Microbiology 09/12/05

Student Test Report On Exam 1 A

Course #: 215
Course Title: Micro
Day/Time:

Instructor: Dr. Han / Team
Description: Immunology/Med Microbiology
Term/Year: Fall 2005

Student Name: [redacted]
Student ID: XXXXX[redacted] **Code:**

	Possible Pts.	Raw	Objective	Exam#/Essay	Percent	Grade
EXAM 1:	74.00	58.00	58.00	0	78.38%	C

Response Description:
<dash> correct response <#> multiple marks <space> no response
<alphabet> student's incorrect response <*> bonus test item

Test Items:	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
Test Key:	E,A,C,D,A	D,E,D,A,D	E,C,B,C,C	D,D,D,B,D	B,E,D,C,D	C,E,E,C,E	A,A,E,B,D	A,B,C,C,A	A,B,E,B,E	A,E,E,A,C
Answers	-,-,-,-,C	-,-,B,-,B	-,D,-,-,-	-,-,-,-,-	-,-,-,-,-	-,-,-,-,-	-,-,-,-,-	-,A,-,-,-	-,-,C,D,-	-,A,-,C,-

Test Items:	51-55	56-60	61-65	66-70	71-75					
Test Key:	E,A,D,A,A	B,D,E,B,	D,B,D,A,D	D,C,E,E,E	E,B,E,A,C					
Answers	A,-,-,B,-	-,-,-,-,D	-,C,-,-,-	A,-,A,-,-	D,-,-,B,-					

Remarks: 8% is being added to your percentage score

86 70

Student's Answer to Multiple Mark Question:

No multiple mark answers or answer keys found on this test.

9, 13, 14, 15, ?, 38, 49
71 → These questions are unclear and should not be on this exam as they were taught last year.

NAME_____ COMMENTS ON QUESTIONS

#_____

#_____

DENT 215
MEDICAL MICROBIOLOGY/IMMUNOLOGY
EXAM I
Fall 2005

INSTRUCTIONS: Make sure you get complete information on your Answer Sheet. Use a number 2 pencil to mark all answers clearly. If you care to explain an answer or comment on a question, list the number of the question and the response you marked on your Answer Sheet in the space above and make whatever comments you care to make where the question appears in the Exam. Choose the BEST answer for each question.

I Multiple Choice Questions

1. Characteristic findings in a patient with multiple myeloma would most likely include:

   A. High titer of rheumatoid factor in serum and deformed finger joints
   B. High titer of anti-DNA antibody and low titers of C3 and C4 in serum
   C. High titer of CRP, IgM, and anti-intercellular antibodies
   D. High titer of smooth muscle antibody in serum and a T4:T8 ratio of 1:5
   E. Bence-Jones proteins in the urine and increase of plasma cell in blood and a single, high sharp peak in the gamma globulin fraction

2. Interleukin 4 and 5 is produced by which of the following cell types and would most likely signal what activity?

   A. Activated CD4 Helper T Cell; B Cell proliferation and Class-switching
   B. Activated CD8 Suppressor T Cell; Immune suppression
   C. Activated Macrophage; CD4 Helper T Cell proliferation
   D. Activated Neutrophil; Increased opsinization
   E. Activated B Cell; Increased immunoglobulin production

3. What type of immunoglobulin would you expect to find in highest concentration in the blood of a 36 week fetus?

   A. IgA of maternal origin
   B. IgD of fetal origin
   C. IgG of maternal origin
   D. IgG of fetal origin
   E. You find little or no immunoglobulins in fetal blood

4. In which of the following conditions would you not expect to see a fall in the C4 component of complement in the serum?

