Immunology - Multiple Choice Questions

**UNIT –I (Dr.KB)**

**1. The molecules and cells of the immune system that gives collective and coordinated response to the foreign substance or pathogen is known as\_\_\_\_\_**

a) Immune response

 b) Immune system

 c) Immunology

 d) Immunity

2. Which of the following can induce immunity

 a) bacteria

 b) virus

 c) parasite

 d) all the above

 3. which of the following part of the body is included in the immune system?

 a) white blood cells

 b) Lymphocytes

 c) Phacocytes

 d) All of them

 4. The bone marrow and thymus are the--------- organs

a) Primary lymphoid organs

 b) secondary lymphoid organs

 c) Tertiary lymphoid organs

 d) Quaternary lymphoid organs

5. The mucosa associated lymphoid tissue, Gut associated lymphoid tissue, spleen and lymph nodes are the organs of ----------

 a) Primary lymphoid organs

 b) secondary lymphoid organs

 c) Tertiary lymphoid organs

 d) Quaternary lymphoid organs

**6.** Lymphoid Organs are not responsible for \_\_\_\_\_\_\_\_\_\_\_
 a) Proliferation of lymphocytes
 b) Differentiation of lymphocytes
c) Destruction of lymphocytes
 d) Maturation of lymphocytes

7. In which of the following places MALT is not found?
 a) Respiratory tract
 b) Digestive tract
 c) Urogenital tract d) Eyes

**8.** MALT constitutes for about \_\_\_\_\_\_\_ percentage of the lymphoid tissue in the human body.
 a) 30%
 b) 40%
 c) 50%
 d) 60%

9. Which of the following organs is also called as “Graveyard of RBCs”?
 a) Spleen
 b) Heart
 c) Bone Marrow
 d) Liver

10. Thymus growth occurs up to\_\_\_.

 a) 17 years

b) 12 years

c) 5 years

d) 30 years

11. Primary Lymphoid organ in birds is \_\_\_\_\_.

a) Bone marrow

b) Thymus

c) Bursa fabaricus

d) spleen

12. The thymus develops at above \_\_\_.

a) 12th week of gestation

b) 3rd week of gestation

c) 6th week of gestation

d) 4th week of gestation

13. The primary function of thymus is \_\_\_.

 a) Production of phagocytes

b) Production of lymphocytes

c) Production of T cells

d) Production of B cells

14. The total number of lymph nodes in human body is about\_\_\_.

 a) 500

 b) 700

 c) 600

 d) 800

15. The lymphocytes which can develop immunocompetence in the thymus is\_\_\_.

a) B lymphocytes

b) T lymphocytes

c) NK cells

d) None of these

16. What is the life span of the memory B-cells of the immune system?

 a) A few days

 b) A few hours

 c) A few years

 d) A few years to whole life

17**. 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

18. **Which of the following cells is involved in humoral immunity?**

 a) T-cells

 b) B-cell

 c) Mast cells

d) Both T and B cells

19. Which of the following cells of the immune system do not perform phagocytosis?

 a) Macrophage

 b) Neutrophil

 c) Eosinophil

d) Basophil

20. Monocytes differentiate into which kind of phagocytic cells?

a) Neutrophil

b) B cell

 c) Macrophage

d) T cell

21. Lymphocytes are of two types, they are

a) T-cells and erythrocytes

b) Erythrocytes and Platelets

c) T-cells and Platelets

d) T-cells and B-cells

22. Which of these immune cells are able to quickly respond post any subsequent encounter with the same antigen**?**

a) helper T cells

b) memory cells

c) plasma cells

d) basophil

23. Basophils, Eosinophils and Neutrophils are referred to as

a) Platelets

b) Astocytomas

c) Granulocytes

d) Buffers

24. Cytotoxic T cells destroy the target cells

a) through injection of tumor necrosis factor

b) by phagocytosis

c) through insertion of perforins into the target’s membrane

d) by releasing oxidizing agents

25. The phenomena that initiates when a helper T cell binds with a class II MHC protein on a displaying cell is referred to as

a) T cell proliferation

b) costimulation

c) self-antigen recognition

d) antigen proliferation

26. The nonself particle that provoked an immune response is known as

a) immunoglobulin

b) antibody

c) antigen

d) interferon

27. The only blood cells which are not viewed as a part of the immune system are

a) fat cells

b) glial cells

c) osteocytes

d) red blood cells

28. Which of the following secretes immunoglobulin?

a) T-Lymphocyte

b) B- Lymphocyte

c) Macrophage

d) Mast cells.

29. Natural killer cells can be generated from \_\_\_.

a) T-Lymphocytes

b) B-Lymphocytes

c) Stem cells

d) Delta cells

30. Cell mediated immunity is the responsibility of \_\_\_\_.

a) cytotoxic lymphocytes

b) antigen presenting cells.

c) B-type of lymphocytes

d) T4 cells

31. Which of the following is not involved in first line defence?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a)Mucus membranesb)Salivac)Tearsd)Antibodies32. Natural killers cells are found in all of the following except:

|  |  |  |
| --- | --- | --- |
| a)Bloodb)Thymusc)Spleend)Lymph nodes33. Wandering macrophages are phagocytes that develop from:

|  |  |
| --- | --- |
| a)Neutrophilsb)Fixed macrophagesc)Basophilsd)Monocytes34. Chemicals released from mast cells during an allergic reaction include all of the following except:

|  |
| --- |
| a)Histamineb)Interferonsc)Prostaglandinsd)Leukotrienes35. Which of the following is responsible for B cell activation? |

 |

 |
|  a)Infection b)Antibody c)Antigen d) Allergy 36. What is the meaning of thymus independent B-cell activation? a) Without the participation of T-cell b) Do not mature in the thymus c) Thymus would not take part in its activation d) Affinity maturation takes place in the thymus |

 37. During the B cell maturation, which of the following stage expresses surrogate light chain complexed with the heavy chain? a) Pro-B cell b) Pre-B cell c) Immature B cell d) Mature B cell38. Which of the following cell surface marker is not expressed throughout the B cell maturation process from Pro B cell to Mature B cell? a) CD19 b) Igα/Igβ c) CD24 d) IgD/IgM |

39. Thymus-independent antigens activate B cells without the help of T-helper cells. These molecules include
 a) Lipids
 b) Lipopolysaccharides
 c) Polysaccharides
d) Proteins

40.Antibodies are produced by \_\_\_\_\_\_\_\_.

a) plasma cells

b) T cells

c) bone marrow

d) Macrophages

41. Which of the following cell types is not considered a professional antigen-presenting cell?

 a) macrophage

b) neutrophil

c) dendritic cell

d) all of the above are professional antigen-presenting cells.

