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Register Number:

DATE: 12-04-2017

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**M.Sc. MICROBIOLOGY – II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2017**

**MB 8216 – Immunology**

**Time- 2 1/2 hrs Max Marks-70**

**This paper contains 3 printed pages and 4 parts**

1. Answer any **FIVE** of the following **5 x 3 = 15**
2. Differentiate between primary and secondary immune response.
3. List the different properties of cytokines.
4. Explain the myeloid lineage of hematopoiesis.
5. What are adjuvants? Give examples.
6. List the criteria for a substance to qualify as an antigen.
7. What is oxygen dependent killing mechanism?
8. Mention the characteristic features of an ideal vaccine.
9. Answer any **FIVE** of the following **5 x 5 = 25**
10. You have purified IgG antibodies to bovine red blood cells (BRBCs) and digested some of the antibodies into Fab, Fc, and F(ab)2 fragments. Each preparation is placed in a separate tube and labeled as 1, 2. Based on the test results described below, indicate which preparation was contained in each tube and justify your answer.
11. The preparation in tube 1 agglutinated BRBCs but did not lyse them in the presence

complement.

1. The preparation in tube 2 did not agglutinate or lyse BRBCs and did not inhibit agglutination of BRBCs by whole anti-BRBC antiserum.
2. Describe the structure and function of the immune organ of which tonsils are an example.

**MB 8216-B -17**

1. Classify hypersensitive reactions based on generated effector molecules. How would you detect such reactions?
2. Define apoptosis and explain its mechanism with a diagram.
3. What is Isotype switching? Explain its mechanism .
4. How do cancerous cells manage to proliferate and circulate in the human body without being eliminated?
5. What is RIA? Explain
6. Answer any **TWO** of the following **2 x 10 = 20**
7. What are complement proteins? Explain how the complement system would be activated in an individual who has been bitten by a cobra.
8. Define monoclonal antibodies. Explain the important applications of the same.
9. Identify the condition from the clue(s) mentioned and elaborate on the mechanism involved with each:
10. Pulmonary hemorrhage
11. Drooping eyelids

1. Answer the following **1 x 10 = 10**
2. You are a pediatrician treating a child who needs a kidney transplant. The child does not have an identical twin, but both parents and five siblings are willing to donate a kidney.

a. Cells from the potential donors are screened with monoclonal antibodies to the HLA-A, -B, and -C antigens in a microcytotoxicity assay. In addition, ABO blood-group typing is performed. With help of the results tabulated below, the graft from which donor has the highest chances to survive in the host body? **(5)**

**Results table for 18(a)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **ABO TYPE** | **HLA-A TYPE** | **HLA-B TYPE** | **HLA-C TYPE** |
| RECIPIENT | O | A1/A2 | B8/B12 | Cw3 |
| MOTHER | A | A1/A2 | B8/B12 | Cw1/Cw3 |
| FATHER | O | A2 | B12/B15 | Cw3 |
| SIBLING 1 | O | A1/A2 | B8/B15 | Cw3 |
| SIBLING 2 | O | A2 | B12 | Cw1/Cw3 |
| SIBLING 3 | O | A1/A2 | B8/B12 | Cw3 |
| SIBLING 4 | A | A1/A2 | B8/B12 | Cw3 |
| SIBLING 5 | O | A1/A2 | B8/B15 | Cw3 |

b. To be doubly sure, one-way MLR is performed using various combinations of mitomycin-treated lymphocytes. The results, expressed as counts per minute of [3H] thymidine incorporated, are tabulated below; the stimulation index (ratio of the sample(donor) value to the control in which identical leukocytes are mixed) is listed below in parentheses. Based on these data, a graft from which donor(s) is most likely to be accepted? **(5)**

**Results table for 18(b)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Responder cells** | **Mitomycin C treated stimulator cells** | | | | | |
| **Patient** | **Sibling 1** | **Sibling 2** | **Sibling 3** | **Sibling 4** | **Sibling 5** |
| **Patient** | 1,672  (1.0) | 1,800  (1.1) | 13,479  (8.1) | 5,210  (3.1) | 13,927  (8.3) | 13,808  (8.3) |