A. Autoimmune hemolytic anemia
B. Ongoing inflammatory response in the body
C. DIC
D. Contact dermatitis
E. Immune complex-Type III hypersensitivity

5. Characteristic findings in a patient with Grave's disease would include which of the following?

A. High serum titer of thyroxine and thyroid stimulating immunoglobulin (TSI)
B. High serum titer of ANA and significant hemolytic anemia
C. High serum titer of anti-thyroglobulin immunoglobulins and anti-microsomal antigen immunoglobulins
D. High serum titer of anti-HLA antigen immunoglobulins and renal basement membrane immunoglobulins
E. High serum titer of anti-thyroid stimulating hormone immunoglobulins

6. Which of the following therapies would be appropriate emergency treatment of a severe episode of anaphylactic shock?

A. Antilymphocytic serum
B. Complete blood transfusion
C. Bone marrow transplant
D. Epinephrine + antihistamine
E. Hyposensitization with a subcutaneous injection of a low dose of the allergen

7. Cathepsin C

a. is a newly discovered enzyme associated with implant failures in people with Chediak-Higashi syndrome.
b. is related to polymorphonuclear cell (PMN) disfunction in localized juvenile periodontitis (LJP) and therefore, needs to be determined a priori in implant candidates.
c. is related to hypokeratosis in collegiate swimmers.
d. may be a new marker for susceptibility to periodontal disease, since the gene encoding it is mutated in LJP patients.
e. may be a new marker for susceptibility to periodontal disease, since mutations in the gene encoding it have been associated with Papillon-LeFèvre syndrome.

8. Which of the following would be most likely be associated with the diagnosis of Toxic Shock Syndrome in a patient?

A. Rapidly spreading viral infection
B. Gram negative sepsis
C. Viremia
D. Localized but severe staphylococcal infection
E. Complement immunodeficiency

9. A bacterial species that causes disease only in immunocompromised hosts is referred to as:

A. An opportunistic pathogen
B. An endemic pathogen
C. An overt pathogen
D. An antibiotic sensitive pathogen
E. An avirulent strain of pathogen

10. Which of the following would be indicative of a systemic inflammatory reaction occurring in the body?

A. Leucopenia
B. Lymphocytosis
C. Reduced erythrocyte sedimentation rate
D. Elevated levels of C-reactive protein in serum
E. Elevated number of RBC in circulation

11. Which of the following stages would occur the earliest in the course of an acute infection?

A. Crisis
B. Acute phase
C. Convalescent phase
D. Latent phase
E. Prodromal phase

12. B-cell lymphocytes are identified by the presence of what surface marker?

A. CD8
B. CD4
C. Immunoglobulin
D. HLA antigens
E. All of the above

13. What region of the immunoglobulin monomer binds and activates the C1 component of the complement system?

A. Fab
B. Fc
C. Hinge
D. Variable region of light chain
E. Constant region of heavy + light chains

14. Immunization with a toxoid is designed to produce what type of immunization?

A. Artificial active immunity to endotoxins
B. Natural passive immunity to exotoxins

C. Artificial active immunity to exotoxins
D. Artificial passive immunity to viruses
E. Natural passive immunity to viruses

15. Which of the following would be characteristic of exotoxins and **not** endotoxins?

A. Usually lipids excreted by living cells
B. Produces a strong cell-mediated immunity
C. Usually proteins encoded by plasmids in the bacteria
D. Produced by both bacteria and viruses but not fungi
E. Lipopolysaccharides of the bacterial cell wall

16. What would you expect to find in the serum of an individual suffering from drug-induced hemolytic anemia?

A. Anti-thymus cell autoimmune immunoglobulins
B. Anti-thyroid cell autoimmune immunoglobulins
C. Elevated titer of IgE immunoglobulins
D. Reduced C4 Complement protein
E. Significantly lower levels of gammaglobulins

17. Fluid phase host defense against microorganisms has been ascribed to a variety of glycoproteins secreted in saliva. The substance which exerts an antimicrobial effect by both enzymatic and non-enzymatic mechanisms is:

a. salivary peroxidase
b. MG1
c. MG2
d. lysozyme
e. lactoferrin

18. Characteristic finding in a patient with active, severe, myasthenia gravia may include:

A. High titer of rheumatoid factor
B. High titer of anti-DNA antibody
C. LE cells
D. High titer of anti-acetylcholine receptor antibody
E. Bence-Jones proteins in the urine

