

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – BIO TECHNOLOGY**

**FIRST SEMESTER – NOVEMBER 2009**

**BT 1819 - MICROBIAL PHYSIOLOGY & GENETICS**

Date & Time: 04/11/2009 / 1:00 - 4:00

Dept. No.

Max. : 100 Marks

**PART A**

**Answer all the questions**

**(20 Marks)**

**(5x1=5)**

**I. Choose the correct answer:**

1. Which one of the following is a contribution by Waksman?  
(a) Antitoxin (b) Antibiotic (c) Antisepsis (d) Antibody.
2. The enzyme nitrogenase is extremely sensitive to  
(a) Hydrogen (b) nitrogen (c) oxygen (d) carbon.
3. The process of recombination by naked DNA within a living cell is  
(a) Conjugation (b) Transduction (c) Sexduction (d) Transformation.
4. Fluorescent microscope uses \_\_\_\_\_ as detector.  
(a) Fluorescein isothiocyanate (b) Rhodamine (c) Peroxidase (d) Catalase.
5. The mutation that causes premature termination of codon is  
(a) Point (b) Nonsense (c) Missense (d) Frame-shift.

**II. State whether the following are true or false; If false state the reason: (5x1=5)**

6. Acetogenesis and methanogenesis are related to sludge digestion.
7. Missense suppressions are tend to be tRNA mutations.
8. The role of nitrifying bacteria is to convert nitrates to ammonia.
9. Chi-sites are found every 64 kb along the bacterial genome.
10. Sorbic acid is used as a direct antimicrobial additive in foods.

**III. Complete the following:**

**(5x1=5)**

11. The outer membrane of the Gram negative cell wall is anchored to the underlying peptidoglycan layer by means of \_\_\_\_\_.
12. Plasmids to which the phenotypic traits have not been ascribed are called \_\_\_\_\_.
13. The mutation that causes a total loss of gene expression is called \_\_\_\_\_.
14. The cells that carry non-integrated transducing fragments are called \_\_\_\_\_.
15. The microbial association in which the nutrients are exchanged between two species is called \_\_\_\_\_.

**IV. Answer the following questions each in about 50 words:**

**(5x1=5)**

16. Define resolving power.
17. What are base analogs?
18. What is commensalism?
19. What is post-replicative repair?
20. What are bacteroids?

**PART B**

**V. Answer any five of the following questions each in about 350 words. (5x8=40)**

21. What is sterilization? Describe the physical methods of sterilization.
22. Explain the Lac operon model in positive regulation.
23. Write briefly about the bacterial chromosomes and their role in genetic transformation.
24. Explain the mechanism of photo-reactivation and excision repair in prokaryotes.
25. Define culture medium. Explain the various types with examples.
26. Describe the lytic cycle of phage lambda.
27. Classify the microbes based on the environmental factors that influence the growth.
28. Illustrate and explain about point and frame-shift mutations and what are their consequences?

**PART C**

**VI. Answer the following questions each in about 1500 words. (2x20=40)**

29. (a) Describe the ultra-structure and function of bacterial cell with a neatly labeled diagram.  
(or)  
(b) Explain the cyclic and non- cyclic phosphorylation in bacterial photosynthesis.
30. (a) Explain the role of gene products in molecular mechanism of conjugation.  
(or)  
(b) Describe the RecBCD pathway of recombination in prokaryotes.

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