



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

**M.Sc. DEGREE EXAMINATION – ZOOLOGY**

**FOURTH SEMESTER – APRIL 2022**

**PZO 4501 – MICROBIOLOGY AND IMMUNOLOGY**

Date: 15-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

### **PART A**

**Answer all the questions**

**(10×2=20 marks)**

1. How is 16S rRNA gene sequencing performed and used to identify bacteria?
2. What is the motility test for bacteria?
3. Give two examples of cytoplasmic inclusions found in bacteria.
4. What is meant by bacterial glycocalyx.
5. Explain the structure of an *E. coli* nucleoid.
6. Name any two types of plasmids mentioning their functions.
7. Mention the cause and symptoms of chronic granulomatous disease?
8. Name any two types of vaccines in use for SARS-CoV2 with examples.
9. What is meant by affinity maturation and class switching with respect to B cells?
10. Discuss the two types of superantigens.

### **PART B**

**Answer any FOUR questions**

**(4×10=40 marks)**

11. Discuss the staining techniques used to identify bacteria.
12. Describe the process of bacterial sporulation.
13. Write a note on bacterial transduction.
14. Discuss how haematopoietic stem cells can be used for regenerative medicine.
15. Explain the production of a recombinant live attenuated vaccine for *V. cholera*.
16. Give an account of nitrogen sources of microbial nutrition.

### **PART C**

**Answer any TWO questions**

**(2×20=40 marks)**

17. Write notes on the following:  
(i) Types of bacterial colony morphology      (ii) Structure of bacterial cell walls
18. Discuss the different types of DNA repair mechanisms in prokaryotes.
19. Explain B cell and T cell immunodeficiencies and combined immunodeficiencies giving examples.
20. Describe the process of T-cell maturation and antigen-specific activation.

&&&&&&&&&&&&