Reg. No: 22BBT0212

Y/K/TX

VIT
Vellore Institute of Technology

Final Assessment Test – November 2024

Course: BBIT305L - Immunology
Class NBR(s): 4173 / 4175
Time: Three Hours

Slot: A1+TA1
Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

General Instruction: Draw diagrams wherever necessary

Answer ALL Questions

(10 X 10 = 100 Marks)

1. You have just caught an infection, and you are at the doctor's office. The doctor examines you and notices that your lymph nodes are swollen. Briefly, explain why? Also add a note on any two secondary lymphoid organs.

2. Roshini is a virologist studying the effects of swine influenza virus (SIV) on the immune system in pigs. She got sloppy and did not use all the right precautions when handling the SIV and became sick but recovered after about two weeks. Two weeks later Roshini was back at work and once again exposed himself to the SIV, however this time he did not get nearly as sick as the first time. Please explain using words and diagrams the immunological reason for this phenomenon.

3. Describe how somatic hypermutation contributes to affinity maturation, a selective phenomenon that increases the ability to neutralize pathogens.

4. Compare and contrast the structure, expression and functions of MHC class I and class II molecules with diagram.

5. A person is exposed to *Streptococcal* infection for first time.....Which complement pathway will be activated? Explain the pathway and Justify your answer with proper explanation.

6. Mention the factors contribute to the low levels of immune responsiveness to *Plasmodium spp*. Also add a note on immune response to parasitic infections.

7. A 25-year-old male went to see his dermatologist because of a red rash he developed on his right middle finger. The young man reported that he had been wearing a silver ring for five months without any problem. He had recently replaced the silver with a gold ring and observed the rash after 4 days. A skin biopsy revealed the presence of T cells, macrophages and fibrin. What is the likely diagnosis? Explain.

8. Define immune surveillance. Write a brief note on immune response against tumor antigens.

9.a) You are provided with 10 different blood samples, how do you screen the presence of HIV in blood samples? If any of the samples showed positive result in screening, how will you confirm the results? Briefly explain the principle of the screening test.

OR

9.b) Suppose that you were developing a new vaccine from polysaccharide components of a bacterial capsule. Initially, you start with the purified form of a single type of polysaccharide. Explain why each of the following vaccine modification may improve the immune response?

(i) covalently coupling the polysaccharide to a protein carrier.

(ii) adding aluminum hydroxide. Explain the reason.

10.a) Briefly describe the principles of *in vitro* monoclonal antibody production, and comment on the applications of monoclonal antibodies.

OR

10.b) Explain in detail about the current trends in immunotherapy.

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