

M. Sc. (BIOTECHNOLOGY) EXAMINATION, 2023

(1st Year, 2nd Semester)

IMMUNOLOGY**PAPER – 233T**

Time : Two hours

Full Marks : 40

Group – AAnswer *any four* questions.

4×5=20

1. Mention the key function of TLR 9. Why Retinoic acid-inducible gene I (RIG-I)-like receptors (RLRs) are called key sensors of virus infection? What are the main proteins which constitute inflammasome. What are the two main function of Inflammasome? (1+1+1+2)
2. Why as adjuvant Alum is not preferred? How Intracellular antibody-mediated virus degradation occurs? How IgM appears in mucosal surface? (1+3+1)
3. In terms of antibody gene what is the significance of Tonegawa and Hozumi experiment? What is advantage and disadvantage of junctional flexibility? Why CDR3 is most hyper variable? Between light and heavy chain which CDR3 is more hypervariable and why? (1+2+1+1)
4. Demonstrate experiments to show that for T cell activation both T cell co-receptor and MHC molecules are indispensable. Which properties of T cells are ensured by positive and negative selection in thymus. If T cell escapes from thymic selection, what will be the consequences. (3+1+1)
5. Name the three factors which are responsible for T cell differentiation. Outline the metabolic pathways associated with T cell differentiation. (2+3)
6. How lymphocyte protein tyrosine kinase (Lck) is activated? What is the function of Lck in T cell signalling? Describe briefly the role of CD45 for the activation of Naïve and memory T cells. (2+1+2)
7. Explain three signals that are necessary for activation of CTL-P to become functional CTL. Mention the silent features of NKT cells. How NK cells eliminate cancer cells? (2+1+2)

Group – BAnswer *any four* questions.

4×5=20

8. What are the differences between acute and chronic graft rejection? What is hyper acute rejection? State the difference between direct and indirect allorecognition. (2+1+2=5)
9. What is lymphodepletion? Whether you will suggest lymphodepletion before transplantation to an already immune compromised patient? What is the possible role of calcineurin inhibitors in preventing graft rejection? Name any calcineurin inhibitor used in preventing graft rejection. (2+1+1+1=5)

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10. What is the role of adenylation and phosphorylation in anaphylactic shock? What is the difference between systemic anaphylaxis and localized hypersensitivity? (2+2+1=5)
11. What is the basic difference between T cell exhaustion and senescence w.r.t features and surface immunophenotypes? What is the role of sestrin protein in bystander activation of senescent T cells? What is the fate of SASP releasing senescent T cells? (3+1+1=5)
12. Differentiate between the immunophenotype of Memory B cell and Plasma B cell w.r.t their surface markers. Which cells form germinal center complex? What is the function of T-follicular helper cells in germinal centre complex? What will happen to the Plasma B cell differentiation process if there is no somatic hypermutation? (2+1+1+1=5)
13. Explain the mechanism of action for anti-PD1 immunotherapy in cancer. What could be the possible impact of anti-PD1 immunotherapy on germinal centre function in cancer? (3+2=5)
14. State the difference between tumor-specific and tumor-associated antigens. Neo antigens have better antigenicity and T-cell affinity than differentiation antigens. Is the statement correct? Justify your answer. Define the function of super antigens. (2+2+1=5)