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SEAT No. _____

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SARDAR PATEL UNIVERSITY
M.Sc Genetics Semester II
FINAL EXAMINATION, April 2018

PS02CGEN23: FUNDAMENTALS OF IMMUNOLOGY

Date: 13-04-2018 TIME: 2.00 to 500 pm

Maximum Marks:70

Q.1 Attempt all the questions 1x8=8

- a) Lymphoid follicles are present in
 - a. Lymph nodes b. Spleen c. MALT d. all the three
- b) The following is not an example of lymphocyte
 - a. B cell b. T cell c. NK cell d. Monocyte
- c) The following statement is *not true*
 - a. D and J gene segments join first in HC
 - b. junctional flexibility is present between coding joints-
 - c. N nucleotide addition occurs in light chain rearrangement
 - d. RAG1/2 are lymphoid specific enzymes
- d) Antigen presenting cells express.....molecules on their surface
 - a. Class I b. Class II c. both class I & II d. Neither Class I nor II
- e) The following is *not* an example of initiator protein in complement activation
 - a. C1q complex b. MBL c. Factor B d. The Ficolins
- f) The uptake of antigen by macrophages is by
 - a. Endocytosis b. Phagocytosis c. Pinocytosis d. all the three
- g) Immunity against viral infection is provided mainly by
 - a. NK cells b. B cells c. macrophage d. Neutrophils
- h) The following can be used for the labeling of antibody
 - a. Fluorescent compound b. Biotin c. Colloidal gold particle d. all the three

Q.2 Attempt any seven questions 2x7=14

- a) How an innate immune system differs from adaptive immune system?
- b) Define hapten. Enlist its uses?
- c) Mention the characteristics of B cell epitopes.
- d) The B- and T-cell receptor proteins have remarkably short intracytoplasmic regions of just a few amino acids. How the signal transduction initiates upon antigen binding?
- e) Explain why serum IgM cannot activate complement prior to antigen binding?
- f) Define the terms pleiotropy, synergy and redundancy as they apply to cytokine.

C.P.T.O.-)

- g) Draw labeled diagrams of Class I and Class II MHC molecules.
- h) Explain the terms 'agglutination' and 'precipitation'.
- i) Explain different formats of ELISA.

Q.3	A	Describe the structure of spleen and comment on its role in B cell activation.	06
	B	Discuss various receptors of innate immunity.	06
OR			
	B	Write a note on inflammation.	06
Q.4	A	Describe how the following experimental manipulations were used to determine antibody structure.	06
		a. Reduction and alkylation of the antibody molecule	
		b. Enzymatic digestion of the antibody molecule	
		c. Antibody detection of immunoglobulin fragments	
	B	Describe the generation of C3 and C5 convertases by the three major pathways of complement activation.	06
OR			
	B	Write a note on "Gene rearrangement in T cell receptor genes".	06
Q.5	A	Which antigen processing and presentation pathway is used for cells infected with virus? Explain endogenous antigen processing and presentation pathway	06
	B	(i) Differentiate between peptide binding by MHC class I and class II molecules.	06
		(ii). Explain the characteristics of cytokines.	
OR			
	B	Explain the general model of signal transduction through JAK-STAT signaling pathway as mediated by most Class I and Class II cytokine receptors.	06
Q.6	A	Explain the mechanism of cell mediated and humoral immune response to viral infection.	06
	B	What are the two different ways by which a CTL kills target cells? Explain how a CTL kills cells by via Granzyme and Perforin Mediated Cytolysis.	06
OR			
	B	Write a note on antibody mediated effector response.	06

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