MEDICAL TECHNOLOGY LICENSURE EXAM

PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING

PRACTICE EXAM QUESTION

400 QUESTIONS

TEST YOUR KNOWLEDGE AS IF YOU WERE TAKING A BOARD EXAM

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. All of the following are DELAYED IMMUNE HEMOLYTIC TRANSFUSION REACTION, EXCEPT:

A. Hemolytic
B. TA-GVHD
C. Hemosiderosis
D. Post transfusion purpura

2. Which of the following additive solutions does not contain Mannitol but contains citrate and phosphate?

A. AS-1
B. AS-3
C. AS-5
D. AS-7

3.Leukocyte-reduced filters can do all of the following, EXCEPT:

A. Reduce risk of CMV transmission
B. Prevent HLA alloimmunization and Platelet refractoriness
C.Prevent FNHTR and TACO
D.Prevent TA-GVHD

4. Which of the following is associated with myasthenia gravis and celiac disease?

A. HLA-C1
B. HLA-A8
C. HLA-B8
D. HLA-DR4

5.Which of the following IgG type is best for complement fixation due to its larger hinge region?

A. IgG1
B. IgG2
C. IgG3
D. IgG4

6.What molecule on the surface of most T cells allows antigen recognition?

A. CD3, with six different chains
B. TCR, consisting of two chains, alpha and beta
C. IgT, a four chain molecule that includes the tau heavy chain
D. HLA

7.What is detected in RPR and VDRL?

A. Cardiolipin
B. Anti-treponemal antibodies
C. Live Treponema pallidum
D. Anti-cardiolipin antibody

8.Which of the following blood group antigens are associated with HLA antigens?

A. Diego
B. Bg
C. Rodgers
D. Xg

9.Which is true about the relationship of blood group antigens to HLA antigens?

A. HLA antigens are not considered a blood group antigen
B. HLA antigens are considered a blood group antigen.
C. Bga represents HLA-B17
D. Mature RBCs generally have detectable levels of HLA

10.Most of the blood group systems are coded by variants of a single gene. Which of the following is an example?

A. ABO
B. RH
C. CH/Rg and Xg
D. MNSs

11.What is the most common Gerbich antibody?

A. Anti-Ge1
B. Anti-Ge2
C. Anti- Ge3
D. Anti-Ge4

12.Which of the following describes the expression of most blood group antigens?

A. Dominant
B. Recessive
C. Codominant
D. X-linked

13.If a patient has a positive DAT, should you perform a weak D test on the cells?

A. Yes, Rh reagents are enhanced in protein media
B. No, the cells are Rh null
C. Yes, the immunoglobulin will not interfere with the test
D. No, the cells are already coated with antibody

14.Which procedure would help to distinguish between an anti-e and anti- Fya in an antibody mixture?

A. Lower the pH of test serum
B. Run an enzyme panel
C. Use thiol reagent
D. Run a LISS panel

15.What would be the result of group A blood given to a group O patient?

A. Nonimmune transfusion reaction
B. Immediate hemolytic transfusion reaction
C. Delayed hemolytic transfusion reaction
D. Febrile nonhemolytic transfusion reaction

16.A patient showed positive results with screening cells and 4 donor units. The patient auto-control was negative. What was the most likely antibody?

a. Anti-H
b. Anti-S
c. Anti-Kpa
d. Anti-k

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

17.Component of an additive solution that serves as source of energy for blood
A. Saline
B. Dextrose
C. Mannitol
D. Adenine

18.In what manner is whole blood stored?
A. Horizontally in refrigerator
B. Horizontally in room temperature
C. Standing upright in room temperature
D. Standing upright in refrigerator

19.Which of the following viruses is the most commonly associated to tumors?
A. HPV
B. EBV
C. HIV
D. HEPA B

20.What is the most common mother to fetus transmitted virus?
A. HIV
B. Hepatitis
C. CMV
D. HTLV

21.Which of the following best describes the mechanism of paroxysmal cold hemoglobinuria?
A. Antibodies attach to RBCs at 4°C, hemolysis at 4°C
B. Antibodies attach to RBCs at 4°C, hemolysis at 22°C
C. Antibodies attach to RBCs at 4°C, hemolysis at 37°C
D. Antibodies attach to RBCs and red cell hemolysis occurs simultaneously

22.RBCs are split in 2 aliquots at 6am under closed conditions. What is the lifespan of the aliquot?
A. Discarded and must not be issued
B. The same as the original expiry date
C. The next day at 6am
D. The same day at 6pm

23.When do you add additive solutions to RBCs?
A. After removing the plasma or platelets
B. Before removing the plasma
C. After blood collection
D. Incorporated in the blood bag during collection

24.Which of the following precludes acceptance of a platelet pheresis donor?
A. Platelet count of 75 x 10^9/L in a donor who is a frequent platelet donor
B. Plasma loss of 800 mL from plasmapheresis 1 week ago
C. Plateletpheresis performed 4 days ago
D. Aspirin ingested 7 days ago

25.Which is the quality control for platelets acquired from apheresis?
A. 3 x 10^11 platelets
B. 3 x 10^10 platelets
C. 5.5 x 10^11 platelets
D. 5.5 x 10^10 platelets

26.Should an A-negative woman who has just had a miscarriage receive RhIg?
A. Yes, only if she does not have evidence of active Anti-D
B. No, the type of the baby is unknown
C. Yes, but only a minidose regardless of trimester
D. No, Rhlg is given for term pregnancies only

27. Temperature requirement for lyophilization:
A. 0°C
B. 70°C
C. – 4°C
D. – 40°C

28.What is the purpose of preservatives?
A. To maintain the color of RBCs
B. To prevent bacterial contamination
C. To serve as an additive
D. To rejuvenate RBCs

29.Immunologic response to DPT vaccine is under what immunity?
A. Passive Cellular immunity
B. Active Humoral Immunity
C. Passive Humoral Immunity
D. Active Cellular Immunity

30.Which of the following is specific only to the alternative pathway?
A. C3 convertase
B. Properdin
C. C5 convertase
D. C1q

31.What is the immunity marker for Hepatitis B infection?
A. Anti-HBe
B. Anti-HBsAg
C. Anti-HBc IgM
D. HBsAg

32.Which of the following is NOT considered a Type I Hypersensitivity Reaction?
A. Hay fever
B. Anaphylaxis
C. Dust mites
D. Serum sickness

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

33.Which two organs are considered the primary lymphoid organs in which immunocompetent cells originate and mature?
A. Thyroid and Peyer's patches
B. Thymus and Bone marrow
C. Spleen and MALT
D. Lymph nodes and thoracic duct

34.Which is most likely a positive Western blot result for infection with HIV?
A. p24
B. gp60
C. p24 and gp120
D. p24 and p31

35.All of these are causes of donor deferral, EXCEPT:
A. Body temperature of 38'C
B. 110 Diastolic pressure
C. 75 pulse rate
D. 30% Hematocrit level

36. SITUATION: An emergency trauma patient requires transfusion. Six units of blood are ordered STAT. There is no time to draw a patient sample. O-negative blood is released. When will compatibility testing be performed?
A. Compatibility testing must be performed before blood is issued
B. Compatibility testing will be performed when a patient sample is available
C. Compatibility testing may be performed immediately using donor serum
D. Compatibility testing is not necessary when blood is released in emergency situations

37. What is the purpose of C3a, C4a, and C5a, the split products of the complement cascade?
A. To bind with specific membrane receptors of lymphocytes and cause release of cytotoxic substances
B. To cause increased vascular permeability, contraction of smooth muscle, and release of histamine from basophils
C. To bind with membrane receptors of macrophages to facilitate phagocytosis and the removal of debris and foreign substances
D. To regulate and degrade membrane cofactor protein after activation by C3 convertase

38. Can crossmatching be performed on March 1st using a patient sample drawn on Feb 28th?
A. Yes, a new sample would not be needed
B. Yes, but only if the previous sample has no alloantibodies
C. No, a new sample is needed because the 2-day limit has expired
D. No, a new sample is needed for each testing

39.Why is testing a pregnant woman for weak D not required?
A. An Rh-negative fetus may yield false positive results in a fetal maternal bleed
B. An Rh-positive fetus may yield false positive results in a fetal maternal bleed
C. D antigen strength decreases during pregnancy
D. D antigen strength increases during pregnancy

40. Which of the following may be a cause of a permanent deferral?
A. Tattoo
B. Pregnancy
C. High risk occupation (e.g., prostitution)
D. Malaria

41. Which of the following pertains to anaphylaxis?
A. cytotoxic T cell activation
B. buildup of IgE on mast cells
C. AOTA
D. complement activation

42.Of which of the following best explains the difference between type III and type II Hypersensitivity reactions?
A. IgG is actively involved in type III reactions
B. Type II has cellular antigens
C. Type II reactions have no antibodies
D. Type III involves IgE

43. General definition for autoimmunity:
A. manifestation of immunosuppression
B. loss of tolerance to self-antigens
C. increase of tolerance to self-antigens
D. Increase in clonal mutation

44. Which Carbohydrate Antigen is related on Lewis antigen?
a. CA 19-9
b. CA 15-3
c. CA 125 d.
d. AOTA

45.Alpha 1 –antitrypsin inactivates this protease released from leukocytes:
A. Amylase
B. Elastase
c. Myeloperoxidase
d. Pronase

46.Proposed cellular theory on phagocytosis:
A. Pasteur
B. Metchnikoff
C. Milstein
D. Pasteur

47. What cell grows in Hypoxanthine, Aminopterin and thymidine (HAT) medium?
A. B cells
B. Hybridoma
C. Myeloma cells
D. AOTA

48. The secretory component (SC) of IgA is produced by what cell?
A. Epithelial cells
B. Kidney
C. Liver
D. Bone marrow

49. Deficiency of C4 is most likely implicated with:
A. Lupus-like syndrome
B. unknown
C. Neisserial infections and pneumococcal diseases
D. Atherosclerosis

50.CGD represents a defect of:
A. Oxidative metabolism
B. Abnormal granulation of neutrophils
C. Diapedesis
D. Chemotaxis

51.The method of choice for detecting IgM antibodies in toxoplasmosis is:
A. Enzyme-linked immunosorbent assay
B. Indirect fluorescent antibody (IFA)
C. Indirect hemagglutination (IHA)
D. PCR

52.The stage of syphilis that can be diagnosed only by serologic (laboratory) methods is the:
A. Incubation phase
B. Primary phase
C. Secondary phase
D. Latent phase

53.What type of cells are involved in type III hypersensitivity?
A. Macrophages
B. AOTA
C. Host tissue
D. RBC

54. Which of the following viruses is considered the most infectious in a working bench laboratory?
A. HIV
B. HAV
C. HBV
D. HCV

55.This is important for detection of early acute HDV infection:
A. ANTI-HDV IgM
B. ANTI-HDV IgG
C. HDV RNA
D. HDV DNA

56.Which of the following can activate the alternative pathway of complement system?
A. Bacterial cell wall
B. Immune complex
C. Lectin
D. CRP

57. Which of the following is not a characteristic of an HIV intermediate stage?
A. Positive HIV test
B. Increased levels of antibodies
C. CD4 count of more than 1000/ul
D. Anemia

58. What are the two most common Lewis antigens?
A. Lwa and Lwb
B. Le1 and Le2
C. Le A and Le
B D. Lea and Leb

59. Which of the following method is the least expensive to quantify T cells?
A. Rosette technique
B. Flow cytometry
C. Wright and Giemsa staining
D. Impedance

60.What are the two most common RBC isolate that is associated with blood transfusion infection?
A. Yersinia and Staphylococcus
B. Yersinia and Pseudomonas
C. Staphylococcus and Bacillus spp.
D. Pseudomonas and Staphylococcus

61. It releases histamine that triggers inflammatory process:
A. Eosinophils
B. Neutrophils
C. Lymphocytes
D. Mast cells

62. The relationship between the forward and reverse typing of Blood type O phenotype to Oh phenotype is:
A. Both parallel
B. Both Inverse
C. Inverse reverse typing only
D. Inverse forward typing only

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

63. Which of the following is not correlated with acquired B phenomenon?
A. E. coli 086
B. Negative reaction to both A and B cells
C. NOTA
D. Mistyped as blood type AB

64. Cryoprecipitate is used for deficiency of what clotting factor?
A. AHF
B. IX
C.XI
D. All coagulation factors

65. What is the genotype of Bombay?
A. Hh
B. Oh
C. hh
D.h—

66. Which of the following cell contains MHC Class II?
A. T cell
B. Fibroblast
C. Plasma cell
D. NOTA

67. Brain Natriuretic Peptide (BNP) cut-off value that supports diagnosis of TACO:
A. 1
B. 1.5
C. 2
D. 2.5

68. What is the purpose of using enzymes in performing antibody identification?
A. To destroy certain antigens
B. To enhance cell clumping
C. To destroy certain antibodies
D. To denature protein

69. Which of the following blood group incompatibility between the mother and fetus protects somewhat RH HDN?
A. Kidd incompatibility
B. Duffy incompatibility
C. Kell incompatibility
D. ABO incompatibility

70. Which is not attributed to IgE?
A. Monomer
B. Heat stable
C. Does not fix complement
D. Attaches to basophil and mast cell

71. Which of the following is the most fatal transfusion reaction?
A. ABO incompatibility
B. RH incompatibility
C. Kell incompatibility
D. AOTA

72. If the working area is contaminated, which part of the chain of infection is usually involved?
A. Source
B. Mode of transmission
C. Host
D. Infectious agent

73. ABO phenotype that is associated with “good teeth”:
A. Blood type B
B. Blood type A
C. Blood type O
D. Blood type AB

74.ABO HDFN is usually mild because:
a. ABO antigens are poorly developed in the fetus
b. ABO antibodies prevent the disease itself
c. ABO antibodies readily cross the placenta
d. ABO incompatibility is rare

75. Which of the following blood component can be transfused even without ABO typing or with ABO incompatibility?
A. Granulocyte pheresis
B. Platelet pheresis
C. FFP
D. Cryoprecipitate

76.In ABO HDN, the neonate can develop hyperbilirubinemia of unconjugated bilirubin. A Phototherapy at _____nm is used to change the unconjugated bilirubin to isomers, which are less lipophilic and less toxic to the brain.
A. 460-490
B. 270-300
C. 350-450
D. 150-250

77.A patient has hypofibrinogenemia. What component is the best choice for transfusion?
A. FFP
B. Cryoprecipitate
C. Prothrombin concentrate
D. AOTA

78.What component/s may be shipped together with FFP?
A. Platelet product
B. Platelet product and Frozen RBCs
C. Platelet product, Frozen RBCs, and Cryoprecipitate
D. Frozen RBCs, and Cryoprecipitate

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

79.A shipment of packed RBCs, platelets, and leukocyte-reduced RBCs arrived in the same container at 1-6 C. What should be done?

A. Accept all and place on the blood bank ref
B. Accept RBC products and discard platelet product
C. Accept all and freeze
D. Discard all the products

80.What would be the expected result if blood from a group A patient was given to a group O patient?

A. Nothing
B. Immediate hemolytic transfusion reaction
C. Delayed hemolytic transfusion reaction
D. Compatible

81. What components are indicated for patients who have anti-IgA antibodies?

A. Washed RBC
B. Leukocyte reduced RBC
C. Deglycerolized RBC
D. Any of these can be transfused

82. Transfusion of an irradiated blood product is indicated in all of the following conditions, EXCEPT:

A. TA-GVHD
B. Neonatal transfusion
C. WAIHA
D. Relatives

83. What component may not be prepared if whole blood is centrifuged at 1-6C?

A. FFP
B. Platelet concentrate
C. Packed RBC
D. AOTA

84. Which type of antibody can cause HDFN in any pregnancy, but is usually limited to less severe symptoms?

A. Anti-c
B. Anti -A, B
C. Anti- Le
D. Anti-Kell

85. Which Rh antibody might be produced if a unit of blood with Rh genotype DCe/dce is given to a patient with Rh genotype of DCe/DCe?

A. Anti-C
B. Anti-c
C. Anti- E
D. Anti- e

86. Which of the following antigen is prevalent in Arab and Iranians?

A. Sc2
B. Ina
C. Dia
D. k

87. Which of the following is not a cause of temporary deferral?

A. Hypertension
B. Visited an endemic place with malaria
C. Diabetes mellitus
D. active tuberculosis

88. Which of the following is not part of the computer system in Blood banking?

A. Validation
B. People
C. Hardware
D. Software

89. What is the composition of RHIg?

A. IgM Anti-D
B. IgG and IgM anti-D
C. Anti-DCE
D. IgG anti-D

90. The first requirement for laboratory investigation of a transfusion reaction is:

A. Repeat ABO testing
B. Clerical check
C. Visual check of pre and post transfusions specimens
D. DAT on the post transfusion specimen

91. Which of the following transfusion reaction is difficult to prevent and is usually self -limiting?

A. FNHTR
B. TRALI
C. Post transfusion purpura
D. TA Hemosiderosis

92. The first sign during inflammatory response is:s toxic to the brain.

A. Pain
B. Inflammation
C. Redness
D. Swelling

93. The genes that code for the variable region of the Heavy chain of an antibody are divided into three groups. Which of the following is not included?

A. V
B. D
C. J
D. L

94. Release of inflammatory cytokines is attributed to what hypersensitivity reaction?

A. Anaphylactic
B. Cytotoxic
C. Cell mediated
D. Immune complex formation

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

95. All of the following statements are true about ABO HDN, EXCEPT:
HDN, EXCEPT: A. Mild HDN
B. Mother is blood type O, and the fetus is either blood type A or B
C. First born are not commonly affected
D. It is currently the leading cause of HDN

96. What is the test recommended to confirm congenital syphilis?
A. VDRL
B. FTA-ABS
C. Western blot
D. PCR

97. Venereal Disease Research Laboratory test is used to:
A. Confirm a congenital infection
B. Diagnose a sexually transmitted infection
C. AOTA
D. To screen donor units

98. The most extensively validated assay and is considered the "gold standard" for Shingles antibody detection:
A. PCR
B. FAMA
C. Western blot
D. EIA

99. What is the equivalent of Rhz in the fisher race nomenclature?
A. DCE
B. ce
C. DCe
D. Dce

100. Which of the following is being described:
***Compilation of laboratory manuals containing detailed procedure in the lab**
***Provide instructions for each activity in the larger process.**

A. Lab manual
B. SOP
C. Flow chart
D. Work instruction

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. In 1975, Köhler, Milstein, and Jerne discovered how to fuse lymphocytes to produce a cell line that was both immortal and a producer of specific antibodies. These scientists were awarded the Nobel Prize in Physiology and Medicine in 1984 for developing this hybridoma (cell hybrid) from different lines of cultured myeloma cells (plasma cells derived from malignant tumor strains). To induce the fusion of cells, they used a virus that characteristically causes cell fusion. This virus is:

A. Sendai Virus
B. Bourbon Virus
C. Isavirus
D. H3N2 Virus
E. H1N1 Virus

2. In 1901, Karl Landsteiner discovered ABO blood group system. He wrote a book which was published in 1917, detailing the results of an exhaustive study of haptens that has contributed greatly to our knowledge of Ag-Ab reactions. What was the title of the book that he wrote?

A. The Specificity of Serologic Reactions
B. The Sensitivity of Serologic Reactions
C. The Specificity of Immunologic and Serologic Reactions
D. The Sensitivity of immunologic and Serologic Reactions
E. The Specificity and Sensitivity of Immunologic and Serologic Reactions

3. They are connective tissue cells of mesenchymal origin. They are widely distributed throughout the body, with a small round nucleus and more granules. They have a long life span of between 9 and 18 months. The enzyme content of the granules contain ACP, ALP, and Protease.