42. Mark the correct role of cytotoxic T-cells

a) Help in B cell activation

b) Inhibits cytotoxins

c) Proliferate T cell

d) Kill the target cell

43**.** Name the cytokine which act as a T cell growth factor?

a) IL- 3

b) IL- 2

c) IL- 4

d) IL-5

44. Name the syndrome that occurs in children due to deficiency of the thymus function

a) Acromegaly

b) Gigantism

c) Custing syndrome

d) DiGeorge syndrome

45. The B cell receptor on the surface is

a) Monomeric IgM

b) Dimeric IgM

c) Monomeric IgG

d) B cell receptor

46.Humoral immunity is mediated by

a) B cell

b) Macrophage

c) Both a and b

d) Phagocytes

47. B cell differentiates to form

a) Plasma cells

b) Effector cells

c) Plasma cells and memory B cell

d) None of these

48. Which of the following statement is incorrect regarding plasma cells

a) Plasma cells are the effector cells

b) Plasma cells secretes antibodies

c) The precursor of plasma cell is B cell

d) Plasma cell has surface receptors

49. Origin and maturation of B cell takes place at

a) Spleen

b) Thymus

c) Bone marrow

d) Lymph nodes

50. The function of memory B cell is

a) Antibody production

b) Immunologic memory

c) Regulated antibody production

d) None of these

51. B cells are

a) Lymphocytes which are short lived

b) Lymphocytes which are long lived

c) Lymphocytes involved in non- specific defence

d) None of these

52. CD4+ T cells:

a) Recognise antigenic peptides presented in context of MHC classII

b) Recognise antigenic peptides produced by proteasome processing

c) Recognise MHC classI molecules on most nucleated cells

d) Are also known as cytotoxic T cells

53. CD8 co-receptors:

a) Are expressed on helper T cells and interact with MHC classII molecules

b) Are mainly responsible for signal transduction after the T cell binds antigen

c) Are expressed on cytotoxic T cells and interact with MHC classI molecules

d) Are used to identify T helper cells in flow cytometry experiments

54. T-cell antigen receptors are distinguished from antibodies by which of the following

 a) T-Cell receptors are glycosylated

b) T-cell receptors must interact with antigen uniquely presented by other cells but not with free antigen

c) T-Cell receptors bind various cytokines

d) T-Cell receptors bind complement to lyse cells

55. T-cell receptors or antibodies react with antigens

 a) because both are made by lymphocytes

b) because of complementary of molecular fit of both with antigen

c) because both 'have light chain and heavy chain polypeptides

d) cause histamine release

56. One principal function of the Class I and Class II major histocompatibility complex proteins is to

a) transduce the signal to the T-cell interior following antigen binding

b) mediate immunoglobulin class switching

c) present antigen for recognition by the T-cell antigen receptor

d) stimulate production of interleukins

57. The antigen presentation by endogenous pathway involves

a) Antigen presentation to cytotoxic T cells

b) Antigen presentation to TH-1 cells

c) Antigen presentation to B cells

d) Antigen presentation to MHC class II

58. A cytokine which can increase the body temperature directly---

a) IL- 2

b) IL- 3

c) IL- 5

d) IL- 6

59. The cytotoxic T cells recognize antigen in association with -----

a) Class I MHC determinants

b) Class II MHC determinants

c) Class III MHC determinants

d) Class I and Class II determinants

60. Which of the following is not the function of the T- cell receptor?

a) Antigen Recognition

b) Facilitate binding of co- receptor

c) Induce signal transduction via CD3 protein complex

d) Serve as the signal transducer

**UNIT II Dr. KB**

**1. Any molecule that induce an immune response are**

**a) antigens**

**b) antibodies**

**c) epitope**

**d) immunogens**

**2. Majority of antigens are**

**a) proteins**

**b) carbohydrates**

**c) lipids**

**d) nucleic acid**

**3. Which of the following statement is true**

**a) all immunogens are antigens but all antigens are not immunogens**

**b) all immunogens are antigens and all antigens are immunogens**

**c) all immunogens are not antigens but all antigens are immunogens**

**d) all immunogens are proteins and all proteins are immunogens.**

**4. A molecule that reacts with specific antibody but is not immunogenic by itself is called**

**a) carrier**

**b) antigen**

**c) hapten**

**d) immunogen**

**5. Haptens are immunogenic upon binding\_\_\_\_**

**a) covalently to a carrier protein**

**b) covalently to an antibody**

**c) ) covalently to a paratope**

**d) none of these**

**6. Haptens cannot activate T cell or B cell due to**

**a) its low molecular weight antigens**

**b) its inability to bind to MHC**

**c) both a and b**

**d) none of these**

**7. Which of the following is a hapten?**

**a) cyanide**

**b) paracetamol**

**c) penicillin**

**d) none of these**

**8. A complete antigen is capable of**

**a) inducing an immune response**

**b) can interact with antibody**

**c) induces antibody production**

**d) all of these**

9. Major Histocompatibility Complex is a tight cluster of linked\_\_\_\_\_\_\_\_\_\_\_
 a) Carbohydrates
 b) Glycolipids
c) Genes
 d) Lipid molecules

10. What is the name of MHC in humans?
a) HLA
 b) H2
 c) Adjuvants
 d) Haplotype

11. Name the cell which receives antigen presented by MHC molecule.
 a) Nk cells
 b) B-cells
c) T-cells
 d) Macrophages

12. Name the class of MHC which is recognized by CD4 TH cell.
 a) MHC cannot recognize T cells
 b) MHC III
 c) MHC I

d) MHC II

13. Which MHC molecule recognizes CD8 TC cells?
a) MHC I
 b) MHC II
 c) MHC III
 d) HLA-C

14. Name the part of processed antigen that binds to the MHC molecule and recognized by T-cells?
 a) Immunoglobulin
b) Agretope
 c) Epitope
 d) Chaperone

15. Which of the following statement is INCORRECT about superantigens?
 a) Viral or bacterial proteins
b) Endogenous by nature
 c) Unique binding ability
 d) Activate a large number of T-cells

