Unit 6.3. MCQs Set 1

Results



#1. Q1. Red Blood Cells (RBCs) are most noted for

(A). Direct phagocytic activity

(B). Carrying oxygen via hemoglobin and sometimes binding immune complexes

(C). Maturing into plasma cells

(D). No role at all in immunity

While RBCs primarily transport oxygen, they can bind immune complexes via complement receptors, aiding in their clearance by the spleen.

#2. Q2. White Blood Cells (WBCs) in general are key to immunity because they

ш			
(A).	Only	carry	oxygen

(B). Include diverse cell types (e.g., neutrophils, lymphocytes, monocytes) that perform phagocytosis, antibody production, etc. \Box

(C). Disappear after puberty

(D). All are identical in function

WBCs (leukocytes) encompass several immune cell types essential for the body's defense.

#3. Q3. Platelets in immune mechanisms can

(A). Form	immunoglobulins

(B). Release factors that modulate inflammation and help in wound repair

(C). Attack pathogens directly

(D). Have no immune function

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Besides their role in clotting, platelets release cytokines and chemokines that modulate inflammation and promote tissue repair.

#4. Q4. Plasma proteins in immunity include
□ (A). Collagen
(B). Complement proteins, acute-phase reactants, immunoglobulins □
(C). Only hormones
(D). None of the above
Plasma carries critical immune proteins such as complement, CRP, and antibodies.
#5. Q5. Biophysics of the immune system might analyze
(A). The mechanical role of RBC shape in immunity □
□ B). Molecular structures of antigens and antibody interactions (e.g., binding kinetics, affinity)
(C). None
(D). Strictly morphological data
Biophysical analysis focuses on molecular interactions between antigens and antibodies, including binding kinetics and affinity.
#6. Q6. An antigen is typically
□ (A). Always beneficial
(B). A foreign or self molecule capable of eliciting an immune response
(C). A carbohydrate alone
(D). None
Antigens are any molecules—protein, polysaccharide, or otherwise—that elicit an immune response.
#7. Q7. Basic structure of an antibody (immunoglobulin) includes
□ (A). Single polypeptide chain
(B). Two heavy chains and two light chains forming a Y-shaped molecule
(C). 3 subunits of hemoglobin □
(D). None
An antibody is composed of two heavy chains and two light chains that together form a Y-shaped structure.
#8. Q8. T cells recognize antigen when
(A). Antigen is dissolved in blood plasma

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□ (B). Antigenic peptides are presented on MHC molecules by antigen-presenting cells (APCs) □ (C). None
□ (D). The B cell antibody binds T cell directly
T cells recognize antigenic peptides only when they are presented by MHC molecules on APCs.
#9. Q9. B-cell receptor (BCR) gene rearrangement is analogous to
□ (A). None □
(B). TCR gene rearrangement, producing unique specificity via V(D)J recombination
CC). RBC anabolism
(D). MHC linking
Both B cells and T cells generate diverse receptors through V(D)J recombination.
#10. Q10. Antigen presentation involves MHC/HLA complex, meaning
□ (A). None □
□ (B). MHC molecules bind peptides inside cells and display them on cell surfaces for T cell recognition
(C). RBC clotting
(D). No role for immune regulation
MHC molecules bind peptides internally and present them on the cell surface for T cell recognition.
#11. Q11. Antigen-antibody reactions can be tested by
\Box (A). Precipitation, agglutination, neutralization, complement fixation, ELISA \Box
(B). None □
(C). RBC doping □
(D). Genetic doping
These assays are classical methods for detecting and quantifying antigen-antibody interactions.
#12. Q12. Innate immune cells include
□ (A). B and T lymphocytes □
(B). Neutrophils, macrophages, dendritic cells, and natural killer (NK) cells
CC). None
(D). RBC only
The innate immune response is mediated by cells such as neutrophils, macrophages, dendritic cells, and NK cells.

