

Immunology — Mid-Term Past Paper MCQs

Makeup Examination Preparation Bank

33 Questions · 5 Choices Each · Correct Answers Highlighted

note: Some questions are generated by Ai to fit the answers mentioned by students, Others where refined and choices other than mentioned where added to simulate exam questions.

Innate Immunity

Q1. Which of the following does NOT directly contribute to the integrity of the epithelial lining of the upper respiratory tract?

- A. Bacterial microbiota
- B. Tight junctions between epithelial cells
- C. Neutrophils**
- D. Mucus secretion
- E. Intraepithelial T lymphocytes

✓ **Correct Answer: C. Neutrophils**

Q2. Which of the following cell types, when deficient, would most severely impair clearance of extracellular bacterial infections?

- A. B lymphocytes
- B. Neutrophils**
- C. Natural killer (NK) cells
- D. CD8⁺ cytotoxic T cells
- E. Dendritic cells

✓ **Correct Answer: B. Neutrophils**

Q3. All of the following are functions of neutrophils EXCEPT:

- A. Formation of neutrophil extracellular traps (NETs)
- B. Recognition of pathogens via surface pattern-recognition receptors
- C. Secretion of granzymes and lactoferrin
- D. Secretion of collagen and elastin**
- E. Phagocytosis and phagolysosome formation

✓ **Correct Answer: D. Secretion of collagen and elastin**

Q4. Regarding chronic granulomatous disease (CGD), which of the following statements is TRUE?

- A. It results from a deficiency in T cell receptor signaling
- B. It is caused by a defect in the NADPH oxidase complex of phagocytes**
- C. It leads to inability to produce antibodies
- D. It is characterized by deficiency of natural killer cells
- E. It primarily affects adaptive immunity

✓ **Correct Answer: B. It is caused by a defect in the NADPH oxidase complex of phagocytes**

Q5. Defensins are best characterized as:

- A. Large glycoprotein opsonins secreted by macrophages
- B. Small cationic antimicrobial peptides found on epithelial surfaces**
- C. Complement proteins that form the membrane attack complex
- D. Cytokines that activate NK cells
- E. Immunoglobulins secreted across mucosal surfaces

✓ **Correct Answer: B. Small cationic antimicrobial peptides found on epithelial surfaces**

Q6. C-reactive protein (CRP) is best described as:

- A. A cytokine that directly kills bacteria
- B. An acute-phase protein whose serum levels rise during inflammation**
- C. A complement inhibitor that prevents MAC formation
- D. A surface receptor on neutrophils for IgG
- E. A soluble pattern-recognition molecule of the adaptive immune system

✓ **Correct Answer: B. An acute-phase protein whose serum levels rise during inflammation**

Q7. Ficollins are best classified as:

- A. Membrane-bound receptors on B cells
- B. Intracellular inflammasome components
- C. Soluble pattern-recognition molecules of innate immunity**
- D. Pro-inflammatory cytokines secreted by macrophages
- E. Antibody subclasses involved in mucosal immunity

✓ **Correct Answer: C. Soluble pattern-recognition molecules of innate immunity**

Q8. Inflammasomes are intracellular multiprotein complexes. Their primary function is to:

- A. Present antigen on MHC class II molecules to CD4⁺ T cells
- B. Activate caspase-1, leading to maturation and release of IL-1 β and IL-18**
- C. Facilitate VDJ recombination in B lymphocytes
- D. Promote class-switch recombination to IgE
- E. Generate reactive oxygen species via NADPH oxidase

✓ **Correct Answer: B. Activate caspase-1, leading to maturation and release of IL-1 β and IL-18**

Complement System

Q9. Which of the following pairs regarding the complement system is CORRECT?

- A. C4b: component of the alternative pathway C3 convertase
- B. C5b-9: forms a pore (membrane attack complex) in the bacterial cell wall**
- C. Mannose-binding lectin (MBL): activates the classical pathway
- D. C3a: acts as an opsonin to enhance phagocytosis
- E. C1q: activates the alternative pathway directly

✓ **Correct Answer: B. C5b-9: forms a pore (membrane attack complex) in the bacterial cell wall**

Q10. Which complement fragment is the most effective opsonin, enhancing phagocytosis by coating pathogens?

- A. C1q

- B. C3a
- C. C3b**
- D. C5a
- E. C9

✓ **Correct Answer: C. C3b**

NK Cells & Cytotoxic Lymphocytes

Q11. Which of the following is a feature COMMON to both natural killer (NK) cells and cytotoxic T lymphocytes (CTLs)?

