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MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VSEMESTER B.TECH. (BIO TECHNOLOGY)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: IMMUNOTECHNOLOGY [BIO 4006]

REVISED CREDIT SYSTEM (1/12/2016)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitable assumed.

1A.	The bacterial infection is countered by the innate component of the immune system. What are the oxygen dependent and oxygen-independent processes involved in this killing.	4
1B.	The innate immune system constitutes the first line of host defense, playing a crucial role in early recognition and elimination of leptospires, the causative organism for rat fever or leptospirosis. In one of the case studies, the complement system of the person was compromised. Will the person be prone or resistant to this pathogen? Give reasons	2
1C.	Why should the neutrophils undergo diapedesis? What are the hallmarks for the initiation, recruitment stage and destruction stage of inflammation	4
2A.	A child aged 10 months had a regular bout of infections and the test results showed a low level of humoral immunity including IgM levels. The immunologists who was consulted suggested a severe immunodeficiency due to a mutation in the developmental path of these BCR. What according to you would be the candidate molecule responsible for this condition? Give at least three reasons	4
2B.	Why is IgM always the first BCR to be made by the B cells?	2
2C.	A weaning 2 years old child was given locally available cow's milk. The first instance brought about a bout of diarrhea even though the milk was pasteurized. His drinking milk was discontinued. After 3 years he visited his aunt's house where he was offered chocolate shake. The very instance resulted in aggravated reaction in his body and he was rushed to the hospital. Why did the condition become worse even after a lapse of the years? Explain using a diagram only	4

3A.	T cells, are said to be of the lymphoid origin. Depict using a diagram , the development of the T cells starting from the bone marrow and culminating in the thymus	4
3B.	Drug addiction is a chronic, often relapsing brain disease that causes compulsive drug seeking and use, despite of harmful consequences to the drug addict. The chemical molecule that is often targeted is dopamine. Considering different actions of different drugs on this target molecule, how is the immunity affected?	2
3C.	The intracellular pathogens are presented by the MHC proteins to the T cells. With the help of a neat diagram, explain the path taken in the cell for this presentation.	4
4A.	A patient G who was suffering from thalassemia had to be regularly infused with blood. In one of the instance, the blood was not checked for HIV. The patient wanted to get checked for any infection .The clinician suggested ELISA to be undertaken for this patient. The two options were for direct and indirect ELISA. Diagrammatically depict the differences in the two types of ELISA. Which of the two would be more effective for this patient? Justify your choice.	4
4B.	There was an outbreak of scrub typhus, a bacterial infection in one of the tropical regions and the nodal lab was detecting it using the qPCR technique. How does the technique work? How is it different from conventional PCR.	4
4C.	In the technique of immunofluorescence, the antibody used are of monoclonal or polyclonal origin?	2
5A.	Cancer, is also one of the immunological condition. Justify using diagram	4
5B.	A 17-year-old female was admitted with a month-long history of involuntary movement bilaterally in hands and legs. The patient stated that the movements started one month ago and she also had occasionally involuntary movements of her mouth. The symptoms were mild in the beginning and gradually increased. The patient could not stand still and had difficulty while walking. She had consulted a rheumatologist about pain, swelling, redness in the joints, redness on face, and sensitivity to sunlight one and half months ago. After lab tests and physical examination the patient was diagnosed with systemic lupus erythematosus. How is Lupus different from rheumatoid arthritis immunologically	4
5C.	Zika virus had caused a lot of concern during the recent Olympics. If you had to create a vaccine against it, what would be the candidates	2