16. Humoral immunity is mediated by

 a) B cell

 b) Macrophages

 c) both a and b

 d) phagocytes

17. B cell has receptor on its surface which is

 a) monomeric IgM

**b) dimeric IgM**

**c) monomeric IgG**

**d) B cell receptor**

**18. B cell upon activation by antigens**

 **a) undergo clonal expansion followed by clonal selection**

 **b) undergo clonal selection followed by clonal expansion**

 **c) divides continuously**

 **d) secrete antibodies**

**19. B cell differentiates to form**

 **a) plasma cells**

 **b) effector cells**

 **c) plasma cells and memory cells**

 **d) none of these**

**20. Which of the following statement is incorrect regarding plasma cell**

 **a) plasma cells are the effector cells**

 **b) plasma cells secretes antibodies**

 **c) The precursor of plasma cell is B cell**

 **d) plasma cell has surface receptors**

**21. The function of memory B cell is**

 **a) antibody production**

 **b) immunologic memory**

 **c) regulated antibody production**

 **d) none of these**

**22. Generally antibodies produced against a pathogen is**

 **a) monoclonal**

 **b) homogenous**

 **c) polyclonal**

 **d) all of same specificity**

**23. Antibodies clear out antigens by**

 **a) neutralization**

 **b) precipitation**

 **c) agglutination**

 **d) all of these**

 **24. Any substance that promotes phagocytosis of antigens by binding to them are called as**

 **a) opsonins**

 **b) phagocytes**

 **c) macrophages**

 **d) interleukins**

**25. The phenomenon of selective proliferation of B cells in response to their interaction with the antigen is called**

 **a) clonal expansion**

 **b) monoclonal selection**

 **c) clonal proliferation**

 **d) clonal selection**

**26. Which statement below is characteristic of a secondary humoral response?**

 **a) It occurs much more rapidly than a primary response**

 **b) It only occurs in less antibody secretion**

 **c) It only occurs in the spleen**

 **d) It triggers fever**

**27. Which is the following is the hallmark of the humoral immune response**

 **a) Cell lysis by T cell**

 **b) Antigen presentation**

 **c) Binding of antigen to the antibody**

 **d) phagocytosis**

**28.The process that begins when a helper T cell binds to an MHC class II protein on displaying cell is known as**

 **a) Antigen proliferation**

 **b) Self antigen recognition**

 **c) Co stimulation**

 **d) T cell proliferation**

29. Which of the following statements is FALSE:
 Immune responses are controlled by

 a) Elimination of antigen

 **b)**Exclusion of cells from the site of inflammation

 c) Apoptosis of previously activated cells

d) Inhibitory receptors such as CTLA-4 or FcγRII

**30.** Which of the following statements is FALSE

 **a)** Memory B cells constitutively secrete immunoglobulins

 b) Long lived plasma cells are mostly found in the spleen

 c) Memory B cells usually have high affinity for antigen

 d) Generation of long lived B cell memory requires CD4+ T cell help

31.Fusion between a plasma cell and a tumor cell creates a
 a) Myeloma
 b) Lymphoblast
 c) Lymphoma
 d) Hybridoma

32.Monoclonal antibodies recognize a single:
 a) Antigen
 b) Bacterium
 c) Epitope
 d) B cell

**33. \_\_\_\_\_ structure contains 4 peptide chains**

 **a) Antigen**

 **b) Antibody**

 **c) MHC**

 **d) Fab fragment**

**34. Antibodies are**

a) prostaglandins

b) steroids

c) lipoproteins

d) glycoproteins

**35. What is the molecular weight of light (L) chains in the antibody structure?**

 **a) 25000**

 **b) 35000**

 **c) 26000**

 **d) 27000**

**36. What is the molecular weight of heavy (H) chains in the antibody structure?**

 **a) 50000**

 **b) 49000**

 **c) 55000**

 **d) 60000**

**37. \_\_\_\_\_ bond present between the heavy chains and light chains of an antibody molecule.**

 **a) H bond**

 **b) Disulphide bond**

 **c) Covalent bond**

 **d) Ionic bond**

**38. Antibodies are produced by cells called**

 **a) Natural killer cells**

 **b) Helper T cell**

 **c) Beta cell**

 **d) Plasma cell**

**39. The primary mechanism of antibody action is**

 **a) Cytolysis**

 **b) Phagocytosis**

 **c) Cytotoxicity**

 **d) Complement activation**

**40. Interferons are**

a) antibiotic proteins

b) antiviral proteins

c) antigen proteins

d) all of the above

**41. Antigen binding sites are present in**

a) Fab regions of an antibody

b) Fc region of an antibody

c) only in the light chain

 d) only in the heavy chain

42. A single plasma cell can secrete \_\_\_\_ antibody molecules per second

 a) 2000

 b) 3000

 c) 2500

 d) 1500

43. Primary interaction between antigens and antibodies involve all of the following except

 a) Covalent bond

 b) Van der waals forces

 c) Hydrophobic forces

 d) Electrostatic forces

44. The idiotypic of an antibody molecule is determined by the amino acid sequence of the

 a) variable region of the L chain

 b) constant region of the H chain

 c) constant region of the H and L chains

 d) variable region of the H and L chains

45. The primary and secondary antibody responses differ in

 a) the predominant isotype generated

 b) the speed at which antibodies appear in the serum

 c) the number of lymphocytes responding to antigen

 d) all of the above

46. Which of the following statements about interleukin 2(IL-2) is incorrect?

 a) It is produced primarily by activated macrophages

 b) It is produced by CD4+ T cell

 c) It can induce the proliferation of CD4+ T cell

 d) It binds to a specific receptor on CD4+ T cell

47. Which portion of the antibody molecule is most likely recognized by the infant’s receptors?

 a) CH

 b) VL

 c) VH

 d) CL

48. The significance of class switching is that the B cell lineage can

 a) recognize the same antigen but perform different effector functions

 b) perform the same effector function on different antigens

 c) convert to a T cell lineage

 d) all of these are correct.

49. As B cell receptor binds with intact antigen; T cell receptor binds to\_\_\_\_\_

 a) humoral immunity

 b) cell mediate immunity

 c) processed antigen fragments

 d) the intact antigen

50. What is the name of the hypervariable region of immunoglobin, which is responsible for its diversity?
a) CDR
 b) Hinge region
 c) Epitope
 d) Agretope

51. Who discovered the structure of immunoglobulin by treating it with beta-mercaptoethanol?
 a) Nisonoff
b) Edelman
 c) Porter
 d) Whittekar

52. The first immunoglobulin synthesized by the fetus is

 a) IgA

 b)IgE

 c) IgG

 d)IgM

**53. Which of the following immunoglobulins makes the largest percentage in breast milk?**

a) IgM

b) IgD

c) IgG

d) IgA

**54. Which of the following antibodies is predominantly present in tears, saliva and mucous**

a) IgM

b) IgG

c) IgE

d) IgA

55. Which immunoglobulin can pass through placenta?
 a) IgD
 b) IgE
 c) IgM
d) IgG

56. Name the class of immunoglobulin which has a pentameric structure?
 a) IgE
 b) IgG
 c) IgA
d) IgM

57. Name the class of immunoglobulin which takes part in hypersensitivity reaction?
 a) IgG
b) IgE
 c) IgA
 d) IgM

58. \_\_\_\_\_ type of antibody is most abundant in serum

 a) IgD
 b) IgE
 c) IgM
d) IgG

59.The Ig involved in host defence against parasitic infection

 a) IgE
 b) IgG
 c) IgA
 d) IgM

60. Amount of various immunoglobulin classes can be measured by

 a) double diffusion in one dimension

 b) single diffusion in two dimensions

c) single diffusion in one dimension

a) double diffusion in two dimensions

**UNIT – III (Dr.MG)**

1. Agglutination reaction is more sensitive than precipitation for the detection of

a) antigens

b) antibodies

**c)** complement

d) antigen-antibody complexes

2. VDRL test is an example of

a) Tube test

b) Ring test

c) Slide test

d) none of these

3. Antibodies recognize antigens

a) Via their hypervariable regions

b) By covalent bonding to specific epitopes

**c)** Have a similar high binding affinity regardless of their isotype

d) Can neutralise pathogens within host cells

4. A hapten is

a) an epitope

b) a paratope

c) an immunogen

d) a small chemical grouping which reacts with preformed antibodies

5. A discontinuous antigen epitope is

a) Presented by MHC molecules

b) Usually concave

c) Produced by amino acid residues on non-adjacent polypeptide sequences

d) Produced by a continuous linear peptide sequence

6. Binding of antigen to antibody is

a) usually unaffected by molecular rigidity

b) optimized by spatial complementarity

**c)** unaffected by the presence or absence of water molecules

d) usually unaffected by pH.

7. The intermolecular forces which contribute to the interaction between antibody and antigen

a) Are all electrostatic

b) Are all van der Waals

c) Are all hydrophobic

d) Rely on a combination of the above.

8. Which of the following statements is incorrect? Affinity is

a) Avidity

b) A measure of the strength of the binding of antigen to antibody

c) The association constant of the Ag/Ab equilibrium

d) Related to specificity.