- A. Requirement for MHC class I recognition for activation
- B. Requirement for MHC class II recognition for activation
- C. Activation triggered by absence of MHC class I on target cells
- D. Induction of target cell apoptosis via perforin and granzymes**
- E. Activation followed by clonal expansion and memory cell formation

✓ **Correct Answer: D. Induction of target cell apoptosis via perforin and granzymes**

Q12. A mouse is injected with interferon-alpha (IFN- α). Which of the following effects is most expected?

- A. Upregulation of MHC class II on CD4⁺ T cells
- B. Increased expression of MHC class I on CD8⁺ T cells
- C. Suppression of NK cell cytotoxicity
- D. Increased NK cell cytotoxic activity**
- E. Induction of B cell class switching to IgE

✓ **Correct Answer: D. Increased NK cell cytotoxic activity**

T Cells, MHC & Cytokines

Q13. Peptides displayed on MHC class II molecules are derived from:

- A. Endogenous viral peptides processed in the cytosol
- B. Peptides generated by the proteasome
- C. Extracellular antigens taken up by endocytosis**
- D. Self-peptides generated during thymocyte development only
- E. Nuclear antigens released during apoptosis

✓ **Correct Answer: C. Extracellular antigens taken up by endocytosis**

Q14. Which T helper cell subset is primarily responsible for orchestrating the immune response against helminthic (parasitic worm) infections?

- A. Th1
- B. Th2**
- C. Th17
- D. Treg
- E. Tfh

✓ **Correct Answer: B. Th2**

Q15. IFN- γ is a cytokine most closely associated with the activation of which T helper cell subset?

- A. Th2
- B. Th17
- C. Th1**
- D. Treg
- E. Tfh

✓ **Correct Answer: C. Th1**

Q16. To inhibit the effector immune response of macrophages to gram-negative bacteria, which of the following would be the most potent target?

- A. TLR2 inhibitor
- B. TLR4 inhibitor
- C. CR3 (complement receptor 3) inhibitor**
- D. IL-6 receptor antagonist
- E. MHC class II blocker

✓ **Correct Answer: C. CR3 (complement receptor 3) inhibitor**

Q17. Inhibition of MyD88 signaling would primarily affect which of the following processes?

- A. B cell receptor (BCR) activation and antibody production
- B. Toll-like receptor (TLR) downstream signaling and NF- κ B activation**
- C. T cell receptor (TCR) signaling and CD3 complex function
- D. Complement alternative pathway activation
- E. NK cell recognition of missing-self

✓ **Correct Answer: B. Toll-like receptor (TLR) downstream signaling and NF- κ B activation**

B Cells & Immunoglobulins

Q18. Which cells, upon activation by antigen, give rise to both plasma cells and memory B cells?

- A. Naive CD4⁺ T cells
- B. Follicular dendritic cells
- C. B lymphocytes**
- D. Plasmablasts only
- E. NK cells

✓ **Correct Answer: C. B lymphocytes**

Q19. Referring to an immunoglobulin structure diagram, which region contains the complementarity-determining regions (CDRs)?

- A. Constant region of heavy chain only
- B. Variable regions of both heavy and light chains**
- C. Fc region of the heavy chain
- D. Hinge region
- E. Constant region of light chain only

✓ **Correct Answer: B. Variable regions of both heavy and light chains**

Q20. Referring to an immunoglobulin structure diagram, which region of the antibody interacts with Fc receptors on macrophages?

- A. Variable region of the light chain
- B. Variable region of the heavy chain
- C. Fab region
- D. Fc region (constant region of heavy chain)**
- E. Hinge region

✓ **Correct Answer: D. Fc region (constant region of heavy chain)**

Q21. Which immunoglobulin class is the FIRST to appear in circulation during a primary immune response?

- A. IgG
- B. IgA
- C. IgM**
- D. IgE
- E. IgD

✓ **Correct Answer: C. IgM**

Q22. Regarding immunoglobulin gene structure, which of the following is TRUE about the light chain?

- A. Light chains undergo V, D, and J gene segment recombination
- B. Light chains do not contain a D (diversity) gene segment**
- C. Light chains are encoded solely by the J gene segment
- D. Light chains contain more variable regions than heavy chains
- E. Light chains are produced only after class-switch recombination

✓ **Correct Answer: B. Light chains do not contain a D (diversity) gene segment**

Q23. RAG1 and RAG2 recombinases are essential for which process in lymphocyte development?