A. Mast Cells
B. Basophils
C. Neutrophils
D. Macrophage
E. Dendritic Cells

4. Cytokines are polypeptide products of activated cells that control a variety of cellular responses and thereby regulate the immune response. The first cytokine activity to be described was:

A. MIF
B. IL
C. IFN
D. CR1
E. CFU

5. A cell expressing CD3+, CD25+, and FoxP3+ is a

A. (γδ) T cell
B. Helper T cell
C. Cytotoxic T cell
D. Regulatory T cell
E. Natural killer T cell

6. A CD31 cell that is CD1 restricted to glycolipids is a

A. (γδ) T cell
B. Helper T cell
C. Cytotoxic T cell
D. Regulatory T cell
E. Natural killer T cell

7. Not an end cell

1. Monocyte
2. Macrophage
3. B cell
4. T cell
5. Band cell
6. Ferrata Cell

A. 1 and 3
B. 2 and 4
C. 1, 3, and 5
D. 6 only
E. 1, 2, 3, 4, 5 and 6

8. Which of the following cells expresses IgM and IgD on the cell surface?

A. Pro-B Cell
B. Pre-B Cell
C. Immature B Cell
D. Naïve Mature B Cell
E. Plasma Cell

9. A cell directed by IL-4 to promote tissue repair, angiogenesis, and tumor growth is a:

A. M1 macrophage
B. M2 macrophage
C. Kupffer cell
D. Foam cell
E. Giant cell

10. A cell derived from monocytes that attach to the arterial intima and accumulate lipids is a:

A. M1 macrophage
B. M2 macrophage
C. Kupffer cell
D. Foam cell
E. Giant cell

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IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

11. Which of the following describes a giant cell?
A. A syncytial cell found within granuloma
B. A cell performing somatic hypermutation
C. A cell found in the circulation that secretes INFα and INFβ
D. A cell directed by IFNγ to promote ROS production and cytolysis
E. A cell that secretes large quantities of antibody but does not express surface immunoglobulin

12. Which of the following cytokines has a major role in asthma?
A. INF-y
B. IL-4
C. IL-10
D. IL-17

13. Which of the following describes an immature myeloid-derived dendritic cell?
A. A cell producing cytotoxic compounds following Th1 cell activation
B. A cell expressing cell surface MHC Class II, CD80/88 and secretes IL-12
C. A cell captured by endocytosis using transmembrane immunoglobulin
D. A cell with a majority of MHC Class II located within intracellular compartments
E. An epithelial-derived cell expressing cell surface C3-antigen

14. Which of the following is associated with defective killing by phagocytes?
A. Chediak-Higashi Syndrome
B. Chronic Granulomatous Disease
C. Alder-Reilly Anomaly
D. SCID
E. Digeorge Syndrome

15. It is an Acute Phase Reactant, originally thought to be an antibody to the c-polysaccharide of pneumococci. It consists of five identical subunits held together by non-covalent bonds. Binding with foreign particles is calcium-dependent and non-specific, and the main substrate is phosphocholine, a common constituent of microbial enzymes. It can be thought of as a primitive, nonspecific form of antibody molecule that is able to act as a defense against microorganisms or foreign cells until specific antibodies can be produced
A. CRP
B. Serum Amyloid A
C. MBP
D. AAT
E. Complement

16. Actions of Anaphylatoxin except:
A. Increased Vascular permeability
B. Contraction of smooth muscle
C. Release of histamine from basophils and mast cells
D. Coating of foreign cell to neutralize the charge

17. Mixed lymphocyte culture assay (MLC) is a special type of lymphocyte stimulation assay based on the ability of histoincompatible lymphocytes from one individual to stimulate the lymphocytes of another individual (mixed lymphocyte reaction). The major determinant of the MLC phenomenon is found in what HLA locus?
A. A
B. B
C. C
D. D
E. R

18. Cell death (cytotoxicity) is the endpoint commonly used in functional assays of the cellular immune system. In these assays, cell cytotoxicity may occur as the result of complement activity (complement□mediated cytotoxicity) or may be due to the direct effect of one cell on another (cell-mediated cytotoxicity). Conventionally, target cell lysis is determined by the release of a substance such as 51chromium (51Cr) from the target cell upon death, or by the incorporation of a vital dye such as eosin or trypan blue. Based on this explained principle or mechanism, you expect that the device or instrument to be used in the analysis is
A. Scintillation Counter
B. Flow Cytometer
C. Electron Microscope or Ultrathin Microscope
D. Spectrophotometer
E. None of these

19. MICROLYMPHOCYTOTOXICITY ASSAY: The dye exclusion lymphocytotoxicity assay is the standard technique for the detection of an antibody–antigen interaction on a cell surface. The lymphocytotoxicity assay was introduced by Terasaki and McClelland in 1964. Viable cells (usually lymphocytes) are incubated with serum-containing antisera. If a cell surface antigen is present that is recognized by antibodies in the sera, an antigen–antibody complex will form on the surface. These complexes are detected by the sequential addition of rabbit complement and a vital dye, such as eosin, to the reaction mixture. The occurrence of complement fixation on the cell membrane leads to activation of the terminal complement components, and eventually to cell lysis and death. Dead cells are detected and counted after differential uptake of the eosin dye and fixation with formalin. Antibody-bound lymphocytes will die, take up the eosin dye, and give a positive reaction; unbound lymphocytes will remain viable, exclude the eosin dye, and give a negative reaction (dye exclusion). Based on this explained principle or mechanism, you expect that the device or instrument to be used is a microscope but what type of such?

A. Polarizing Microscope
B. Bright-Field Microscope
C. Interference Microscope
C. Interference Microscope
D. Phase-Contrast Microscope E. Dark-Field Microscope

20. Most of the IgD present is found on the surface of immunocompetent but unstimulated B lymphocytes. It is the second type of immunoglobulin to appear (IgM being the first), and it may play a role in B-cell activation, regulation of B-cell maturation and differentiation and prolonging its life span in the periphery. IgD was not discovered until 1965, when it was found in a patient with_____

A. Multiple Myeloma
B. Waldenstroms Macroglubulinemia
C. Multiple Sclerosis
D. Guillaine-Barre Syndrome
E. Ankylosing Spondylitis

21. Which of the following describe/s the bonding of antigen to antibody?
1. Hydrophobic bond
2. Hydrogen bond
3. Van der waals forces
4. Electrostatic forces
5. Non-Covalent bond
6. Ionic Bond

A. 1, 2 and 3
B. 1, 2, 3 and 4
C. 1, 2, 3, 4 and 5
D. 6 only
E. 1 and 3

22. Marker for Bladder Cancer:
A. CFHrp
B. NSE
C. MAGE
D. HE4
E. NRLU-10

23. DiGeorge Syndrome or Congenital Thymic Hypoplasia is characterized by a faulty development of 3rd and 4th pharyngeal pouches during embryogenesis. There is also an Aplasia or hypoplasia of thymus and parathyroid glands. Abnormally high CD4+/CD8+ ratio is present because of a decrease in CD8+ cells. The cause of this congenital anomaly is:
A. Deletion on Chromosome 22
B. Duplication of Chromosome 22
C. Inversion of Chromosome 22
D. Robertsonian Translocation
E. Chromosomal Insertion

24. Which of the following statements is TRUE?
A. An antigen can interact specifically with the immune system but requires other stimuli in order to initiate an immune response
B. An antigen is any molecule or group of molecules, which can induce an immune response.
C. All antigens are immunogens but not all immunogens are antigens.
D. An immunogen can interact specifically with the immune system but cannot itself stimulate an immune response.
E. An immunogen is any molecule or group of molecules, which can react only with antigen-specific receptors on T cells and B cells.

25. Which of the following is NOT typically characteristic of an antigen?
A. An antigen may be protein, lipid, carbohydrate or any combination of these.
B. An antigen may be simple or complex, with many different antigenic determinants.
C. A complex antigen will elicit antibodies to all the different antigenic determinants it expresses. Thus the same antigen introduced into two different individuals will elicit an identical range of antibodies.
D. Antigenic determinants comprise a small number of amino acids or sugar residues.
E. An antigen may be soluble or particulate.

26. One of the important applications of HLA typing is paternity testing. The former is used along with the determination of what RBC antigens?
1. ABO
2. Rh
3. MNS
4. Kell
5. Kidd
6. Duffy

A. 1 and 2
B. 1, 2, and 3
C. 1, 2, 3 and 4
D. 1, 2,3, 4 and 5
E. 1, 2, 3, 4,5, and 6

27. HLA-B5 is mostly associated with:
A. Reiter's Syndrome
B. Behcet's Disease
C. Psoriasis Vulgaris
D. Kaposis Sarcoma
E. Gold-Induced Nephropathy

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

28. Eleven different organs or human body parts can be transplanted—blood vessels, bone, bone marrow or stem, cornea, heart, kidneys, liver, lung, middle ear, pancreas, and skin. Successful organ transplants have increased since the advent of the immunosuppressive drug cyclosporine (cyclosporin A). In corneal transplant, Graft rejection is minimal because of

A. Avascularity
B. Low concentration of class I transplantation antigens
C. Absence of class II antigens.
D. All of these
E. None of these

29. There is an intermediate risk for graft rejection among the following except:

A. Recipients of autologous or allogeneic bone marrow grafts
B. Infants receiving intrauterine transfusions, followed by exchange transfusions
C. Patients receiving total-body radiation
D. Individuals under immunosuppressive therapy

30. DRUG-INDUCED HEMOLYSIS: Coating of RBCs demonstrated by a positive direct anti–human globulin test (DAT) result may be drug induced and accompanied by hemolysis. The reactivity has been described as being caused by four basic mechanisms: (1) drug adsorption; (2) immune complexing; (3) membrane modification; and (4) autoantibody formation. Penicillin is a representative example of an agent that displays drug adsorption. In this type of mechanism, the drug strongly binds to any protein, including RBC membrane proteins. This binding produces a drug-RBC-hapten complex that can stimulate antibody formation. The antibody is specific for this complex and no reactions will take place unless the drug is adsorbed on erythrocytes. Massive doses of IV penicillin are needed to coat the erythrocytes sufficiently for antibody attachment to occur. Penicillin in this case causes what type of hypersensitivity reaction?

A. Type I
B. Type II
C. Type III
D. Type IV
E. Type V

31. Wheal-Flare reaction is also known as:

A. Prausnitz-Kustner Reaction
B. Jenner-Bordet Reaction
C. Tonegawa Reaction
D. Pfeiffer's Reaction

32. It is an adhesion molecule mediating homing to peripheral lymphoid organs.

A. CD 25
B. CD 34
C. CD 44
D. CD 45R

33. This is a product of genetic mutations in the Central regulators of the growth in normal cells that code for proteins involved in growth and repair processes in the body. Its activation causes overexpression of growth promoting proteins, resulting in hypercellular proliferation and tumorigenesis.

A. Proto-oncogene
B. Oncogene
C. Oncofetal Antigen
D. Tumor

34. These antibodies are the most specific for SLE and the antibodies are associated with active/severe disease. Although they are found in only 40-70% of patients, the presence of these antibodies is considered diagnostic for SLE; the antibodies typically produce a peripheral or a homogenous staining pattern in FANA/IIF.

A. Anti-dsDNA
B. Anti-Sm
C. Anti-RNP
D. Anti-DNP
E. Anti-Nucleolar

35. In an antibody titration, a 0.2mL aliquot of a patient's serum sample was added to 0.8mL of saline, and this mixture was placed into tube #1. A 0.5mL sample was removed from tube 1 and placed into tube 2, containing 0.5mL of saline. This procedure was repeated through tube #10. The dilutions were assayed for antibody to S. pyogenes. How should the antibody titer be reported if the last positive reaction was observed in tube #10?

A. 640
B. 2 560
C. 5 120
D. 10 240
E. 1 280

36. What has happened in a titer if tubes 5-7 show a stronger reaction than tubes 1-4?

A. Postzone phenomenon
B. Prozone phenomenon
C. Equivalence reaction
D. Technical difficulty

37. When a precipitation reaction is converted to agglutination by increasing the size of the antigen particles, the test is then referred to as

A. Direct agglutination
B. Optimal agglutination
C. Passive agglutination
D. Prozone reaction

38. An electrophoretically abnormal protein displaced from the normal position may be recognized by
A. Precipitin band of moderate curvature
B. Lines of fusion
C. Precipitin band markedly curved
D. “Gull wing” formation

39. Advantage of counter IE
A. Precipitin lines not sharp
B. Precipitation does not occur at the intermediate point
C. Precipitin lines visible within 30 minutes
D. None of these

40. A laboratory test is evaluating an ELISA for detecting an anti-CCP, which is a more specific marker for RA. The laboratory includes serum from healthy volunteers and patients with other connective tissue diseases in the evaluation. These specimens determine which factor of the assay?
A. A negative result in the absence of the disease
B. A positive result in the presence of the disease
C. Ability of the assay to repeatedly yield the same results on a single specimen
D. Bias result E. Closeness of the result to the true value

41. A patient with Huntington Disease present rigidity, seizures and chorea. You are a staff in the hospital and the latter has a laboratory equipped to perform RFLP analyses. Which of the following techniques is required to carry out RFLP analysis?
A. Southern Blot
B. Northern Blot
C. Western Blot
D. X-ray crystallography
E. Mass spectrometry

42. Which is the best technique to separate oxygenated normal hemoglobin A (HbA) from oxygenated sickle cell hemoglobin (HbS), assuming no protein aggregation?
A. Native gel electrophoresis
B. SDS-PAGE
C. Gel filtration
D. Affinity chromatography with a C-terminal antibody
E. Ultracentrifugation

43. A patient has come in for an HIV test. This test is run in two phases. The first test is an ELISA as a screen, and if two positive test results occur by ELISA, the second test will be run. The second test is a confirmatory Western blot. What do the ELISA and Western blots measure in their respective assays for HIV?
A. The ELISA is measuring the presence of HIV antigen in the sera, whereas the Western blot is measuring the presence of antibodies to HIV proteins in the sera.
B. The ELISA is measuring the presence of antibodies to HIV proteins in the sera only, whereas the Western blot is measuring the presence of HIV antigens in the sera.
C. The ELISA is measuring the presence of HIV antigen in the sera, whereas the Western blot is measuring the presence of HIV antigen in the sera as well.
D. The ELISA is measuring the presence of antibodies to HIV proteins in the sera only, whereas the Western blot is also measuring the presence of antibodies to HIV proteins in the sera.
E. The ELISA measures the presence of antibodies directed against human leukocyte antigen (HLA) molecules to HIV, whereas the Western blot measures levels of free, circulating virus in the sera of the patient.

44. Third generation tests for the detection of HBsAg except:
A. RIA
B. ELISA
C. Reverse Passive Agglutination Test
D. Rheophoresis

45. A PCR assay needs to be developed to determine the HIV status of a newborn in the pediatric intensive care unit whose mother is HIV positive. Which set of primers should be used for the assay?
A. The primers should consist of antiparallel complements of two parts of a noninfected human genome.
B. The primers should be designed so that, after annealing with potential infective DNA, the 5’ end of primer 1 would ‘‘face’’ the 3’ end of primer 2.
C. The primers should be synthesized so that, after annealing with potential infective DNA, the 50 end of both primers ‘‘face’’ each other.
D. The primers should be designed to be synthesized with dideoxynucleotides to allow sequencing of the mutation.
E. The primers should be designed with identical sequences to those in the HIV genome and must bind to DNA in a complementary, antiparallel manner.

46. When performing EMIT, how is the ligand in the patient’s serum detected?
A. Agglutinates by binding to antibody-coated latex beads
B. Binds to enzyme-labeled antibody
C. Forms antigen-antibody complex and precipitates
D. Competes with enzyme-labeled antigen for binding to a specific antibody

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

47. Paloma is a prostitute working in Cardo's Taverna, an infamous night club in Angeles City, Pampanga. Recently, she has undergone a serologic exam for syphilis and the results of her tests were as follows:
RPR: Reactive
VDRL: Reactive
HATTS: Nonreactive
What is the most likely interpretation of her syphilis serologic result?

A. Neurosyphilis
B. Secondary syphilis
C. Successful treatment of syphilis
D. Suspected HIV

48. In monitoring an HIV-infected patient, which parameter may be expected to be the most sensitive indicator of the effectiveness of antiretroviral treatment?
A. HIV Antibody titer
B. CD4 count
C. Viral load
D. ELISA

49. Which of the following is not true?
A. Most blood group alleles are codominant and express a corresponding antigen.
B. When paired chromosomes carry the same silent allele, a null phenotype results.
C. Serologic tests determine only RBC phenotype, not genotype
D. Numeric terminology was originally introduced for the Kell and Rh systems and was subsequently applied to other systems.
E. None of these

50. The discoveries of Th1 and Th2 model of T-helper cell function and the identification of toll-like receptors are credited to
A. Mosmann
B. Frazer
C. Reed
D. Kitasata

51. Which of the following proteins respond to viral infection by blocking the replication of virus in other cells?
A. Interferon
B. Interleukin
C. TNF
D. TGF

52. The interleukins are unrelated cytokines that must satisfy which of the following criteria?
A. They must have had their genes cloned
B. A + They must be inducible in erythrocytes
C. A + B + Their biological activities in inflammatory processes must not be catalogued
D. A + B + C + They must act solely on cells of the immune system

53. The chemokine receptors CXCR4 and CCR5 are utilized by HIV as co-receptors for infection of CD4+ cells and macrophages. These receptors belong to what chemokine?
A. RANTES
B. RANTES, SDF-1
C. RANTES, SDF-1, MIP-1α
D. RANTES, SDF-1, MIP-1α, Eotaxin

54. Which of the following acute-phase reactants is the most widely monitored and is the best indicator of acute inflammation due to its rapid rise and decline?
A. CRP
B. Amyloid
C. AAT
D. MBP
E. None of these

55. CRP threshold for high cardiovascular risk
A. 2mg/L
B.2.5mg/L
C. 3mg/L
D. 3.5mg/L

56. HYBRIDOMA PRODUCTION: A mouse is immunized with a certain antigen, and after a time, spleen cells are combined with myeloma cells in the presence of Polyethylene glycol (PEG), a surfactant. The PEG brings about fusion of plasma cells with myeloma cells or two spleen cells. After fusion, cells are placed in culture using a selective medium containing
A. Aminopterin
B. Aminopterin, Thymidine
C. Aminopterin, Thymidine, Hypoxanthine
D. Aminopterin, Thymidine, Hypoxantine, Phosphoribosine

57. Bonding of antigen to antibody consists of:
A. Hydrogen bonding
B. Van der Waals forces
C. Electrostatic forces
D.Noncovalent bonding
E. Covalent bonding

58. What type of cells would be found in a primary follicle?
a. Memory cells
b. Plasma cells
c. Unstimulated B cells
d. Memory cells

59. True for NK cells
A. They rely on memory for an antigen recognition
B. They share antigens with b cells
C. They recognize a lack of MHC proteins
D. They are found mainly in lymph nodes

60. Where are all undifferentiated lymphocytes made?
A. Thymus
B. Spleen
C. Bone marrow
D. Lymph nodes

61. In the thymus, positive selection of immature T cells is based upon recognition of which of the following?
A. Self-antigens
B. Stress proteins
C. MHC antigens
D. Mu chains

62. Which receptor on T cells is responsible for resetting with Sheep red blood cells?
a. CD8
b. CD4
c. CD2
d. CD3

63. When does genetic rearrangement for coding of light chains take place?
A. Before the pre-b cells stage
B. Not until the cell becomes a mature b cell
C. As the cell becomes a mature b cell
D. When the b cell becomes a plasma cell

64. Where does the major portion of antibody production occur?
a. Peripheral blood
b. bone marrow
c. Lymph nodes
d. Thymus

65. Which of the following best describes the TCR for antigen?
A. It consists of IgM and IgD molecules
B. It is the same for all T cells
C. Alpha and beta chains are unique for each antigen
D. It is present in the double-negative stage

66. What is measured in CH50 assay?
A. RBC quantity needed to agglutinate 50% of antibody
B. Complement needed to lyse 50% of patient red cells
C. Complement needed to lyse 50% of red cells coated with hemolysin
D. Antibody and complement needed to sensitize 50% of red blood cells

67. What type of disorders would show a decrease in C3, C4, and CH50?
A. Autoimmune disorders like RA, Goodpasture's syndrome and Hashimoto's disease
B. Immunodeficiency disorders such as common variable immunodeficiency
C. Tumors
D. Bacterial, Viral, Fungal, or Parasitic infections

68. Hydrogen peroxide test is used to diagnose which phagocytic disorder?
a. CGD
b. PNH
c. HANE
d. Lupus-like syndrome

69. What is the indicator system used in the complement fixation test?
A. Sensitized sheep red cells
B. Guinea pig complement
C. Patient antibodies
D. Known reagent antigen

70. The isotype of an immunoglobulin antibody
A. Is defined by the heavy chain
B. Is defined as different alleles of the same antibody type (e.g., IgG)
C. Is constant for all immunoglobulins of an individual
D. Is the variation within the variable region

71. The alternative complement pathway
A. Can be activated by bacterial capsule polysaccharides
B. Uses C5b as a C3 convertase
C. Bypasses steps C3 through C5
D. Is activated by properdin

72. A cut on person's finger becomes contaminated with Staphylococcus aureus. The first response by the immune system consists of activity of
A. B cells
B. Monocytes
C. Neutrophils
D. T cells

73. Characteristics of T cells include
I. Synthesize antibody
II. Mature in thymus
III. Able to bind unprocessed antigen
IV. Primarily protect against extracellular parasites
a. II
b. II, IV
c. II, III, IV
d. I, II, III, IV

74. Interaction between B and T helper cells involves
A. MHC II molecule on B cell binding to MHC I molecule on the T cell
B. MHC II molecule on B cell binding to CD3 on the T cell
C. Foreign antigen on B cell binding to CD3 on the T cell
D. CD3 molecule on B cell binding to T cell receptor

75. Which of the following statements applies to the Fc fragment of an immunoglobulin molecule?
A. It consists of the entire Heavy chain
B. It contains the variable region of the heavy chain
C. It is the region of the molecule that binds to receptors on various white blood cells
D. It contains the antigen binding sites of the molecule

76. IgM antibodies react well in complement fixation tests. Because of this, complement fixation tests for antibodies should
A. Be positive early in the course of the disease
B. Be useful in identifying antibodies responsible for a delayed hypersensitivity reaction
C. Be useful in identifying antibodies responsible for anaphylactic reactions
D. Detect transplacental antibodies

77. The activity of NK cells
A. Does not require previous immunologic insult
B. Involves phagocytosis and killing of bacteria
C. Requires interaction with cytotoxic T cells
D. Requires interaction with B cells

78. The VDRL test for syphilis is classified as a (an)
A. Agglutination reaction
B. Flocculation reaction
C. Hemagglutination reaction
D. Precipitation reaction

79. The type of immunity that follows the injection of an immunogen is termed
A. Artificial active
B. Natural active
C. Artificial passive
D. Innate

80. Complement activation seldom involves only one pathway. Uptake of immune response complexes in the spleen appears to be complement dependent.
A. First statement is correct, second is incorrect
B. First statement is incorrect, second statement is correct
C. Both statements are correct
D. Both statements are incorrect

81. The alpha and beta polypeptide chains of C5 are linked by
A. Covalent bond
B. Disulfide bond
C. Vander Waals Forces
D. H-bond
E. Non-Covalent bond

82. C9 possesses how many polypeptide chain?
a. 1
b. 2
c. 3
d. 4

83. C5b678 is capable of lysing
I. Red cells
II. Neutrophils
III. Lymphocytes
IV. Monocytes
a. I
b. II, III, IV
c. III, IV
d. IV

84. Which of the following plays an important role as a defense mechanism in infancy during the interval between the loss of maternal antibody and the acquisition of a full-fledge antibody response to pathogens?
A. Serum amyloid A
B. CRP
C. MBL
D. C3 convertase
E. C5b6789

85. Depressed complement levels may be due to
A. Genetic deficiencies
B. Genetic deficiencies, Liver disease
C. Genetic deficiencies, Liver Disease, Autoimmune disease
D. Genetic deficiencies, Liver disease, Autoimmune disease, Hemolytic anemias

86. Elevated levels of complement are found in
A. Acute inflammatory conditions
B. A + Leukemia
C. B + Hodgkin's disease
D. C + Behcet's disease

87. Enhancement of phagocytosis by coating of foreign particles with serum proteins is called
A. Opsonization
B. Agglutination
C. Solubilization
D. Chemotaxis

88. Most significant agent fromed in the phagolysosome to kill microorganisms
A. Proteolytic enzymes
B. Hydroxyl radicals
C. Hydrogen peroxide
D. Superoxides

89. The action of CRP can be distinguished from that of an antibody in which of the following ways?
A. CRP acts before the antibody appears
B. The antibody triggers the complement cascade
C. Binding of antibody is calcium-dependent
D. Only CRP acts as an opsonin

90. Cell-Mediated Immune Response:
1. Contact Sensitivity
2. For Intracellular Organisms
3. Extracellular Antigens
4. Delayed Hypersensitivity

A. 1,2,3,4
B. 1,2,3
C. 1,2,4
D. 1,3,4

91. Which of these statements is correct:
1. An immunogen is a macromolecule capable of eliciting the formation of Immunoglobulin or sensitized cells that have been induced.
2. An antigen is a substance that reacts with an antibody or sensitized cells but may or may not be able to elicit an immune response in the 1st place.
3. All Immunogens are Antigens.
4. All Antigens are Immunogens

A. 1 and 2
B. 1,2,3
C. 2,3,4
D. 1,3,4

92. Which of these traits of Immunogens is/are true:
1. The greater the molecular weight the more potent the molecule is as an Immunogen.
2. Proteins are good Immunogens because they are made up of a variety of units known as monosaccharides.
3. Carbohydrates are more immunogenic than proteins bec. The units of sugars are more limited.
4. The immune response is normally not able to distinguish between self and nonself.