9. The antigen moiety on an antigen-presenting cell recognized by the alpha beta T-cell receptor is

a)native protein antigen plus major histocompatibility complex (MHC) molecule

b) processed (peptide) antigen plus MHC

c) processed peptide antigen

d) MHC alone.

10. In which of the following case a large lattice is formed?

a)Antibody is in excess

b) Antigens and antibodies are in optimal proportion

c) Antigen is in excess

d) None of these

11. Ring test is used for

a)C-reactive protein test

b)Ascoli's thermoprecipitation test

c) typing of *streptococci* and *pneumococci*

d) all of the above

12. Precipitation reaction can be converted into agglutination reaction by coating soluble antigen onto

a)bentonite particles

b)latex particles

c) RBCs

d) all of these

13. Commercially available ELISA kits are used for the detection of

a)rotavirus

b)hepatitis B surface antigen

c) anti-HIV antibodies

d) all of these

14. Monoclonal antibody production requires

a)mouse splenic lymphocytes

b)mouse myeloma cells

c) both (a) and (b)

d) None of these

15. Quellung reaction is used for typing of

a)*Klebsiella pneumoniae*

b)*Streptococcus pneumoniae*

c) both (a) and (b)

d) None of these

16. The processed peptide binding to the MHC class I groove

a) Usually binds to the groove through 2 anchor residues

b)Is usually more than 11 amino acids long

c) Hangs over the ends of the groove

d) Is derived from exogenous protein taken in by endocytosis

17. 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 derived from exogenous protein taken in by endocytosis

18. Cross-presentation of exogenous antigen to a b T-cells does not require the involvement of

a) MHC class II

b) MHC class I

c) An antigen-presenting cell.

d) Antigen-processing

19. NKT cells

a)Bear diverse TCR alpha chains

b) Have a limited TCR beta chain repertoire

c) Following stimulation secrete gamma interferon but not IL-4.

d) Are restricted by CD1 but not by classical MHC molecules.

20. Alkylamine antigens

a) Are produced by *Listeria monocytogenes*

b)Comprise a family of lipid antigens.

c) Do not occur naturally

d) Stimulate alpha beta but not gamma delta T-cells.

21. Superantigens

a) Do not cause pathology.

b)Bind to MHC class III..

c) Bind to all members of a given V beta T-cell receptor family.

d) Have to be processed before recognition by the T-cell..

22. An epitope

a)  Is the area on an antigen which contacts antibody.

b)Is the area on an antibody which contacts antigen.

c) Is usually composed of a linear sequence of amino acids.

d) Is usually associated with a concave region of the antigen.

23. Alpha beta T-cell receptors recognize

a)Native antigen

b)Free linear antigenic peptide.

c) MHC beta2-microglobulin.

d) Linear antigen peptide in the MHC groove.

24. *Staphylococcus aureus* superantigens

a)Do not cause pathology.

b)Are recognized by T-cells in processed form.

c)  Are potent T-cell mitogens.

d) Stimulate T-cells independently of V beta family.

25. In extreme antigen excess, immune complexes between IgG and a tetravalent antigen have the composition

a) Ag1Ab4

b)Ag4Ab3

c) Ag2Ab1

d) Ag3Ab2

26. Antibody titer refers to the

a)Absolute amount of specific antibody.

b)Affinity of specific antibody.

c) Avidity of specific antibody

d) Highest dilution of antibody still able to give a positive result in a test system.

27. The association constant (Ka) at equilibrium is represented by

a) [AgAb complex]/[free Ag][free Ab]

b)[free Ag][free Ab]/[AgAb complex]

**c)** [free Ag][free Ab]

d) [AgAb complex]

28. The affinity of an antibody can be determined by measuring

a)  Its concentration

b) The amount of antibody bound at various antigen concentrations.

c) Its ability to neutralize bacterial toxins.

d) The valency of antigen binding.

29. Latex particles are often used in

a) Agglutination tests

b)Affinity chromatography

c)Affinity measurements

d) Adjuvants.

30. Small chemical groups on the antigen molecule that can react with antibody

a) epitope

b) paratope

c) isotope

d) allotope

31. Complement component C3 is cleaved by

a) C3b

b) C3bBb

c) factor B

d) factor D

32. The membrane attack complex in the complement pathway consists

a) C3b3b,Bb

b) C5b,6,7,8,9

c) Colicins

d) Properdin

33. **Complement component C3b**

a) directly injures bacteria

b) is an anaphylatoxin

c) is chemotactic

d) opsonizes bacteria

34. **A complement component that is strongly chemotactic for neutrophils is**

a) C3

b) C3b

c) C5a

d) C5b

35. **The initial complement component that is bound by complement-fixing antibodies is**

a) C1q

b) C1s

c) C3b

d) C5a

36. **Several of the complement components are**

a) antibodies

b) Cytokines

c) Enzymes

d) Glycolipids

37. **The classical and alternative pathways meet at complement component**

a) C3

b) C4

c) C4b

d) C5

38. **One principal function of complement is to**

a) bind antibodies attached to cell surfaces and to lyse these cells

b) cross-link allergens

c) inactivate perforins

d) mediate the release of histamine

39. **The major role of the complement system is to work in conjunction with**

a) antibodies to lyse cells via the C8 and C9 components

b) antibodies to lyse cells via the perforin molecules

c) antibodies to opsonize cells

d) the major histocompatibility complex for cell recognition

40. **Complement fixation**

a) can be modified by the cholera toxin

b) has extrinsic guanylate cyclase activity

c) can be desensitized by phosphorylation

d)  is an effector function of [IgG](https://microbeonline.com/igg-antibody-structure-subclasses-functions-and-clinical-significance/) and [IgM](https://microbeonline.com/igm-antibody-structure-properties-functions-clinical-significance/) following antigen binding

41. Cytokines primarily involved in T cell proliferation and development is
a) IL-2 and IL-7
b) TGFβ
c) IL-4 and IL-5
d) IL-12

42. The characteristic properties of cytokines are**:**
a) pleiotropy and redundancy
b) synergy and antagonism
c) cascade induction and amplification
d) All of the above

43. Which of the following class of cytokine receptors utilize G-protein coupled receptors for its downstream function?
a) Chemokines receptor
b) Hematopoietic receptor
c) Interferon receptor
d) None of the above

44. Cytokines always act
a) Antagonistically with other cytokines
b) At long range
c) Synergistically with other cytokines
d) By binding to specific receptors

45. Interleukin-1 is an inflammatory cytokine that has the following function
a) Inflammation
b) Leukocyte adhesion
c) Production of acute phase reactant protein
d) All of the above

46. Chemokines are the structurally homologous cytokines family that regulate lymphocyte migration. Which of the following is an incorrect statement regarding the cytokines?
a) Chemokines consist of characteristic N-terminal cysteine residues
b) Chemokines are produced by endothelial cells, epithelial cells, and fibroblasts
c) Chemokines are suppressed by microbes, TNF and IL-1
d) Chemokines bind to the heparan sulfate on the endothelial tissue that enables recruitment and trapping of cells into infection sites

47.Interleukin activate cell-mediated immune response by increasing the synthesis of which of the following cytokines?
a) TNF
b) Interferon-beta
c) Interferon-gamma
d) Interleukin 1