19. Poison ivy lesions are caused by what type of disease?

A. Severe combined immunodeficiency
B. Type IV hypersensitivity
C. T cell immunodeficiency
D. Autoimmune disease
E. Immune complex hypersensitivity

20. Autoimmunity to a self-antigen necessarily occurs only under which of the following conditions?

A. When the individual cannot produce T_s clones for the self-antigen
B. When the B-cell clone responsive to the self-antigen is not wiped out during fetal development
C. When a particular HLA allelic antigen is present on tissue cells
D. When both the central and peripheral tolerance mechanisms for the self-antigen fail
E. When the idiotypic suppression network for the self-antigen is activated

21 Hyperacute tissue transplant rejection occurs under which of the following conditions and the mechanism is analogous to what type of hypersensitivity reactio?

A. IgE immunoglobulins against tissue antigens in serum; Type I
B. High titer of IgG imunoglobulins against tissue antigens in serum; Type II
C. Low titer of C1 Inhibitor present in serum; Type III
D. Low titer of anti-lymphocyte IgM isoantibodies in serum; Type II
E. Lacking CD8 suppressor T cells in lymphoid tissues; Type IV

22. Which of the following is classified as an immunodeficiency disease?

A. Hayfever
B. Serum sickness
C. Arthus reaction
D. Pernicious anemia
E. DiGeorge's syndrome

23. Which of the following is called a *Superantigen* because it activates the release of cytokines from immune responsive cells, and this produces what reaction?

A. The ABO blood group antigen; transfusion reactions
B. The RhD antigen; hemolytic disease of newborn reaction
C. MHC Class II antigens; tissue transplant rejection reactions
D. Toxic Shock toxin; toxic shock reaction
E. Activated Hageman Factor; inflammatory response reaction

24. Which of the following immunoglobulin classes has the ability to cross the placenta and activate the Complement cascade?

A. IgA
B. IgE
C. IgG
D. IgM
E. C and D above

25. Which of the following components of the immune response system provides the body with its primary protection against fungal infections?

A. Complement system
B. Neutrophilic phagocytosis
C. IgM immunoglobulins
D. Cell mediated immune response
E. Immediate-type hypersensitivity response

26. Which of the following would you expect to find in the tissues at the site of a positive Tuberculin skin test and the reaction would be classified as what type of reaction?

A. IgE producing plasma cells; Type I hypersensitivity
B. Cytotoxic T cells; autoimmune reaction
C. T_{DTH} cells and activated macrophages; Type IV hypersensitivity –
D. Elevated levels of complement and histamines; Type II hypersensitivity.
E. IgG-Ag-C complexes and neutrophils; Type III hypersensitivity

27. This compound may be involved in both exerting an antimicrobial effect and in protecting the oral mucosa from oxidative damage.

a. lactoferrin
b. horseradish peroxidase
c. H_2O_2
d. basophil peroxidase
e. salivary peroxidase

28. Class II MHC antigens are encoded by what HLA locus and are found on what type of cells?

A. Locus ABC - all nucleated cells
B. Locus ABC - B cells, macrophage and activated T cells
C. Blood group locus AB0 - all body cells and RBC
D. Locus D - all body cells
E. Locus D - B cells, activated T cells and macrophage

29. Which of the following would be an example of artificial passive acquired specific immunity?

A. Recovery from a viral disease
B. Immunization with diphtheria toxoid
C. Injection of pooled human gamma globulin
D. Transplacental transfer of maternal immunoglobulins to fetus
E. Injection of interferon

30. Which of the following lymphokines is most responsible for supporting the proliferation and differentiation of B cell lymphocytes to produce a clone of plasma cells?

A. Interferon-alpha
B. Interleukin I
C. Macrophage activating factor
D. Anaphylatoxin
E. Interleukin II, IV, V

31. In normal human blood which type of white blood cell is usually found in the highest proportion?

A. Neutrophil
B. Eosinophil
C. Basophil
D. Monocyte
E. Lymphocyte

32. Complement activation plays a significant role in all of the following reactions except:

A. Type I hypersensitivity
B. Type II hypersensitivity
C. Type III hypersensitivity
D. Local inflammatory response

33. Which of the following diseases is indicated by finding high levels of antinuclear antibodies in the serum of a patient?

