MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

VI SEMESTER B.TECH. EXTERNAL EXAMINATIONS MAY 2022

SUBJECT: IMMUNOTECHNOLOGY [BIO 4006]

Date of Exam: **19/05/2022** Time of Exam: **10.00 AM – 1.00 PM** Max. Marks: **50**

Q1a. A student was introduced to the world of drugs during the rave party that the student attended. The student started with smoking weed and finally went to injecting molly a common name for MDMA. The student faced episodes of high followed by depression. What are the effects of the drug on the innate and the adaptive immune system? Depict the effects with a **flow diagram only** (3)

Q1b. Anju was diagnosed of breast cancer at an age of 35. She had a lump in her breast and visited the doctor immediately. What could be the **events in the body** wherein the immune system could not diagnose the growing cancer. (3)

Q1c. Paulomi was not able to eat wheat as she was allergic to gluten. What are the immune cells responsible for this condition? With the **help of a diagram** depict the events which lead to the condition which might be life threatening as well. (4)

Q2a. HIV, a reterovirus is able to mount a response against the immune system of our body. What are the cells in our body which are attacked by this virus? Write two ways in which the HIV is able to fool the immune system (3)

Q2b. With the help of a **neat diagram only** depict the development and the polarization of the T cells taking place in the thymus (3)

Q2c. The naïve B cells after the negative screening reach the spleen where they are further subjected to screening. The screening taking place in the bone marrow is different from the screening at the peripheral organ. With the help of a **diagram only** depict the differences. (4)

Q3a. In one of the neighbourhood areas, a member contracted CoVid infection. The initial symptoms started with a sore throat and slight cold followed by high-grade fever. The doctor prescribed Dolo 650 for the initial five days but this could not control the high temperature, which touched 104℃. The doctor finally started steroids with regular dose of insulin. In the present situation, how did the administration of steroids help control the infection? (3)

Q3b. In a classic case of tuberculosis, the causative organism is able to shut off the response of the body even though the macrophages have identified it and endocytosed. The macrophages are not able to produce the proinflammatory cytokines. How would the *Mycobacterium tuberculosis* be able to control the response (3)

Q3c. In one of the rare situations, RAG1 and RAG2 were expressed in the skin cells. Will it lead to any serious implications? Justify.

In another situation, all the bone marrows of an individual had no stromal cell. Will it be a silent mutation or life threatening? (4)

Q4a. During one of the infections, the serum of the patient showed a spike in Factor B and Factor D still complement cascade was inactive. Depict with the help of **diagram only** the entire cascade of reactions. (4)

Q4b. What is special at the subclavian vein junction that the lymphatic system is able to empty its contents (2)

Q4c. The testing of coronavirus was executed using the elisa kits. With the help of a **diagram** depict the type of elisa used and its advantage over the other types (4)

Q5a. An immunologist researcher encountered cases of different patients wherein the following were reported. Enlist the effect of each defect

i) Mast cells were not secreting TNF-α

ii)TNF-α is systemically secreted (3)

Q5b. A student of immunology came across a person with dilapidated condition of capillaries in the hands and feet. What would be the impact of this condition on lymphatic circulation. Explain this with a **diagram** only (3)

Q5c. In the process of diapedesis, what would happen if the following are not expressed

i) IL-6 receptors

ii) ICAM (4)