- A. Somatic hypermutation of the variable region
- B. Class-switch recombination from IgM to IgG
- C. V(D)J recombination and cleavage during antigen receptor assembly**
- D. Activation-induced deaminase (AID) activity
- E. Affinity maturation in germinal centers

✓ **Correct Answer: C. V(D)J recombination and cleavage during antigen receptor assembly**

Q24. Somatic hypermutation, which increases antibody affinity during an immune response, occurs predominantly in the:

- A. Constant region of the heavy chain
- B. Hinge region of IgG
- C. Variable regions of both heavy and light chains**
- D. J gene segments of the light chain only
- E. Fc region of IgM

✓ **Correct Answer: C. Variable regions of both heavy and light chains**

Q25. Follicular dendritic cells (FDCs) are primarily found in:

- A. The thymic cortex, supporting T cell development
- B. The bone marrow, presenting antigens to B cell precursors
- C. Germinal centers of lymphoid follicles**
- D. The marginal zone of the spleen only

E. Peripheral blood, circulating as antigen-presenting cells

✓ **Correct Answer: C. Germinal centers of lymphoid follicles**

Q26. The enormous diversity of the antibody repertoire, enabling recognition of millions of different antigens, is primarily generated by:

A. Differential glycosylation of the Fc region

B. Combinatorial association of different heavy and light chain V, D, and J gene segments

C. Post-translational modification of the CDR loops

D. Alternative splicing of constant region exons

E. Transcriptional variation in the promoter region

✓ **Correct Answer: B. Combinatorial association of different heavy and light chain V, D, and J gene segments**

Mast Cells, Eosinophils & Hypersensitivity

Q27. IgE complexed with antigen is most important for the activation of which cell type?

A. Neutrophils

B. Macrophages

C. Mast cells

D. CD8⁺ T cells

E. B lymphocytes

✓ **Correct Answer: C. Mast cells**

Q28. The primary immunological role of mast cells in hypersensitivity reactions is:

A. Phagocytosis of opsonized bacteria

B. Presentation of antigen on MHC class II to T helper cells

C. Mediating type I hypersensitivity through degranulation and release of histamine

D. Production of IgE antibodies

E. Killing parasites via antibody-dependent cellular cytotoxicity (ADCC)

✓ **Correct Answer: C. Mediating type I hypersensitivity through degranulation and release of histamine**

Q29. Eosinophils are most critically involved in the immune defense against:

A. Intracellular viral infections

B. Gram-positive bacterial infections

C. Helminthic (parasitic worm) infections

D. Fungal infections of the lung

E. Gram-negative sepsis

✓ **Correct Answer: C. Helminthic (parasitic worm) infections**

Adaptive Immune Response & Clinical Correlates

Q30. In comparing primary and secondary adaptive immune responses, which of the following rows from the table below is INCORRECT?

A. Primary response takes 1–2 weeks; secondary response takes only a few days

B. Primary response produces more antibody classes; secondary response produces fewer classes with IgM predominating

C. Primary response produces less antibody; secondary response produces more antibody

- D. Secondary response relies on memory cells generated during the primary response
- E. Secondary response antibodies have higher affinity due to somatic hypermutation

✓ **Correct Answer: B. Primary response produces more antibody classes; secondary response produces fewer classes with IgM predominating**

Q31. Which of the following findings is NOT likely to be observed in a septic patient within the first 48 hours?

- A. Elevated pro-inflammatory cytokines (e.g., TNF- α , IL-6)
- B. Neutrophilia
- C. Activation of the complement system
- D. Depletion of CD4⁺ T helper cells**
- E. Fever and tachycardia

✓ **Correct Answer: D. Depletion of CD4⁺ T helper cells**

Q32. TNF- α (tumor necrosis factor-alpha) plays a central role in inflammation. Which of the following best describes its primary function?

- A. Inhibiting macrophage activation
- B. Promoting vasodilation, fever, and activation of NF- κ B-driven inflammatory gene expression**
- C. Suppressing neutrophil recruitment to infected tissues
- D. Inducing class-switch recombination to IgA
- E. Stimulating Treg differentiation to dampen immune responses

✓ **Correct Answer: B. Promoting vasodilation, fever, and activation of NF- κ B-driven inflammatory gene expression**

Q33. Rheumatic fever following Streptococcus pyogenes infection is an example of which immune mechanism?

- A. Superantigen-mediated T cell activation
- B. Immune complex deposition (type III hypersensitivity)
- C. Molecular mimicry — cross-reactive antibodies targeting cardiac tissue**
- D. Complement-mediated cytolysis of cardiac cells
- E. Delayed-type hypersensitivity (type IV) mediated by CD8⁺ T cells

✓ **Correct Answer: C. Molecular mimicry — cross-reactive antibodies targeting cardiac tissue**

Note: Questions marked with (may be) in the original notes indicate lower confidence in the recalled answer. Questions involving diagrams (Ig cartoon, complement table) have been reconstructed from the described content. Always cross-reference with your course lecture notes.

Immunology Past Paper Questions of Final Exam

Q1. Which type of transplant has the highest risk of rejection?