A. DiGeorge's Syndrome
B. Contact dermatitis
C. Hashimoto's thyroiditis
D. Myasthenia gravis
E. Systemic Lupus Erythematosus

34. Perforins are used by what type of cell to produce cell damage on target cells?

A. T_{DTH} lymphocytes
B. T_C lymphocytes
C. Degranulating mast cells
D. Angry macrophages
E. Neutrophils

35. An individual shows a positive type I hypersensitivity skin test reaction. If you took a biopsy of the site, which of the following cells would you expect to find at the site?

A. B memory
B. Plasma cells
C. Activated macrophages
D. Degranulated mast cells
E. A and C above

36. Which of the following manifestations of infection would you expect to find in a patient experiencing a significant local primary acute infection caused by a pyogenic, gram positive bacterial agent such as *Staph aureus* (non-toxic shock syndrome strain)?

A. Fever, CRP in serum, neutrophilia, purulent exudate at infection site, elevated ESR, erythema and pain at infection site.
B. Fever, anemia, neutropenia, decreased ESR, anorexia, serous exudate at infection site, swelling at infection site
C. Thrombocytopenia, lymphocytosis, pain and swelling at infection site, elevated WBC, endogenous pyrogens in circulation
D. Elevated ESR, low systolic and diastolic BP, decreased levels of C4 in serum, hemorrhagic skin lesions, DIC, neutrophilia with shift-to left, no fever
E. Large areas of skin exfoliation, hemorrhagic skin lesions at site of infection, high fever, lymphocytosis, decreased ESR and acute phase proteins in peripheral circulation

37. Each of the following statements concerning the variable region of IgG monomer heavy chains and the variable region of light chains in a given antibody molecule is correct **except:**

A. The combination of the variable regions on both chains together determine the antigenic binding specificity of the monomer
B. The amino acid sequence on both the heavy and light chains will be identical to each other in the variable region
C. The heavy chain variable sequence and light chain variable sequence are encoded on different chromosomes
D. The amino acid sequence in the variable region of all light chains synthesized by this plasma cell will be identical
E. All the plasma cells of this clone of cells will be producing IgG monomers with the same antigenic binding specificity

38. A patient comes in to your operatory for scheduled surgical procedure to replace a failed titanium bone screw used to stabilize a jaw bone fracture. During your preparation for the procedure, the patient tells you that he thinks he's "coming down with something". When you question him about why he thinks that, he tells you: " well, my body kinda' hurts all over – like my muscles ache - ; I've got this headache; my throat feels like it's getting sore; I couldn't even think about eating breakfast this morning; I feel like I've got a little temperature; and I just feel lousy". In preparation for the surgery, you have results of standard hematology workup for the patient obtained the day before that indicate all parameters are within normal limits.
What is your assessment of this patient and response?

A. The patient is exhibiting acute stage symptoms of an infectious disease; surgery should be postponed.
B. The patient is exhibiting incubatory stage symptoms of an infectious disease; proceed with surgery using prophylaxis with a broad-spectrum antibiotic.
C. The patient is exhibiting prodromal stage symptoms of an infectious disease; surgery should be postponed.
D. The patient is exhibiting convalescent stage symptoms as the result of his prior tibial surgery; proceed with with the surgery
E. The patient is exhibiting acute stage symptoms of systemic inflammation; begin immediate antibiotic therapy and obtain blood specimen for gram stain; if no organisms are seen on slide, proceed with surgery.

39. A child is injected with a new experimental drug. After weekly injections over a five week period, he begins to develop necrotic lesions at the site where the drug is injected. Biopsy of the lesion sites indicates polymorphonuclear leucocyte infiltration of the tissues at the injection site. What is indicated?

A. Type I hypersensitivity cutaneous anaphylaxis
B. Type II hypersensitivity cytotoxic reaction
C. Type III hypersensitivity Arthus reaction
D. Type IV hypersensitivity contact dermatitis
E. Complement immunodeficiency

40. A patient demonstrating which of the following manifestations of infectious disease is most likely to have the poorest prognosis?

