

Roll No. ....

**D-1010**

**M. Sc. (Fourth Semester) (Main/ATKT)  
EXAMINATION, May-June, 2020**

ZOOLOGY

**(Optional Group—I)**

Paper Fifth

**(Biology of Vertebrate Immune System)**

*Time : Three Hours ] [ Maximum Marks : 80*

**Note :** Attempt all Sections as directed.

**Section—A** 1 each

**(Objective/Multiple Choice Questions)**

**Note :** Attempt all questions.

Choose the correct answer :

1. Cords of Biliroth are found in :

- (a) Bone Marrow
- (b) Spleen
- (c) Lymph Nodes
- (d) Thymus

2. Mesangial cells are found in :

- (a) Brain
- (b) Thymus
- (c) Liver
- (d) Kidney

3. Activation of naïve T lymphocytes is best achieved by :

- (a) Macrophages
- (b) Neutrophils
- (c) Mast cells
- (d) Dendritic cells

4. Identify the incorrect statement :

- (a) The chemical nature of MHC molecules is glycoprotein.
- (b) MHC is located on chromosome 17 in humans.
- (c) Class I MHC expression is seen in all nucleated cells.
- (d) Class II MHC expression is restricted to antigen presenting cells.

5. Which of the following is a primary lymphoid organ ?

- (a) Bone marrow
- (b) Lymph node
- (c) Peyer's patches
- (d) Spleen

6. Lymphokines are secreted by :

- (a) Killer T cells
- (b) Plasma cells
- (c) Helper T cells
- (d) Suppressor T cells

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7. Earliest immunoglobulin to be synthesized in the foetus is :
- (a) IgA
  - (b) IgG
  - (c) IgE
  - (d) IgM
8. Prausnitz-Kustner (PK) reaction is associated with :
- (a) IgD
  - (b) IgB
  - (c) IgG
  - (d) IgM
9. T cell receptors are :
- (a) Heterodimer of two transmembrane glycoprotein chains
  - (b) Homodimer of two transmembrane glycoprotein chains
  - (c) Serpentine transmembrane lipoprotein chains
  - (d) Heterodimer of four transmembrane glycoprotein chains
10. The B cells with longest life span are :
- (a) Pro-B cell
  - (b) Mature Naïve B cell
  - (c) Memory B cell
  - (d) Plasma cell
11. Which of the following structures is constituted by both light and heavy chains of the antibody ?
- (a) Complement binding site

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- (b) J-chain binding site
  - (c) F<sub>C</sub> receptor binding site
  - (d) Antigen binding site
12. Which of the following is not a B cell coreceptor ?
- (a) CD28
  - (b) CD19
  - (c) CD81
  - (d) CD21
13. Light chains are made of :
- (a) one V and one J segment in the variable region plus a constant region that is common in all light chains
  - (b) one V, one D and one J segment in the variable region plus a constant region that is common in all light chains
  - (c) one V and one J segment in the variable region plus one of two possible different constant region segments
  - (d) one V and one J in the variable region and no constant region
14. Vaccines against viruses are usually :
- (a) Given at birth
  - (b) Expensive
  - (c) Either live-attenuated or killed
  - (d) Mainly polysaccharide

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15. Antibody dependent cytotoxicity is mediated by which cells ?
- (a) B cells
  - (b) T cells
  - (c) Thymocytes
  - (d) Natural Killer cells
16. Which of the following statement is not true regarding the sensitization phase of delayed-type hypersensitivity (DTH) ?
- (a) The sensitization phase begins 1-2 weeks after the primary contact with antigens.
  - (b) T cell undergo activation and clonal expansion after interacting with antigen-MHC complex.
  - (c) CD<sup>8+</sup> T Helper-1 cells are primarily activated after exposure to antigen.
  - (d) CD<sup>4+</sup> T Helper-1 cells are primarily activated after exposure to antigen.
17. An enzyme-linked immunoassay (ELISA) :
- (a) Requires an antigen labelled with a radioactive isotope
  - (b) Requires each antibody molecule to recognize two epitopes on the antigen
  - (c) Requires a pure sample of antigen to assay
  - (d) May use chemiluminescence as a detection method

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18. Which of the following statements about monoclonal antibody production is true ?
- (a) B cell + hybridoma → myeloma
  - (b) B cell + myeloma → hybridoma
  - (c) B cell + spleen cell → hybridoma
  - (d) T cell + hybridoma → myeloma
19. Which of the following diagnostic immune tests is incorrectly paired ?
- (a) direct fluorescent antibody : rabies, identification of lymphocytes subsets
  - (b) complement fixation : measles, coxiella, syphilis
  - (c) immunoblot : confirms HIV and Lyme disease
  - (d) immunodiffusion : diagnosis of specific strains of viruses
20. Which of the following is evidence of viral neutralization ?
- (a) presence of viral hemagglutination
  - (b) absence of cytopathic effect
  - (c) absence of antigen-antibody precipitation
  - (d) presence of viral fragments in the patient's serum

**Section—B**

2 each

**(Very Short Answer Type Questions)**

**Note :** Attempt all questions in 1-2 sentences.

1. What is the role of spleen in human body ?

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2. What are dendritic cells ?
3. Define tissue typing.
4. Define complement system.
5. What is Haemolytic disease of the new born ?
6. Which antibodies are expressed by naïve B cells ?
7. Define anaphylactic shock.
8. What are the third-generation vaccines ?

**Section—C**

3 each

**(Short Answer Type Questions)**

**Note :** Attempt all questions in 75 words.

1. Which cells are derived from myeloid lineage ?
2. Explain the first line of defense in human body.
3. What are atitigenic determinants ?
4. Draw well labelled diagram of atypical antibody.
5. Define class switching.
6. What is the function of NK cells in immunity ?
7. A child is stung by honey bee. What immune responses will be elicited in the body ?
8. What is Sandwich ELISA ?

**Section—D**

5 each

**(Long Answer Type Questions)**

**Note :** Attempt all questions in 150 words.

1. What are the differences between innate and acquired immunity ?

*Or*

Explain physiological barriers of immune system.

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2. What is the role of MHC I and MFC II proteins in immunity ?

*Or*

Write down the properties of different classes of antibodies.

3. Explain V(D)J recombination in immunoglobulins.

*Or*

Explain the different types of vaccines.

4. Describe the process of monoclonal antibody formation.

*Or*

Explain the different techniques to study immunodiffusion.

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