48. Which of the following viral antigens activates the production of Type I interferon?
a) Capsid protein
b) Double-stranded RNA
c) Double-stranded DNA
d) None of the above

49. Which of the following cytokine antagonizes the function of IL-12 and the absence of specific cytokine in mice develop inflammatory bowel disease?
a) IL-1
b) IL-2
c) IL-10
d) IFN-gamma

50. Which of the following cytokine is used for the treatment of the chronic granulomatous disease?
a) INF-alpha
b) INF-beta
c) INF-gamma
d) TNF

51. Which of the following cytokine is used for the treatment of viral hepatitis and multiple sclerosis?
a) INF-alpha
b) INF-beta
c) INF-gamma
d) TNF

52. Which of the following interleukin is responsible for T cell expansion after antigen recognition?
a) IL-1
b) IL-2
c) IL-4
d) IL-5

53. Which of the following interleukin stimulate differentiation of Th2 subset and production of IgE?
a) IL-1
b) IL-2
c) IL-4
d) IL-5

54. Which of the following interleukin activates eosinophil that consists of FcR for IgE?
a) IL-1
b) IL-2
c) IL-4
d) IL-5

55. Which of the following cytokines stimulate the production of IgA that is required for mucosal immunity?
a) Interferon-gamma
b) Tumor Necrosis Factor
c) Transforming growth factor-beta
d) All of the above

56. Which of the following is called as Competent lymphocytes?
a) B-lymphocytes
b) T-lymphocytes
c) C- lymphocytes
d) S-lymphocytes

57. Number of lymphocytes present in a healthy human is \_\_\_\_\_\_\_\_\_\_\_
a) 1 trillion
b) 1 million
c) 1 billion
d) 10 trillion

58. Which of the following sets include all the types of T-cells?
a) Killer cells and Helper cells
b) Suppressor and Cytotoxic cells
c) Depressor cells, Helper cells and Memory cells
d) Killer cells, Helper cells, Suppressor cells and Memory cells.

59. Which of the following cell surfaces do not have Major Histocompatibility complex?
a) Red Blood Corpuscles
b) White Blood Cells
c) Helper T-cells
d) Killer T-cells

60. Life span of T-cell is
a) 4-5 hours
b)4-5 daysc) 4-5 weeks

**UNIT – IV (Dr.MG)**

1) Hypersensitivity reactions are broadly classified into four different types.

Which of the following hypersensitivity occurs via IgE antibody?
a) Type I hypersensitivity
b) Type II hypersensitivity
c) Type III hypersensitivity
d) Type IV hypersensitivity

2) Which of the following hypersensitivity reactions are mediated by sensitized T helper-1 cells?
a) Type I hypersensitivity
b) Type II hypersensitivity
c) Type III hypersensitivity
d) Type IV hypersensitivity

3) Which of the following hypersensitivity reactions is a result of massive deposition of immune complex in various tissues, and can induce complement activation and inflammation responses?
a) Type I hypersensitivity
b) Type II hypersensitivity
c) Type III hypersensitivity
d) Type IV hypersensitivity

4) Which of the following hypersensitivity reactions involve antibody-directed complement activation and antibody-dependent cell cytotoxicity?
a) Type I hypersensitivity
b) Type II hypersensitivity
c) Type III hypersensitivity
d) Type IV hypersensitivity

5) Which of the following receptor have a high affinity towards IgE?
a) FcεRI
b) FcεRII
c) Both of the above
d) None of the above

6) A hereditary predisposition of the development of immediate hypersensitivity reaction against common environmental antigens are called**.........................**
a) Atrophy
b) Atopy
c) Anergy
d) Synergy

7) Which of the following domain present in the Fc region of IgE molecule enables the binding of glycoprotein receptors on the surface of the basophils and mast cells?
a)CH1
b)CH2
c) CH3
d) CH4

8) The high-affinity FcεRI receptor functions in signal transduction, activation, and degranulation of chemical mediators such as histamine, leukotrienes, and prostaglandins for the mast cells.

Which of the following intracellular messenger serves this function?
a) Ca++
b) cAMP
c) cGMP
d) None of the above

9) The persistent level of which of the following second messenger inhibits the degranulation of the mast cells and release of the mediators of anaphylaxis?
a) Ca++
b) cAMP
c) cGMP
d) None of the above

10) Which of the following is not an example of Type I hypersensitivity reaction?

a) Asthma
b) Allergic Rhinitis
c) Systemic Lupus Erythematosus
d) Atopic Dermatitis

11) Which of the following is the early mediator of type I hypersensitivity reaction?
a) Histamine
b) Leukotrienes
c) Prostaglandins
d) All of the above

12) The type I late response occurs hours later and involves the following mediators.
a) IL4
b) IL-5
c) TNF-α
d) All of the above

13) All of the following drugs are involved in increased production or maintenance of cAMP level to prevent anaphylaxis, EXCEPT:
a) Theophylline
b) Epinephrine
c) Cromolyn sodium
d) Cortisone

14) During a blood transfusion, ABO incompatibilities lead to the recognition of A or B antigens present on the RBC resulting in complement-mediated cell lysis.

Which of the following antibody isotype is primarily involved in this type II hypersensitivity reaction?
a) IgG
b) IgM
c) IgE
d) IgA

15) Erythroblastosis fetalis is a severe form of hemolytic disease developed when Rh+ fetus expresses Rh antigen on its blood that the mother does not express.

Which of the following condition is true regarding this condition?
a) During the first pregnancy, the exposure of Rh antigen leads to the generation of memory cells and the IgG response that is harmful during the subsequent pregnancy
b) The condition may be prevented by infusing and reducing exposure to Rh antigen within 24-48 hours of pregnancy
c) Plasmapheresis may be used to remove the antibodies from the circulation
d) All of the above

16) Which of the following drugs can induce all four types of hypersensitive reactions?
a) Penicillin
b) Sulfonamides
c) Local anesthetics
d) Salicylates

17) Which of the following disease is not the example of type III hypersensitivity reaction?
a) Systemic Lupus Erythematosus
b) Rheumatoid Arthritis
c) Good Pasture’s syndrome
d) Down Syndrome

18) All of the following statement regarding Type III hypersensitivity reaction is true, except**:**
a) Antigen-antibody forms a large complex and is deposited in the nearby tissue
b) Immune complex activate the complement system and anaphylatoxins
b) The anaphylatoxin such as C3a, C3b recruits neutrophils at the site of immune complex deposition
c) Neutrophils and macrophages clear the immune complexes and tissue damage

19) 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) CD8+ T Helper-1 cells are primarily activated after exposure to antigen
d) CD4+ T Helper-1 cells are primarily activated after exposure to antigen

20) Which of the following statement is not true regarding the effector phase of delayed-type hypersensitivity **(**DTH**)**?
a) The response generally peaks at 48-72 hours after a second exposure to the antigen
b) T Helper 2 cells secrete antibodies and activate antibody-dependent cell cytotoxicity
c) T Helper 2 cells secrete a variety of cytokines that recruit and activate macrophages
d) DTH response becomes self-destructive to the intense response that is visible as the granulomatous reaction.