A. 1,2,3,4
B. 1,2,3
C. 1 and 2
D. 1 only

93. Which of these 4 major subclasses of IgG have shorter hinge segments
1. IgG1
2. IgG2
3. IgG3
4. IgG4

A. 1 and 2
B. 1 and 3
C. 2 and 4
D. 3 and 4

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

94. Plasma cells that produce IgE are located primarily in the:
1. Kidneys
2. Lungs
3. Skin
4. Intestines

A. 1,2,3,4
B. 2 and 4
C. 2 and 3
D. 2 and 1

95. Destruction of the myelin sheath of axon caused by the presence of antibody is characteristic of which disease?
A. Multiple Sclerosis
B. Myasthenia gravis
C. Grave's disease
D. Goodpasture's disease

96. SLE can be distinguished from RA on the basis of which of the following?
A. Joint pain
B. Presence of antinuclear antibodies
C. Immune complex formation with activation of complement
D. Deposition of Immune Complexes in the kidneys

97. Most widely used method for Antinuclear Antibody
A. RIA
B. EIA
C. Immunofluorescence
D. Immunoenzyme

98. Rheumatoid Arthritis with Lung involvement
A. Felty's Syndrome
B. Caplan's Syndrome
C. Polyarticular
D. Pauriarticula

99. LE cells are:
A. Lymphocytes engulfing another Lymphocytes
B. Normal lymphocytes engulfed by neutrophils
C. Damaged Lymphocytes engulfing Neutrophils
D. Damaged Lymphocytes engulfed by Neutrophils

100. Felty's Syndrome
1. RA
2. Leukocytosis
3. Splenomegaly
4. Leukopenia

A. 1,2,3
B. 1,3,4
C. 1 only
D. 1,4

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. Metchnikoff first described which of the following?
A. Phagocytosis
B. Variolation
C. Humoral immunity
D. Opsonization

2. Jenner's work with cowpox, which provided immunity against smallpox, demonstrates which phenomenon?
A. Natural Immunity
B. Cross-immunity
C. Attenuation of vaccines
D. Reactivity of haptens

3. Chronic granulomatous disease represents a defect of:
A. Oxidative metabolism
B. Abnormal granulation of neutrophils
C. Diapedesis
D. Chemotaxis

4. The major role of neutrophils is phagocytosis. Which one of the following events is not associated with some aspect of neutrophil function?
A. Recognition of antigen via primitive pattern receptor patterns
B. Recognition of opsonins on bacteria
C. Secretion of perforin
D. Activation of the NADPH oxidase

5. Which one of the following cells destroys tumor cells using ADCC as a recognition mode, and perforin as an effector molecule?
A. B cells
B. CD4+ cells
B. CD8+ cells
D. NK cells

6. Which of the following is a potent mediator in acute-phase response?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

7. Which of the following enhances the cytolytic activity of lymphokine-activated killer cells (LAK)?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

8. Which of the following stimulates hematopoietic cells?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

9. Which one of the following cells recognizes a cell surface complex consisting of antigenic peptide complexed with an MHC protein?
A. Phagocytes
B. Eosinophils
C. T cells
D. B cells

10. Which one of the following activates both T and B cells?
A. PHA
B. Con A
C. LPS
D. PWM

11. The type of immunity that follows the injection of an antigen is:
A. Adaptive
B. Active
C. Passive
D. Innate

12. Which of the following is true of MHC (HLA) class II antigens?
A. They are found on all nucleated cells
B. They are found on B cells and macrophages
C. They all originate at one locus
D. They are coded on chromosome 9

13. Bence-Jones proteins are identical:
A. H chains
B. L chains
C. IgM molecules
D. IgG molecules

14. Mannose-binding protein in the lectin pathway is most similar to which classical component pathway component?
A. C3
B. C1rs
C. C1q
D. C4

15. In the complement fixation procedure, a negative result is manifested by:
A. Antigen-binding
B. Lysis of guinea pig cells
C. Lysis of sheep red blood cells
D. Agglutination of sheep red blood cells

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

16. A positive direct Coomb's test could occur under which circumstances?
A. Hemolytic disease of the newborn
B. Autoimmune hemolytic anemia
C. Antibodies to drug that bind to red cells
D. Any of the above

17. Which one of the following antibody isotypes is captured by Protein A?
A. IgG
B. IgA
C. IgM
D. IgD

18. To determine id a patient is allergic to rye grass, the best test to perform is:
A. RAST
B. RIST
C. DAT
D. Complement fixation

19. What is the immune phenomenon associated with Arthus reaction?
A. Tissue destruction by cytotoxic T cells
B. Removal of antibody-coated red blood cells
C. Deposition of immune complexes in blood vessels
D. Release of histamine from mast cells

20. The Mantoux test is an example of:
A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Type IV hypersensitivity

21. Anaphylaxis as a result of bee sting is an example of:
A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Type IV hypersensitivity

22. What immune elements are involved in a reaction to poison ivy?
A. IgE antibodies
B. T cells and macrophages
C. NK cells and IgG
D. B cells and IgM

23. What antibodies are represented by the peripheral or rim pattern of IF tests for ANA?
A. Anti-histone antibodies
B. Anti-dsDNA antibodies
C. Anti-ENA antibodies
D. Anti-RNA antibodies

24. Destruction of the myelin sheath of axons caused by the presence of antibody is characteristic of which disease?
A. Multiple sclerosis
B. Myasthenia gravis
C. Graves' disease
D. Goodpasture's syndrome

25. It is suggestive of Goodpasture's disease:
A. Acetylcholine receptor-blocking antibodies
B. Anti-cardiolipin antibodies
C. Anti-DNA antibodies
D. Anti-glomerular basement membrane antibodies

26. It is strongly suggestive, in a high titer, of primary biliary cirrhosis:
A. Anti-myelin antibody
B. Anti-intrinsic factor antibody
C. Anti-centromere antibody
D. Anti-mitochondrial antintibody

27. A defect in C1INH results in which one of the following disorders?
A. Bruton's agammaglobulinemia
B. Selective IgA deficiency
C. Chronic granulomatous disease
D. Hereditary angioneurotic edema

28. Individuals who are at risk for ankylosing spondylitis have inherited which one of the following alleles?
A. HLA-A3
B. HLA-B8
C. HLA-B27
D. HLA-B7

29. Individuals who are at risk for rheumatoid arthritis have inherited which one of the following alleles?
A. HLA-A3
B. HLA-B27
C. HLA-B7
D. HLA-DR4

30. A kidney transplantation between one identical twin to another is an example of:
A. An allograft
B. An autograft
C. A heterograft
D. A syngeneic graft

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

31. CA-15.3 is used conditionally in the monitoring of:
A. Pancreatic adenocarcinoma
B. Colonic adenocarcinoma
C. Breast adenocarcinoma
D. Hairy cell leukemia

32. A biological false-positive reaction is least likely with which test for syphilis?
A. VDRL
B. FTA-ABS
C. RPR
D. All are equally likely to detect a false positive

33. A 24-year-old man who had just recovered from infectious mononucleosis had evidence of a genital lesion. His RPR was positive. What should the technologist do next?
A. Report out as false positive
B. Do a confirmatory treponemal test
C. Do a VDRL
D. Have the patient return in 2 weeks for a repeat test

34. The serologic marker during the "window period" of hepatitis B is
A. Anti-HBs
B. Anti-HBc
C. Anti-HBe
D. HBsAg

35. The specific diagnostic test for hepatitis C is:
A. Absence of anti-HAV and anti-HBs
B. An increase in serum ALT
C. Detection of non-A, non-B antibodies
D. Anti-HCV

36. Antibodies to which of the following retroviral antigens are usually the first to be detected in HIV infection?
A. gp120
B. gp160
C. gp41
D. p24

37. Which of the following combinations of bands would represent a positive Western blot for HIV antibody?
A. p24 and p55
B. p24 and p31
C. gp41 and gp120
D. p31 and p55

38. The confirmation of a heterophile antibody of infectious mononucleosis would be
A. Agglutination with beef erthrocytes
B. Agglutination of sheep cells after incubation with guinea pig cells; no agglutination of sheep cells after incubation with beef erythrocytes
C. Agglutination of sheep cells after incubation with beef erythrocytes; no agglutination of sheep cells after incubation with guinea pig cells
D. Agglutination with guinea pig cells

39. Which of the following identifies the pattern of antibody cross-reactivity that is generated during infection with R. rickettsii?
A. P. vulgaris OX-19 (+), P. vulgaris OX-2 (+), P. mirabilis OX-K (-)
B. P. vulgaris OX-19 (-), P. vulgaris OX-2 (+), P. mirabilis OX-K (-)
C. P. vulgaris OX-19 (-), P. vulgaris OX-2 (+), P. mirabilis OX-K (+)
D. P. vulgaris OX-19 (-), P. vulgaris OX-2 (-), P. mirabilis OX-K (+)

40. The least immunogenic transplant tissue:
A. Bone marrow
B. Cornea
C. Heart
D. Skin

41. Streptococcus MG agglutinins occur in normal serum at low titers (1:10). A titer of 400 or greater is considered to be suggestive of:
A. Paroxysmal cold hemoglobinuria
B. Primary atypical pneumonia
C. Lupus erythematosus
D. Rheumatoid arthritis

42. The most common cause of congenital infections in humans, affecting 0.5 to 2.4% live births:
A. Cytomagelovirus
B. Rubella
C. Toxoplasmosis
D. Hepatitis

43. Which one of the following tests measures the production of parasitic lactate dehydrogenase?
A. RIDASCREEN Entamoeba
B. ProSpect Entamoeba histolytica
C. MalaQuick Standby Malaria tes
D. OptiMal Malaria test
E. Bordier Immunoassay for E. granulosus

44. Hybridoma is produced from the fusion of:
A. Natural killer cell and plasma cell
B. T cell and plasma cell
C. Myeloma cell and plasma cell
D. Myeloma cell and T cell

45. Sensitivity
A. The detection of specific antibody in the serum of an individual in whom the antibody was previously undetectable
B. The frequency of positive results obtained in the testing of a population of individuals who are truly positive for antibody
C. The proportion of negative test results obtained in the population of individuals who actually lack the antibody in question
D. The time of recovery from conditions such as illness, injury or surgery

46. Which of the following conditions can result in rouleaux formation or pseudoagglutination:
1. Elevated levels of globulin
2. Elevated levels of fibrinogen
3. Presence of plasma expanders
4. Presence of Wharton' s jelly

A. 1 and 3
B. 2 and 4
C. 1, 2 and 3
D. 1, 2, 3 and 4

47. Determine what incompatibility is demonstrated: Group A (donor) with group O (patient):
A. Incompatible in minor crossmatch
B. Incompatible in major crossmatch
C. Both of these
D. None of these

48. Inheritance of Sese and the Lewis gene produces the following phenotype:
A. Le (a+b-)
B. Le (a+b+)
C. Le (a-b+)
D. Le (a-b-)

49. Which Duffy phenotype offers the greatest resistance to invasion by malarial parasites?
A. Fy (a+b-)
B. Fy (a+b+)
C. Fy (a-b+)
D. Fy (a-b-)

50. A previously named HLA that is not uncommonly detected on erythrocytes is:
A. Dia
B. Sda
C. Bga
D. Coa

51. A low-incidence antigen that serves as a useful anthropologic marker for Mongolian ancestry:
A. Xga
B. Doa
C. Dia
D. Yta

52. Mutations in the carrier molecule for this blood group system may result in changes of reb blood cell shape in the forms of acanthocytosis or ovalocytosis?
A. DI
B. DO
C. CO
D. SC

53. Antigen is found on the petite arm of the X chromosome and is noted with higher frequency in females than in males.
A. Xga
B. Doa
C. Dia
D. Yta

54. Rh immune globulin provides ___ protection against fetal D antigen.
A. Active
B. Passive
C. Antigen-stimulated
D. Antibody-stimulated

55. If an Rh negative woman recently delivered an Rh positive baby and the Kleihauer-Betke test result is 5%, how many vials of Rh Ig should be administered?
A. 6
B. 7
C. 8
D. 9

56. If a prospective allogeneic donor has received blood or blood components known to be sources of hepatitis (e.g., surgery), the donor should be deferred from donating for ____ after the transfusion.
A. 6 weeks
B. 3 months
C. 6 months
D. 12 months

57. Minimum number of platelets in a platelet concentrate prepared from whole blood by centrifugation
A. 5.5 x 1011
B. 3.0 x 10 10
C. 3.0 x 1011
D. 5.5 x 1010

58. Additive solutions are approved for blood storage for how many days?
A. 21 days
B. 42 days
C. 35 days
D. 7 days

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

59. Graft-versus-host disease is caused by:
A. Granulocytes
B. Platelets
C. Lymphocytes
D. Erythrocytes

60. The radiation source for irradiation of blood products is:
A. 131I
B. 137Ce
C. 14C
D. 131Te

61. Once defrosted, cryoprecipitate must be administered within ____ hours of thawing.
A. 2
B. 4
C. 6
D. 12

62. Perfluorocarbons have been investigated as:
A. Platelet substitutes
B. Granulocyte substitutes
C. Red blood cell substitutes
D. Plasma substitutes

63. Allogeneic donor blood collected and processes from outside sources must have the following tests repeated by the hospital blood bank:
1. ABO
2. Rh
3. HBsAg
4. Anti-HIV1

A. 1 and 2
B. 3 and 4
C. 1, 2 and 3
D. All

64. The minimum hemoglobin concentration in g/dL in a fingerstick from a male blood donor is:
A. 12.0
B. 13.5
C. 12.5
D. 15.0

65. The required hemoglobin and hematocrit for autologous donation should be at least:
A. 11 g/dL hgb, 33% hct
B. 11 g/dL hgb, 38% hct
C. 12.5 g/dL hgb, 33% hct
D. 12.5 g/dL hct, 38% hct

66. Autologous blood donor units must be tested for:
1. ABO
2. Rh
3. HBsAg
4. Anti-HIV1

A. 1 and 2
B. 3 and 4
C. 1, 2 and 3
D. All

67. Samples of recipient's blood and donor units must be stored for ____ days after transfusion.
A. 1
B. 3
C. 5
D. 7

68. A febrile transfusion reaction is defined as a rise in body temperature of ____ occurring in association with the transfusion of blood or components and without any other explanation.
A. 1 oC or more
B. 1 oF or more
C. 5 oC or more
D. 5 oF or more

69. Blood component most frequently associated with transfusion reaction due to bacterial contamination:
A. Red cells
B. Fresh frozen plasma
C. Cryoprecipitate
D. Platelet concentrate

70. The most common cause of transfusion-related sepsis is:
A. Whole blood
B. Platelet concentrates
C. Packed red cells
D. Leukocytes conc.

71. Of the deaths caused by bacterial contamination of blood components reported to Centers for Disease Control (CDC), most are caused by blood components contaminated by:
A. Escherichia coli
B. Pseudomonas species
C. Yersinia enterocolitica
D. None of these

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

72. Polyspecific AHG reagent contains:
A. Anti-IgG
B. Anti-IgG and anti-IgM
C. Anti-IgG and anti-C3d
D. Anti-C3d

73. A positive DAT may be found in which of the following situations?
A. A weak-D positive patient
B. A patient with anti-K
C. Hemolytic disease of the newborn
D. An incompatible crossmatch

74. Each unit of whole blood will yield approximately how many units of cryoprecipitated AHF?
A. 40
B. 130
C. 80
D. 250

75. According to AABB standards, 75% of all platelets, pheresis units shall contain how many platelets per uL?
A. 5.5 x 1010
B. 3.0 x 1011
C. 6.5 x 1010
D. 5.5 x 1011

76. Which of the following blood components is the best source of factor IX?
A. Prothrombin complex
B. Cryoprecipitated AHF
C. Fresh frozen plasma
D. Single-donor plasma

77. Hives and itching are symptoms of which of the following transfusion reactions?
A. Febrile
B. Circulatory overload
C. Allergic
D. Anaphylactic

78. Cold agglutinin syndrome is best associated with which of the following blood groups?
A. Duffy
B. Ii
C. P
D. Rh

79. Rejuvenation of a unit of red blood cells is a method used to:
A. Remove antibody attached to rbc
B. Inactivate viruses and bacteria
C. Restore 2,3 DPG and ATP to normal levels
D. Filter blood clots and other debris

80. According to AABB standards, what is the minimum pH required for platelets?
A. 4
B. 6
C. 5
D. 7

81. Which of the following transfusion reactions occurs after infusion of only a few milliliters of blood and gives no history of fever?
A. Febrile
B. Anaphylactic
C. Circulatory overload
D. Hemolytic

82. Which of the following antigens gives enhanced reactions with its corresponding antibody following treatment of the red cells with proteolytic enzymes?
A. Fya
B. S
C. E
D. M

83. A lectin with anti-N specificity can be made from:
A. Bandeirae simplicifolia
B. Dolichos biflorus
C. Iberis amara
D. Vicia graminea

84. Which of the following would be the component of choice for treatment of von Willebrand's disease?
A. Platelets
B. Factor IX concentrate
C. Cryoprecipitated AHF
D. Fresh frozen plasma

85. If the seal is entered on a unit of whole blood stored at 1-6 oC, what is the maximum allowable storage period, in hours?
A. 6
B. 48
C. 24
D. 72

86. The drug cephalosporin can cause a positive direct antiglobulin test by which of the following mechanisms?
A. Immune-complex formation
B. Complement fixation
C. Autoantibody production
D. Membrane modification

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

87. Which of the following is a characteristic of anti-I?
A. Often associated with HDN
B. Frequently a cold agglutinin
C. Reacts best at 37 oC
D. Is usually IgG

88. The mechanism that best explains hemolytic anemia due to penicillin is:
A. Drug adsorption
B. Membrane modification
C. Immune complex formation
D. Autoantibody production

89. Posttransfusion anaphylactic reactions occur often in patients with:
A. Leukocyte antibodies
B. Erythrocyte antibodies
C. IgA deficiency
D. Factor VIII deficiency

90. Hydroxyethyl starch (HES) is a rouleaux-promoting agent used to:
A. Increase the harvest of granulocytes in leukapheresis
B. Treat patients following hemolytic transfusion reaction
C. Resolve ABO typing discrepancies
D. Stabilize the pH of stored platelets

91. Which of the following is the proper storage temperature requirements for granulocytes?
A. 1 to 6 oC
B. 10 to 18 oC
C. Room temperature with constant agitation
D. Room temperature without agitation

92. Which of the following best reflects the discrepancy seen when a person's red cells demonstrated the acquired-B phenotype?

