

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

M.tech II Sem (BT)

COURSE CODE (CREDITS): 14M11BT212 (3-0-0)

MAX. MARKS: 35

COURSE NAME: Immunotechnology

COURSE INSTRUCTORS: Dr. Tyson

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

1. What are the correct roles of APC's in the immune response, and how do they facilitate the activation of other immune cells without directly engaging in the destruction of pathogens?
[CO- 1] 3 Marks
2. Explain how antibody variations are categorized into isotypes, allotypes, and idiotypes, and describe the significance of each category in terms of structure, function, and immunological diversity?
[CO- 1] 3 Marks
3. Pattern Recognition Receptors (PRRs) play a vital role in the immune response by detecting PAMPs. Explain the different classes of PRRs and also describe the nature of PAMPs providing three examples of these molecular patterns.
[CO- 1] 3 Marks
4. Explain the concept of immunization and how does a vaccine work to protect against infectious diseases? Provide a brief overview of the different types of vaccines commonly used.
[CO- 3] 4 Marks
5. Discuss the process of monoclonal antibody production using hybridoma technology. Outline the key steps involved in process and describe the different types of monoclonal antibodies (mAbs) based on their source and specificity.
[CO- 3] 4 Marks
6. Explain the concept of tissue rejection in organ transplantation. What are the main immunological mechanisms involved in graft rejection, and how do they vary between hyper acute, acute, and chronic rejection?
[CO- 2] 4 Marks
7. Discuss the diverse roles of cytokines in regulating immune responses and evaluate the functional differences between the types of chemokines in immune cell migration and activation.
[CO- 1] 4 Marks

8. Describe the stages of B cell development in the bone marrow, starting from hematopoietic stem cells and explain the process of affinity maturation in the context of B cell immune responses. [CO- 1] 5 Marks
9. Explain the basic principles of ELISA and ELISPOT, highlighting the differences in their applications and detection methods. Discuss a specific scenario where one technique would be more suitable than the other for detecting and quantifying immune responses. [CO- 2] 5 Marks