KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

Marks Scored:

Level : B.Tech.
Year : II

Course : BIOT 201
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : 26 JUN 2023

SECTION "A"
[20 Q. × 1 = 20 marks]

Mark [X] in the most appropriate option.

1. 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 a microorganism.
[ ] develop vaccines for specific diseases.

2. What approximate resolution can be obtained with a lower power (10X, N.A. 0.25) objective lens if the wavelength of light is 550 nm?
[ ] 0.2 microns [ ] 0.3 microns [ ] 1.1 microns [ ] 0.25 microns

3. The bacterial conjugation between Hfr and F- cell results in
[ ] Two F+ cells [ ] Two F- cells [ ] Two Hfr cells [ ] Hfr and F-

4. An experiment began with 5 cells and ended with 5×10^9 cells. How many generations did the multiplication go through?
[ ] 81 [ ] 30 [ ] 13 [ ] 5

5. _____ is not an adherence factor in host-parasite interaction.
[ ] Adhesin [ ] Ligand [ ] Fimbriae [ ] Endotoxin

6. Which antibody does cross the placental barrier and thereby provides passive immunity to the fetus?
[ ] IgM [ ] IgG [ ] IgA [ ] IgE

7. What type of cells does HIV attack?
[ ] T helper [ ] T suppressor
[ ] Natural killer cells [ ] Red Blood Corpuscles

8. _____ is the method of reducing or inhibiting microorganisms on living things.
[ ] Sterilization [ ] antisepsis [ ] Disinfection [ ] sanitization

9. _____ is the time interval between bacterial cell divisions.
[ ] Incubation period [ ] Generation time
[ ] Latent period [ ] Eclipse time

10. Which immunity that develops within a person as a result of an injection of a vaccine?
[ ] natural active immunity [ ] artificial active immunity
[ ] natural passive immunity [ ] artificial passive immunity

Fill in the blanks.

11. _____can best be described as small, circular DNA molecules that can exist independently of chromosomes commonly found in bacteria.

12. _____ is the ability to produce disease in a host organism.

13. _____ 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.

14. The first Classic transformation experiment was first performed by Griffith using the bacteria _____.

15. In _____ a high temperature is used for a short time to destroy pathogens without altering the flavor of the food.

16. Some fungi switch between a single-celled yeast phase of growth & a mycelial phase and is termed _____.

17. Addition of blood to a culture medium allows the hemolytic bacteria to grow on the plate is an example of a _____ media.

18. _____ is a number that indicates the disinfection ability of antiseptic or disinfectant in comparison to Phenol.

19. The fatal food poisoning called bolulism is caused by _____.

20. The induction of defects during embryonic development is _____.

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Level : B.Tech.
Year : II
Time : 2 hrs. 30 mins.

Course : BIOT 201
Semester : I
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 one method.

2. What is cardinal temperature? Discuss the significance of oxygen and temperature in bacterial growth.

3. What is genetic recombination? Explain the recombination of bacteria by transduction.

4. Draw a typical structure of a bacteriophage and explain its life cycle.

OR

Describe how does our immune system operates in the production of antibodies.

SECTION "D"
[27 marks]

5. Define generation time. Suppose the generation time of a bacterium is 20 mins and the initial number of cells in a culture is 10^2 cells at the start of the log phase. How many bacteria will there be after 24 hours of exponential growth? [3]

6. If you dilute a sample by 10 folds down to 10^6 using sterile distilled water tubes, then plated 0.1 ml to agar plates respectively and got 87 colonies at 10^5 dilution. How many viable bacteria are there in your sample? [3]

7. Give the importance of selective media and differential media with examples. [4]

8. Give the location, composition and function of the bacterial structures.(*ANY TWO*) [4]
   a. nucleoid
   b. cell wall
   c. Endospore

9. Distinguish between [3×2=6]
   a. Active and passive immunity
   b. Exotoxin and endotoxin
   c. Lag phase and log phase

10. Give the significance of choice of micro-organism in a fermentation process. [3]

11. Short notes on *ANY TWO*. [2×2=4]
   a. Virulence factor
   b. Wastewater treatment
   c. Economic importance of fungi