	Forward Grouping	Reverse Grouping
A.	B	O
B.	AB	A
C.	O	B
D.	B	AB

93. The process of separation of antibody from its antigen is known as:
A. Diffusion
B. Lyophilization
C. Absorption
D. Elution

94. To validate the reaction obtained in the antiglobulin test, one can:
A. Use green antiglobulin reagent
B. Add IgG-coated red cells to each test tube
C. Add IgG-coated red cells to each positive reaction
D. Add IgG-coated red cells to each negative reaction

95. This type of transfusion reaction may occur in IgA-deficient patients who demonstrate potent IgG anti-IgA and who are exposed to IgA containing plasma products:
A. Anaphylactic
B. Circulatory overload
C. Allergic
D. Hemolytic

96. An iron chelating agent which is important in lowering the body iron stores of patients with thalassemia:
A. Deferroxamine
B. Desmopressin
C. Steroids
D. Aspirin

97. For autologous blood donation, blood should not be drawn from the donor-patient within _____ hours of the time of the anticipated operation or transfusion.
A. 12 hours
B. 24 hours
C. 48 hours
D. 72 hours

98. Paroxysmal cold hemoglobinuria is often associated with antibodies in which system?
A. MNS
B. P
C. Lewis
D. Rh

99. Cryoprecipitated antihemophilic factor (AHF) is not recommended for the treatment of:
A. Hemophilia A
B. Hemophilia B
C. vWD
D. Hypofibrinogenemia

100. Which of the following is usually employed to start an IV liner prior to blood transfusion?
1. Normal (0.9%) saline
2. Ringer's lactate
3. 5% Dextrose in water (D5W)
4. Distilled water

A. 1 only
B. 1 and 3
C. 1, 2 and 3
D. 1, 2, 3 and 4

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. Natural barriers of the immune system include all except which of the following?
a. pH of secretions
b. Coughing
c. Hair follicles
d. Intestinal bacteria

2. The fundamental difference between primary and secondary organs of the lymphatic system is:
a. Antibody production occurs only in the primary lymph organs
b. Complement production occurs only in the primary lymph organs
c. Maturation of lymphocytes occurs in secondary organs, and activation occurs in primary organs
d. Maturation of lymphocytes occurs in primary organs, and activation occurs in secondary organs

3. Toll-like receptors act in which way?
a. Enhance recognition of bacteria by phagocytic cells
b. Activate B cells to produce antibody
c. Activate helper T cells
d. Aid in processing antigen in the form of an MHC molecule

4. Neutrophils and monocytes have receptors for which part of the immunoglobulin molecule?
a. Fc
b. Fab
c. Hinge region
d. Variable region

5. A double-positive T-cell would express which markers?
a. CD4+ | CD8+ | CD3+
b. CD4- | CD8+ | CD3+
c. CD4- | CD8- | CD3-
d. CD4+ | CD8- | CD3+

6. Which cell is considered to be a bridge between the innate and adaptive immune systems?
a. NK cell
b. Mast cell
c. Monocyte-macrophage
d. T cell

7. Immunoglobulin that is most efficient at crossing the placenta:
a. IgG
b. IgA
c. IgM
d. IgD

8. The key structural difference that distinguishes immunoglobulin subclasses:
a. Stereometry of the hypervariable region
b. Number of domains
c. Sequence of the constant regions
d. Number of disulfide bridges

9. A haptenic determinant will react with:
a. Both T cells and antibody
b. T cells but not antibody
c. Neither T cells nor antibody
d. Antibody but not T cells

10. The function of the complement system include(s) which of the following?
a. Clearance of cellular debris
b. Chemotaxis
c. Lysis of bacteria
d. All of the above

11. Immunoglobulin idiotypes are antibodies with variations in the domains of which of the following?
a. CH1 and CH2
b. VH and VL
c. VH and CL
d. CH1, CH2, and CH3

12. Mannose-binding lectin is similar to which component of the classical pathway?
a. C3
b. C2
c. C1q
d. C5a

13. Molecules that bind to an antigen to increase phagocytosis are:
a. Opsonins
b. Cytokines
c. Haptens
d. Isotypes

14. Which CD4:CD8 ratio is most likely in a patient with AIDS??
a. 2:1
b. 3:1
c. 2:3
d. 1:2

15. Which tests are considered screening tests for HIV?
a. ELISA, 4th generation, and rapid antibody tests
b. Immunofluorescence, Western blot, radioimmuno-precipitation assay
c. Culture, antigen capture assay, DNA amplification
d. Reverse transcriptase and messenger RNA (mRNA) assay

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

16. A patient with a viral infection to the ABC virus is found to have a high antibody titer to the ABC virus' RNA, or anti-ABCr. Which of the following is true?

a. MHC class I molecules presented antigen to CD4+ T cells
b. MHC class II molecules presented antigen to CD8+ T cells
c. MHC class I molecules presented antigen to CD8+ T cells
d. MHC class II molecules presented antigen to CD4+ T cells

17. What is the main difference between agglutination and precipitation reactions?

a. Agglutination occurs between a soluble antigen and antibody
b. Agglutination occurs when the antigen is particulate
c. Precipitation occurs when the antigen is particulate
d. Precipitation occurs when both antigen and antibody are particulate

18. Post-zone causes false-negative reactions in antibody titers as a result of which of the following?

a. Too much diluent added to test
b. Excess antibody in test
c. Excess antigen in test
d. Incorrect diluent added to test

19. Antibodies produced against two or more epitopes of specific antigen are considered _____.

a. Monoclonal
b. Pleomorphic
c. Dimorphic
d. Polyclonal

20. In the radial immunodiffusion test, the gel contains which of the following?

a. The antigen to be tested
b. Antibody
c. Patient sample
d. None of the above; the gel is the medium to which the antibody and antigen are applied in equal proportion

21. The indirect antiglobulin test is for _____, whereas the direct antiglobulin test is for _____.

a. Serum antigen; bound antigen
b. Serum antigen; bound antibody
c. Serum antibody; bound antigen
d. Serum antibody; bound antibody

22. What is the difference between nephelometry and turbidimetry?

a. There is no difference between the two assays, only in name
b. Nephelometry is a newer example of turbidimetry
c. Nephelometry measures light transmitted through a solution, and turbidimetry measures light scattered in a solution
d. Nephelometry measures light scattered in a solution, and turbidimetry measures light transmitted through a solution

23. In an Ouchterlony immunodiffusion, the line of precipitation between the antibody and the antigen wells form an X. This reaction would be described as which of the following?

a. Nonidentity
b. Partial identity
c. Identity
d. No correlation

24. Which of the following cytokines is also known as the T-cell growth factor?

a. IFN-γ
b. IL-12
c. IL-2
d. IL-10

25. How do heterogeneous assays differ from homogeneous assays?

a. Heterogeneous assays require a separation step.
b. Heterogeneous assays are easier to perform than homogeneous assays.
c. The concentration of patient analyte is directly proportional to bound label in homogeneous assays.
d. Homogeneous assays are more sensitive than heterogeneous ones.

26. A deficiency of T cells can result in which of the following?

a. Low levels of complement
b. Dysfunctional macrophages
c. Fewer B cells maturing to plasma cells
d. Contact dermatitis

27. What is the basic difference between the RPR and VDRL tests?

a. The RPR detects antigen, whereas the VDRL detects antibody.
b. The RPR test is read macroscopically, whereas the VDRL is read microscopically.
c. The RPR test is a treponemal test, whereas the VDRL is nontreponemal.
d. There is no difference because they are both specific tests for syphilis

28. A patient has the following hepatitis B serology:
HBsAg: Negative
Anti-HBc: Positive
Anti-HBS: Positive

These results are consistent with which of the following?

a. Acute hepatitis B
b. Chronic hepatitis B
c. Recovery from hepatitis B
d. Acute hepatitis A

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

29. The HLA genes are inherited as:
a. Diplotypes: Two diplotypes from each parent
b. Haplotypes: One haplotype from each parent
c. HLAs are not inherited, instead are proteins absorbed onto cells
d. Only the HLA-A antigen is an inheritable trait

30. Agglutination and precipitation that is visible depends on antigen-antibody ratios _____.
a. With antigen in excess
b. With antibody in excess
c. That are equivalent
d. All of the above

31. Which of the following cell types is implicated in immediate hypersensitivity?
a. Neutrophil
b. Mast cell
c. Macrophage
d. Monocyte

32. Anti-dsDNA antibodies are associated with which of the following?
a. Syphilis
b. CMV infection
c. SLE
d. Hemolytic anemia

33. Rheumatoid factor is typically an IgM autoantibody with specificity for which of the following?
a. SS-B
b. dsDNA
c. RNP
d. Fc portion of IgG

34. In Grave's disease, one of the main autoantibodies is:
a. Anti-CCP
b. Antibody to islet cells of pancreas
c. Antibody to thyroid-stimulating hormone receptor
d. Anti-dsDNA

35. Skin testing for exposure to tuberculosis is an example of which type of hypersensitivity?
a. Type I
b. Type II
c. Type III
d. Type IV

36. Which of the following is a test for specific treponemal antibody?
a. VDRL
b. RPR
c. FTA-ABS
d. All of the above

37. A 1-year-old boy is seen for having many recurrent infections with Streptococcus pneumoniae. Laboratory tests revealed a normal quantity of T cells, but no B cells and no immunoglobulins were seen on electrophoresis. Which of the following would most likely be the cause?
a. Chronic granulomatous disease
b. Bruton's agammaglobulinemia
c. DiGeorge's syndrome
d. Wiskott-Aldrich syndrome

38. In chronic active hepatitis, high titers of which of the following antibodies are seen?
a. Anti-smooth muscle
b. Antimitochondrial
c. Anti-DNA
d. Anti-parietal cell

39. The chronic nature of parasitic infections is due to the host's
a. Inability to eliminate the infective agent
b. Type I hypersensitivity response to the infection
c. Ability to form a granuloma around the parasite d
. Tendency to form circulating immune complexes

40. Most of the pathology associated with parasitic infections results from which of the following?
a. Symbiotic relationships with the host
b. Elaborate parasitic life cycles
c. Immune response to the offending organism
d. Innate defense mechanisms of the host

41. A patient with hereditary angioedema has which of the following deficiencies?
a. C5-9
b. Phagocytic cell function
c. Mature B cells
d. C1 inhibitor

42. A radiograph of a 1-year-old boy indicates the lack of a thymus. Complete blood count and flow cytometry confirm a below-normal lymphocyte count and a lack of T cells. Which of the following would most likely be the cause?
a. DiGeorge's syndrome
b. Wiskott-Aldrich syndrome
c. Bare lymphocyte syndrome
d. Bruton's agammaglobulinemia

43. A 3-year-old boy is seen by his physician because of many recent bacterial infections. Flow cytometry indicates normal levels of T and B cells. The nitroblue tetrazolium test for oxidative reduction is negative. The most likely cause is:
a. Wegener's syndrome
b. Chronic granulomatous disease
c. Bruton's agammaglobulinemia
d. Diabetes mellitus

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

44. A person has an infected bug bite with pain, swelling, and redness. What is the cause of these physical symptoms of inflammation?
a. Production of antibody
b. Secondary immune responset
c. Increased blood flow and neutrophils to site
d. Activation of NK cells

45. The type of graft rejection that occurs within minutes of a tissue transplant is _____.
a. Acute
b. Chronic
c. Hyperacute
d. Accelerated

46. PCR technology can be used to:
a. Amplify small amounts of DNA.
b. Isolate intact nuclear RNA.
c. Digest genomic DNA into small fragments.
d. Repair broken pieces of DNA.

47. How much diluent needs to be added to 0.2 ml of serum to make a 1:20 dilution?
a. 19.8 mL
b. 4.0 mL
c. 3.8 mL
d. 10.0 mL

48. Which of the following plays an important role as an external defense mechanism?
a. Phagocytosis
b. C-reactive protein
c. Lysozyme
d. Complement

49. Which test is used to evaluate the cellular immune system in a patient?
a. Skin test for commonly encountered antigens
b. Determination of isohemagglutinin titer
c. Immunoelectrophoresis of serum
d. Measurement of anti-HbsAg after immunization

50. Tumor markers found in the circulation are most frequently measured by:
a. Immunoassays
b. TLC
c. HPLC
d. Colorimetry

51. A DPT vaccination is an example of:
a. Active humoral-mediated immunity
b. Passive humoral-mediated immunity
c. Cell-mediated immunity
d. Immediate hypersensitivity

52. In a hemagglutination test, the antigen is:
a. On the red cell membrane
b. Secreted by the red cell
c. In the red cell nucleus
d. In the plasma or serum

53. Hemagglutination can be enhanced by increasing:
a. The temperature higher than 37'C
b. The incubation time
c. Increasing the antigen concentration
d. pH greater than 7

54. Agglutination reactions characterized by many small agglutinates in a background of free cells would be graded in tube testing as:
a. 1+
b. 2+
c. 3+
d. 4+

55. An order for blood products for a recent recipient of a bone marrow graft was received in the transfusion service. Because these patients are especially susceptible to GVHD from a transfusion, which blood product would best prevent GVHD?
a. Leukocyte reduction of the unit
b. Washing the unit with normal saline
c. Irradiation of the blood product
d. Providing HLA-matched blood products

56. The mixed lymphocyte culture (MLC) is an older technique in the HLA laboratory used to determine:
a. HLA-A antigens
b. HLA-C antigens
c. HLA antibody identification
d. HLA-D antigens and compatibility

57. What is the purpose of including a reagent control when interpreting group AB, D-positive red cells after testing with a low-protein anti-D reagent?
a. to detect false-positive agglutination reactions
b. to detect false-negative agglutination reactions
c. to identify a mix up with patient's sample
d. to confirm ABO typing results

58. Monospecific AHG reagents:
a. increase the dielectric constant in-vitro
b. contain either anti-IgG or anti-C3d antibody specificities
c. are not useful in identifying the molecule causing a positive DAT
d. contain human IgG or complement molecules

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

59. You have added IgG-sensitized red cells to a negative indirect antiglobulin test. You observe agglutination in the tube. What situation was not controlled for in testing by adding these control cells?
a. the addition of patient serum
b. the addition of AHG reagent
c. adequate washing of cell suspension
d. adequate potency of AHG reagent

60. Part of the daily quality control in the blood bank laboratory is the testing of reagent antisera with corresponding antigen-positive and antigen-negative red cells. What does this procedure ensure?
a. Antibody class
b. Antibody titer
c. Antibody specificity
d. Antibody sensitivity

61. Group O red cells are used as a source for commercial screening cells because:
a. anti-A is detected using group O cells
b. anti-D reacts with most group O cells
c. weak subgroups of A react with group O cells
d. ABO antibodies do not react with group O cells

62. Information regarding reagent limitations is located in the:
a. SOPs
b. Blood bank computer system
c. Product inserts
d. Product catalogs

63. After the addition of anti-D reagent to a patient's red cell suspension, agglutination was observed. The result with anti-A reagent was negative. What is the interpretation of this patient's D typing?
a. Patient is D-negative
b. Patient is D-positive
c. Cannot interpret the test
d. Invalid result

64. What reagent would be selected to detect the presence of unexpected red cell antibodies in a patient's serum sample?
a. A1 and B cells
b. Panel cells
c. IgG-sensitized cells
d. Screening cells

65. To determine the specificity of a red cell antigen in a patient sample, what source of antibody is selected?
a. commercial reagent red cells
b. commercial antisera
c. patient serum
d. patient plasma

66. What reagents are derived from plant extracts?
a. Panel cells
b. Commercial anti-B
c. Lectins
d. Antiglobulin reagents

67. Which of the following describes the expression of most blood group inheritance?
a. Dominant
b. Recessive
c. Sex-linked
d. Codominant

68. With which of the following red cell phenotypes would anti-Jka react most strongly?
a. Jk (a−b+)
b. Jk (a+b−)
c. Jk (a+b+)
d. Jk (a−b−)

69. A gene that can inhibit the expression of another gene is called:
a. An amorph
b. A cis gene
c. A null gene
d. A regulator gene

72. The following ABO typing results were noted:
Anti-A: 0 Anti-B: 0
A1 cells: 4+ B cells: 4+

What ABO phenotypes would be compatible if the patient required a transfusion of RBCs?
a. Group AB, O, A, or B
b. Group O or B
c. Group AB or O
d. Only group O

73. Using known sources of reagent antisera (known antibodies) to detect ABO antigens on a patient's red cells is known as:
a. Rh typing
b. Reverse grouping
c. DAT
d. Forward grouping

74. The following ABO typing results were noted:
Anti-A: 0 Anti-B: 4+
A1 cells: 0 B cells: 0

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

Which result is discrepant if the red cell typing shown in the following chart is correct?
a. Negative reaction with group B cells
b. Positive reaction with anti-B
c. Negative reaction with group A1 cells
d. No discrepancies in these results

75. What immunoglobulin class is primarily associated with ABO antibodies?
a. IgA
b. IgG
c. IgE
d. IgM

76. What immunodominant sugar confers B blood group specificity?
a. D-galactose
b. L-fructose
c. N-acetylgalactosamine
d. L-glucose

77. Which of the following genotypes is heterozygous for the C antigen?
a. R1r
b. R2R2
c. R1R1
d. r'r

78. A donor tested D-negative using commercial anti-D reagent. The weak D test was positive. How should the RBC unit be labeled?
a. D-positive
b. D-negative
c. D-variant
d. Varies with blood bank policy

79. Which of the following phenotypes would react with anti-f?
a. rr
b. R1R1
c. R2R2
d. R1R2

80. Anti-D was detected in the serum of a D-positive person. What is a possible explanation?
a. the antibody is really anti-G
b. compound antibody was formed
c. regulator gene failure
d. missing antigen epitope

81. Chronic granulomatous disease is associated with a depression of the antigens in the _____ blood group system
a. Duffy
b. Kidd
c. P
d. Kell

82. Which of the following antibodies can be neutralized by pooled human urine?
a. Anti-Csa
b. Anti-Sda
c. Anti-Ch
d. Anti-Vel

83. What is the most likely Lewis phenotype of a non-secretor?
a. Le(a−b−)
b. Le(a+b+)
c. Le(a+b−)
d. Le(a−b+)

84. What procedure would help to distinguish between an anti-Fya and anti-Jka in an antibody mixture?
a. lowering the pH of the patient's serum
b. using a thiol reagent
c. testing at colder temperatures
d. testing ficin-treated panel cells

85. An antibody commonly associated with delayed transfusion reactions is:
a. Anti-Lua
b. Anti-S
c. Anti-Jkb
d. Anti-M

86. HTLA antibodies:
a. Typically react at room temperature
b. Can be enhanced with PEG
c. Are usually clinically insignificant
d. Are associated with HDFN

87. Which of the following statements is associated with anti-I?
a. It has weaker reactions with stored blood
b. It can be neutralized with commercially prepared substance
c. It reacts best at 37'C
d. It does not react with cord blood cells

88. A DAT performed on a clotted sample stored at 4° C may demonstrate:
a. in vivo complement attachment
b. in vivo IgG attachment
c. in vitro complement attachment
d. in vitro IgM attachment

89. The removal of an antibody from serum or plasma using the individual's own red cells is:
a. Autoadsorption
b. Differential adsorption
c. Neutralization
d. Elution

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

90. The procedure that removes intact antibodies from the red cell membranes is:
a. Autoadsorption
b. Neutralization
c. Enzyme pretreatment
d. Elution

91. The neutralization technique was performed on a sample containing an anti-Leb. The control and the Lewis-neutralized sera were both negative when retested with panel cells. How should this test be interpreted?
a. the anti-Leb was successfully neutralized and no underlying antibodies were found
b. the panel cells were not washed sufficiently
c. the sample was probably diluted
d. the antibody originally identified was probably not anti-Leb

92. The purpose of additional procedures when working up a warm autoantibody is to:
a. identify the warm autoantibody specificity in the serum
b. locate RBC units that are compatible with the autoantibody
c. identify potential underlying alloantibodies
d. identify the antibodies coating the red cells

93. Detection of serologic incompatibility between donor RBCs and recipient serum is performed in the:
a. Antibody screen
b. Crossmatch
c. DAT
d. Autologous control

94. A recipient's antibody screen is negative; however, the recipient is incompatible with the selected donor unit. Select a possible explanation for these results.
a. recipient RBCs possess a high-frequency antigen
b. recipient has a warm autoantibody
c. recipient possesses an antibody to a low-frequency antigen
d. recipient RBCs possess a cold autoantibody

95. A patient who has a phenotype group AB, D-negative requires 1 unit of plasma. Which of the following units of plasma would be best for transfusion?
a. Group A, D-negative
b. Group B, D-positive
c. Group AB, D-positive
d. Group O, D-negative

96. In the gel test, a button of cells at the bottom of the well is a:
a. 4+ positive reaction
b. 1+ positive reaction
c. Negative reaction
d. Invalid reaction

97. What is the expected therapeutic effect in the recipient's hematocrit after the transfusion of 1 unit of RBCs?
a. Increase of 0.5%
b. Increase of 1%
c. Increase of 2%
d. Increase of 3%

98. In a delayed serologic or hemolytic transfusion reaction, the DAT is typically:
a. Negative
b. Weak positive, mixed field
c. Positive with C3 only
d. Negative if serum antibody screen is negative

99. Which of the following patient histories might suggest future transfusions with saline-washed RBCs?
a. History of multiple red cell alloantibodies
b. History of congestive heart failure
c. IgA-negative recipient with anti-IgA antibodies
d. History of transfusion-associated sepsis

100. The greatest danger to the fetus (before delivery) affected by HDFN is:
a. Kernicterus
b. Anemia
c. Hyperbilirubinemia
d. Hypertension

