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(190) SEAT No._____ No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY
M.Sc (III Semester) Examination (CBCS)
Monday, 29th October, 2018
2:00 pm to 5:00 pm
Biochemistry
PS03EBIC21 – Advanced Immunology

TOTAL MARKS: 70

Q.1 Write both correct option as well as answer to the MCQ questions in your main answer book **(08 Marks)**

1. Hypersensitivity reactions to penicillin have been identified that correspond to which of the above types of reactions?
   a. Type I hypersensitivity
   b. Type II hypersensitivity
   c. Type III hypersensitivity
   d. All of the above

2. Which of the following BEST describes the difference(s) between types II and III hypersensitivity reactions?
   a. Direct recognition of cell-surface antigens by antibodies in type II reactions versus deposition of improperly cleared antibody-antigen complexes in type III reactions
   b. Direct recognition of cell-surface antigens by antibodies in type III reactions versus deposition of improperly cleared antibody-antigen complexes in type II reactions
   c. Cross-linking of FcεRI by IgE-opsonized pathogens
   d. Cross-linking of FcγRIIB by IgG-opsonized pathogens

3. In case of Myasthenia Gravis auto antibodies are produced against?
   a. Histones
   b. Clotting factors
   c. Platelets
   d. Acetylcholine receptors

4. Vaccines are MOST readily made against:
   a. bacteria because their cell walls remain relatively unchanged from generation to generation.
   b. helminths because they are large organisms and make for easy targets.
   c. prions because they are new microbe so there is much research effort to stop prion related diseases.
   d. viruses, particularly RNA viruses, because their cell receptors are unchanging and bind human cell receptors.

5. Graft rejection consists of:?
   a. sensitization, when T cells are stimulated, and effector, when they attack the graft.
   b. sensitization, when B cells are stimulated, and effector, when they attack the graft.
   c. recognition, when T cells are stimulated, and effector, when they attack the graft.
   d. recognition, when B cells are stimulated, and effector, when they attack the graft.

6. Which cell type is found in both B- and T-cell lineages?
   a. Common lymphoid progenitors
   b. Common pro-B-T cells
   c. Immature B cell
   d. Naïve lymphoid progenitor

7. Naïve CD4+ and CD8+ T cells leave the _____ and enter circulation.
   a. bone marrow
   b. lymph node
   c. spleen
   d. Thymus

8. Hematopoiesis begins at around day 7 after fertilization in mice. What is the site of precursor cells at this stage of fetal development?
   a. Bone Marrow
   b. Fetal Liver
   c. Placenta
   d. Yolk Sac

(1)

(P.T.O)

Q.2 Answer **any seven** from the following: 14

a) Differentiate between primary and secondary immunodeficiency.
b) Explain how TATA differs from TSTA in the context of cancer immunology?
c) Explain the term, "Molecular Mimicry"
d) When might you elect to use a polyclonal rather than a monoclonal antibody preparation, and why?
e) Is Asthma a localized or systemic hypersensitivity? Explain 'Hygiene hypothesis' for more incidences of Asthma and other forms of allergy in developing countries.
f) Discuss any two ways that distinguishes B-1 B cells from B-2 B cells. Which type of B – cell is found in pleural and peritoneal cavities of mice
g) Citing suitable examples state the different types of graft.
h) Name the two signals involved in 'Two Signal' hypothesis for T-cell activation. Explain the role of negative costimulatory receptors such as CTLA-4 and PD-1 in cancer therapy that eventually led to the award of Nobel Prize in Physiology and medicine to James P. Allison, Tasuku Honjo in the year 2018.
i) Explain the terms 'positive selection' and 'negative selection' with their significance in T-cell Development?

Q.3 (A) Explain the procedure adapted by Georges Köhler and Cesar Milstein to generate large quantities of monoclonal antibody. Add a note on the applications of monoclonal antibodies. 6

(B) What is vaccination? Explain various types of vaccines with their advantages and disadvantages. 6

OR

(B) Write a short note on antibody engineering. 6

Q.4 (A) Give a diagrammatic overview of B-Cell Development beginning from Bone Marrow till its completion in peripheral lymphoid organ. 6

(B) Describe how a naïve T-cell is activated. What is the role of costimulatory signals for the optimal T-Cell Activation and proliferation 6

OR

(B) Compare and contrast the structure or processes involved in T cell and B cell development. 6

Q.5 (A) Discuss the general mechanism involved in IgE-mediated hypersensitivity in detail and citing suitable examples explain the therapeutic role of Antihistamines, Leukotriene antagonists and Inhalation corticosteroids in the clinical management of IgE-mediated hypersensitivity. 6

(B) Give a brief overview of general and targeted immunosuppressive therapy to enable survival of allogenic transplants. 6

OR

(B) Briefly describe the sensitization phase and effector phase of typical delayed-type hypersensitivity (DTH) reaction. 6

Q.6 (A) "The immune system can be harnessed to fight cancer" – Justify this statement by discussing various strategies involved in cancer immunotherapy. 6

(B) Explain AIDS as a secondary immunodeficiency illustrating infection cycle of HIV 6

OR

(B) What is immunological tolerance? Briefly explain the mechanism of central and peripheral tolerance. 6

—X—

(3)