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#13. Q13. PAMP (Pathogen-associated molecular pattern) is recognized by
□ (A). RBC doping □
(B). Pattern recognition receptors (PRRs) on innate immune cells □
(C). None □
(D). BCR gene rearrangement
PRRs, such as toll-like receptors (TLRs), recognize PAMPs on pathogens.
#14. Q14. Complement system can
☐ (A). Always cause RBC doping ☐
(B). Lyse pathogens, opsonize them, and enhance inflammation
(C). None
(D). Only degrade immunoglobulins
The complement system is crucial for lysing pathogens, opsonization, and enhancing inflammatory responses.
#15. Q15. Natural (innate) immunity is
□ (A). Highly specific memory □
(B). Nonspecific defense present from birth via skin, mucosa, phagocytes, and NK cells $\hfill\Box$
(C). None
(D). Only T cell-based
Innate immunity provides a rapid, nonspecific first line of defense.
#16. Q16. Acquired immunity can be subdivided into
(A). None
☐ (B). Humoral (B-cell/antibody-mediated) and cell-mediated (T-cell mediated) immunity
(C). RBC doping only
□ (D). Infectious illusions
Acquired immunity includes the humoral and cell-mediated arms of the adaptive immune response.
#17. Q17. Cell-mediated immunity specifically involves
□ (A). RBC doping □
(B). T lymphocytes (CD4+ helper and CD8+ cytotoxic cells) targeting infected or abnormal cells
(C). None
□ (D). Complementing RBC shape

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Cell-mediated immunity primarily involves T cells, which can eliminate infected or abnormal cells.

#18. Q18. T cell-mediated toxicity means
(A). None
(B). CD8+ T cells induce apoptosis in target cells presenting foreign peptides on MHC-I molecules
(C). RBC doping
(D). Pure illusions
CD8+ cytotoxic T cells kill target cells by inducing apoptosis when foreign peptides are presented via MHC-I.
#19. Q19. Cytokines are
(A). None
(B). Signaling proteins (e.g., interleukins, interferons, tumor necrosis factor) that orchestrate immune cell communication
(C). RBC-bound proteins
(D). Bacterial toxins only
Cytokines are essential signaling molecules that regulate the immune response.
#20. Q20. Immunopathology includes
(A). None
\square (B). The study of diseases caused by immune dysfunction such as autoimmunity, hypersensitivities, immune deficiencies,
and transplant rejections □
(C). RBC doping
(D). Infectious illusions
Immunopathology focuses on disorders resulting from improper or overactive immune responses.
#21. Q21. Autoimmune disease example
(A). Influenza
(B). Rheumatoid arthritis
□ (C). None
(D). Common cold
Rheumatoid arthritis is a well-known autoimmune disorder affecting the joints.
#22. Q22. Transplant rejection typically stems from
(A). None □
(B). Host T cells recognizing donor MHC antigens as foreign

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(C). RBC doping
(D). Infectious illusions
Host T cells recognize and respond to foreign MHC antigens on a transplanted organ, leading to rejection.
#23. Q23. Allergy is associated with
(A). RBC doping
(B). IgE-mediated hypersensitivity causing mast cell degranulation and histamine release
(C). None ☐ (D). Complement fixation only
Allergic reactions are typically mediated by IgE antibodies, which trigger mast cell degranulation and release histamine.
#24. Q24. Immunomodulators can
(A). Only suppress immunity
(B). Either enhance or suppress immune function (e.g., cytokines, herbal extracts, synthetic drugs)
(C). None
(D). RBC doping
Immunomodulators have the capacity to either boost or dampen the immune response depending on their nature and application.
#25. Q25. Antibody isolation and purification often uses
(A). None
(B). Techniques such as Protein A/G affinity chromatography and salt precipitation
(C). RBC doping
(D). Infectious illusions
Antibodies are often isolated using Protein A or Protein G affinity chromatography, in addition to precipitation methods.
#26. Q26. ELISA (Enzyme-Linked Immunosorbent Assay) is used to
□ (A). None □
□ (B). Detect or quantify antigens or antibodies in a sample via enzyme-labeled detection
(C). RBC doping
(D). Infectious illusions
ELISA is a common immunoassay technique used to detect and measure antigens or antibodies in a sample through a colorimetric or chemiluminescent reaction.