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. All of the following are DELAYED IMMUNE HEMOLYTIC TRANSFUSION REACTION, EXCEPT:
A. Hemolytic
B. TA-GVHD
C. Hemosiderosis
D. Post transfusion purpura

2. Which of the following additive solutions does not contain Mannitol but contains citrate and phosphate?
A. AS-1
B. AS-3
C. AS-5
D. AS-7

3.Leukocyte-reduced filters can do all of the following, EXCEPT:
A. Reduce risk of CMV transmission
B. Prevent HLA alloimmunization and Platelet refractoriness
C.Prevent FNHTR and TACO
D.Prevent TA-GVHD

4. Which of the following is associated with myasthenia gravis and celiac disease?
A. HLA-C1
B. HLA-A8
C. HLA-B8
D. HLA-DR4

5.Which of the following IgG type is best for complement fixation due to its larger hinge region?
A. IgG1
B. IgG2
C. IgG3
D. IgG4

6.What molecule on the surface of most T cells allows antigen recognition?
A. CD3, with six different chains
B. TCR, consisting of two chains, alpha and beta
C. IgT, a four chain molecule that includes the tau heavy chain
D. HLA

7.What is detected in RPR and VDRL?
A. Cardiolipin
B. Anti-treponemal antibodies
C. Live Treponema pallidum
D. Anti-cardiolipin antibody

8.Which of the following blood group antigens are associated with HLA antigens?
A. Diego
B. Bg
C. Rodgers
D. Xg

9.Which is true about the relationship of blood group antigens to HLA antigens?
A. HLA antigens are not considered a blood group antigen
B. HLA antigens are considered a blood group antigen.
C. Bga represents HLA-B17
D. Mature RBCs generally have detectable levels of HLA

10.Most of the blood group systems are coded by variants of a single gene. Which of the following is an example?
A. ABO
B. RH
C. CH/Rg and Xg
D. MNSs

11.What is the most common Gerbich antibody?
A. Anti-Ge1
B. Anti-Ge2
C. Anti- Ge3
D. Anti-Ge4

12.Which of the following describes the expression of most blood group antigens?
A. Dominant
B. Recessive
C. Codominant
D. X-linked

13.If a patient has a positive DAT, should you perform a weak D test on the cells?
A. Yes, Rh reagents are enhanced in protein media
B. No, the cells are Rh null
C. Yes, the immunoglobulin will not interfere with the test
D. No, the cells are already coated with antibody

14.Which procedure would help to distinguish between an anti-e and anti- Fya in an antibody mixture?
A. Lower the pH of test serum
B. Run an enzyme panel
C. Use thiol reagent
D. Run a LISS panel

15.What would be the result of group A blood given to a group O patient?
A. Nonimmune transfusion reaction
B. Immediate hemolytic transfusion reaction
C. Delayed hemolytic transfusion reaction
D. Febrile nonhemolytic transfusion reaction

16.A patient showed positive results with screening cells and 4 donor units. The patient auto-control was negative. What was the most likely antibody?
a. Anti-H
b. Anti-S
c. Anti-Kpa
d. Anti-k

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

17.Component of an additive solution that serves as source of energy for blood
A. Saline
B. Dextrose
C. Mannitol
D. Adenine

18.In what manner is whole blood stored?
A. Horizontally in refrigerator
B. Horizontally in room temperature
C. Standing upright in room temperature
D. Standing upright in refrigerator

19.Which of the following viruses is the most commonly associated to tumors?
A. HPV
B. EBV
C. HIV
D. HEPA B

20.What is the most common mother to fetus transmitted virus?
A. HIV
B. Hepatitis
C. CMV
D. HTLV

21.Which of the following best describes the mechanism of paroxysmal cold hemoglobinuria?
A. Antibodies attach to RBCs at 4°C, hemolysis at 4°C
B. Antibodies attach to RBCs at 4°C, hemolysis at 22°C
C. Antibodies attach to RBCs at 4°C, hemolysis at 37°C
D. Antibodies attach to RBCs and red cell hemolysis occurs simultaneously

22.RBCs are split in 2 aliquots at 6am under closed conditions. What is the lifespan of the aliquot?
A. Discarded and must not be issued
B. The same as the original expiry date
C. The next day at 6am
D. The same day at 6pm

23.When do you add additive solutions to RBCs?
A. After removing the plasma or platelets
B. Before removing the plasma
C. After blood collection
D. Incorporated in the blood bag during collection

24.Which of the following precludes acceptance of a platelet pheresis donor?
A. Platelet count of 75 x 10^9/L in a donor who is a frequent platelet donor
B. Plasma loss of 800 mL from plasmapheresis 1 week ago
C. Plateletpheresis performed 4 days ago
D. Aspirin ingested 7 days ago

25.Which is the quality control for platelets acquired from apheresis?
A. 3 x 10^11 platelets
B. 3 x 10^10 platelets
C. 5.5 x 10^11 platelets
D. 5.5 x 10^10 platelets

26.Should an A-negative woman who has just had a miscarriage receive RhIg?
A. Yes, only if she does not have evidence of active Anti-D
B. No, the type of the baby is unknown
C. Yes, but only a minidose regardless of trimester
D. No, Rhlg is given for term pregnancies only

27. Temperature requirement for lyophilization:
A. 0°C
B. 70°C
C. – 4°C
D. – 40°C

28.What is the purpose of preservatives?
A. To maintain the color of RBCs
B. To prevent bacterial contamination
C. To serve as an additive
D. To rejuvenate RBCs

29.Immunologic response to DPT vaccine is under what immunity?
A. Passive Cellular immunity
B. Active Humoral Immunity
C. Passive Humoral Immunity
D. Active Cellular Immunity

30.Which of the following is specific only to the alternative pathway?
A. C3 convertase
B. Properdin
C. C5 convertase
D. C1q

31.What is the immunity marker for Hepatitis B infection?
A. Anti-HBe
B. Anti-HBsAg
C. Anti-HBc IgM
D. HBsAg

32.Which of the following is NOT considered a Type I Hypersensitivity Reaction?
A. Hay fever
B. Anaphylaxis
C. Dust mites
D. Serum sickness

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

33.Which two organs are considered the primary lymphoid organs in which immunocompetent cells originate and mature?
A. Thyroid and Peyer's patches
B. Thymus and Bone marrow
C. Spleen and MALT
D. Lymph nodes and thoracic duct

34.Which is most likely a positive Western blot result for infection with HIV?
A. p24
B. gp60
C. p24 and gp120
D. p24 and p31

35.All of these are causes of donor deferral, EXCEPT:
A. Body temperature of 38'C
B. 110 Diastolic pressure
C. 75 pulse rate
D. 30% Hematocrit level

36. SITUATION: An emergency trauma patient requires transfusion. Six units of blood are ordered STAT. There is no time to draw a patient sample. O-negative blood is released. When will compatibility testing be performed?
A. Compatibility testing must be performed before blood is issued
B. Compatibility testing will be performed when a patient sample is available
C. Compatibility testing may be performed immediately using donor serum
D. Compatibility testing is not necessary when blood is released in emergency situations

37. What is the purpose of C3a, C4a, and C5a, the split products of the complement cascade?
A. To bind with specific membrane receptors of lymphocytes and cause release of cytotoxic substances
B. To cause increased vascular permeability, contraction of smooth muscle, and release of histamine from basophils
C. To bind with membrane receptors of macrophages to facilitate phagocytosis and the removal of debris and foreign substances
D. To regulate and degrade membrane cofactor protein after activation by C3 convertase

38. Can crossmatching be performed on March 1st using a patient sample drawn on Feb 28th?
A. Yes, a new sample would not be needed
B. Yes, but only if the previous sample has no alloantibodies
C. No, a new sample is needed because the 2-day limit has expired
D. No, a new sample is needed for each testing

39.Why is testing a pregnant woman for weak D not required?
A. An Rh-negative fetus may yield false positive results in a fetal maternal bleed
B. An Rh-positive fetus may yield false positive results in a fetal maternal bleed
C. D antigen strength decreases during pregnancy
D. D antigen strength increases during pregnancy

40. Which of the following may be a cause of a permanent deferral?
A. Tattoo
B. Pregnancy
C. High risk occupation (e.g., prostitution)
D. Malaria

41. Which of the following pertains to anaphylaxis?
A. cytotoxic T cell activation
B. buildup of IgE on mast cells
C. AOTA
D. complement activation

42.Of which of the following best explains the difference between type III and type II Hypersensitivity reactions?
A. IgG is actively involved in type III reactions
B. Type II has cellular antigens
C. Type II reactions have no antibodies
D. Type III involves IgE

43. General definition for autoimmunity:
A. manifestation of immunosuppression
B. loss of tolerance to self-antigens
C. increase of tolerance to self-antigens
D. Increase in clonal mutation

44. Which Carbohydrate Antigen is related on Lewis antigen?
a. CA 19-9
b. CA 15-3
c. CA 125 d.
d. AOTA

45.Alpha 1 –antitrypsin inactivates this protease released from leukocytes:
A. Amylase
B. Elastase
c. Myeloperoxidase
d. Pronase

46.Proposed cellular theory on phagocytosis:
A. Pasteur
B. Metchnikoff
C. Milstein
D. Pasteur

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

47. What cell grows in Hypoxanthine, Aminopterin and thymidine (HAT) medium?
A. B cells
B. Hybridoma
C. Myeloma cells
D. AOTA

48. The secretory component (SC) of IgA is produced by what cell?
A. Epithelial cells
B. Kidney
C. Liver
D. Bone marrow

49. Deficiency of C4 is most likely implicated with:
A. Lupus-like syndrome
B. unknown
C. Neisserial infections and pneumococcal diseases
D. Atherosclerosis

50.CGD represents a defect of:
A. Oxidative metabolism
B. Abnormal granulation of neutrophils
C. Diapedesis
D. Chemotaxis

51.The method of choice for detecting IgM antibodies in toxoplasmosis is:
A. Enzyme-linked immunosorbent assay
B. Indirect fluorescent antibody (IFA)
C. Indirect hemagglutination (IHA)
D. PCR

52.The stage of syphilis that can be diagnosed only by serologic (laboratory) methods is the:
A. Incubation phase
B. Primary phase
C. Secondary phase
D. Latent phase

53.What type of cells are involved in type III hypersensitivity?
A. Macrophages
B. AOTA
C. Host tissue
D. RBC

54. Which of the following viruses is considered the most infectious in a working bench laboratory?
A. HIV
B. HAV
C. HBV
D. HCV

55.This is important for detection of early acute HDV infection:
A. ANTI-HDV IgM
B. ANTI-HDV IgG
C. HDV RNA
D. HDV DNA

56.Which of the following can activate the alternative pathway of complement system?
A. Bacterial cell wall
B. Immune complex
C. Lectin
D. CRP

57. Which of the following is not a characteristic of an HIV intermediate stage?
A. Positive HIV test
B. Increased levels of antibodies
C. CD4 count of more than 1000/ul
D. Anemia

58. What are the two most common Lewis antigens?
A. Lwa and Lwb
B. Le1 and Le2
C. Le A and Le
B D. Lea and Leb

59. Which of the following method is the least expensive to quantify T cells?
A. Rosette technique
B. Flow cytometry
C. Wright and Giemsa staining
D. Impedance

60.What are the two most common RBC isolate that is associated with blood transfusion infection?
A. Yersinia and Staphylococcus
B. Yersinia and Pseudomonas
C. Staphylococcus and Bacillus spp.
D. Pseudomonas and Staphylococcus

61. It releases histamine that triggers inflammatory process:
A. Eosinophils
B. Neutrophils
C. Lymphocytes
D. Mast cells

62. The relationship between the forward and reverse typing of Blood type O phenotype to Oh phenotype is:
A. Both parallel
B. Both Inverse
C. Inverse reverse typing only
D. Inverse forward typing only

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

63. Which of the following is not correlated with acquired B phenomenon?
A. E. coli 086
B. Negative reaction to both A and B cells
C. NOTA
D. Mistyped as blood type AB

64. Cryoprecipitate is used for deficiency of what clotting factor?
A. AHF
B. IX
C.XI
D. All coagulation factors

65. What is the genotype of Bombay?
A. Hh
B. Oh
C. hh
D.h—

66. Which of the following cell contains MHC Class II?
A. T cell
B. Fibroblast
C. Plasma cell
D. NOTA

67. Brain Natriuretic Peptide (BNP) cut-off value that supports diagnosis of TACO:
A. 1
B. 1.5
C. 2
D. 2.5

68. What is the purpose of using enzymes in performing antibody identification?
A. To destroy certain antigens
B. To enhance cell clumping
C. To destroy certain antibodies
D. To denature protein

69. Which of the following blood group incompatibility between the mother and fetus protects somewhat RH HDN?
A. Kidd incompatibility
B. Duffy incompatibility
C. Kell incompatibility
D. ABO incompatibility

70. Which is not attributed to IgE?
A. Monomer
B. Heat stable
C. Does not fix complement
D. Attaches to basophil and mast cell

71. Which of the following is the most fatal transfusion reaction?
A. ABO incompatibility
B. RH incompatibility
C. Kell incompatibility
D. AOTA

72. If the working area is contaminated, which part of the chain of infection is usually involved?
A. Source
B. Mode of transmission
C. Host
D. Infectious agent

73. ABO phenotype that is associated with “good teeth”:
A. Blood type B
B. Blood type A
C. Blood type O
D. Blood type AB

74.ABO HDFN is usually mild because:
a. ABO antigens are poorly developed in the fetus
b. ABO antibodies prevent the disease itself
c. ABO antibodies readily cross the placenta
d. ABO incompatibility is rare

75. Which of the following blood component can be transfused even without ABO typing or with ABO incompatibility?
A. Granulocyte pheresis
B. Platelet pheresis
C. FFP
D. Cryoprecipitate

76.In ABO HDN, the neonate can develop hyperbilirubinemia of unconjugated bilirubin. A Phototherapy at _____nm is used to change the unconjugated bilirubin to isomers, which are less lipophilic and less toxic to the brain.
A. 460-490
B. 270-300
C. 350-450
D. 150-250

77.A patient has hypofibrinogenemia. What component is the best choice for transfusion?
A. FFP
B. Cryoprecipitate
C. Prothrombin concentrate
D. AOTA

78.What component/s may be shipped together with FFP?
A. Platelet product
B. Platelet product and Frozen RBCs
C. Platelet product, Frozen RBCs, and Cryoprecipitate
D. Frozen RBCs, and Cryoprecipitate

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

79.A shipment of packed RBCs, platelets, and leukocyte-reduced RBCs arrived in the same container at 1-6 C. What should be done?

A. Accept all and place on the blood bank ref
B. Accept RBC products and discard platelet product
C. Accept all and freeze
D. Discard all the products

80.What would be the expected result if blood from a group A patient was given to a group O patient?

A. Nothing
B. Immediate hemolytic transfusion reaction
C. Delayed hemolytic transfusion reaction
D. Compatible

81. What components are indicated for patients who have anti-IgA antibodies?

A. Washed RBC
B. Leukocyte reduced RBC
C. Deglycerolized RBC
D. Any of these can be transfused

82. Transfusion of an irradiated blood product is indicated in all of the following conditions, EXCEPT:

A. TA-GVHD
B. Neonatal transfusion
C. WAIHA
D. Relatives

83. What component may not be prepared if whole blood is centrifuged at 1-6C?

A. FFP
B. Platelet concentrate
C. Packed RBC
D. AOTA

84. Which type of antibody can cause HDFN in any pregnancy, but is usually limited to less severe symptoms?

A. Anti-c
B. Anti -A, B
C. Anti- Le
D. Anti-Kell

85. Which Rh antibody might be produced if a unit of blood with Rh genotype DCe/dce is given to a patient with Rh genotype of DCe/DCe?

A. Anti-C
B. Anti-c
C. Anti- E
D. Anti- e

86. Which of the following antigen is prevalent in Arab and Iranians?

A. Sc2
B. Ina
C. Dia
D. k

87. Which of the following is not a cause of temporary deferral?

A. Hypertension
B. Visited an endemic place with malaria
C. Diabetes mellitus
D. active tuberculosis

88. Which of the following is not part of the computer system in Blood banking?

A. Validation
B. People
C. Hardware
D. Software

89. What is the composition of RHIg?

A. IgM Anti-D
B. IgG and IgM anti-D
C. Anti-DCE
D. IgG anti-D

90. The first requirement for laboratory investigation of a transfusion reaction is:

A. Repeat ABO testing
B. Clerical check
C. Visual check of pre and post transfusions specimens
D. DAT on the post transfusion specimen

91. Which of the following transfusion reaction is difficult to prevent and is usually self -limiting?

A. FNHTR
B. TRALI
C. Post transfusion purpura
D. TA Hemosiderosis

92. The first sign during inflammatory response is:s toxic to the brain.

A. Pain
B. Inflammation
C. Redness
D. Swelling

93. The genes that code for the variable region of the Heavy chain of an antibody are divided into three groups. Which of the following is not included?

A. V
B. D
C. J
D. L

94. Release of inflammatory cytokines is attributed to what hypersensitivity reaction?

A. Anaphylactic
B. Cytotoxic
C. Cell mediated
D. Immune complex formation

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

95. All of the following statements are true about ABO HDN, EXCEPT:
HDN, EXCEPT: A. Mild HDN
B. Mother is blood type O, and the fetus is either blood type A or B
C. First born are not commonly affected
D. It is currently the leading cause of HDN

96. What is the test recommended to confirm congenital syphilis?
A. VDRL
B. FTA-ABS
C. Western blot
D. PCR

97. Venereal Disease Research Laboratory test is used to:
A. Confirm a congenital infection
B. Diagnose a sexually transmitted infection
C. AOTA
D. To screen donor units

98. The most extensively validated assay and is considered the "gold standard" for Shingles antibody detection:
A. PCR
B. FAMA
C. Western blot
D. EIA

99. What is the equivalent of Rhz in the fisher race nomenclature?
A. DCE
B. ce
C. DCe
D. Dce

100. Which of the following is being described:
***Compilation of laboratory manuals containing detailed procedure in the lab**
***Provide instructions for each activity in the larger process.**

A. Lab manual
B. SOP
C. Flow chart
D. Work instruction

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. In 1975, Köhler, Milstein, and Jerne discovered how to fuse lymphocytes to produce a cell line that was both immortal and a producer of specific antibodies. These scientists were awarded the Nobel Prize in Physiology and Medicine in 1984 for developing this hybridoma (cell hybrid) from different lines of cultured myeloma cells (plasma cells derived from malignant tumor strains). To induce the fusion of cells, they used a virus that characteristically causes cell fusion. This virus is:

A. Sendai Virus
B. Bourbon Virus
C. Isavirus
D. H3N2 Virus
E. H1N1 Virus

2. In 1901, Karl Landsteiner discovered ABO blood group system. He wrote a book which was published in 1917, detailing the results of an exhaustive study of haptens that has contributed greatly to our knowledge of Ag-Ab reactions. What was the title of the book that he wrote?

A. The Specificity of Serologic Reactions
B. The Sensitivity of Serologic Reactions
C. The Specificity of Immunologic and Serologic Reactions
D. The Sensitivity of immunologic and Serologic Reactions
E. The Specificity and Sensitivity of Immunologic and Serologic Reactions

3. They are connective tissue cells of mesenchymal origin. They are widely distributed throughout the body, with a small round nucleus and more granules. They have a long life span of between 9 and 18 months. The enzyme content of the granules contain ACP, ALP, and Protease.