A. Septic shock with DIC
B. Severe sepsis
C. Bacteremia
D. CRP in serum
E. Elevated ESR

41. This secreted compound is a large proteoglycan which serves as a lubricant in the mouth.

a. MG1
b. lysozyme
c. histatin
d. lactoferrin
e. salivary peroxidase

42. . What immune protective immune product is released into circulation by the activation of a specific B cell clone in a regional lymph node?

A. Tdth cells
B. Monoclonal immunoglobulin
C. Polyclonal immunoglobulins
D. NK cells and macrophages
E. Plasma cells

43. . Which of the following proteins is encoded in the MHC Class III genetic region on human chromosome 6?

A. HLA-A antigen
B. HLA-DR antigen
C. T cell receptor
D. Kappa-type light chain
E. C4 complement proteins

44. An antimicrobial molecule found in both phagocytes and oral epithelial cells is known as:

a. cryptdin
b. calprotectin
c. cobalophilin
d. beta-defensins
e. all of the above

45. Which of the following is a characteristic of a secondary immune response and not of the primary immune response?

A. Long induction phase
B. IgM immunoglobulins are the principle immunoglobulins produced
C. Short duration of IgG immunoglobulin synthesis
D. CD4 Th cells not involved
E. Short induction phase and greater amount of IgG immunoglobulin synthesized

46 What is the principle immunoglobulin class involved in mediating the Type II hypersensitivity reaction and what is the pathogenetic mechanism involved in the tissue damage of Type II hypersensitivities?

A. IgG; cytolysis of cells
B. IgA; immune complex initiated inflammatory reaction
C. IgG; effect of release of pharmacologically active mediators from mast cells
D; IgE; cellular lysis
E. IgE; immune complex mediated inflammatory reaction

47. A caries vaccine must be both safe and effective. Therefore, the most potentially acceptable vaccine is:

a. recombinant SpA in whole cells of *Streptococcus mutans* serotype c.
b. Leuconostoc mesenteroides in attenuated form
c. lipoteichoic acid of *Streptococcus sanguis*
d. *Streptococcus mutans* in attenuated form
e. surface antigen I/II

48. . Which of the following is a unique characteristic of the Class II MHC protein?

A. A major antigen on RBCs and all nucleated tissue cells
B. Is involved in antigenic determinant display recognition by CD8 Tc cells
C. Beta-2 microglobulin comprises one of its structural chains
D. Is the principle surface markers on a non-activated T cell lymphocyte
E. Interacts with the CD4 molecule on Th cells

49. . Which of the following represents the major advantage of passive immunization over active immunization and what would be appropriately introduced into the body to produce passive immunization?

A. Shorter duration of protection; hyperimmune serum
B. Provision of cell mediated immunity; activated lymphocytes
C. Immediate protection; preformed antibodies in hyperimmune serum
D. Can be given safely to immunodeficient or immunocompetent patients; bone marrow cells
E. Longer duration of protection; toxoid

50 A woman is actively immunized (shows both elevated IgG and IgA antibodies) against *Streptococcus mutans.* What protects the neonate against dental caries?

a. The baby will be actively immune against *S. mutans.*
b. The baby will actively secrete IgA against *S. mutans.*
c. The baby will not have teeth ✓
d. The baby will be passively protected by maternal sIgA and serum IgG
e. None of the above.

51. . The *Rheumatoid Factor* found elevated in the serum of 90% of individuals suffering from active rheumatoid arthritis is most often described by which of the following?