21. Allergy to penicillin is an example of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

22. Type IV hypersensitivity is also called as

a) immediate hypersensitivity

b) delayed hypersensitivity

c) cytotoxic hypersensitivity

d) immune complex hypersensitivity

23. The most common class of antibody involved in type II hypersensitivity is

a) IgG

b) IgM

c) IgE

d) IgD

24. T helper cell mediated hypersensitivity is

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

25. Type III hypersensitivity is triggered by

a) mast cells and IgE

b) K cells and IgG

c) deposition of antigen antibody complexes

d) Th cells

26. Autoimmune hemolytic anemia (AHA) is an example of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

27. “Wheal and flare” reaction is characteristic reaction associated with identification of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

28. K cells and IgG mediated hypersensitivity is

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

29. Antibody dependant cytotoxicity is associated with

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

30. Allergies to sea foods, eggs etc is an example of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

31. Asthma is an example of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

32. Which of the following is called as antibody mediated cytotoxic hypersensitivity?

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

33. Type I hypersensitivity is mediated by

a) B cells and IgE

b) mast cells and IgG

c) mast cells and IgE

d) B cella and Ig G

34. T cells called as TDTH mediated

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

35. Killer cells along with IgM mediates

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

36. Serum sickness is an example of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

37. Tuberculosis is a classical example for

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

38. ‘Arthus’ reaction is a characteristic reaction for the identification of

a) Type I hypersensitivity

b) Type II hypersensitivity

c) Type III hypersensitivity

d) Type IV hypersensitivity

39. Type IV hypersensitivity is also called as

a) antibody mediated hypersensitivity

b) IgE mediated hypersensitivity

c) cell mediated hypersensitivity

d) IgG mediated hypersensitivity

40. All are examples of Type I hypersensitivity except

a) penicillin allergy

b) serum sickness

c) dust sickness

d) pollen allergy

41. The process of removal and replacement of damaged tissues or organs with healthy ones from a donor is called as

a) transplantation

b) replacement therapy

c) repair and replacement

d) none of these

42. The transfer of individuals own tissue to another part of the body is called

a) autograft

b) xenograft

c) allograft

d) syngeneic graft

43. The transfer of tissue between genetically identical individuals (like twins) is called

a) autograft

b) xenograft

c) allograft

d) syngeneic graft

44. The transfer of tissue between individuals of different species is called

a) autograft

b) xenograft

c) allograft

d) syngeneic graft

45. The transfer of tissue between genetically different individuals of same species is called

a) autograft

b) xenograft

c) allograft

d) syngeneic graft

46. Which of the following has the maximum transplantation success rate

a) autograft

b) xenograft

c) allograft

d) syngeneic graft

47. The major molecules responsible for rejection of transplant is

a) B cells

b) T cells

c) MHC molecule

d) antibodies

48. Genes encoding cell surface glycoproteins that are required for antigen presentation to T cells and also responsible for rapid graft rejection is called as

a) MHC complex

b) B cell complex

c) T cell complex

d)none of these

49. Which of the following statements are true regarding transplantation

a) The compatibility of MHC proteins of donor and recipient will determine the success of transplantation

b) MHCs are just like fingerprints and all nucleated cells possess this fingerprint

c) The compatibility of MHC/HLA proteins of donor and recipient will be high if they are genetically closely related and may lead to successful transplantation.

d) all of these

50. In humans, MHC is called as

a) human MHC

b) Homo MHC

c) Human leucocyte antigen (HLA)

d) all of the above

51. Which of the following is the cause of autoimmune diseases?
a) Immune System begins to attack its cells and tissues
b) Immune System starts producing cells and tissues
c) Immune System fails completely
d) Immune System produces WBCs in a huge number

52. Which of the following is not an autoantigen?
a) RBCs
b) Liver Cells
c) Acetylcholine receptors
d) Brain

53. Which of the following is not an autoimmune disorder?
a) Rheumatoid Arthritis
b) Multiple sclerosis
c) Influenza
d) Chronic Hepatitis

54. In which of the following diseases the autoantigens are β-cells?
a) Myasthenia gravis
b) Insulin-dependent diabetes
c) Multiple sclerosis
d) Chronic anaemia

55. Which of the following is not an immune system disorder?
a) Allergies
b) Immunodeficiency
c) Genetic Disorders
d) Autoimmune Diseases

56. Which of the following is an autoimmune disease?
a) Addison’s disease
b) Syphilis
c) Tuberculosis
d) AIDS

57. Which of the following statements is incorrect regarding Rheumatoid arthritis?
a) It is an autoimmune disorder
b) It occurs only in old people
c) Inflammation of synovial fluid
d) Diagnosed by the presence of rheumatoid factor

58. In Myasthenia gravis, antibodies start attacking the \_\_\_\_\_\_\_\_\_\_
a) Proprioceptors
b) Chemoreceptors
c) Acetylcholine receptors
d) Cortisol receptors