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#27. Q27. Immunoblotting (Western blot) checks
□ (A). None □ (B). The presence of specific proteins that have been separated by electrophoresis and probed with antibodies
□ (C). RBC doping
□ (D). Indirect illusions
Western blotting is used to detect particular proteins after separation by SDS-PAGE and transfer onto a membrane.
#28. Q28. Immunohistochemistry uses
□ (A). None □
(B). Antibodies conjugated to enzymes or fluorophores to visualize antigens in tissue sections \Box
(C). RBC doping
(D). Culture expansions
Immunohistochemistry employs labeled antibodies to detect specific antigens within tissue sections, visualized vi colorimetric or fluorescent methods.
#29. Q29. Immunoprecipitation helps
(A). None
(B). Isolate a specific antigen from a mixture by using an antibody to form an insoluble complex \Box
(C). RBC doping □
(D). Infectious illusions
Immunoprecipitation uses antibodies to pull down a particular antigen from solution, facilitating further analysis.
#30. Q30. Immune cell isolation might use
(A). RBC doping
\square (B). Techniques like density gradient centrifugation (e.g., Ficoll) or flow cytometry-based cell sorting
(C). None
□ (D). Only mechanical pressing
Techniques such as Ficoll density gradients and FACS are standard methods for isolating immune cell subpopulations.
#31. Q31. Flow cytometry can evaluate
□ (A). None □
(B). Cell surface markers, cell size, and granularity to distinguish various immune subsets \Box
(C). RBC doping □

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(D). Infectious illusions

Flow cytometry uses fluorescent antibodies to evaluate cell-surface markers, size, and granularity, enabling detailed immunophenotyping.

#32. Q32. Immunotherapy example might be
(A). RBC doping
□ (B). Monoclonal antibody therapy or immune checkpoint inhibitors targeting tumor antigens □ (C). None
(D). Antibiotic usage
Immunotherapy includes strategies such as monoclonal antibody treatments and checkpoint inhibitors to enhance the immune response against tumors.
#33. Q33. The first successful vaccine in history was
□ (A). Louis Pasteur's rabies vaccine □ (B). Edward Jenner's smallpox vaccine □ (C). None
□ (D). Jonas Salk's polio injection
Edward Jenner's smallpox vaccine using cowpox material is regarded as the first successful vaccine.
#34. Q34. Attenuated vaccine means
□ (A). Using a non-infectious agent □
(B). Using a live pathogen that has been weakened so it does not cause severe disease but still stimulates immunity □ (C). None
□ (D). A heat-killed approach
Attenuated vaccines use live but weakened pathogens to elicit a strong immune response without causing serious illness.
#35. Q35. Heat-killed vaccine uses
□ (A). Live bacteria □
(B). Pathogens killed by heat or chemical treatment so they cannot replicate□(C). None
(C). Notice (D). RBC doping

 $Heat\text{-}killed \ or \ inactivated \ vaccines \ use \ pathogens \ that \ have \ been \ rendered \ non\text{-}infectious \ by \ heat \ or \ chemicals.$

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#36. Q36. Subunit vaccine example
□ (A). Complete virus
\Box (B). Only the essential antigens (proteins or polysaccharides) from the pathogen, not the entire organism
(C). None
(D). RBC doping
Subunit vaccines contain only the key antigenic components of a pathogen, reducing side effects.
Subunit vaccines contain only the key antigenic components of a pathogen, reducing side effects.
#37. Q37. Recombinant vaccine:
(A). None
(B). Involves cloning genes encoding antigenic proteins in expression systems (e.g., yeast, bacteria) to produce safe, pure antigens
(C). A weakened virus
(D). RBC doping
Recombinant vaccines use genetic engineering to produce antigenic proteins in controlled systems for safe vaccination.
#38. Q38. DNA vaccine concept:
(A). None
(B). A plasmid carrying the gene for an antigen is injected, leading to in situ antigen production by host cells
(C). Must be a live virus
(D). RBC doping
DNA vaccines deliver plasmids with antigen-coding genes, leading host cells to produce the antigen and stimulate immunity.
#39. Q39. RNA vaccine (like some COVID-19 vaccines) indicates
(A). None
(B). mRNA encoding the antigen is delivered into host cells, leading to in situ protein expression and immune stimulation
(C). RBC doping
(D). Attenuated virus approach
RNA vaccines use synthetic mRNA to direct host cells to produce the antigen, eliciting an immune response.
#40. Q40. Dendritic cell-based vaccine typically involves
□ (A). None
(A). Notice (B). Harvesting a patient's dendritic cells, loading them with tumor antigens, and re-infusing them to stimulate T-cell

