MANIPAL UNIVERSITY
MANIPAL INSTITUTE OF TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
M.Tech. Industrial Biotechnology
II SEM – END SEMESTER EXAMINATION – MAY 2016

BIO 534: IMMUNOTECHNOLOGY

REG.No. | | | | | | | | | |

TIME: 3 hrs **Answer any FIVE FULL questions** **MARKS: 50**

1A. What are the different types of blood group antigens in the human system? **(2m)**

1B. What are the components of innate immunity? Name a few examples. **(2m)**

1C. There are different methods by which antigens can be classified. Choose a method and give short notes on each of the types of antigens, according to that classification method. **(2m)**

1D. How did Robert Koch propose his postulates? Explain the experiment and its basis. **(4m)**

2A. What is the difference between an antibody and an immunoglobulin? **(2m)**

2B. B Cells + Antigen → _____ + _____ ;; T Cells + Antigen → _____ + _____ **(1m+1m)**

2C. Enlist any two unique features of the Complement System. **(2m)**

2D. Draw the general structure of am immunoglobulin and label all the important parts. **(4m)**

3A. Antigens from a same source/species are less immunogenic than an antigen from an unrelated source. Why is it so? **(2m)**

3B. What do you mean by an adjuvant? Cite an example. **(2m)**

3C. How is a monoclonal antibody different from an antibody synthesized by the human body? State any two functions of monoclonal antibodies. **(2m)**

3D. How is the blood grouping test done? Explain with neat schematic diagrams of the reactions involved. **(4m)**

4A. What are the different types of grafts possible? What type is the ordinary human kidney transplant? **(2m)**

4B. 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 secreted immunoglobulin? **(2m)**

4D. What do you understand by MHC? What are its different types? Draw the labelled structure of each of the types. **(4m)**

5A. Name any two methods to overcome Graft-vs-Host Reaction (GvHR). **(2m)**

5B. The antigen-binding fragment, F_{ab}, of the immunoglobulin has hypervariable genes. Why should it be so? What purpose does this serve? **(2m)**

5C. What is meant by Class Switching? Describe with a random example pathway that involves a change of immunoglobulin type. **(2m)**

5D. How many units of the IgM molecule make it a fully functional unit? Describe the salient structural features of this immunoglobulin. **(4m)**

6A. What is the purpose of positive selection of T-cells? Describe in brief. **(2m)**

6B. State any two examples of immunosuppressive drugs. **(2m)**

6C. Explain the major steps in the Classical Pathway of the Complement System, upto the C3 cleavage step. **(2m)**

6D. State any four functions of macrophages in warding off pathogenic infections. **(4m)**