59. What tissues, organs, or body systems can be affected by autoimmune diseases

a) Skin

b) Joints

c) Thyroid

d) All of the above

60. Which of these autoimmune diseases can be cured

a) Lupus

b) Multiple sclerosis

c) Scleroderma

d) None of the above

**UNIT- V (Dr.VL)**

1. Antigenic substances produced in tumour cells are called as
	1. Tumour antigens
	2. Tumour substances
	3. Carcinogens
	4. Tumourigens
2. Tumour antigens triggers an
	1. immune response in the host.
	2. immune response in the virus.
	3. immune response against the host.
	4. immune response against the neighbouring cells.
3. Tumor antigens are useful markers in identifying
	1. Viruses
	2. Mutations
	3. Tumours
	4. Vaccines
4. Tumor-Specific Antigens (TSA) are present on
	1. All cells
	2. Only tumor cells
	3. Both normal and tumour cells
	4. Only normal cells
5. ₋₋₋₋₋₋₋₋₋₋₋₋₋, are found in elevated levels on tumor cells, but are also expressed at lower levels on healthy cells.
	1. Tumor-aggrevated antigens
	2. Tumor-amplifying antigens
	3. Tumor-annealing antigens
	4. Tumor-associated antigens
6. Alphafetoprotein (AFP) is a ₋₋₋₋₋₋₋₋₋₋₋
	1. Tumor-associated antigens (TAA)
	2. Tumor-Specific Antigens (TSA)
	3. Tumor-Spreading Antigens (TSA)
	4. Tumor-Amplifying Antigens (TAA)
7. Melanoma-associated antigen is
	1. Tumor-associated antigens (TAA)
	2. Tumor-Specific Antigens (TSA)
	3. Tumor-Spreading Antigens (TSA)
	4. Tumor-Amplifying Antigens (TAA)
8. Origin for tumor antigens include
	1. Oncofetal antigens
	2. Oncoviral proteins
	3. Release of antigens when tumor cells die
	4. All the above
9. Trastuzumab is used to treat breast cancers by targeting
	1. HER2 antigen
	2. HERPES antigen
	3. HERCULUS antigen
	4. HER20 antigen
10. Rituximab targets the CD20 antigen present on B cells and used to control
	1. leukemia
	2. hepatoma
	3. non-Hodgkin’s lymphoma
	4. sarcoma
11. The constant monitoring of the body for small tumours is known as
	1. immune surveillance.
	2. immune editing.
	3. immune escape.
	4. immune survival.
12. The immunological surveillance theory was originally put forth by
	1. Burnet
	2. Thomas
	3. Burnet and Thomas
	4. Thomas Alwa Edison
13. Cancer immunoediting process is envisaged to consist of
	1. elimination
	2. equilibrium
	3. escape
	4. all the above
14. Tumour cells that elude the immunosurveillance phase will progress to the
	1. immune profiling phase
	2. immune processing phase
	3. immune editing phase
	4. immune diagnostic phase
15. The equilibrium phase of advanced oncogenesis is characterised by
	1. Minimal tumour expansion and metastasis
	2. Expression of clinical symptoms
	3. Advanced matastasis
	4. IV stage of tumour
16. In the equilibrium phase, the immune system may
	1. eventually eliminate all tumour cells
	2. edit or sculpt the phenotype of the developing tumour
	3. either a or b
	4. both a and b
17. Tumours that are no longer susceptible to immune attack then progress into the immunoediting process, termed
	1. Elimination
	2. Escape
	3. Selection
	4. Withdrawal
18. The emergence of clinical symptoms of cancer generally correlates with the
	1. escape stage.
	2. Elimination stage
	3. Preliminary stage
	4. Surveillance stage
19. Tumour cells induce
	1. Innate immune mechanisms
	2. Acquired immune mechanisms
	3. Both innate and acquired immune mechanisms
	4. None of the above
20. The immune mechanism that is more effective in controlling tumour growth is
	1. Antibody-mediated response
	2. Humoral immune e response
	3. Cell mediated immune response
	4. Cytokine mediated immune response.
21. The effector cells, that have effective tumoricidal abilities are,
	1. Natural killer cells
	2. T cytotoxic cells
	3. Macrophages
	4. All the above
22. The Innate Immune System in Tumour Immunity is comprised of
	1. NK cells, macrophages and dendritic cells
	2. Platelets, clotting factors and vitamin K
	3. B cells, T cells and APCs
	4. Lymphocytes, tonsils, and lymph nodes
23. The major Antigen presenting cells that present tumour antigens to T cells are
	1. Macrophages
	2. Bcells
	3. Dendritic cells
	4. All the above
24. NK cells identify tumour cells through
	1. High expression of MHC molecules by tumour cells
	2. Low expression of MHC molecules by tumour cells
	3. High expression of tumour antigens by tumour cells
	4. Low expression of tumour antigens by tumour cells
25. The two pathways involved in processing of tumour antigens are
	1. Exopathogenic pathway and endopathogenic pathway
	2. Exopyrolytic pathway and endopyrolytic pathway
	3. Exogenous pathway and endogenous pathway
	4. Exophthalmic pathway and enophthalmic pathway
26. The source of antigens for the endogenous pathway in tumour immunity is
	1. unfolded intracellular proteins
	2. oncoviral proteins
	3. mutated protein products
	4. all the above
27. MHC-I/peptide complexes expreesed by tumour cells are recognized by
	1. CD8 +ve cells
	2. CD4 +vecells
	3. CD8 –ve cells
	4. CD4 –ve cells
28. In the exogenous pathway of tumour immunity, the source of antigen is
	1. Tumour antigens engulfed by through endocytic pathway by antigen presenting cells
	2. Antigens released from damaged or injured tumour cells.
	3. Both a and b
	4. None of the above
29. Antibodies involve in tumour immunity through
	1. Antibody-dependent cellular cytotoxicity (ADCC)
	2. activation of the complement system
	3. both a and b
	4. none of the above
30. Regulatory T cell-mediated immune suppression is brought through
	1. IL-10 and TGF-β secreted by tumour cells
	2. IL-10 and TGF-β secreted by normal cells
	3. TNFα and TNFβ secreted by tumour cells
	4. TNFα and TNFβ secreted by normal cells
31. Evasion of immune responses by tumours is through
	1. Active Inhibition of Immune Responses
	2. Escaping Immune Recognition by Loss of Antigen Expression
	3. Both a and b
	4. Neither a nor b
32. Loss of tumour antigens happen due to
	1. the high mitotic rate of tumor cells and their genetic instability
	2. mutations or deletions in genes encoding tumor antigens
	3. low expression of tumour antigens
	4. all the above
33. tumour cells show
	1. decreased synthesis of class I MHC molecules
	2. decreased synthesis of β2-microglobulin
	3. decreased synthesis of components of the antigen processing machinery
	4. all the above
34. Myeloid-derived suppressor cells (MDSCs)
	1. suppress anti-tumour innate and T cell responses
	2. supress tumour growth
	3. enhance anti-tumour innate and T cell responses
	4. inhibits endocytic pathway in tumour cells
35. Secreted products of tumour cells may suppress antitumor immune responses and thus
	1. causes tumours to escape from immune system
	2. causes tumours to die
	3. causes tumour resistance
	4. enhance immunity
36. The treatment that uses a person's own immune system to fight cancer.
	1. Chemotherapy
	2. Immunotherapy
	3. Radiotherapy
	4. Self therapy
37. Immunotherapy uses immunological substances
	1. made by the body
	2. made in a laboratory
	3. both a and b
	4. neither a nor b
38. Checkpoint inhibitors are drugs that
	1. take the ‘brakes’ off the immune system
	2. check the tumour antigens
	3. controls the immune system
	4. all the above
39. Chimeric antigen receptor (CAR) T-cell therapy is
	1. Treatment of T cells
	2. Removal of T cells
	3. Activation of T cells
	4. Using T cells with new antigen
40. Imlygic is
	1. Talimogene laherparepvec
	2. T-VEC.
	3. a and b are same
	4. none of the above
41. T-VEC is
	1. a genetically modified herpes simplex virus, type 1 (HSV-1)
	2. a virulent form of type 1 (HSV-1)
	3. a dead type 1 (HSV-1)
	4. all the above
42. Imlygic is used for treating
	1. Hepatoma
	2. Melanoma
	3. Sarcoma
	4. Lymphoma
43. Oncolytic virus therapy uses viruses
	1. that have been modified in a lab to infect and kill certain tumour cells.
	2. To induce tumours
	3. To analyse tumours
	4. For oncogenesis
44. The alternate therapy for cancer includes
	1. Cancer vaccines
	2. Immunomodulators
	3. Cytokines
	4. All the above
45. Using monoclonal antibodies in cancer therapy is called
	1. Antibody therapy
	2. Clonal therapy
	3. Targeted therapy
	4. Immunoglobin therapy
46. Immunoprophylaxis is a process of
	1. immunization used for preventing infections
	2. treating immune system
	3. vaccine preparation
	4. drug preparation
47. A process of immunization used for preventing infections is called
	1. Immunoediting
	2. immunomodulation
	3. Immunoprophylaxis
	4. Immunotherapy
48. Attenuated vaccines.
	1. Live vaccines
	2. Dead vaccines
	3. Both a and b
	4. Neither a nor b
49. Sabin polio vaccine is
	1. A dead vaccine
	2. An attenuated vaccine
	3. A mutated vaccine
	4. A killed vaccine
50. Salk vaccine for polio is
	1. A dead vaccine
	2. An attenuated vaccine
	3. A mutated vaccine
	4. A killed vaccine
51. Vaccines that do not contain bacteria that cause disease, but inactivated forms of their toxins are called
	1. Toxonins
	2. Toxilins
	3. Toxoporins
	4. Toxoids
52. Hepatitis B (HBV) vaccine is a
	1. Live vaccine
	2. Dead vaccine
	3. subunit vaccine
	4. DNA vaccine
53. Polyvalent vaccines are vaccines that contain
	1. several antigens of different serotypes of the same pathogen
	2. a number of antigens from different pathogens.
	3. Either a or b
	4. None of the above
54. DNA vaccine is
	1. DNA sequence that codes for antigenic protein of pathogen
	2. DNA sequence that codes for immunomodulators
	3. DNA sequence that codes for immunosuppressors
	4. DNA sequence that codes for antibodies
55. Immunological techniques include
	1. experimental methods to study the immune system
	2. methods to generate immunological reagents
	3. methods to use immunological reagents
	4. all the above
56. Double immunodiffusion  is an [immunological technique](https://en.wikipedia.org/wiki/Immunology) used in
	1. the identification of [antibodies](https://en.wikipedia.org/wiki/Antibody) and [antigens](https://en.wikipedia.org/wiki/Antigen)
	2. [quantification](https://en.wikipedia.org/wiki/Quantification_%28science%29) of [antibodies](https://en.wikipedia.org/wiki/Antibody) and [antigens](https://en.wikipedia.org/wiki/Antigen)
	3. Both a and b
	4. Neither a nor b
57. The immunological techniquedouble immunodiffusion is invented by
	1. [Orjan Ouchterlony](https://en.wikipedia.org/wiki/%C3%96rjan_Ouchterlony)
	2. Carl Linnaeus
	3. [Paul Ehrlich](https://en.wikipedia.org/wiki/Paul_Ehrlich)
	4. Emil von Behring
58. A radioimmunoassay (RIA) is an
	1. Immunoassay that uses radio
	2. Immunotherapy that uses radio
	3. Immunoassay that uses radiolabelled antigens and antibodies.
	4. Immunotherapy using radiolabelled antigens and antibodies.
59. The height of the precipitation 'rocket’ in rocket electrophoresis indicates
	1. the level of antibody concentration
	2. the level of antigen concentration
	3. the level of antigen antibody complex concentration
	4. all the above
60. ELISA is
	1. Enzyme linked immunosorbent assay
	2. Enzyme lost immunosorbent assay
	3. Enzyme linked immunoradiant assay
	4. Erythrocytes linked immunosorbent assay
61. The common enzyme used in ELISA is
	1. Lipid peroxidase
	2. Horseradish peroxidase
	3. Horsegram peroxidase
	4. Horse lLipid peroxidase
62. Agglutination is the process of
	1. Soluble antigen with antibody reaction
	2. Cellular antigen with antibody reaction
	3. Particulate antigen with antibody reaction
	4. Cell lysis
63. Agglutination reactions produce visible aggregates of
	1. antigen complexes
	2. antibody complexes
	3. complement complexes
	4. antibody – antigen complexes
64. Haemagglutination is the clumping together of
	1. red blood cells
	2. bacteria
	3. hemoglobin
	4. heme protein
65. Erythroblastosis fetalis is hemolytic anemia in
	1. Man
	2. fetus
	3. monkeys
	4. mice
66. Erythroblastosis fetalis classically results from
	1. Rho(D) incompatibility
	2. ABO incompatibility
	3. A antigen incompatibility
	4. All the above
67. The A, B, and O blood groups were first identified by
	1. Peter Erickson
	2. Carl Linnaeus
	3. Karl Landsteiner
	4. Karl Erickson
68. Widal test is an indirect agglutination test for
	1. typhoid fever due to *Salmonella* infection
	2. flu fever due to influenza
	3. cholera fever due to *Vibrio cholerae*
	4. Tuberculosis
69. The Coombs’ test is used to detect antibodies that act against
	1. The surface of WBCs
	2. The surface of macrophages
	3. The surface of lymphocytes
	4. the surface of red blood cells.
70. Coomb’s test positive indicates a condition known as
	1. Erythroblastosis faetalis
	2. Megaloblastic anemia
	3. Hemolytic anemia
	4. Erythroma