responses

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□ (C). RBC doping
□ (D). Basic heat-killed approach
Dendritic cell-based vaccines involve the ex vivo loading of a patient's dendritic cells with antigens, then re-infusing ther to prompt a targeted immune response.
#41. Q41. Virus-Like Particles (VLPs) in vaccines are
(A). Infectious viruses
□ (B). Non-infectious structures resembling viruses but lacking genetic material, used to present antigens
(C). None
(D). RBC doping
VLPs mimic the structure of viruses to stimulate immunity without the risk of infection.
#42. Q42. Adjuvants in vaccines help by
(A). None
(B). Enhancing the immune response by prolonging antigen release and activating antigen-presenting cells
(C). RBC doping
(D). Only providing color
Adjuvants boost the immune response by increasing antigen retention and stimulating APC activity.
#43. Q43. "Toxoid vaccine" uses
□ (A). None
\square (B). Inactivated bacterial toxins that induce an immune response without causing disease
(C). RBC doping
(D). Subunit DNA
Toxoid vaccines use inactivated bacterial toxins to stimulate a protective immune response without the risk of toxin mediated disease.
#44. Q44. The reason behind "booster doses" in vaccination is
(A). None
(B). To re-stimulate memory cells, maintaining high antibody titers or memory T-cell populations
(C). RBC doping
(D). Infectious illusions
Booster doses help to reinforce and sustain the immune memory generated by the primary vaccine series.

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#45. Q45. "Herd	immunity"	arises	when
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"451 Q451 Hera immunity united time."
□ (A). None
☐ (B). A sufficient proportion of a population is immunized, reducing disease spread and protecting unvaccinated individuals
□ (C). RBC doping
(D). Infectious illusions
Herd immunity occurs when enough people are immune, thereby indirectly protecting those who are not immunized.
#46. Q46. Pathogen Recognition Receptors (PRRs) like TLRs detect
(A). None
(B). Pathogen-associated molecular patterns (PAMPs) on microbes, triggering innate immune responses
(C). RBC doping
(D). Unknown illusions
PRRs such as TLRs recognize conserved molecular motifs on pathogens to activate innate immunity.
#47. Q47. Flow cytometry in immunology can measure
□ (A). None □
(B). Cell size, granularity, and fluorescence of labeled markers to distinguish different cell populations
(C). RBC doping
(D). Basic illusions
Flow cytometry evaluates cell size, granularity, and fluorescently labeled markers for detailed immunophenotyping.
#48. Q48. Immunoblotting (Western blot) steps typically are
(A). None
(B). Separating proteins by SDS-PAGE, transferring them to a membrane, and probing with labeled antibodies
(C). RBC doping
(D). Infectious illusions
Western blotting consists of protein separation by SDS-PAGE, membrane transfer, and antibody-based detection.
#49. Q49. "Neutralizing antibody" function is to
□ (A). None
(B). Bind to pathogens or toxins to prevent them from infecting or damaging host cells
(C). RBC doping
(D). Amplify T-cell exhaustion

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Neutralizing antibodies block the key functional domains of pathogens or toxins to stop infection or tissue damage.

#50. Q50. An example of immunotherapy is

(A). Antibiotic injection	
(B). CAR T-cell therapy or monoclonal	antibody therapy
(C) DDC doning	
(C). RBC doping	
(D). None	

Examples of immunotherapy include CAR T-cell therapy and monoclonal antibody treatments used especially in cancer management.

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