A. Mast Cells
B. Basophils
C. Neutrophils
D. Macrophage
E. Dendritic Cells

4. Cytokines are polypeptide products of activated cells that control a variety of cellular responses and thereby regulate the immune response. The first cytokine activity to be described was:
A. MIF
B. IL
C. IFN
D. CR1
E. CFU

5. A cell expressing CD3+, CD25+, and FoxP3+ is a
A. (γδ) T cell
B. Helper T cell
C. Cytotoxic T cell
D. Regulatory T cell
E. Natural killer T cell

6. A CD31 cell that is CD1 restricted to glycolipids is a
A. (γδ) T cell
B. Helper T cell
C. Cytotoxic T cell
D. Regulatory T cell
E. Natural killer T cell

7. Not an end cell
1. Monocyte
2. Macrophage
3. B cell
4. T cell
5. Band cell
6. Ferrata Cell

A. 1 and 3
B. 2 and 4
C. 1, 3, and 5
D. 6 only
E. 1, 2, 3, 4, 5 and 6

8. Which of the following cells expresses IgM and IgD on the cell surface?
A. Pro-B Cell
B. Pre-B Cell
C. Immature B Cell
D. Naïve Mature
B Cell E. Plasma Cell

9. A cell directed by IL-4 to promote tissue repair, angiogenesis, and tumor growth is a:
A. M1 macrophage
B. M2 macrophage
C. Kupffer cell
D. Foam cell
E. Giant cell

10. A cell derived from monocytes that attach to the arterial intima and accumulate lipids is a:
A. M1 macrophage
B. M2 macrophage
C. Kupffer cell
D. Foam cell
E. Giant cell

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

11. Which of the following describes a giant cell?
A. A syncytial cell found within granuloma
B. A cell performing somatic hypermutation
C. A cell found in the circulation that secretes INFα and INFβ
D. A cell directed by IFNγ to promote ROS production and cytolysis
E. A cell that secretes large quantities of antibody but does not express surface immunoglobulin

12. Which of the following cytokines has a major role in asthma?
A. INF-y
B. IL-4
C. IL-10
D. IL-17

13. Which of the following describes an immature myeloid-derived dendritic cell?
A. A cell producing cytotoxic compounds following Th1 cell activation
B. A cell expressing cell surface MHC Class II, CD80/88 and secretes IL-12
C. A cell captured by endocytosis using transmembrane immunoglobulin
D. A cell with a majority of MHC Class II located within intracellular compartments
E. An epithelial-derived cell expressing cell surface C3-antigen

14. Which of the following is associated with defective killing by phagocytes?
A. Chediak-Higashi Syndrome
B. Chronic Granulomatous Disease
C. Alder-Reilly Anomaly
D. SCID
E. Digeorge Syndrome

15. It is an Acute Phase Reactant, originally thought to be an antibody to the c-polysaccharide of pneumococci. It consists of five identical subunits held together by non-covalent bonds. Binding with foreign particles is calcium-dependent and non-specific, and the main substrate is phosphocholine, a common constituent of microbial enzymes. It can be thought of as a primitive, nonspecific form of antibody molecule that is able to act as a defense against microorganisms or foreign cells until specific antibodies can be produced
A. CRP
B. Serum Amyloid A
C. MBP
D. AAT
E. Complement

16. Actions of Anaphylatoxin except:
A. Increased Vascular permeability
B. Contraction of smooth muscle
C. Release of histamine from basophils and mast cells
D. Coating of foreign cell to neutralize the charge

17. Mixed lymphocyte culture assay (MLC) is a special type of lymphocyte stimulation assay based on the ability of histoincompatible lymphocytes from one individual to stimulate the lymphocytes of another individual (mixed lymphocyte reaction). The major determinant of the MLC phenomenon is found in what HLA locus?
A. A
B. B
C. C
D. D
E. R

18. Cell death (cytotoxicity) is the endpoint commonly used in functional assays of the cellular immune system. In these assays, cell cytotoxicity may occur as the result of complement activity (complement□mediated cytotoxicity) or may be due to the direct effect of one cell on another (cell-mediated cytotoxicity). Conventionally, target cell lysis is determined by the release of a substance such as 51chromium (51Cr) from the target cell upon death, or by the incorporation of a vital dye such as eosin or trypan blue. Based on this explained principle or mechanism, you expect that the device or instrument to be used in the analysis is
A. Scintillation Counter
B. Flow Cytometer
C. Electron Microscope or Ultrathin Microscope
D. Spectrophotometer
E. None of these

19. MICROLYMPHOCYTOTOXICITY ASSAY: The dye exclusion lymphocytotoxicity assay is the standard technique for the detection of an antibody–antigen interaction on a cell surface. The lymphocytotoxicity assay was introduced by Terasaki and McClelland in 1964. Viable cells (usually lymphocytes) are incubated with serum-containing antisera. If a cell surface antigen is present that is recognized by antibodies in the sera, an antigen–antibody complex will form on the surface. These complexes are detected by the sequential addition of rabbit complement and a vital dye, such as eosin, to the reaction mixture. The occurrence of complement fixation on the cell membrane leads to activation of the terminal complement components, and eventually to cell lysis and death. Dead cells are detected and counted after differential uptake of the eosin dye and fixation with formalin. Antibody-bound lymphocytes will die, take up the eosin dye, and give a positive reaction; unbound lymphocytes will remain viable, exclude the eosin dye, and give a negative reaction (dye exclusion). Based on this explained principle or mechanism, you expect that the device or instrument to be used is a microscope but what type of such?

A. Polarizing Microscope
B. Bright-Field Microscope
C. Interference Microscope
C. Interference Microscope
D. Phase-Contrast Microscope E. Dark-Field Microscope

20. Most of the IgD present is found on the surface of immunocompetent but unstimulated B lymphocytes. It is the second type of immunoglobulin to appear (IgM being the first), and it may play a role in B-cell activation, regulation of B-cell maturation and differentiation and prolonging its life span in the periphery. IgD was not discovered until 1965, when it was found in a patient with_____

A. Multiple Myeloma
B. Waldenstroms Macroglubulinemia
C. Multiple Sclerosis
D. Guillaine-Barre Syndrome
E. Ankylosing Spondylitis

21. Which of the following describe/s the bonding of antigen to antibody?
1. Hydrophobic bond
2. Hydrogen bond
3. Van der waals forces
4. Electrostatic forces
5. Non-Covalent bond
6. Ionic Bond

A. 1, 2 and 3
B. 1, 2, 3 and 4
C. 1, 2, 3, 4 and 5
D. 6 only
E. 1 and 3

22. Marker for Bladder Cancer:
A. CFHrp
B. NSE
C. MAGE
D. HE4
E. NRLU-10

23. DiGeorge Syndrome or Congenital Thymic Hypoplasia is characterized by a faulty development of 3rd and 4th pharyngeal pouches during embryogenesis. There is also an Aplasia or hypoplasia of thymus and parathyroid glands. Abnormally high CD4+/CD8+ ratio is present because of a decrease in CD8+ cells. The cause of this congenital anomaly is:
A. Deletion on Chromosome 22
B. Duplication of Chromosome 22
C. Inversion of Chromosome 22
D. Robertsonian Translocation
E. Chromosomal Insertion

24. Which of the following statements is TRUE?
A. An antigen can interact specifically with the immune system but requires other stimuli in order to initiate an immune response
B. An antigen is any molecule or group of molecules, which can induce an immune response.
C. All antigens are immunogens but not all immunogens are antigens.
D. An immunogen can interact specifically with the immune system but cannot itself stimulate an immune response.
E. An immunogen is any molecule or group of molecules, which can react only with antigen-specific receptors on T cells and B cells.

25. Which of the following is NOT typically characteristic of an antigen?
A. An antigen may be protein, lipid, carbohydrate or any combination of these.
B. An antigen may be simple or complex, with many different antigenic determinants.
C. A complex antigen will elicit antibodies to all the different antigenic determinants it expresses. Thus the same antigen introduced into two different individuals will elicit an identical range of antibodies.
D. Antigenic determinants comprise a small number of amino acids or sugar residues.
E. An antigen may be soluble or particulate.

26. One of the important applications of HLA typing is paternity testing. The former is used along with the determination of what RBC antigens?
1. ABO
2. Rh
3. MNS
4. Kell
5. Kidd
6. Duffy

A. 1 and 2
B. 1, 2, and 3
C. 1, 2, 3 and 4
D. 1, 2,3, 4 and 5
E. 1, 2, 3, 4,5, and 6

27. HLA-B5 is mostly associated with:
A. Reiter's Syndrome
B. Behcet's Disease
C. Psoriasis Vulgaris
D. Kaposis Sarcoma
E. Gold-Induced Nephropathy

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

28. Eleven different organs or human body parts can be transplanted—blood vessels, bone, bone marrow or stem, cornea, heart, kidneys, liver, lung, middle ear, pancreas, and skin. Successful organ transplants have increased since the advent of the immunosuppressive drug cyclosporine (cyclosporin A). In corneal transplant, Graft rejection is minimal because of

A. Avascularity
B. Low concentration of class I transplantation antigens
C. Absence of class II antigens.
D. All of these
E. None of these

29. There is an intermediate risk for graft rejection among the following except:

A. Recipients of autologous or allogeneic bone marrow grafts
B. Infants receiving intrauterine transfusions, followed by exchange transfusions
C. Patients receiving total-body radiation
D. Individuals under immunosuppressive therapy

30. DRUG-INDUCED HEMOLYSIS: Coating of RBCs demonstrated by a positive direct anti–human globulin test (DAT) result may be drug induced and accompanied by hemolysis. The reactivity has been described as being caused by four basic mechanisms: (1) drug adsorption; (2) immune complexing; (3) membrane modification; and (4) autoantibody formation. Penicillin is a representative example of an agent that displays drug adsorption. In this type of mechanism, the drug strongly binds to any protein, including RBC membrane proteins. This binding produces a drug-RBC-hapten complex that can stimulate antibody formation. The antibody is specific for this complex and no reactions will take place unless the drug is adsorbed on erythrocytes. Massive doses of IV penicillin are needed to coat the erythrocytes sufficiently for antibody attachment to occur. Penicillin in this case causes what type of hypersensitivity reaction?

A. Type I
B. Type II
C. Type III
D. Type IV
E. Type V

31. Wheal-Flare reaction is also known as:

A. Prausnitz-Kustner Reaction
B. Jenner-Bordet Reaction
C. Tonegawa Reaction
D. Pfeiffer's Reaction

32. It is an adhesion molecule mediating homing to peripheral lymphoid organs.

A. CD 25
B. CD 34
C. CD 44
D. CD 45R

33. This is a product of genetic mutations in the Central regulators of the growth in normal cells that code for proteins involved in growth and repair processes in the body. Its activation causes overexpression of growth promoting proteins, resulting in hypercellular proliferation and tumorigenesis.

A. Proto-oncogene
B. Oncogene
C. Oncofetal Antigen
D. Tumor

34. These antibodies are the most specific for SLE and the antibodies are associated with active/severe disease. Although they are found in only 40-70% of patients, the presence of these antibodies is considered diagnostic for SLE; the antibodies typically produce a peripheral or a homogenous staining pattern in FANA/IIF.

A. Anti-dsDNA
B. Anti-Sm
C. Anti-RNP
D. Anti-DNP
E. Anti-Nucleolar

35. In an antibody titration, a 0.2mL aliquot of a patient's serum sample was added to 0.8mL of saline, and this mixture was placed into tube #1. A 0.5mL sample was removed from tube 1 and placed into tube 2, containing 0.5mL of saline. This procedure was repeated through tube #10. The dilutions were assayed for antibody to S. pyogenes. How should the antibody titer be reported if the last positive reaction was observed in tube #10?

A. 640
B. 2 560
C. 5 120
D. 10 240
E. 1 280

36. What has happened in a titer if tubes 5-7 show a stronger reaction than tubes 1-4?

A. Postzone phenomenon
B. Prozone phenomenon
C. Equivalence reaction
D. Technical difficulty

37. When a precipitation reaction is converted to agglutination by increasing the size of the antigen particles, the test is then referred to as

A. Direct agglutination
B. Optimal agglutination
C. Passive agglutination
D. Prozone reaction

38. An electrophoretically abnormal protein displaced from the normal position may be recognized by
A. Precipitin band of moderate curvature
B. Lines of fusion
C. Precipitin band markedly curved
D. "Gull wing" formation

39. Advantage of counter IE
A. Precipitin lines not sharp
B. Precipitation does not occur at the intermediate point
C. Precipitin lines visible within 30 minutes
D. None of these

40. A laboratory test is evaluating an ELISA for detecting an anti-CCP, which is a more specific marker for RA. The laboratory includes serum from healthy volunteers and patients with other connective tissue diseases in the evaluation. These specimens determine which factor of the assay?
A. A negative result in the absence of the disease
B. A positive result in the presence of the disease
C. Ability of the assay to repeatedly yield the same results on a single specimen
D. Bias result E. Closeness of the result to the true value

41. A patient with Huntington Disease present rigidity, seizures and chorea. You are a staff in the hospital and the latter has a laboratory equipped to perform RFLP analyses. Which of the following techniques is required to carry out RFLP analysis?
A. Southern Blot
B. Northern Blot
C. Western Blot
D. X-ray crystallography
E. Mass spectrometry

42. Which is the best technique to separate oxygenated normal hemoglobin A (HbA) from oxygenated sickle cell hemoglobin (HbS), assuming no protein aggregation?
A. Native gel electrophoresis
B. SDS-PAGE
C. Gel filtration
D. Affinity chromatography with a C-terminal antibody
E. Ultracentrifugation

43. A patient has come in for an HIV test. This test is run in two phases. The first test is an ELISA as a screen, and if two positive test results occur by ELISA, the second test will be run. The second test is a confirmatory Western blot. What do the ELISA and Western blots measure in their respective assays for HIV?
A. The ELISA is measuring the presence of HIV antigen in the sera, whereas the Western blot is measuring the presence of antibodies to HIV proteins in the sera.
B. The ELISA is measuring the presence of antibodies to HIV proteins in the sera only, whereas the Western blot is measuring the presence of HIV antigens in the sera.
C. The ELISA is measuring the presence of HIV antigen in the sera, whereas the Western blot is measuring the presence of HIV antigen in the sera as well.
D. The ELISA is measuring the presence of antibodies to HIV proteins in the sera only, whereas the Western blot is also measuring the presence of antibodies to HIV proteins in the sera.
E. The ELISA measures the presence of antibodies directed against human leukocyte antigen (HLA) molecules to HIV, whereas the Western blot measures levels of free, circulating virus in the sera of the patient.

44. Third generation tests for the detection of HBsAg except:
A. RIA
B. ELISA
C. Reverse Passive Agglutination Test
D. Rheophoresis

45. A PCR assay needs to be developed to determine the HIV status of a newborn in the pediatric intensive care unit whose mother is HIV positive. Which set of primers should be used for the assay?
A. The primers should consist of antiparallel complements of two parts of a noninfected human genome.
B. The primers should be designed so that, after annealing with potential infective DNA, the 5' end of primer 1 would "face" the 3' end of primer 2.
C. The primers should be synthesized so that, after annealing with potential infective DNA, the 50 end of both primers "face" each other.
D. The primers should be designed to be synthesized with dideoxynucleotides to allow sequencing of the mutation.
E. The primers should be designed with identical sequences to those in the HIV genome and must bind to DNA in a complementary, antiparallel manner.

46. When performing EMIT, how is the ligand in the patient's serum detected?
A. Agglutinates by binding to antibody-coated latex beads
B. Binds to enzyme-labeled antibody
C. Forms antigen-antibody complex and precipitates
D. Competes with enzyme-labeled antigen for binding to a specific antibody

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

47. Paloma is a prostitute working in Cardo's Taverna, an infamous night club in Angeles City, Pampanga. Recently, she has undergone a serologic exam for syphilis and the results of her tests were as follows:
RPR: Reactive
VDRL: Reactive
HATTS: Nonreactive
What is the most likely interpretation of her syphilis serologic result?

A. Neurosyphilis
B. Secondary syphilis
C. Successful treatment of syphilis
D. Suspected HIV

48. In monitoring an HIV-infected patient, which parameter may be expected to be the most sensitive indicator of the effectiveness of antiretroviral treatment?
A. HIV Antibody titer
B. CD4 count
C. Viral load
D. ELISA

49. Which of the following is not true?
A. Most blood group alleles are codominant and express a corresponding antigen.
B. When paired chromosomes carry the same silent allele, a null phenotype results.
C. Serologic tests determine only RBC phenotype, not genotype
D. Numeric terminology was originally introduced for the Kell and Rh systems and was subsequently applied to other systems.
E. None of these

50. The discoveries of Th1 and Th2 model of T-helper cell function and the identification of toll-like receptors are credited to
A. Mosmann
B. Frazer
C. Reed
D. Kitasata

51. Which of the following proteins respond to viral infection by blocking the replication of virus in other cells?
A. Interferon
B. Interleukin
C. TNF
D. TGF

52. The interleukins are unrelated cytokines that must satisfy which of the following criteria?
A. They must have had their genes cloned
B. A + They must be inducible in erythrocytes
C. A + B + Their biological activities in inflammatory processes must not be catalogued
D. A + B + C + They must act solely on cells of the immune system

53. The chemokine receptors CXCR4 and CCR5 are utilized by HIV as co-receptors for infection of CD4+ cells and macrophages. These receptors belong to what chemokine?
A. RANTES
B. RANTES, SDF-1
C. RANTES, SDF-1, MIP-1α
D. RANTES, SDF-1, MIP-1α, Eotaxin

54. Which of the following acute-phase reactants is the most widely monitored and is the best indicator of acute inflammation due to its rapid rise and decline?
A. CRP
B. Amyloid
C. AAT
D. MBP
E. None of these

55. CRP threshold for high cardiovascular risk
A. 2mg/L
B.2.5mg/L
C. 3mg/L
D. 3.5mg/L

56. HYBRIDOMA PRODUCTION: A mouse is immunized with a certain antigen, and after a time, spleen cells are combined with myeloma cells in the presence of Polyethylene glycol (PEG), a surfactant. The PEG brings about fusion of plasma cells with myeloma cells or two spleen cells. After fusion, cells are placed in culture using a selective medium containing
A. Aminopterin
B. Aminopterin, Thymidine
C. Aminopterin, Thymidine, Hypoxanthine
D. Aminopterin, Thymidine, Hypoxantine, Phosphoribosine

57. Bonding of antigen to antibody consists of:
A. Hydrogen bonding
B. Van der Waals forces
C. Electrostatic forces
D.Noncovalent bonding
E. Covalent bonding

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

58. What type of cells would be found in a primary follicle?
a. Memory cells
b. Plasma cells
c. Unstimulated B cells
d. Memory cells

59. True for NK cells
A. They rely on memory for an antigen recognition
B. They share antigens with b cells
C. They recognize a lack of MHC proteins
D. They are found mainly in lymph nodes

60. Where are all undifferentiated lymphocytes made?
A. Thymus
B. Spleen
C. Bone marrow
D. Lymph nodes

61. In the thymus, positive selection of immature T cells is based upon recognition of which of the following?
A. Self-antigens
B. Stress proteins
C. MHC antigens
D. Mu chains

62. Which receptor on T cells is responsible for resetting with Sheep red blood cells?
a. CD8
b. CD4
c. CD2
d. CD3

63. When does genetic rearrangement for coding of light chains take place?
A. Before the pre-b cells stage
B. Not until the cell becomes a mature b cell
C. As the cell becomes a mature b cell
D. When the b cell becomes a plasma cell

64. Where does the major portion of antibody production occur?
a. Peripheral blood
b. bone marrow
c. Lymph nodes
d. Thymus

65. Which of the following best describes the TCR for antigen?
A. It consists of IgM and IgD molecules
B. It is the same for all T cells
C. Alpha and beta chains are unique for each antigen
D. It is present in the double-negative stage

66. What is measured in CH50 assay?
A. RBC quantity needed to agglutinate 50% of antibody
B. Complement needed to lyse 50% of patient red cells
C. Complement needed to lyse 50% of red cells coated with hemolysin
D. Antibody and complement needed to sensitize 50% of red blood cells

67. What type of disorders would show a decrease in C3, C4, and CH50?
A. Autoimmune disorders like RA, Goodpasture's syndrome and Hashimoto's disease
B. Immunodeficiency disorders such as common variable immunodeficiency
C. Tumors
D. Bacterial, Viral, Fungal, or Parasitic infections

68. Hydrogen peroxide test is used to diagnose which phagocytic disorder?
a. CGD
b. PNH
c. HANE
d. Lupus-like syndrome

69. What is the indicator system used in the complement fixation test?
A. Sensitized sheep red cells
B. Guinea pig complement
C. Patient antibodies
D. Known reagent antigen

70. The isotype of an immunoglobulin antibody
A. Is defined by the heavy chain
B. Is defined as different alleles of the same antibody type (e.g., IgG)
C. Is constant for all immunoglobulins of an individual
D. Is the variation within the variable region

71. The alternative complement pathway
A. Can be activated by bacterial capsule polysaccharides
B. Uses C5b as a C3 convertase
C. Bypasses steps C3 through C5
D. Is activated by properdin

72. A cut on person's finger becomes contaminated with Staphylococcus aureus. The first response by the immune system consists of activity of
A. B cells
B. Monocytes
C. Neutrophils
D. T cells

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

73. Characteristics of T cells include
I. Synthesize antibody
II. Mature in thymus
III. Able to bind unprocessed antigen
IV. Primarily protect against extracellular parasites
a. II
b. II, IV
c. II, III, IV
d. I, II, III, IV

74. Interaction between B and T helper cells involves
A. MHC II molecule on B cell binding to MHC I molecule on the T cell
B. MHC II molecule on B cell binding to CD3 on the T cell
C. Foreign antigen on B cell binding to CD3 on the T cell
D. CD3 molecule on B cell binding to T cell receptor

75. Which of the following statements applies to the Fc fragment of an immunoglobulin molecule?
A. It consists of the entire Heavy chain
B. It contains the variable region of the heavy chain
C. It is the region of the molecule that binds to receptors on various white blood cells
D. It contains the antigen binding sites of the molecule

76. IgM antibodies react well in complement fixation tests. Because of this, complement fixation tests for antibodies should
A. Be positive early in the course of the disease
B. Be useful in identifying antibodies responsible for a delayed hypersensitivity reaction
C. Be useful in identifying antibodies responsible for anaphylactic reactions
D. Detect transplacental antibodies

77. The activity of NK cells
A. Does not require previous immunologic insult
B. Involves phagocytosis and killing of bacteria
C. Requires interaction with cytotoxic T cells
D. Requires interaction with B cells

78. The VDRL test for syphilis is classified as a (an)
A. Agglutination reaction
B. Flocculation reaction
C. Hemagglutination reaction
D. Precipitation reaction

79. The type of immunity that follows the injection of an immunogen is termed
A. Artificial active
B. Natural active
C. Artificial passive
D. Innate

80. Complement activation seldom involves only one pathway. Uptake of immune response complexes in the spleen appears to be complement dependent.
A. First statement is correct, second is incorrect
B. First statement is incorrect, second statement is correct
C. Both statements are correct
D. Both statements are incorrect

81. The alpha and beta polypeptide chains of C5 are linked by
A. Covalent bond
B. Disulfide bond
C. Vander Waals Forces
D. H-bond
E. Non-Covalent bond

82. C9 possesses how many polypeptide chain?
a. 1
b. 2
c. 3
d. 4

83. C5b678 is capable of lysing
I. Red cells
II. Neutrophils
III. Lymphocytes
IV. Monocytes
a. I
b. II, III, IV
c. III, IV
d. IV

84. Which of the following plays an important role as a defense mechanism in infancy during the interval between the loss of maternal antibody and the acquisition of a full-fledge antibody response to pathogens?
A. Serum amyloid A
B. CRP
C. MBL
D. C3 convertase
E. C5b6789

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

85. Depressed complement levels may be due to
A. Genetic deficiencies
B. Genetic deficiencies, Liver disease
C. Genetic deficiencies, Liver Disease, Autoimmune disease
D. Genetic deficiencies, Liver disease, Autoimmune disease, Hemolytic anemias

86. Elevated levels of complement are found in
A. Acute inflammatory conditions
B. A + Leukemia
C. B + Hodgkin's disease
D. C + Behcet's disease

87. Enhancement of phagocytosis by coating of foreign particles with serum proteins is called
A. Opsonization
B. Agglutination
C. Solubilization
D. Chemotaxis

88. Most significant agent fromed in the phagolysosome to kill microorganisms
A. Proteolytic enzymes
B. Hydroxyl radicals
C. Hydrogen peroxide
D. Superoxides

89. The action of CRP can be distinguished from that of an antibody in which of the following ways?
A. CRP acts before the antibody appears
B. The antibody triggers the complement cascade
C. Binding of antibody is calcium-dependent
D. Only CRP acts as an opsonin

90. Cell-Mediated Immune Response:
1. Contact Sensitivity
2. For Intracellular Organisms
3. Extracellular Antigens
4. Delayed Hypersensitivity

A. 1,2,3,4
B. 1,2,3
C. 1,2,4
D. 1,3,4

91. Which of these statements is correct:
1. An immunogen is a macromolecule capable of eliciting the formation of Immunoglobulin or sensitized cells that have been induced.
2. An antigen is a substance that reacts with an antibody or sensitized cells but may or may not be able to elicit an immune response in the 1st place.
3. All Immunogens are Antigens.
4. All Antigens are Immunogens

A. 1 and 2
B. 1,2,3
C. 2,3,4
D. 1,3,4

92. Which of these traits of Immunogens is/are true:
1. The greater the molecular weight the more potent the molecule is as an Immunogen.
2. Proteins are good Immunogens because they are made up of a variety of units known as monosaccharides.
3. Carbohydrates are more immunogenic than proteins bec. The units of sugars are more limited.
4. The immune response is normally not able to distinguish between self and nonself.