**ANSWER KEY**

UNIT-I

 1.a 2.d 3.d 4.a 5.b 6.c 7.d 8.c 9.a 10.a 11.c 12.c

13.c 14.c 15.b 16.d 17.a 18.d 19.d 20.c 21.d 22.b 23.c 24.c

25.b 26.c 27.d 28.b 29.c 30.a 31.d 32.b 33.d 34.b 35.c 36.a

37.b 38.d 39.d 40.a 41.b 42.d 43.b 44.d 45.a 46.a 47.c 48.d

49.c 50.b 51.a 52.a 53.c 54.b 55.b 56.c 57.a 58.d 59.a 60.d

UNIT-II

 1.d 2.a 3.a 4.c 5.a 6.c 7.c 8.d 9.c 10.a 11.c 12.d

13.a 14.b 15.b 16.a 17.a 18.b 19.c 20.d 21.b 22.c 23.d 24.a

25.d 26.a 27.c 28.c 29.b 30.a 31.d 32.c 33.b 34.d 35.a 36.a

37.b 38.d 39.d 40.b 41.a 42.a 43.a 44.d 45.d 46.a 47.a 48.a

49.c 50.a 51.b 52.d 53.d 54.d 55.d 56.d 57.b 58.d 59.a 60.b

UNIT-III

1.a 2.c 3.a 4.d   5.c  6.b 7.d  8.a  9.b 10.b 11.d 12.d

13.d  14.c 15.c 16.a 17.c 18.a 9.b 20.a 21.c 22.a 23.d 24.c

25.c 26.d 27.a 28.b 29.a 30.a 31.a 32.b 33.d 34.c 35.a 36.c

37.a 38.a 39.a 40.d 41.d 42.d 43.a 44.d 45.d 46.c 47.c 48.b

49.c 50.c 51.b 52.b 53.c 54.d 55.c 56.b 57.a 58.d 59.a 60.d

UNIT-IV

 1.a 2.d 3.c 4.b 5.a 6.b 7.d 8.a 9.b 10.c 11.d 12.d

13.c 14.b 15.d 16.a 17.d 18.c 19.c 20.b 21.a 22.b 23.a 24.d

25.c 26.b 27.a 28.b 29.b 30.a 31.a 32.b 33.b 34.d 35.b 36.c

37.d 38. c 39.c 40.b 41.a 42.a 43.d 44.b 45.c 46.a 47.c 48.a

49.d 50.c 51.a 52.d 53.c 54.b 55.c 56.a 57.b 58.c 59.d 60.d

UNIT-V

 1.a 2.a 3.c 4.b 5.d 6.b 7.a 8.d 9.a 10.c 11.a 12.c

13.d 14.c 15.a 16.c 17.b 18.a 19.c 20.c 21.d 22.a 23.c 24.b

25.c 26.d 27.a 28.c 29.c 30.a 31.c 32.d 33.d 34.a 35.a 36.b

37.c 38. a 39.d 40.c 41.a 42.b 43.a 44.d 45.c 46.a 47.c 48.a

49.b 50.d 51.d 52.c 53.c 54.a 55.d 56.c 57.a 58.c 59.b 60.a

61.b 62.c 63.d 64.a 65.b 66.a 67.c 68.a 69.d 70.c