King Saud University

Collage of science

Department of Botany & Microbiology

Final Exam (MBio 451 Immunology)

First semester of 1436 / 1437

Time: 3 hours

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Un. No:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**جامعة اللملك سعود**

**كلية العلوم**

**قسم النبات والأحياء الدقيقة**

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**Important note: Transfer all your answers to this sheath**

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| **Q4: (5marks)** |
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| **Q1:**  **(12marks)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **Q2:**  **(15marks)** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** |  | |
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| **Q3:**  **(3marks)** | **23** | **24** | **25** | **26** | **27** |  | | | | |
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| **Q5: (5marks)** | |
| **28** |  |
| **29** |  |
| **30** |  |
| **31** |  |
| **32** |  |

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**Q1: Choose the correct answer in the following statement:** (12 marks)

1. Immediately following a break in the skin, phagocytes engulf bacteria within the wound. This is an example of an \_\_\_\_\_\_\_\_\_ immune response which is \_\_\_\_\_\_\_\_\_\_ against a pathogen.

1. Adaptive, specific
2. innate, specific
3. innate, nonspecific
4. adaptive, nonspecific

2. \_\_\_\_\_\_\_\_\_\_ are responsible for the production of antibody against free pathogens and soluble products from pathogens while \_\_\_\_\_\_\_\_\_\_ destroy pathogen, virally infected cells and abnormal cells.

1. Cytotoxic T cells, B cells
2. Macrophage, T cells
3. B cells, Th cells
4. B cells, Cytotoxic T cells

3. Antigen presenting cells (APCs) expresses \_\_\_\_\_, which have the ability to recognise pathogen.

1. Pathogen Associated Molecular Patterns (PAMPs)
2. Toll-like receptors (TLR)
3. A and B
4. Non of the above

4. Which components are considered a T- independent antigen?

1. Polysaccharides
2. Adjuvant
3. Flagella
4. Peptidoglycan
5. All the above

5. Which statement is true about CD4+ T cells?

1. Expressed by most human nucleated cells
2. Bind antigen associated with MHC-II
3. Bind antigen associated with MHC-I
4. Cytotoxic cells
5. C and D

6. One of the features of adaptive immune response below is false.

1. Antigenic Specificity
2. Immunologic memory
3. Self/ Non-Self Recognition
4. First line of defence against infection

7. Active regions of pathogen that binds to antigen-specific receptors on lymphocytes or to secreted antibodies are known as \_\_\_\_\_\_\_\_\_\_.

1. Epitope
2. Antibody
3. Complements
4. Fc receptor

8. The central lymphoid tissue where T cells maturation is\_\_\_\_\_\_\_\_\_.

1. Lymph node
2. Thymus
3. Spleen
4. Payer’s patches
5. Bone marrow

9. Glycoproteinsfound in serum and tissue fluids which are produced in response to contact with immunogenic foreign molecules as well as bind specifically to the antigen that induced their formation.

1. Antibody
2. Lysozyme
3. Complement
4. Plasma cells
5. B cells

10. \_\_\_\_\_\_\_\_\_\_\_\_ is an attachment of the antigen to the polystyrene plate (microplate) followed by an enzyme-labeled antibody.

1. Indirect ELISA
2. Sandwich ELISA
3. Agglutination test
4. Direct ELISA
5. Immunofluorescence assay

11. Which figure below represents the lowest affinity?



A

C

B

12. \_\_\_\_\_\_\_\_\_\_are soluble factors of innate immunity against viral infection and also are capable to protect uninfected cells, but\_\_\_\_\_\_\_\_\_\_\_ have cytotoxicity function and can lyse target cells.

1. IFN-γ / NK cells
2. IFN-α and IFN-β / NK cells
3. Complements / NK cells
4. Antibodies / CD8+ cells

**Q2: Write True or False at the end of each statement?**  (15 marks)

13. Anaphylaxis is caused by IgG-mediated histamine release from mast cells.

14. Live (attenuated) vaccine is more immunogenic than killed (inactivated) vaccine but is less safe.

15. Passive immunisation is an administration of antibody-containing serum or sensitised cells.

16. NK cells recognise cell that have no expression of MHC-I.

17. Variolation is the term used for the process of both getting the vaccine and becoming immune to the disease.

18. Lymph node is part of secondary lymphoid tissue and its paracortex contains B and T cells

19. The antibacterial role of antibody role is to activate the alternative complement pathway resulting membrane attack complex (MAC) and opsonisation of bacteria via CR.

20. All test based on Ab/Ag reaction can be used to detect only antibody.

21. The ability of an individual Ab combining site to react with one antigen is known as cross reactivity.

22. IgM has 10 identical heavy and 5 identical light chains and also, it is more efficient complement fixing antibody than IgG

**Q3: Choose from the following**; each choice may be used once, more than once or not at all **(5 marks)**

a) transferred across the placenta

b) exists in in both monomeric and Dimeric forms

c) Found at B lymphocyte cell surface as a membrane bound monomer

d) predominant Ig in primary and secondary responses

e) Binds to the Fc receptors of mast cells and basophils.

23. \_\_\_\_\_ IgA

24. \_\_\_\_\_ IgG

25. \_\_\_\_\_ IgM

26. \_\_\_\_\_ IgE

27. \_\_\_\_\_ IgD

**Q4:** Recently, the ministry of health in Saudi Arabia has scheduled pneumococcal conjugate vaccine (PCV) instead of pneumococcal PS vaccine in the national immunization programme. **Why do you think the ministry of health has approved that?** On the other hand, **PCV have several limitations. State them?** (3 marks)

**Q5:** Mrs Emaan has the blood group O, Rhesus negative, and her husband Mr Ahmed is B, Rhesus positive. They have four children, but two have been affected by hemolytic disease of the newborn (HDNB), as follow: (5 marks)

* First child was born 2003- unaffected
* Second child was born 2009- mildly affected
* Third child was born 2012- seriously affected, required blood transfusion
* Fourth child was born 2015- unaffected

The cause of hemolytic disease in both affected cases was identified as antibodies to Rhesus D binding to the child’s red blood cells. Mrs Emaan was given antibodies to the Rhesus D blood group following the second, third, and fourth deliveries.

28. From this information what can you deduce about the blood group of the first child?

29. What is the reason for giving the mother anti-Rhesus D antibodies?

30. Why are antibodies given postpartum (after birth) and not earlier?

31. What is the type of hypersensitivity reaction of HDNB?

32. Which antibodies classes are mediated in this reaction?

Good luck ****

Dr. Ayman S Mubarak