



ST JOSEPH'S UNIVERSITY, BENGALURU -27
M.Sc. Biotechnology- III SEMESTER
SEMESTER EXAMINATION: OCTOBER 2023
(Examination conducted in November/December 2023)
BT 9223: IMMUNOLOGY AND MEDICAL BIOTECHNOLOGY
(For current batch students only)

Registration Number:

Date & session:

Time: 2 hours

Total Marks: 50

This paper contains ONE printed page and THREE parts

PART-A

Answer any SEVEN of the following:

2m x 7 = 14 marks

1. IgM was cleaved overnight with pepsin. What will be the product?
2. Why is allelic exclusion important for B cell specificity?
3. Draw a schematic of the pre-B cell.
4. What are DRiPs and why are they relevant?
5. Are all immunogens also antigenic?
6. As an oncologist when will you prescribe checkpoint inhibitors?
7. State the components of a membrane attack complex.
8. State two chemicals found predominantly within the granules of a basophil.
9. A patient suffered from burn injury for which grafting will be required. Which type of transplantation will ensure a higher success rate?

PART B

Answer any FOUR of the following:

5m x 4 = 20 marks

10. Briefly describe the various steps of hybridoma generation. Gullu has used HT instead of HAT media for hybridoma selection. Will this affect the screening process?
11. Draw a schematic diagram of endogenous antigen processing? Which cells do this best?
12. CAR-T cells have been around for nearly a decade. How have tumors evolved resistance to them? Explain one strategy to counter this resistance.
13. What is the sequence of events for B cell activation by a thymus dependent antigen? What would be the outcome of a) successful activation, b) no activation? Justify.
14. Which type of complement system requires an antibody for its activation? Explain with the help of a suitable diagram.
15. Explain the mechanism of graft versus host disease in detail.

PART C

Answer any TWO of the following:

8m x 2 = 16 marks

16. Illustrate the recombination of the kappa light chain. What is the role of the RSS in this process? What would be the fate of a B cell that failed to carry out this process a) once, b) twice?
17. Write a note on the molecular basis of the following:
 - a. Immunological synapse. (4 marks)
 - b. Chemotaxis during initiation of phagocytosis. (4 marks)
18. 'The central tolerance is leaky' - justify this statement with suitable examples. (5 marks)
What are the various ways by which peripheral tolerance compartmentalizes auto-reactive cells? (3 marks)