JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS - 2022

M.Tech-II Semester (BT)

COURSE CODE (CREDITS): 14M11BT212 (3) MAX. MARKS: 35

COURSE NAME: IMMUNOTECHNOLOGY

COURSE INSTRUCTORS: Dr. Rahul & Dr. Jitendraa MAX. TIME: 2 Hours

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Note: All questions are compulsory. Marks are indicated against each question in square brackets.

All Questions of a section must be answered at one place

Section A

Q1. A negatively charged protein antigen is present in a cell lysate. Design an experiment strategy for:

a) Separation and visualization of the protein antigen using gel matrix system. **[3]**

b) How do you purify the above-mentioned antigen on charge basis and using antigen-antibody interaction? **[4]**

Q2. If you need to detect the presence of a pathogen in a population of 150 people using the antigen-antibody reaction, which method is best suited for the detection? Justify your answer with suitable example. **[4]**

Section B

Q3. Answer the following with respect to Immunoglobulins: **(Do Not Write Question) [0.5 X 6 = 3]**

a. Most preferred Ig for cancer therapy.
b. Ig type present in breast milk protecting newborn.
c. Cells which produce IgE.
d. Ig classes which are co-expressed on B cells due to differential RNA splicing.
e. Ig fragments produced by digestion with papain enzyme.
f. Ig classes which contain a J-chain in their multimeric form.

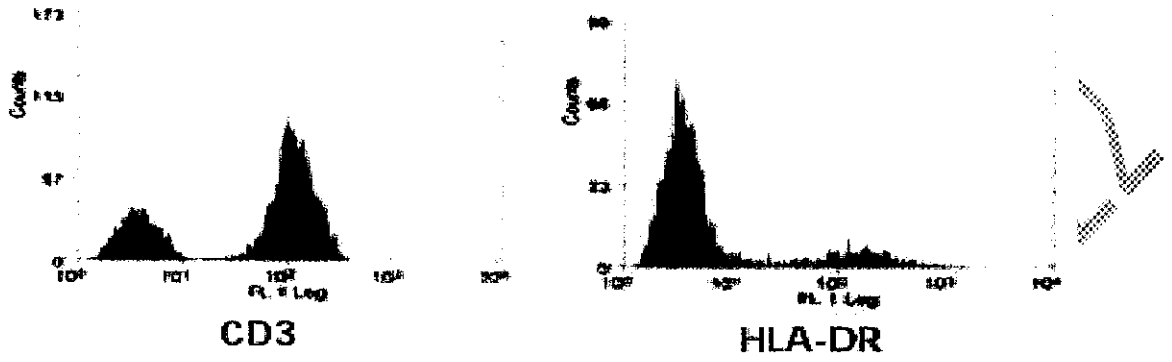
Q4. Indicate the type of immunity developed / provided in the body of the person if: **[2]**

A. A snake bite is followed by a Serum Immunoglobulin treatment.

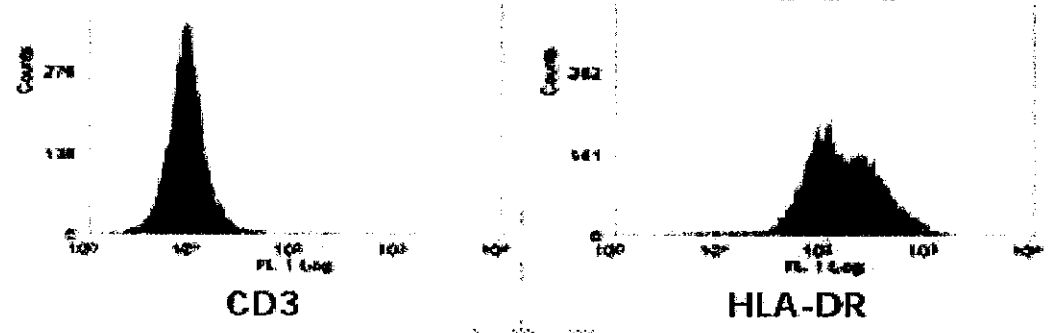
B. A snake bite is followed by No treatment, but the person survives.

Q5. Given below is a flow-cytometry data indicating fluorescence obtained using Anti-CD3 and Anti-HLA-DR antibodies from two individuals A and B. Explain the data obtained in both sets and predict the diseased condition which can be diagnosed using given data sets. **[4]**

A.



B.



Q6. Draw a histogram plot depicting different phases of human cell cycle obtained in a flow cytometry experiment. Draw peak for cells undergoing apoptosis in the histogram. How it can be used for diagnosis of clinical conditions. **[4]**

Q7. The complex mechanisms of immunity, which under normal circumstances work to identify foreign microbes and direct the immune system to destroy the pathogens, may work for rejection of cells, tissues, organs. Discuss the 'Cellular' and 'Antibody' mediated rejection process and its implications. **[4]**

Q8. Can carbohydrates be used as vaccine candidates? Provide suitable justification for your answer with example and possible immunological mechanism of such vaccines. **[4]**

Q9. Illustrate with a flow chart important steps required for processing a tissue or organ for the purpose of histopathological examination. **[3]**