

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
IMMUNOLOGY: BIO F342
II SEMESTER: 2022-23
COMPREHENSIVE EXAMINATION

Max Marks: 90 (45 CB + 45B)
Total Time: 180 min

Date: 8th May, 2023

CLOSED BOOK (25+ 20)

NOTE: Be specific in your answer. Collect open book answer paper after submitting closed book answer sheet.

PART A (25M)

- Q1. Would vaccination be effective against chemically induced cancers. Justify. (3)
- Q2. Why do you think the body needs 5 different classes of antibodies, when an enormous repertoire could be generated even in a single class? (3)
- Q3. How can you explain the association of inflammation (at the site of infection) with
(i) Swelling (ii) Redness and (iii) Pain (3)
- Q4. Do you agree with the statement that the cell receptors participating in immunity are entirely germline-encoded. Justify (3)
- Q5. Which functions of antibody are independent of its receptors. Briefly explain (3)
- Q6. The circulation of blood depends on Heart. But what causes movement of lymph through the lymphatic vessel. Briefly suggest. (2)
7. Suggest 4 non immunological defenses against cancer. (2)
- Q8. Suggest 3 ways by which cyclosporin acts as an immunosuppressive agent. (3)
- Q9. Draw a graph showing the variation of CD4 cells and Viral Load with Time in patients inflicted with HIV. Also depict the various stages through which the patient passes from infection till death. (3)

PART B

Q10. Diagrammatically represent the locus of Ig heavy chain and the kappa light chain showing the distribution of individual gene segments. (5)

Q11. What is C3 tickover? How does the nature of C3 change after cleavage? What are the properties which assist in the binding of these molecules to bacterial surfaces? (5)

Q12. Why are CD4+ Tcells Class II MHC restricted and CD8+ Tcells Class I restricted? (5)

Q13. What is the 12/23 rule and how does it influence recombination in B cells? (5)

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
IMMUNOLOGY: BIO F342
II SEMESTER: 2022-23
COMPREHENSIVE EXAMINATION

Max Marks: 90
Total Time: 180 min

Date: 8th May, 2023

OPEN BOOK (25+20)

Note: Only hard copy (original or photocopy) of lecture notes, ppt. or text book/RB are allowed for the open book exam.

PART A (25M)

Q1. Why must you take an anti-tetanus injection if you step on a rusted nail in spite of receiving a childhood vaccine against Tetanus. Briefly explain. (3)

Q2. Can the following be immunogenic. Justify your answer

- (i) Mud
- (ii) Gaseous Sulphur dioxide
- (iii) Wheat

(3)

Q3 a. How many light chain domains are present in IgM in the following states (3)

- (i) Circulating form
- (ii) Membrane bound form

b. How many heavy chain domains are present in IgA present in milk

Q4. Can the Chemokine receptor 4 (CCR4) inhibitor such as SDF 1 be used for cure of M Tropic HIV virus. Justify. (3)

Q5. Do you think that bone is an immunology privileged site. What about testes. Justify your answer. (3)

Q6. Do you believe that it is possible to cause tumor regression by injecting inactivated bacteria. as done by Colin in 1891). Justify. (2)

Q7. Can DNA profiling be used to differentiate between muscle cells, Nerve cells and lymphocytes from the same individual. Justify your answer. (3)

Q8. Do you think that SCID mice can be used to study autoimmunity. Justify your answer. (3)

Q9. Enumerate 8 lessons that you have learnt from the Covid 19 era. (2)

PART B (20)

Q 10. What would possibly happen to antibody molecules if during development of the B cells, terminal transferase underwent a loss of function mutation? Explain. (5)

Q11. If the gene for artemis was deleted in an early embryonic state, what would be the possible effects on B and T cell production and why? Immunologically what would be the status of the organism if it survived? (5)

Q12. Are there differences in the late stage of complement activation by the three individual pathways? Justify your answer? What would happen if C9 was prevented from polymerizing? (5)

Q13. What is the difference between the Pro B cell and immature B cell surface receptors? What would happen if the pro B cell surface receptor did not form? (5)

GOOD LUCK