A. IgG immunoglobulins that bind to synovial membrane proteins -
B. Isoatibodies against the ABO blood group antibodies present in the patient -
C. Anti-nuclear protein antibodies complexed with Complement -
D. IgE immunoglobulins that bind to Fc-epsilon receptors on synovial mast cells ×
E. IgM immunoglobulins that bind to altered Fc region of IgG immunoglobulins

II. Problem Questions. Answer the questions posed concerning the following situations.

Problem I.
On January 1, a 20 month old child, JEB, developed symptoms that appeared to be those of Influenza A viral respiratory infection; blood was drawn from JEB on January 2 and an anti- influenza A antibody titer in serum was shown to be 0. After seven days of symptoms the child improved without therapy. A second serum sample taken on January 15, showed a positive anti-influenza A antibody titer of 40. On February 1, JEB developed another respiratory tract infection and a third serum sample taken at that time showed a positive anti-influenza A antibody titer of 120. On Feb. 1, a sputum sample was also shown to be positive for anti-influenza A antibody as well. The child recovered from the second respiratory trat infection in 8 days without complications.On February 10, an anti-influenza A antibody serum titer of 110 was obtained. The child had no influenza immunization during the period. memory

52. Which of the following is the most appropriate interpretation of these findings?

A. The child was ill with Influenza A viral infection on January 1 ✓
B. The January 1 infection was not caused by Influenza A ×
C. The February 1 infection was caused by Influenza A ✓
D. The child has an obvious immune deficiency evidenced by the second respira- ×
tory tract infection
E. B and C above

53. The posititive anti-influenza A antibody test in the sputum would be the result of which of the following?

A. Interferon-alpha in the sputum
B. Presence of maternal immunoglobulins transferred in mother's breast milk
C. The secondary immune response reaction
D. IgA immunoglobulins—
E. IgE immunoglobulins

54. Which of the following conclusions is also indicated by these findings?

A. The February 1 infection was not caused by Influenza A
B. The rise in anti-influenza A antibody titer recorded on February 1 was the result of a secondary immune response reaction
C. The slight reduction in anti-influenza A antibody titer recorded on February 10 demonstrated that the antibody was binding the virus in the serum
D. The positive antibody activity seen in the child's serum indicates that he is capable of production of all classes of immunoglobulins against the influenza virus
E. The prinipal immunoglobulin class providing serum antibody activity in the February 1 serum sample would be IgM

Problem 2

You have been asked by a dental supply company to use a new impression material made from "natural organic compounds." The material has all of the positive characteristics of the "artificial" impression polymers, but is being marketed as superior because it is "all natural." You use the new material extensively with excellent results. On the current patient when you apply the impression material, however, you notice that his lips seem to be swelling like he has a "fat lip" and there is a spreading erythematous ring beginning to spread from his lips onto his cheeks and chin within minutes of the application of the impression material. The patient reports his lips "feel funny" but otherwise he is OK.

55 What is the cause of this reaction?

A. Type I hypersensitivity reaction
B. The material activates the complement cascade
C. A localized inflammatory response reaction has been triggered
D. Type II hypersensitivity reaction
E. Type III hypersensitivity reaction

56. What would be the most appropriate therapy?

A. Immediately remove the impression material and give the patient an injection of epinephrine and antihistamine to prevent serious sequelae
B. Immediately remove the impression material, have the patient thoroughly rinse his mouth, inspect the oral cavity to see how far the swelling has spread, offer an oral antihistamine such as benadryl and observe the patient for at least 30 minutes
C. Finish taking the impression because the condition will get no worse; the reaction is limited to only the tissues in direct contact with the impression material, and the reaction will subside as quickly as it developed
Call 911 for medical support, take the patient's blood pressure, be ready to provide CPR, but don't remove the impression material because this might trigger hemorrhage at the site
Remove the impression material as soon as the impression is completed, have the patient rinse his mouth with a disinfectant and explain that his mouth will be sore but an anti-inflammatory, like aspirin, will reduce the swelling and pain

Problem 3

In preparation for orthodonture you are going to have to do 4 dental extractions under general anaesthesia on a 15-year-old patient. You ask for a CBC and Differential prior to the oral surgery. When the results come back they are as follows:

WBC	-	47,000/mm^3
RBC	-	low
Platelets	-	low
Differential WBC		
Neutrophils	-	12%
Basophils	-	0 %
Eosinophils	-	1 %
Monocytes	-	1 %
Lymphocytes	-	86% with mostly atypical cells

