



**KISII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE**  
**OF BACHELOR OF SCIENCE IN NURSING**  
**FIRST SEMESTER, 2021/2022**  
**(FEBRUARY - JUNE, 2022)**

**NUR 211: IMMUNOLOGY**

**STREAM: Y2 S1**

**TIME: 3 HOURS**

**DAY: FRIDAY, 9:00 – 12:00 P.M.**

**DATE: 20/05/2022**

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**INSTRUCTIONS:**

- 1. Do not write anything on this question paper.**
- 2. Instructions: Answer all questions in section A, B and C.**

**SECTION A (20 marks)**

1. The mononuclear phagocyte system does not include:  
A Monocytes  
B Kupffer cells.  
C Kidney mesangial cells.  
D Lymph node medullary macrophages.  
E Endothelial cells.
2. Complement component C3 is cleaved by:  
A C3b  
B C3bBb  
C Factor B  
D Factor D  
E Factor H
3. Which of the following cells is involved in cell-mediated immunity?  
A Neutrophils  
B T cells  
C Mast cells  
D Thrombocytes  
E Fibroblasts
4. Which of the following statements is true about the IgM of humans?  
A IgM can cross the placenta  
B IgM can protect the mucosal surface  
C IgM is produced by high-affinity plasma cells  
D IgM is primarily restricted in the circulation  
E IgM is associated with allergies

5. Adoptive transfer of acquired immune responsiveness involves the transfer of:
  - A Antibody
  - B Complement
  - C Phagocytes
  - D Lymphocytes
  - E Serum
6. Immunological unresponsiveness to self antigens is called:
  - A Tolerance
  - B Tolerogen
  - C Memory
  - D Acquired immunity
  - E ADCC
7. Edward Jenner vaccinated against smallpox using:
  - A Killed smallpox virus
  - B A recombinant protein derived from smallpox
  - C An unrelated virus
  - D Toxoid
  - E Cowpox
8. An immune response against grass pollen often involves:
  - A Pathogen-associated molecular patterns
  - B Breakdown of self-tolerance
  - C A hypersensitivity reaction
  - D Reaction against MHC
  - E Persistent infection by the pollen
9. The basic Ig unit is composed of:
  - A 2 identical heavy and 2 identical light chains.
  - B 2 identical heavy and 2 different light chains.
  - C 2 different heavy and 2 identical light chains.
  - D 2 different heavy and 2 different light chains.
  - E Non-covalently bound polypeptide chains.
10. The MHC class I heavy chain consists of:
  - A Beta<sub>2</sub>-microglobulin.
  - B Three Ig-type domains.
  - C A truncated MHC class II heavy chain.
  - D Three globular domains.
  - E Two globular domains.
11. The processing of cytosolic protein involves:
  - A Transport into late endosomes.
  - B Proteasome-mediated cleavage.
  - C Displacement of invariant chain.
  - D Displacement of beta<sub>2</sub>-microglobulin.
  - E Binding to the MHC class II groove.
12. The processed peptide binding to the MHC class I groove:
  - A Is usually more than 11 amino acids long.
  - B Hangs over the ends of the groove.
  - C Usually binds to the groove through 2 anchor residues.
  - D Is mainly recognized by the CDR2 of the T-cell receptor chains.
  - E Is derived from exogenous protein taken in by endocytosis.

13. An example of a 'nonclassical' MHC molecule is:
- A H-2 A
  - B HLA-C
  - C H-2 L
  - D H-2E
  - E H-2 m
14. An epitope:
- A Is the area on an antigen which contacts antibody.
  - B Is the area on an antibody which contacts antigen.
  - C Requires both antigen-binding arms of the antibody molecule for its recognition.
  - D Is usually composed of a linear sequence of amino acids.
  - E Is usually associated with a concave region of the antigen.
15. Peptides produced by processing of cytosolic proteins largely:
- A Are generated in late endosomal vacuoles.
  - B Enter the endoplasmic reticulum by diffusion.
  - C Are presented at the cell surface with MHC class II to CD4 T-helpers.
  - D Are presented at the cell surface with MHC class II to CD8 cytotoxic T-cells.
  - E Are presented at the cell surface with MHC class I to CD8 cytotoxic T-cells.
16. Which one of the following is a primary lymphoid organ:
- A Lymph nodes
  - B Spleen
  - C Peyer's patch
  - D Tonsil
  - E Thymus
17. The paracortical area of a lymph node comprises mainly:
- A Follicular dendritic cells
  - B Plasma cells
  - C Macrophages
  - D B-cells
  - E T-cells
18. Langerhans' cells are found in:
- A Lymph
  - B Lymph nodes
  - C Periarteriolar lymphoid sheaths
  - D Skin
  - E Mantle zone
19. Which of the following immunity is present from our birth?
- A Innate Immunity
  - B Active immunity
  - C Passive immunity
  - D Acquired immunity
  - E Adaptive immunity
20. Which of the following cells is involved in cell-mediated immunity?

- A T-cells
- B B-cells
- C Mast cells
- D Both T and B cells
- E NK cells

**SECTION B (40 marks)**

1. List factors not directly related to immune system that affect an individual's overall ability to resist infections [6 marks]
2. Analyze the intact skin as physical barriers in innate immunity [7marks]
3. Interview biological effects of complement activation in innate immunity [5marks]
4. Summarise characteristics of specific immunity [4marks]
5. Relate the functions of:
  - a) Functions of MHC class I [4marks]
  - b) Functions of MHC class II [4 marks]
6. Discuss variety of possible effects caused when Antibodies bind to antigens [6 marks]
7. Use a well labelled diagram to illustrate the structure of the Thymus gland [5marks]

**SECTION B (40 marks)**

1. Elaborate factors influencing immunogenicity [20 marks]
2. Discuss macrophages guided by titles below:
  - a. Types of Macrophages [8 marks]
  - b. The functions of macrophages (5marks)
  - c. The process of phagocytosis [7marks]