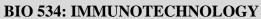


## MANIPAL UNIVERSITY MANIPAL INSTITUTE OF TECHNOLOGY DEPARTMENT OF BIOTECHNOLOGY

M.Tech. Industrial Biotechnology

## II SEM – END SEMESTER EXAMINATION – MAY 2016





	REG.No.						
TIME: 3 hrs	Answer any FIVE FULL ques	tions_			MAI	RKS	: 50
<b>1A.</b> What are the different type	es of blood group antigens in the	human sy	stem	?		(	(2m)
<b>1B.</b> What are the components	of innate immunity? Name a few	examples				(	(2m)
1C. There are different metho	ds by which antigens can be clas	sified. Ch	oose	a m	ethod	and	give
short notes on each of the type	es of antigens, according to that cl	assificatio	on me	tho	d.	(	(2m)
<b>1D.</b> How did Robert Koch pro	pose his postulates? Explain the e	experimen	t and	its !	basis.	(	(4m)
<b>2A.</b> What is the difference bet	ween an antibody and an immuno	globulin?	•			(	(2m)
<b>2B.</b> B Cells + Antigen →	+ ;; T Cells + Antiger	n <b>→</b>	+_		(	1m+	1m)
<b>2C.</b> Enlist any two unique feat	cures of the Complement System.					(	(2m)
<b>2D.</b> Draw the general structure of am immunoglobulin and label all the important parts. (4m)							
<b>3A.</b> Antigens from a same	source/species are less immuno	genic tha	an an	ı an	itigen	fron	n an
unrelated source. Why is it so	?					(	(2m)
<b>3B.</b> What do you mean by an a	adjuvant? Cite an example.					(	(2m)
<b>3C.</b> How is a monoclonal anti	ibody different from an antibody	synthesiz	ed by	y the	e huma	an bo	ody?
State any two functions of mor	noclonal antibodies.					(	(2m)
<b>3D.</b> How is the blood grouping	g test done? Explain with neat sc	hematic d	iagra	ms (	of the	react	ions
involved.						(	(4m)

<b>4A.</b> What are the different types of grafts possible? What type is the ordinary human k	idney
transplant?	(2m)
<b>4B.</b> What are the two important primary signals that are required for B-cell activation?	(2m)
4C. What do understand by surface immunoglobulin? How is it different from a sec	creted
immunoglobulin?	(2m)
4D. What do you understand by MHC? What are its different types? Draw the labelled stru	ucture
of each of the types.	(4m)
<b>5A.</b> Name any two methods to overcome Graft-vs-Host Reaction (GvHR).	(2m)
${\bf 5B.}$ The antigen-binding fragment, $F_{ab}$ , of the immunoglobulin has hypervariable genes.	Why
should it be so? What purpose does this serve?	(2m)
<b>5C.</b> What is meant by Class Switching? Describe with a random example pathway that inv	volves
a change of immunoglobulin type.	(2m)
5D. How many units of the IgM molecule make it a fully functional unit? Describe the s	salient
structural features of this immunoglobulin.	(4m)
<b>6A.</b> What is the purpose of positive selection of T-cells? Describe in brief.	(2m)
<b>6B.</b> State any two examples of immunosuppressive drugs.	(2m)
6C. Explain the major steps in the Classical Pathway of the Complement System, upto the	he C3
cleavage step.	(2m)
6D State any four functions of macrophages in warding off pathogenic infections	(4m)