57. What condition would you suspect in this patient?

A. Severe infection
B. Underlying autoimmune disease
C.. Lymphoma
D. Lymphocyte leukemia
E. Multiple myeloma

58. Is it safe to proceed with your oral surgery?

A. Yes, as long as you provide prophylactic antibiotic therapy
B. Yes, as long as you provide antibiotic therapy to clear up the infection and then do the surgery
C. Yes, as long as you provide immunosuppressive therapy prior to and following the surgery and also provide prophylactic antibiotic therapy
D. No, you should wait until the infection is past and the WBC count returns to normal
E. No, you should cancel the elective surgery and refer the case immediately to an oncologist

Problem 4

Provide the identification asked for:

59. The type of immune dysfunction associated with multiple sclerosis

A. Hypersensitivity
B. Autoimmune disease ✓
C. Lymphoma
D. Immunodeficiency
E. Monoclonal gammopathy

60. The type of immunodeficiency involved in Ataxia telangiectasia syndrome

A. Phagocytic cell immunodeficiency
B. Complement component immunodeficiency
C. B cell immunodeficiency
D. T cell immunodeficiency
E. Combined B cell and T cell immunodeficiency

61. The type of skin reaction that would develop at the site where a small amount of allergen to which the individual had a Type I hypersensitivity was injected subcutaneously.

A. Purulent necrotic lesion with accumulation of neutrophils and macrophages
B. Induration and erythema with lymphocyte infiltration
C. Bullous vesicular lesion
D. Wheal-flare reaction
E. Inflammatory erythematous lesion with neutrophil infiltration

62. The predominant antigenic surface protein in *Streptococcus sobrinus* is:

a. dextranase
b. SpaA ✗
c. glucosyltransferase GTF
d. lipoteichoic acid
e. serotype antigen

63. The basis of the disease known as serum sickness

A. Autoimmune disease
B. Immunodeficiency disease
C. Type II hypersensitivity
D. Type III hypersensitivity
E. Transfusion reaction

64. Why can't we use dead or attenuated *Streptococcus mutans* in a parenteral vaccine?

a. Such a vaccine would contain lipoteichoic acid ✓
b. Such a vaccine would not have a long shelf life
c. Such a vaccine would contain LPS
d. Such a vaccine may lead to severe anaphylactic responses
e. none of the above

65. These bacteria are known to be able to impair leukocytic transepithelial migration

a. *Eikenella corrodens*
b. *Fusobacterium nucleatum*
c. *Prevotella intermedia*
d. *Porphyromonas gingivalis*
e. *Actinobacillus actinomycetemcomitans*

66. The "window of opportunity" hypothesis in regards to LJP requires that:

a. complement act at the right time against *P. gingivalis* during the "ugly duckling" phase of tooth eruption.
b. complement act at the right time against *A. actinomycetemcomitans* during the "ugly duckling" phase of tooth eruption.
c. the proper antibody isotype be established after *A. actinomycetemcomitans* colonizes the sulcus.
d. the proper antibody isotype be established before *A. actinomycetemcomitans* colonizes the sulcus.
e. none of the above

Problem 5

Ms DeCarlo is a 28-year-old woman who comes in for a routine dental check-up appointment. While you are preparing her, she asks you to check her lymph nodes, because she says that she thinks that they are swollen. When you palpate them you confirm that they are swollen and you ask if she has other symptoms; you have already noticed that she has a facial rash. Ms DeCarlo relates the following history:

> Two weeks ago she returned from a trip to Cancun, Mexico with her boyfriend, and a day after her return she developed a bladder infection for which she was prescribed sulfonamide/trimethoprim tablets to be taken for 8 days. She finished the course of therapy, and 2 days ago she woke up in the morning with swollen and painful joints, a slight fever, and the itchy rash on her face, neck and arms. Yesterday she noticed that her urine was cloudy when she had to urinate more frequently than normal, but today she says that her urine output is less than normal and it is darker than usual.

Rash
SLE

You do a quick test for protein in her urine and find that she is +3 for protein in urine. You send her to your internist colleague in the building who obtains the following results.