- A. Heart transplant
- B. Kidney transplant
- **C. Hematopoietic stem cell transplant**
- D. All of them pose the same risk

Q2. Treatment with steroids downregulates all of the following EXCEPT:

- **A. Lipocortin**
- B. Pro-inflammatory cytokines
- C. Cyclooxygenase-2 (COX-2)
- D. Adhesion molecules

Q3. Failure of positive selection in the thymus will result directly into:

- A. Autoimmune disease
- **B. Death by neglect**

Q4. A kidney transplant patient experiences rejection after 6 months, presenting with lymphocyte infiltration and vasculitis. This process is primarily mediated by:

- A. Complement C1q deposition
- **B. Cytotoxic T lymphocytes**

Q5. Which of the following is TRUE regarding memory B lymphocytes?

- A. They actively secrete IgM
- B. They permanently reside only in the bone marrow
- **C. They can undergo somatic hypermutation upon reactivation**

Q6. Which of the following immunodeficiencies is associated with a good prognosis?

- A. Chronic granulomatous disease
- **B. IgA deficiency**

Q7. Which vaccine does NOT cause herd immunity?

- **A. Tetanus vaccine**
- B. Measles vaccine
- C. Pertussis vaccine

Q8. Which vaccine is produced after multiple culture episodes (live-attenuated method)?

- A. Pertussis vaccine
- **B. Measles vaccine**
- C. Influenza B vaccine

Q9. HIV utilizes which envelope molecule to enter host cells?

- **A. gp120**
- B. CXCR5

Q10. Which enzyme adds non-templated nucleotides during V(D)J recombination?

- A. RAG 1
- B. RAG 2
- **C. TdT (Terminal deoxynucleotidyl transferase)**

Q11. Which of the following statements is INCORRECT regarding Systemic Lupus Erythematosus (SLE)?

- **A. It induces efficient cellular debris clearance**
- B. It is characterized by antinuclear antibodies (ANAs)
- C. It involves Type III hypersensitivity mechanisms

Q12. Which of the following immunosuppressive drugs is most strongly associated with a high risk

of reactivation of latent Tuberculosis (TB) infection?

- A. Infliximab
- B. Cyclosporine
- C. Daclizumab

Q13. Which of the following structural changes is characteristically included in asthma pathogenesis?

- A. Smooth muscle hypertrophy
- B. Alveolar destruction
- C. Atrophy of mucus-secreting glands

Q14. Which of the following statements is correct regarding the Purified Protein Derivative (PPD) skin test?

- Core Concept Answer: It relies on a Type IV (Delayed-Type) Hypersensitivity reaction peaking 48–72 hours after injection.

Q15. Chimeric Antigen Receptor (CAR)-T cell therapy has demonstrated a major clinical impact primarily in:

- A. B-cell malignancies and multiple myeloma
- B. Epithelial solid tumors
- C. Autoimmune disorders

Q16. Which of the following immunosuppressive medications is associated with the highest risk of causing new-onset Diabetes Mellitus (Post-Transplant Diabetes Mellitus)?

- A. Tacrolimus
- B. Cyclosporin
- C. Sirolimus

Q17. Which of the following cytokines possesses the most potent, direct antiviral activity?

- A. IFN-alpha
- B. IL-4
- C. TNF-alpha

Q18. All of the following mechanisms are involved in Type II hypersensitivity EXCEPT:

- A. C3a/C5a generation and complement activation
- B. Opsonization and phagocytosis
- C. Receptor dysfunction
- D. T cell cytotoxicity

Q19. A treatment where immune cells are taken out of the patient, activated/expanded outside the body, and then reinfused for more targeted killing is known as:

- A. Adoptive cell transfer
- B. Passive immunization
- C. Non-specific immune stimulation

Q20. The mechanism of action for the BCG vaccine in certain cancer therapies (like bladder cancer) is an example of:

- A. Specific active immunization
- B. Non-specific immune stimulation

Q21. Following the birth of a child to an Rh-negative mother, which direct diagnostic test is used to detect maternal antibodies bound to fetal RBCs in vivo?

- A. Direct Coombs test
- B. Indirect Coombs test

Q22. Type I Hypersensitivity reactions are primarily mediated by which class of immunoglobulins?

- A. IgE
- B. IgG
- C. IgM

Q23. Which biological drug is used for rheumatoid arthritis by specifically targeting the B-cell component (CD20)?

- A. Rituximab
- B. Infliximab
- C. Adalimumab

Q24. A patient develops fever, rash, and arthritis roughly a week after receiving an antitoxin serum

derived from an immunized animal. What is the diagnosis?

- **A. Serum Sickness**
- B. Anaphylaxis
- C. Arthus reaction