A. 1,2,3,4
B. 1,2,3
C. 1 and 2
D. 1 only

93. Which of these 4 major subclasses of IgG have shorter hinge segments
1. IgG1
2. IgG2
3. IgG3
4. IgG4

A. 1 and 2
B. 1 and 3
C. 2 and 4
D. 3 and 4

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

94. Plasma cells that produce IgE are located primarily in the:
1. Kidneys
2. Lungs
3. Skin
4. Intestines

A. 1,2,3,4
B. 2 and 4
C. 2 and 3
D. 2 and 1

95. Destruction of the myelin sheath of axon caused by the presence of antibody is characteristic of which disease?
A. Multiple Sclerosis
B. Myasthenia gravis
C. Grave's disease
D. Goodpasture's disease

96. SLE can be distinguished from RA on the basis of which of the following?
A. Joint pain
B. Presence of antinuclear antibodies
C. Immune complex formation with activation of complement
D. Deposition of Immune Complexes in the kidneys

97. Most widely used method for Antinuclear Antibody
A. RIA
B. EIA
C. Immunofluorescence
D. Immunoenzyme

98. Rheumatoid Arthritis with Lung involvement
A. Felty's Syndrome
B. Caplan's Syndrome
C. Polyarticular
D. Pauriarticula

99. LE cells are:
A. Lymphocytes engulfing another Lymphocytes
B. Normal lymphocytes engulfed by neutrophils
C. Damaged Lymphocytes engulfing Neutrophils
D. Damaged Lymphocytes engulfed by Neutrophils

100. Felty's Syndrome
1. RA
2. Leukocytosis
3. Splenomegaly
4. Leukopenia

A. 1,2,3
B. 1,3,4
C. 1 only
D. 1,4

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. Metchnikoff first described which of the following?
A. Phagocytosis
B. Variolation
C. Humoral immunity
D. Opsonization

2. Jenner's work with cowpox, which provided immunity against smallpox, demonstrates which phenomenon?
A. Natural Immunity
B. Cross-immunity
C. Attenuation of vaccines
D. Reactivity of haptens

3. Chronic granulomatous disease represents a defect of:
A. Oxidative metabolism
B. Abnormal granulation of neutrophils
C. Diapedesis
D. Chemotaxis

4. The major role of neutrophils is phagocytosis. Which one of the following events is not associated with some aspect of neutrophil function?
A. Recognition of antigen via primitive pattern receptor patterns
B. Recognition of opsonins on bacteria
C. Secretion of perforin
D. Activation of the NADPH oxidase

5. Which one of the following cells destroys tumor cells using ADCC as a recognition mode, and perforin as an effector molecule?
A. B cells
B. CD4+ cells
B. CD8+ cells
D. NK cells

6. Which of the following is a potent mediator in acute-phase response?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

7. Which of the following enhances the cytolytic activity of lymphokine-activated killer cells (LAK)?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

8. Which of the following stimulates hematopoietic cells?
A. IL-1
B. IL-2
C. IL-3
D. IL-4

9. Which one of the following cells recognizes a cell surface complex consisting of antigenic peptide complexed with an MHC protein?
A. Phagocytes
B. Eosinophils
C. T cells
D. B cells

10. Which one of the following activates both T and B cells?
A. PHA
B. Con A
C. LPS
D. PWM

11. The type of immunity that follows the injection of an antigen is:
A. Adaptive
B. Active
C. Passive
D. Innate

12. Which of the following is true of MHC (HLA) class II antigens?
A. They are found on all nucleated cells
B. They are found on B cells and macrophages
C. They all originate at one locus
D. They are coded on chromosome 9

13. Bence-Jones proteins are identical:
A. H chains
B. L chains
C. IgM molecules
D. IgG molecules

14. Mannose-binding protein in the lectin pathway is most similar to which classical component pathway component?
A. C3
B. C1rs
C. C1q
D. C4

15. In the complement fixation procedure, a negative result is manifested by:
A. Antigen-binding
B. Lysis of guinea pig cells
C. Lysis of sheep red blood cells
D. Agglutination of sheep red blood cells

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

16. A positive direct Coomb's test could occur under which circumstances?
A. Hemolytic disease of the newborn
B. Autoimmune hemolytic anemia
C. Antibodies to drug that bind to red cells
D. Any of the above

17. Which one of the following antibody isotypes is captured by Protein A?
A. IgG
B. IgA
C. IgM
D. IgD

18. To determine id a patient is allergic to rye grass, the best test to perform is:
A. RAST
B. RIST
C. DAT
D. Complement fixation

19. What is the immune phenomenon associated with Arthus reaction?
A. Tissue destruction by cytotoxic T cells
B. Removal of antibody-coated red blood cells
C. Deposition of immune complexes in blood vessels
D. Release of histamine from mast cells

20. The Mantoux test is an example of:
A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Type IV hypersensitivity

21. Anaphylaxis as a result of bee sting is an example of:
A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Type IV hypersensitivity

22. What immune elements are involved in a reaction to poison ivy?
A. IgE antibodies
B. T cells and macrophages
C. NK cells and IgG
D. B cells and IgM

23. What antibodies are represented by the peripheral or rim pattern of IF tests for ANA?
A. Anti-histone antibodies
B. Anti-dsDNA antibodies
C. Anti-ENA antibodies
D. Anti-RNA antibodies

24. Destruction of the myelin sheath of axons caused by the presence of antibody is characteristic of which disease?
A. Multiple sclerosis
B. Myasthenia gravis
C. Graves' disease
D. Goodpasture's syndrome

25. It is suggestive of Goodpasture's disease:
A. Acetylcholine receptor-blocking antibodies
B. Anti-cardiolipin antibodies
C. Anti-DNA antibodies
D. Anti-glomerular basement membrane antibodies

26. It is strongly suggestive, in a high titer, of primary biliary cirrhosis:
A. Anti-myelin antibody
B. Anti-intrinsic factor antibody
C. Anti-centromere antibody
D. Anti-mitochondrial antintibody

27. A defect in C1INH results in which one of the following disorders?
A. Bruton's agammaglobulinemia
B. Selective IgA deficiency
C. Chronic granulomatous disease
D. Hereditary angioneurotic edema

28. Individuals who are at risk for ankylosing spondylitis have inherited which one of the following alleles?
A. HLA-A3
B. HLA-B8
C. HLA-B27
D. HLA-B7

29. Individuals who are at risk for rheumatoid arthritis have inherited which one of the following alleles?
A. HLA-A3
B. HLA-B27
C. HLA-B7
D. HLA-DR4

30. A kidney transplantation between one identical twin to another is an example of:
A. An allograft
B. An autograft
C. A heterograft
D. A syngeneic graft

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

31. CA-15.3 is used conditionally in the monitoring of:
A. Pancreatic adenocarcinoma
B. Colonic adenocarcinoma
C. Breast adenocarcinoma
D. Hairy cell leukemia

32. A biological false-positive reaction is least likely with which test for syphilis?
A. VDRL
B. FTA-ABS
C. RPR
D. All are equally likely to detect a false positive

33. A 24-year-old man who had just recovered from infectious mononucleosis had evidence of a genital lesion. His RPR was positive. What should the technologist do next?
A. Report out as false positive
B. Do a confirmatory treponemal test
C. Do a VDRL
D. Have the patient return in 2 weeks for a repeat test

34. The serologic marker during the "window period" of hepatitis B is
A. Anti-HBs
B. Anti-HBc
C. Anti-HBe
D. HBsAg

35. The specific diagnostic test for hepatitis C is:
A. Absence of anti-HAV and anti-HBs
B. An increase in serum ALT
C. Detection of non-A, non-B antibodies
D. Anti-HCV

36. Antibodies to which of the following retroviral antigens are usually the first to be detected in HIV infection?
A. gp120
B. gp160
C. gp41
D. p24

37. Which of the following combinations of bands would represent a positive Western blot for HIV antibody?
A. p24 and p55
B. p24 and p31
C. gp41 and gp120
D. p31 and p55

38. The confirmation of a heterophile antibody of infectious mononucleosis would be
A. Agglutination with beef erthrocytes
B. Agglutination of sheep cells after incubation with guinea pig cells; no agglutination of sheep cells after incubation with beef erythrocytes
C. Agglutination of sheep cells after incubation with beef erythrocytes; no agglutination of sheep cells after incubation with guinea pig cells
D. Agglutination with guinea pig cells

39. Which of the following identifies the pattern of antibody cross-reactivity that is generated during infection with R. rickettsii?
A. P. vulgaris OX-19 (+), P. vulgaris OX-2 (+), P. mirabilis OX-K (-)
B. P. vulgaris OX-19 (-), P. vulgaris OX-2 (+), P. mirabilis OX-K (-)
C. P. vulgaris OX-19 (-), P. vulgaris OX-2 (+), P. mirabilis OX-K (+)
D. P. vulgaris OX-19 (-), P. vulgaris OX-2 (-), P. mirabilis OX-K (+)

40. The least immunogenic transplant tissue:
A. Bone marrow
B. Cornea
C. Heart
D. Skin

41. Streptococcus MG agglutinins occur in normal serum at low titers (1:10). A titer of 400 or greater is considered to be suggestive of:
A. Paroxysmal cold hemoglobinuria
B. Primary atypical pneumonia
C. Lupus erythematosus
D. Rheumatoid arthritis

42. The most common cause of congenital infections in humans, affecting 0.5 to 2.4% live births:
A. Cytomagelovirus
B. Rubella
C. Toxoplasmosis
D. Hepatitis

43. Which one of the following tests measures the production of parasitic lactate dehydrogenase?
A. RIDASCREEN Entamoeba
B. ProSpect Entamoeba histolytica
C. MalaQuick Standby Malaria tes
D. OptiMal Malaria test
E. Bordier Immunoassay for E. granulosus

44. Hybridoma is produced from the fusion of:
A. Natural killer cell and plasma cell
B. T cell and plasma cell
C. Myeloma cell and plasma cell
D. Myeloma cell and T cell

45. Sensitivity
A. The detection of specific antibody in the serum of an individual in whom the antibody was previously undetectable
B. The frequency of positive results obtained in the testing of a population of individuals who are truly positive for antibody
C. The proportion of negative test results obtained in the population of individuals who actually lack the antibody in question
D. The time of recovery from conditions such as illness, injury or surgery

46. Which of the following conditions can result in rouleaux formation or pseudoagglutination:
1. Elevated levels of globulin
2. Elevated levels of fibrinogen
3. Presence of plasma expanders
4. Presence of Wharton' s jelly

A. 1 and 3
B. 2 and 4
C. 1, 2 and 3
D. 1, 2, 3 and 4

47. Determine what incompatibility is demonstrated: Group A (donor) with group O (patient):
A. Incompatible in minor crossmatch
B. Incompatible in major crossmatch
C. Both of these
D. None of these

48. Inheritance of Sese and the Lewis gene produces the following phenotype:
A. Le (a+b-)
B. Le (a+b+)
C. Le (a-b+)
D. Le (a-b-)

49. Which Duffy phenotype offers the greatest resistance to invasion by malarial parasites?
A. Fy (a+b-)
B. Fy (a+b+)
C. Fy (a-b+)
D. Fy (a-b-)

50. A previously named HLA that is not uncommonly detected on erythrocytes is:
A. Dia
B. Sda
C. Bga
D. Coa

51. A low-incidence antigen that serves as a useful anthropologic marker for Mongolian ancestry:
A. Xga
B. Doa
C. Dia
D. Yta

52. Mutations in the carrier molecule for this blood group system may result in changes of reb blood cell shape in the forms of acanthocytosis or ovalocytosis?
A. DI
B. DO
C. CO
D. SC

53. Antigen is found on the petite arm of the X chromosome and is noted with higher frequency in females than in males.
A. Xga
B. Doa
C. Dia
D. Yta

54. Rh immune globulin provides ___ protection against fetal D antigen.
A. Active
B. Passive
C. Antigen-stimulated
D. Antibody-stimulated

55. If an Rh negative woman recently delivered an Rh positive baby and the Kleihauer-Betke test result is 5%, how many vials of Rh Ig should be administered?
A. 6
B. 7
C. 8
D. 9

56. If a prospective allogeneic donor has received blood or blood components known to be sources of hepatitis (e.g., surgery), the donor should be deferred from donating for ____ after the transfusion.
A. 6 weeks
B. 3 months
C. 6 months
D. 12 months

57. Minimum number of platelets in a platelet concentrate prepared from whole blood by centrifugation
A. 5.5 x 1011
B. 3.0 x 10 10
C. 3.0 x 1011
D. 5.5 x 1010

58. Additive solutions are approved for blood storage for how many days?
A. 21 days
B. 42 days
C. 35 days
D. 7 days

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

59. Graft-versus-host disease is caused by:
A. Granulocytes
B. Platelets
C. Lymphocytes
D. Erythrocytes

60. The radiation source for irradiation of blood products is:
A. 131I
B. 137Ce
C. 14C
D. 131Te

61. Once defrosted, cryoprecipitate must be administered within ____ hours of thawing.
A. 2
B. 4
C. 6
D. 12

62. Perfluorocarbons have been investigated as:
A. Platelet substitutes
B. Granulocyte substitutes
C. Red blood cell substitutes
D. Plasma substitutes

63. Allogeneic donor blood collected and processes from outside sources must have the following tests repeated by the hospital blood bank:
1. ABO
2. Rh
3. HBsAg
4. Anti-HIV1

A. 1 and 2
B. 3 and 4
C. 1, 2 and 3
D. All

64. The minimum hemoglobin concentration in g/dL in a fingerstick from a male blood donor is:
A. 12.0
B. 13.5
C. 12.5
D. 15.0

65. The required hemoglobin and hematocrit for autologous donation should be at least:
A. 11 g/dL hgb, 33% hct
B. 11 g/dL hgb, 38% hct
C. 12.5 g/dL hgb, 33% hct
D. 12.5 g/dL hct, 38% hct

66. Autologous blood donor units must be tested for:
1. ABO
2. Rh
3. HBsAg
4. Anti-HIV1

A. 1 and 2
B. 3 and 4
C. 1, 2 and 3
D. All

67. Samples of recipient's blood and donor units must be stored for ____ days after transfusion.
A. 1
B. 3
C. 5
D. 7

68. A febrile transfusion reaction is defined as a rise in body temperature of ____ occurring in association with the transfusion of blood or components and without any other explanation.
A. 1 oC or more
B. 1 oF or more
C. 5 oC or more
D. 5 oF or more

69. Blood component most frequently associated with transfusion reaction due to bacterial contamination:
A. Red cells
B. Fresh frozen plasma
C. Cryoprecipitate
D. Platelet concentrate

70. The most common cause of transfusion-related sepsis is:
A. Whole blood
B. Platelet concentrates
C. Packed red cells
D. Leukocytes conc.

71. Of the deaths caused by bacterial contamination of blood components reported to Centers for Disease Control (CDC), most are caused by blood components contaminated by:
A. Escherichia coli
B. Pseudomonas species
C. Yersinia enterocolitica
D. None of these

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

72. Polyspecific AHG reagent contains:
A. Anti-IgG
B. Anti-IgG and anti-IgM
C. Anti-IgG and anti-C3d
D. Anti-C3d

73. A positive DAT may be found in which of the following situations?
A. A weak-D positive patient
B. A patient with anti-K
C. Hemolytic disease of the newborn
D. An incompatible crossmatch

74. Each unit of whole blood will yield approximately how many units of cryoprecipitated AHF?
A. 40
B. 130
C. 80
D. 250

75. According to AABB standards, 75% of all platelets, pheresis units shall contain how many platelets per uL?
A. 5.5 x 1010
B. 3.0 x 1011
C. 6.5 x 1010
D. 5.5 x 1011

76. Which of the following blood components is the best source of factor IX?
A. Prothrombin complex
B. Cryoprecipitated AHF
C. Fresh frozen plasma
D. Single-donor plasma

77. Hives and itching are symptoms of which of the following transfusion reactions?
A. Febrile
B. Circulatory overload
C. Allergic
D. Anaphylactic

78. Cold agglutinin syndrome is best associated with which of the following blood groups?
A. Duffy
B. Ii
C. P
D. Rh

79. Rejuvenation of a unit of red blood cells is a method used to:
A. Remove antibody attached to rbc
B. Inactivate viruses and bacteria
C. Restore 2,3 DPG and ATP to normal levels
D. Filter blood clots and other debris

80. According to AABB standards, what is the minimum pH required for platelets?
A. 4
B. 6
C. 5
D. 7

81. Which of the following transfusion reactions occurs after infusion of only a few milliliters of blood and gives no history of fever?
A. Febrile
B. Anaphylactic
C. Circulatory overload
D. Hemolytic

82. Which of the following antigens gives enhanced reactions with its corresponding antibody following treatment of the red cells with proteolytic enzymes?
A. Fya
B. S
C. E
D. M

83. A lectin with anti-N specificity can be made from:
A. Bandeirae simplicifolia
B. Dolichos biflorus
C. Iberis amara
D. Vicia graminea

84. Which of the following would be the component of choice for treatment of von Willebrand's disease?
A. Platelets
B. Factor IX concentrate
C. Cryoprecipitated AHF
D. Fresh frozen plasma

85. If the seal is entered on a unit of whole blood stored at 1-6 oC, what is the maximum allowable storage period, in hours?
A. 6
B. 48
C. 24
D. 72

86. The drug cephalosporin can cause a positive direct antiglobulin test by which of the following mechanisms?
A. Immune-complex formation
B. Complement fixation
C. Autoantibody production
D. Membrane modification

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

87. Which of the following is a characteristic of anti-I?
A. Often associated with HDN
B. Frequently a cold agglutinin
C. Reacts best at 37 oC
D. Is usually IgG

88. The mechanism that best explains hemolytic anemia due to penicillin is:
A. Drug adsorption
B. Membrane modification
C. Immune complex formation
D. Autoantibody production

89. Posttransfusion anaphylactic reactions occur often in patients with:
A. Leukocyte antibodies
B. Erythrocyte antibodies
C. IgA deficiency
D. Factor VIII deficiency

90. Hydroxyethyl starch (HES) is a rouleaux-promoting agent used to:
A. Increase the harvest of granulocytes in leukapheresis
B. Treat patients following hemolytic transfusion reaction
C. Resolve ABO typing discrepancies
D. Stabilize the pH of stored platelets

91. Which of the following is the proper storage temperature requirements for granulocytes?
A. 1 to 6 oC
B. 10 to 18 oC
C. Room temperature with constant agitation
D. Room temperature without agitation

92. Which of the following best reflects the discrepancy seen when a person's red cells demonstrated the acquired-B phenotype?