Investigation	Result (normal range)
Haemoglobin (g/dl)	14.1 (11.5–16.0)
White cell count (x 10⁹/l)	10.1 (4.0–11.0) nrm
Eosinophils (x 10⁹/l)	1.45 (0.4–0.44)
Total lymphocytes (x 10⁹/l)	2.2 (1.6–3.5)
ESR	34 mm/hr
C3 (g/l)	0.41 (0.75–1.65)
C4 (g/l)	0.09 (0.20–0.65)
Anti-nuclear antibodies	Negative Not SLE
Rheumatoid factor	Negative

67 Which of the following diagnoses is best supported by these results?

A. Type I hypersensitivity reaction to drugs ✗
B. Type II hypersensitivity with hemolytic anemia
C. Type III hypersensitivity to drugs with glomerular nephritis ✓
D. Systemic Lupus Erythematosis
E. Return of her bladder infection

68. These data indicate which of the following?

A. Bence-Jones proteins in urine ✓
B. Leucocytosis
C. Presence of gram-negative septicemia
D. Activation of the alternative complement pathway
E. Activation of the classical complement pathway

69 What therapy is indicated for this patient?

A. Immediate IV epinephrine
B. Place on immunosuppressive drug to reduce autoimmune response
C. Transfusion with matched packed RBC's
D. Immediate IV broad-spectrum antibiotic therapy and Cult/Sens. on urine and blood
E. No immediate therapy needed but if symptoms don't improve in 5 days place on corticosteroid anti-inflammatory therapy

70. What symptom(s) in this patient indicated that the ANA test should be run?

A. Facial rash
B. Lymphadenopathy
C. Proteinuria
D. Eosinophilia
E. A,B, and C above

71 What other complement components will also be reduced in this patient's serum?

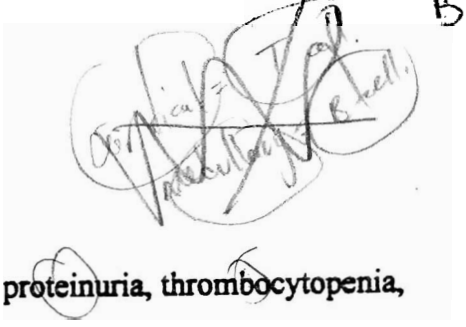
A. C1
B. C2
C. C5
D. B and C
E. A, B, and C

Problem 6

What conclusions can be drawn from the following clinical data and test results?

72. A lymph node biopsy in a two-week-old infant demonstrates no cells in the follicular germinal centers in the cortex of the node with normal paracortical/medullary cell population.

A. Leucopenia
B. B-cell deficiency
C. DiGeorge's syndrome — T cell
D. SCID
E. Multiple myeloma



73. 58-year-old patient with bone pain, hypercalcemia, proteinuria, thrombocytopenia, anemia, recurrent infections, and renal failure.

A. Polyclonal gammopathy
B. SLE
C. Myelocytic leukemia
D. IgA secretory deficiency
E. Multiple myeloma

74. 48-year-old woman with myxedema, severely reduced thyroxine in serum, enlarged thyroid, elevated TSH in serum, reduced BMR, and antithyroglobulin antibodies in serum.

A. Autoimmune Hashimoto's thyroiditis ✓
B. Grave's disease
C. Type IV autoimmune hypersensitivity to thyroid
D. Type I hypersensitivity to thyroxine
E. Autoimmune TSH receptor blocking antibodies in patient

75. When blood donor RBC's are mixed with recipient's serum there is immediate hemagglutination and hemolysis.

A. Donor's blood contains ABO IgM isoantibodies for recipient's RBC's ✗
B. Recipient's serum contains IgG antibodies for donor RhD antigen on RBC's
C. Recipient's serum contains ABO IgM isoantibodies for donor's RBC's ✓
D. There is a mismatch in minor protein antigen between donor and recipient ✗
E. There is a mismatch in Class II HLA antigens between donor and recipient ✗

MAJOR RBC → Serum