ] They usually have a single, circular chromosome.
[ ] They have cell walls containing peptidoglycan.
[ ] Their DNA is not associated with histones.
[ ] They lack a plasma membrane.

3. Which of the following pairs is mismatched?
[ ] glycocalyx—adherence [ ] pili—reproduction
[ ] cell wall—toxin [ ] plasma membrane—transport

4. Assume you stain *Bacillus* by applying malachite green with heat and then counterstain with safranin. Through the microscope, the green structures are --
[ ] cell walls [ ] capsules [ ] endospores [ ] vegetative part

5. Recognize the correct system of scientific nomenclature of the given bacteria.
[ ] Staphylococcus aureus [ ] *Staphylococcus Aureus*
[ ] Staphylococcus aureus [ ] Staphylococcus aureus

6. Which of the following is best to sterilize heat labile solutions?
[ ] Dry heat [ ] Autoclave
[ ] Membrane filtration [ ] Pasteurization

7. A large vessel containing media used to grow industrially important microorganism.
[ ] Baffles [ ] Sparger [ ] Fermenter [ ] Impeller

8. Which of the following secrete Antibodies?
[ ] Plasma cells [ ] Macrophages [ ] T- lymphocytes [ ] erythrocytes

9. The relationship between a virus and host where no new viral particles are produced and the viral genome is replicated along with host chromosome.
[ ] transduction [ ] Bacteriophage [ ] lysogeny [ ] lysis

10. This is the obligatory interaction.
[ ] Mutualism [ ] Commensalism [ ] Cooperation [ ] Ammensalism

## SECTION "B"

[10 Q. × 1 = 10 marks]

Fill in the blanks.

11. Microbial population is maintained in _____phase for long time using continuous culture.

12. Bacteria reproduce by _____.

13. The capsid of a virus is composed of smaller, repeating units known as _____.

14. The enzyme that digests the polysaccharide a type of "intercellular cement" which binds cells together in tissues is called _____.

15. A sign of disease is a measurable evidence of disease noted by an observer, while a _____is a subjective measure of disease as noted by the patient.

16. The transfer of a naked fragment of DNA between bacteria is called _____.

17. F factor plasmids play a major role in bacterial _____.

18. Maternal antibodies are _____ immunity.

19. _____describes the negative interaction that one organism has on another organism because of release of a specific compound that detrimentally effects the second organism.

20. Fermenter is equipped with _____ to prevent vortex and to improve aeration efficiency.

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F. M. : 55

SECTION "C"
(Long answer question)
[4 Q. × 7 = 28 marks]

Attempt *ALL* questions

1. Compare and contrast the flagella and fimbriae found in bacteria with the help of diagram.

2. What is growth curve? Describe different phases of the growth curve in a closed system and discuss the causes of each.

3. What is genetic recombination? How does recombination occur in bacteria by conjugation?

4. Describe the different methods for bacterial culture preservation.

**OR**

Illustrate a typical structure of a bacteriophage and explain its life cycle.

SECTION "D"
(Short answer question)

Attempt *ALL* questions.

5. Describe in detail the composition and structure of peptidoglycan, and give its function. [5]

6. What are cardinal temperatures? Why does the growth rate rise with increasing temperature and then fall again at higher temperatures? [4]

7. Distinguish between: (*ANY TWO*) [2 × 3 = 6]
   a. Generalized transduction and specialized transduction
   b. prokaryotic and eukaryotic cell
   c. Lytic and lysogenic cycle

8. Draw a labelled diagram of a fermenter. [2]

9. What are fungi? Give its importance. [3]

10. What is generation time? Calculate the generation time of a culture that increases in the exponential phase from $5 \times 10^2$ to $1 \times 10^8$ in 12 hours. [3]

11. Short notes on: (*ANY TWO*) [2 × 2 = 4]
    a. Antibody
    b. Virulence factor
    c. Pasteurization