Forward Grouping	Reverse Grouping
A. B	O
B. AB	**A**
C. O	B
D. B	AB

93. The process of separation of antibody from its antigen is known as:
A. Diffusion
B. Lyophilization
C. Absorption
D. Elution

94. To validate the reaction obtained in the antiglobulin test, one can:
A. Use green antiglobulin reagent
B. Add IgG-coated red cells to each test tube
C. Add IgG-coated red cells to each positive reaction
D. Add IgG-coated red cells to each negative reaction

95. This type of transfusion reaction may occur in IgA-deficient patients who demonstrate potent IgG anti-IgA and who are exposed to IgA containing plasma products:
A. Anaphylactic
B. Circulatory overload
C. Allergic
D. Hemolytic

96. An iron chelating agent which is important in lowering the body iron stores of patients with thalassemia:
A. Deferroxamine
B. Desmopressin
C. Steroids
D. Aspirin

97. For autologous blood donation, blood should not be drawn from the donor-patient within _____ hours of the time of the anticipated operation or transfusion.
A. 12 hours
B. 24 hours
C. 48 hours
D. 72 hours

98. Paroxysmal cold hemoglobinuria is often associated with antibodies in which system?
A. MNS
B. P
C. Lewis
D. Rh

99. Cryoprecipitated antihemophilic factor (AHF) is not recommended for the treatment of:
A. Hemophilia A
B. Hemophilia B
C. vWD
D. Hypofibrinogenemia

100. Which of the following is usually employed to start an IV liner prior to blood transfusion?
1. Normal (0.9%) saline
2. Ringer's lactate
3. 5% Dextrose in water (D5W)
4. Distilled water

A. 1 only
B. 1 and 3
C. 1, 2 and 3
D. 1, 2, 3 and 4

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

1. Natural barriers of the immune system include all except which of the following?
a. pH of secretions
b. Coughing
c. Hair follicles
d. Intestinal bacteria

2. The fundamental difference between primary and secondary organs of the lymphatic system is:
a. Antibody production occurs only in the primary lymph organs
b. Complement production occurs only in the primary lymph organs
c. Maturation of lymphocytes occurs in secondary organs, and activation occurs in primary organs
d. Maturation of lymphocytes occurs in primary organs, and activation occurs in secondary organs

3. Toll-like receptors act in which way?
a. Enhance recognition of bacteria by phagocytic cells
b. Activate B cells to produce antibody
c. Activate helper T cells
d. Aid in processing antigen in the form of an MHC molecule

4. Neutrophils and monocytes have receptors for which part of the immunoglobulin molecule?
a. Fc
b. Fab
c. Hinge region
d. Variable region

5. A double-positive T-cell would express which markers?
a. CD4+ | CD8+ | CD3+
b. CD4- | CD8+ | CD3+
c. CD4- | CD8- | CD3-
d. CD4+ | CD8- | CD3+

6. Which cell is considered to be a bridge between the innate and adaptive immune systems?
a. NK cell
b. Mast cell
c. Monocyte-macrophage
d. T cell

7. Immunoglobulin that is most efficient at crossing the placenta:
a. IgG
b. IgA
c. IgM
d. IgD

8. The key structural difference that distinguishes immunoglobulin subclasses:
a. Stereometry of the hypervariable region
b. Number of domains
c. Sequence of the constant regions
d. Number of disulfide bridges

9. A haptenic determinant will react with:
a. Both T cells and antibody
b. T cells but not antibody
c. Neither T cells nor antibody
d. Antibody but not T cells

10. The function of the complement system include(s) which of the following?
a. Clearance of cellular debris
b. Chemotaxis
c. Lysis of bacteria
d. All of the above

11. Immunoglobulin idiotypes are antibodies with variations in the domains of which of the following?
a. CH1 and CH2
b. VH and VL
c. VH and CL
d. CH1, CH2, and CH3

12. Mannose-binding lectin is similar to which component of the classical pathway?
a. C3
b. C2
c. C1q
d. C5a

13. Molecules that bind to an antigen to increase phagocytosis are:
a. Opsonins
b. Cytokines
c. Haptens
d. Isotypes

14. Which CD4:CD8 ratio is most likely in a patient with AIDS??
a. 2:1
b. 3:1
c. 2:3
d. 1:2

15. Which tests are considered screening tests for HIV?
a. ELISA, 4th generation, and rapid antibody tests
b. Immunofluorescence, Western blot, radioimmuno-precipitation assay
c. Culture, antigen capture assay, DNA amplification
d. Reverse transcriptase and messenger RNA (mRNA) assay

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

16. A patient with a viral infection to the ABC virus is found to have a high antibody titer to the ABC virus' RNA, or anti-ABCr. Which of the following is true?

a. MHC class I molecules presented antigen to CD4+ T cells
b. MHC class II molecules presented antigen to CD8+ T cells
c. MHC class I molecules presented antigen to CD8+ T cells
d. MHC class II molecules presented antigen to CD4+ T cells

17. What is the main difference between agglutination and precipitation reactions?

a. Agglutination occurs between a soluble antigen and antibody
b. Agglutination occurs when the antigen is particulate
c. Precipitation occurs when the antigen is particulate
d. Precipitation occurs when both antigen and antibody are particulate

18. Post-zone causes false-negative reactions in antibody titers as a result of which of the following?

a. Too much diluent added to test
b. Excess antibody in test
c. Excess antigen in test
d. Incorrect diluent added to test

19. Antibodies produced against two or more epitopes of specific antigen are considered _____.

a. Monoclonal
b. Pleomorphic
c. Dimorphic
d. Polyclonal

20. In the radial immunodiffusion test, the gel contains which of the following?

a. The antigen to be tested
b. Antibody
c. Patient sample
d. None of the above; the gel is the medium to which the antibody and antigen are applied in equal proportion

21. The indirect antiglobulin test is for _____, whereas the direct antiglobulin test is for _____.

a. Serum antigen; bound antigen
b. Serum antigen; bound antibody
c. Serum antibody; bound antigen
d. Serum antibody; bound antibody

22. What is the difference between nephelometry and turbidimetry?

a. There is no difference between the two assays, only in name
b. Nephelometry is a newer example of turbidimetry
c. Nephelometry measures light transmitted through a solution, and turbidimetry measures light scattered in a solution
d. Nephelometry measures light scattered in a solution, and turbidimetry measures light transmitted through a solution

23. In an Ouchterlony immunodiffusion, the line of precipitation between the antibody and the antigen wells form an X. This reaction would be described as which of the following?

a. Nonidentity
b. Partial identity
c. Identity
d. No correlation

24. Which of the following cytokines is also known as the T-cell growth factor?

a. IFN-γ
b. IL-12
c. IL-2
d. IL-10

25. How do heterogeneous assays differ from homogeneous assays?

a. Heterogeneous assays require a separation step.
b. Heterogeneous assays are easier to perform than homogeneous assays.
c. The concentration of patient analyte is directly proportional to bound label in homogeneous assays.
d. Homogeneous assays are more sensitive than heterogeneous ones.

26. A deficiency of T cells can result in which of the following?

a. Low levels of complement
b. Dysfunctional macrophages
c. Fewer B cells maturing to plasma cells
d. Contact dermatitis

27. What is the basic difference between the RPR and VDRL tests?

a. The RPR detects antigen, whereas the VDRL detects antibody.
b. The RPR test is read macroscopically, whereas the VDRL is read microscopically.
c. The RPR test is a treponemal test, whereas the VDRL is nontreponemal.
d. There is no difference because they are both specific tests for syphilis

28. A patient has the following hepatitis B serology:
HBsAg: Negative
Anti-HBc: Positive
Anti-HBS: Positive

These results are consistent with which of the following?

a. Acute hepatitis B
b. Chronic hepatitis B
c. Recovery from hepatitis B
d. Acute hepatitis A

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

29. The HLA genes are inherited as:
a. Diplotypes: Two diplotypes from each parent
b. Haplotypes: One haplotype from each parent
c. HLAs are not inherited, instead are proteins absorbed onto cells
d. Only the HLA-A antigen is an inheritable trait

30. Agglutination and precipitation that is visible depends on antigen-antibody ratios _____.
a. With antigen in excess
b. With antibody in excess
c. That are equivalent
d. All of the above

31. Which of the following cell types is implicated in immediate hypersensitivity?
a. Neutrophil
b. Mast cell
c. Macrophage
d. Monocyte

32. Anti-dsDNA antibodies are associated with which of the following?
a. Syphilis
b. CMV infection
c. SLE
d. Hemolytic anemia

33. Rheumatoid factor is typically an IgM autoantibody with specificity for which of the following?
a. SS-B
b. dsDNA
c. RNP
d. Fc portion of IgG

34. In Grave's disease, one of the main autoantibodies is:
a. Anti-CCP
b. Antibody to islet cells of pancreas
c. Antibody to thyroid-stimulating hormone receptor
d. Anti-dsDNA

35. Skin testing for exposure to tuberculosis is an example of which type of hypersensitivity?
a. Type I
b. Type II
c. Type III
d. Type IV

36. Which of the following is a test for specific treponemal antibody?
a. VDRL
b. RPR
c. FTA-ABS
d. All of the above

37. A 1-year-old boy is seen for having many recurrent infections with Streptococcus pneumoniae. Laboratory tests revealed a normal quantity of T cells, but no B cells and no immunoglobulins were seen on electrophoresis. Which of the following would most likely be the cause?
a. Chronic granulomatous disease
b. Bruton's agammaglobulinemia
c. DiGeorge's syndrome
d. Wiskott-Aldrich syndrome

38. In chronic active hepatitis, high titers of which of the following antibodies are seen?
a. Anti-smooth muscle
b. Antimitochondrial
c. Anti-DNA
d. Anti-parietal cell

39. The chronic nature of parasitic infections is due to the host's
a. Inability to eliminate the infective agent
b. Type I hypersensitivity response to the infection
c. Ability to form a granuloma around the parasite d
. Tendency to form circulating immune complexes

40. Most of the pathology associated with parasitic infections results from which of the following?
a. Symbiotic relationships with the host
b. Elaborate parasitic life cycles
c. Immune response to the offending organism
d. Innate defense mechanisms of the host

41. A patient with hereditary angioedema has which of the following deficiencies?
a. C5-9
b. Phagocytic cell function
c. Mature B cells
d. C1 inhibitor

42. A radiograph of a 1-year-old boy indicates the lack of a thymus. Complete blood count and flow cytometry confirm a below-normal lymphocyte count and a lack of T cells. Which of the following would most likely be the cause?
a. DiGeorge's syndrome
b. Wiskott-Aldrich syndrome
c. Bare lymphocyte syndrome
d. Bruton's agammaglobulinemia

43. A 3-year-old boy is seen by his physician because of many recent bacterial infections. Flow cytometry indicates normal levels of T and B cells. The nitroblue tetrazolium test for oxidative reduction is negative. The most likely cause is:
a. Wegener's syndrome
b. Chronic granulomatous disease
c. Bruton's agammaglobulinemia
d. Diabetes mellitus

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

44. A person has an infected bug bite with pain, swelling, and redness. What is the cause of these physical symptoms of inflammation?
a. Production of antibody
b. Secondary immune responset
c. Increased blood flow and neutrophils to site
d. Activation of NK cells

45. The type of graft rejection that occurs within minutes of a tissue transplant is _____.
a. Acute
b. Chronic
c. Hyperacute
d. Accelerated

46. PCR technology can be used to:
a. Amplify small amounts of DNA.
b. Isolate intact nuclear RNA.
c. Digest genomic DNA into small fragments.
d. Repair broken pieces of DNA.

47. How much diluent needs to be added to 0.2 ml of serum to make a 1:20 dilution?
a. 19.8 mL
b. 4.0 mL
c. 3.8 mL
d. 10.0 mL

48. Which of the following plays an important role as an external defense mechanism?
a. Phagocytosis
b. C-reactive protein
c. Lysozyme
d. Complement

49. Which test is used to evaluate the cellular immune system in a patient?
a. Skin test for commonly encountered antigens
b. Determination of isohemagglutinin titer
c. Immunoelectrophoresis of serum
d. Measurement of anti-HbsAg after immunization

50. Tumor markers found in the circulation are most frequently measured by:
a. Immunoassays
b. TLC
c. HPLC
d. Colorimetry

51. A DPT vaccination is an example of:
a. Active humoral-mediated immunity
b. Passive humoral-mediated immunity
c. Cell-mediated immunity
d. Immediate hypersensitivity

52. In a hemagglutination test, the antigen is:
a. On the red cell membrane
b. Secreted by the red cell
c. In the red cell nucleus
d. In the plasma or serum

53. Hemagglutination can be enhanced by increasing:
a. The temperature higher than 37'C
b. The incubation time
c. Increasing the antigen concentration
d. pH greater than 7

54. Agglutination reactions characterized by many small agglutinates in a background of free cells would be graded in tube testing as:
a. 1+
b. 2+
c. 3+
d. 4+

55. An order for blood products for a recent recipient of a bone marrow graft was received in the transfusion service. Because these patients are especially susceptible to GVHD from a transfusion, which blood product would best prevent GVHD?
a. Leukocyte reduction of the unit
b. Washing the unit with normal saline
c. Irradiation of the blood product
d. Providing HLA-matched blood products

56. The mixed lymphocyte culture (MLC) is an older technique in the HLA laboratory used to determine:
a. HLA-A antigens
b. HLA-C antigens
c. HLA antibody identification
d. HLA-D antigens and compatibility

57. What is the purpose of including a reagent control when interpreting group AB, D-positive red cells after testing with a low-protein anti-D reagent?
a. to detect false-positive agglutination reactions
b. to detect false-negative agglutination reactions
c. to identify a mix up with patient's sample
d. to confirm ABO typing results

58. Monospecific AHG reagents:
a. increase the dielectric constant in-vitro
b. contain either anti-IgG or anti-C3d antibody specificities
c. are not useful in identifying the molecule causing a positive DAT
d. contain human IgG or complement molecules

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

59. You have added IgG-sensitized red cells to a negative indirect antiglobulin test. You observe agglutination in the tube. What situation was not controlled for in testing by adding these control cells?

a. the addition of patient serum
b. the addition of AHG reagent
c. adequate washing of cell suspension
d. adequate potency of AHG reagent

60. Part of the daily quality control in the blood bank laboratory is the testing of reagent antisera with corresponding antigen-positive and antigen-negative red cells. What does this procedure ensure?

a. Antibody class
b. Antibody titer
c. Antibody specificity
d. Antibody sensitivity

61. Group O red cells are used as a source for commercial screening cells because:

a. anti-A is detected using group O cells
b. anti-D reacts with most group O cells
c. weak subgroups of A react with group O cells
d. ABO antibodies do not react with group O cells

62. Information regarding reagent limitations is located in the:

a. SOPs
b. Blood bank computer system
c. Product inserts
d. Product catalogs

63. After the addition of anti-D reagent to a patient's red cell suspension, agglutination was observed. The result with anti-A reagent was negative. What is the interpretation of this patient's D typing?

a. Patient is D-negative
b. Patient is D-positive
c. Cannot interpret the test
d. Invalid result

64. What reagent would be selected to detect the presence of unexpected red cell antibodies in a patient's serum sample?

a. A1 and B cells
b. Panel cells
c. IgG-sensitized cells
d. Screening cells

65. To determine the specificity of a red cell antigen in a patient sample, what source of antibody is selected?

a. commercial reagent red cells
b. commercial antisera
c. patient serum
d. patient plasma

66. What reagents are derived from plant extracts?

a. Panel cells
b. Commercial anti-B
c. Lectins
d. Antiglobulin reagents

67. Which of the following describes the expression of most blood group inheritance?

a. Dominant
b. Recessive
c. Sex-linked
d. Codominant

68. With which of the following red cell phenotypes would anti-Jka react most strongly?

a. Jk (a–b+)
b. Jk (a+b–)
c. Jk (a+b+)
d. Jk (a–b–)

69. A gene that can inhibit the expression of another gene is called:

a. An amorph
b. A cis gene
c. A null gene
d. A regulator gene

72. The following ABO typing results were noted:

Anti-A: 0 Anti-B: 0
A1 cells: 4+ B cells: 4+

What ABO phenotypes would be compatible if the patient required a transfusion of RBCs?

a. Group AB, O, A, or B
b. Group O or B
c. Group AB or O
d. Only group O

73. Using known sources of reagent antisera (known antibodies) to detect ABO antigens on a patient's red cells is known as:

a. Rh typing
b. Reverse grouping
c. DAT
d. Forward grouping

74. The following ABO typing results were noted:

Anti-A: 0 Anti-B: 4+
A1 cells: 0 B cells: 0

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

Which result is discrepant if the red cell typing shown in the following chart is correct?
a. Negative reaction with group B cells
b. Positive reaction with anti-B
c. Negative reaction with group A1 cells
d. No discrepancies in these results

75. What immunoglobulin class is primarily associated with ABO antibodies?
a. IgA
b. IgG
c. IgE
d. IgM

76. What immunodominant sugar confers B blood group specificity?
a. D-galactose
b. L-fructose
c. N-acetylgalactosamine
d. L-glucose

77. Which of the following genotypes is heterozygous for the C antigen?
a. R1r
b. R2R2
c. R1R1
d. r'r

78. A donor tested D-negative using commercial anti-D reagent. The weak D test was positive. How should the RBC unit be labeled?
a. D-positive
b. D-negative
c. D-variant
d. Varies with blood bank policy

79. Which of the following phenotypes would react with anti-f?
a. rr
b. R1R1
c. R2R2
d. R1R2

80. Anti-D was detected in the serum of a D-positive person. What is a possible explanation?
a. the antibody is really anti-G
b. compound antibody was formed
c. regulator gene failure
d. missing antigen epitope

81. Chronic granulomatous disease is associated with a depression of the antigens in the _____ blood group system
a. Duffy
b. Kidd
c. P
d. Kell

82. Which of the following antibodies can be neutralized by pooled human urine?
a. Anti-Csa
b. Anti-Sda
c. Anti-Ch
d. Anti-Vel

83. What is the most likely Lewis phenotype of a non-secretor?
a. Le(a−b−)
b. Le(a+b+)
c. Le(a+b−)
d. Le(a−b+)

84. What procedure would help to distinguish between an anti-Fya and anti-Jka in an antibody mixture?
a. lowering the pH of the patient's serum
b. using a thiol reagent
c. testing at colder temperatures
d. testing ficin-treated panel cells

85. An antibody commonly associated with delayed transfusion reactions is:
a. Anti-Lua
b. Anti-S
c. Anti-Jkb
d. Anti-M

86. HTLA antibodies:
a. Typically react at room temperature
b. Can be enhanced with PEG
c. Are usually clinically insignificant
d. Are associated with HDFN

87. Which of the following statements is associated with anti-I?
a. It has weaker reactions with stored blood
b. It can be neutralized with commercially prepared substance
c. It reacts best at 37'C
d. It does not react with cord blood cells

88. A DAT performed on a clotted sample stored at 4° C may demonstrate:
a. in vivo complement attachment
b. in vivo IgG attachment
c. in vitro complement attachment
d. in vitro IgM attachment

89. The removal of an antibody from serum or plasma using the individual's own red cells is:
a. Autoadsorption
b. Differential adsorption
c. Neutralization
d. Elution

MEDICAL TECHNOLOGY LICENSURE EXAM PREPARATION IN THE PHILIPPINES

IMMUNOLOGY/ SEROLOGY AND BLOOD BANKING EXAM

90. The procedure that removes intact antibodies from the red cell membranes is:
a. Autoadsorption
b. Neutralization
c. Enzyme pretreatment
d. Elution

91. The neutralization technique was performed on a sample containing an anti-Leb. The control and the Lewis-neutralized sera were both negative when retested with panel cells. How should this test be interpreted?
a. the anti-Leb was successfully neutralized and no underlying antibodies were found
b. the panel cells were not washed sufficiently
c. the sample was probably diluted
d. the antibody originally identified was probably not anti-Leb

92. The purpose of additional procedures when working up a warm autoantibody is to:
a. identify the warm autoantibody specificity in the serum
b. locate RBC units that are compatible with the autoantibody
c. identify potential underlying alloantibodies
d. identify the antibodies coating the red cells

93. Detection of serologic incompatibility between donor RBCs and recipient serum is performed in the:
a. Antibody screen
b. Crossmatch
c. DAT
d. Autologous control

94. A recipient's antibody screen is negative; however, the recipient is incompatible with the selected donor unit. Select a possible explanation for these results.
a. recipient RBCs possess a high-frequency antigen
b. recipient has a warm autoantibody
c. recipient possesses an antibody to a low-frequency antigen
d. recipient RBCs possess a cold autoantibody

95. A patient who has a phenotype group AB, D-negative requires 1 unit of plasma. Which of the following units of plasma would be best for transfusion?
a. Group A, D-negative
b. Group B, D-positive
c. Group AB, D-positive
d. Group O, D-negative

96. In the gel test, a button of cells at the bottom of the well is a:
a. 4+ positive reaction
b. 1+ positive reaction
c. Negative reaction
d. Invalid reaction

97. What is the expected therapeutic effect in the recipient's hematocrit after the transfusion of 1 unit of RBCs?
a. Increase of 0.5%
b. Increase of 1%
c. Increase of 2%
d. Increase of 3%

98. In a delayed serologic or hemolytic transfusion reaction, the DAT is typically:
a. Negative
b. Weak positive, mixed field
c. Positive with C3 only
d. Negative if serum antibody screen is negative

99. Which of the following patient histories might suggest future transfusions with saline-washed RBCs?
a. History of multiple red cell alloantibodies
b. History of congestive heart failure
c. IgA-negative recipient with anti-IgA antibodies
d. History of transfusion-associated sepsis

100. The greatest danger to the fetus (before delivery) affected by HDFN is:
a. Kernicterus
b. Anemia
c. Hyperbilirubinemia
d. Hypertension