

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY****FIRST SEMESTER – NOVEMBER 2022****PBT1MC04 – IMMUNOLOGY AND IMMUNOTECHNOLOGY**

Date: 30-11-2022

Dept. No. 

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

**SECTION A****Answer ALL the questions**

<b>1</b>	<b>Choose the best option</b>	<b>(5 x 1 = 5)</b>	
a)	Which of the following arises from a myeloid progenitor? a) Neutrophil b) Myelin c) Memory B-cell d) Cytotoxic T-cell	K1	CO1
b)	Which of the following is the most abundant immunoglobulin present in mucous secretions? a) IgG b) IgM c) IgA d) IgE	K1	CO1
c)	Mast cells have a key role in the development of allergies as they can/have a tendency to a) produce IgE b) produce IgD c) agglutinate d) degranulate	K1	CO1
d)	The first production of live but non-virulent forms of chicken cholera bacillus was by a) Pasteur b) Jenner c) Salk d) Sabin	K1	CO1
e)	Which of the following is used as a blocking agent in immunofluorescence assays? a) BSA b) TE buffer c) TAE buffer d) Tween-20 in PBS	K1	CO1
<b>2</b>	<b>Answer in one or two sentences</b>	<b>(5 x 1 = 5)</b>	
a)	Identify the cell. I am a granulocyte and my granules stain red with Giemsa. I have enzymes that target parasitic worms.	K2	CO1
b)	Which chromosome/s are the Kappa light chain gene family and the Lambda light chain gene family located on?	K2	CO1
c)	Give an example of graft vs host rejection.	K2	CO1
d)	What is ring vaccination?	K2	CO1
e)	A blood sample agglutinated with Anti A and Anti B but not with Anti-D. Predict the blood group and Rh type.	K2	CO1

**SECTION B****Answer any THREE of the following in 500 words****(3 x 10 = 30)**

3	Compare positive and negative selection of T-cells.	K3	CO2
4	Draw a neat labelled diagram of the lymph node and comment on its immunological significance.	K3	CO2
5	Choose the correct terms with respect to type I hypersensitivity and arrange them in the right sequence to demonstrate the immune reaction.  binding of allergen to antigen presenting cell, RBCs, IL-4, Vasodilation, Neutrophils, Entry of Allergen, histamine release, IgE binds to receptor on Basophil, binding of allergen to antigen presenting cell, degranulation of basophils, presentation of allergen to T-Helper cells, B-cell activation, IgE production	K3	CO2

6	Sketch an image to depict different routes of vaccine administration and complete the following table with respect to vaccine administration.	<b>Vaccine</b>		<b>Route of Administration</b>		K3	CO2
		Rotavirus					
		Hepatitis B					
		Measles					
		BCG					
		Tetanus					

7	Plan an experiment based on immunodiffusion to estimate the concentration of an antigen in a given test sample.	K3	CO2
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**SECTION C**

**Answer any TWO of the following in 500 words (2 x 12.5 = 25)**

8	Distinguish between cellular and humoral immunity.	K4	CO3
9	a) Classify antigens on the basis of their origin b) Classify types of grafts	K4	CO3
10	Compare the Sabin and Salk polio vaccine.	K4	CO3
11	Compare anaphylaxis and atopy.	K4	CO3

**SECTION D**

**Answer any ONE of the following in 1000 words (1 x 15 = 15)**

12	The complement system provides a critical first-line defense against infection and depends on a sequence of proteins. Order the complement proteins to explain the formation of the MAC in the classical pathway.	K5	CO4
13	Summarise the key steps in site specific recombination of the kappa light chain of IgG.	K5	CO4

**SECTION E**

**Answer any ONE of the following in 1000 words (1 x 20 = 20)**

14	Present an essay on Type I Diabetes - highlight symptoms and immunological basis. How has biotechnology helped in disease management?	K6	CO5
15	A person received a live attenuated vaccine. Explain with a flow chart the immune response to the vaccine considering that the person had a healthy immune system.	K6	CO5

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