

**Pathogenic Microbiology
Examination #4
Fall Semester 2007**

Student name: _____

Score: _____ points out of 65points

Your percent score is _____%

Students:

- 1. Please use a #2 pencil on the scantron sheet.**
 - 2. Each scantron question has a point value of 0.91 points**
 - 3. Record any erasures on the list provided at the front of the room. Protect yourself, as the verdict of the scoring machine is final.**
 - 4. Feel free to ask for further information about any of the questions.**
 - 5. The total value of this portion of the examination is 45.5 points**
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1. The application of Koch's Postulates is designed to allow the investigator to ____.
 - A) Determine how a microbe causes disease
 - B) Determine if a microbe causes a specific disease
 - C) Determine how an individual acquires a disease causing microbe
 - D) None of these
 2. Proteins are extremely important molecules to the functioning of living organisms. They are constructed out of subunits known as ____.
 - A) Amino acids
 - B) Fatty acids
 - C) Nucleic acids
 - D) None of these
 3. Cells which have a nuclear membrane are considered to be ____ in nature.
 - A) Prokaryotic
 - B) Mesokaryotic
 - C) Eukaryotic
 - D) None of these
 4. The fluid mosaic model is associated with describing the structure of the ____ of the cell.
 - A) Cell wall
 - B) Ribosome
 - C) Plasma membrane
 - D) None of these

5. The autoclave makes use of ____ heat to do its job of sterilizing materials.
- A) Dry
 - B) Moist
 - C) Conditional
 - D) None of these
6. The first virus that man actually saw was that which caused ____.
- A) Polio
 - B) Influenza
 - C) Tobacco Mosaic Disease
 - D) None of these
7. In determining water safety from a microbial standpoint, one normally determines the “coliform numbers” in the water supply. This is because ____.
- A) Most coliforms are disease causing agents as far a man is concerned
 - B) The presence of coliforms is a very good indicator that actual disease causing agents are present
 - C) Coliforms can cause many nondisease producing bacteria to gain the ability to cause disease in man
 - D) None of these
8. In conducting the evaluation of Quarton Lake Water, you made use of ____ levels of testing.
- A) 2
 - B) 3
 - C) 4
 - D) None of these
9. In conducting the above evaluation you utilized what is known as EMB agar (Eosin Methylene Blue agar) to indicate the presence of *E. coli* in certain samples. The characteristic that allows you to easily identify this bacterium on EMB agar is the development of ____.
- A) A clear zone around the colony
 - B) A clear colony on the medium
 - C) A yellowish color in the medium surrounding the colony
 - D) None of these
10. Many microbial growth media contain agar. The function of this material is to serve as a ____ in microbiological growth media.
- A) Energy source
 - B) Vitamin
 - C) Solidifying agent
 - D) None of these

11. The causative agent of Amebiasis is a type of ____.
- A) Fungus
 - B) Bacterium
 - C) Virus
 - D) None of these
12. There has been a very large amount of attention given to a microbe known as H5N1 in the last few years. This is really a type of influenza virus which, at the present time, mainly has infected ____.
- A) Man
 - B) Rats
 - C) Birds
 - D) None of these
13. Reverse transcriptase is an enzyme that was mentioned in connection with the replication of the HIV virus. This enzyme has the ability to ____.
- A) Direct the production of RNA using DNA as a guide
 - B) Direct the production of DNA using RNA as a guide
 - C) Direct the production of protein using the ribosome as a guide
 - D) None of these
14. Protease inhibitors have become an important class of antiviral drugs in the management of HIV infections. These agents prevent the production of HIV ____.
- A) Nucleic acids
 - B) HIV envelopes
 - C) HIV coat proteins
 - D) None of these
15. A human cell is invaded by a virus and is transformed. This means that the cell is now ____.
- A) Capable of producing viruses
 - B) Incapable of reproducing
 - C) Cancerous
 - D) None of these
16. Viroids are ____.
- A) Very dangerous viruses
 - B) Small, naked RNA molecules
 - C) Small, nonhuman viruses
 - D) None of these
17. Human influenza viruses are known to be a type of ____ virus.
- A) Nonenveloped
 - B) RNA
 - C) DNA
 - D) None of these

18. If a plate is countable it should have between ____ colonies on it.
- A) 10-100
 - B) 30-300
 - C) 30-3000
 - D) None of these
19. In order to make use of a spectrophotometer to determine number of microbes/ml, you would have to ____.
- A) Have available a microscope
 - B) A special counting slide
 - C) A color chart
 - D) None of these
20. The Tsetse fly is associated with the transmission of ____ to humans
- A) Cholera
 - B) Bubonic plague
 - C) Yellow fever
 - D) None of these
21. The above-mentioned fly is a biting fly that is found in certain parts of the continent of ____.
- A) Asia
 - B) Australia
 - C) S. America
 - D) None of these
22. If you were attempting to sterilize a fluid using filtration, it would be the group of microbes known as the ____ that would cause you the greatest concern.
- A) Protozoans
 - B) Fungi
 - C) Bacteria
 - D) None of these
23. The above would cause this concern because of their ____.
- A) Great virulence
 - B) Great ability to produce toxins
 - C) Very small size
 - D) None of these
24. The basis of the genetic code is a linear sequence of ____ nitrogenous bases
- A) 3
 - B) 4
 - C) 5
 - D) None of these

25. The infection of a bacterial cell by a lysogenic phage results ____.
- A) The lysis of the cell
 - B) The transdetermination
 - C) The development of *statis* by the cell
 - D) None of these
26. If the nitrogenous base sequence in a gene is AATCGTTATGTTGCG, this genes codes for a protein which consists of ____ amino acids
- A) 2
 - B) 5
 - C) 10
 - D) None of these
27. Plaques are really ____.
- A) Viruses which are very virulent
 - B) Bacteria which are resistant to viral attack
 - C) Zones of destruction in a bacterial lawn
 - D) None of these
28. The type of antibiotic testing that you did in the laboratory was a type of ____ testing.
- A) In vitum
 - B) In vivo
 - C) In vitro
 - D) None of these
29. One of the prominent and relativity common early signs of Lyme Disease is what is known as a ____ rash.
- A) Median
 - B) Bulbous
 - C) Bull's Eye
 - D) None of these
30. The Rat Flea is perhaps the most famous of vectors because of its association with the transmission of ____ to us.
- A) Syphilis
 - B) Tuberculosis
 - C) Bubonic plague
 - D) None of these
31. The stomach serves as an excellent barrier to infection because of its ability to generate ____.
- A) Lysozyme
 - B) Hydrogen peroxide
 - C) Hydrochloric acid
 - D) None of these

32. You would expect to find a normal flora in ____.
- A) The lungs
 - B) The urinary bladder
 - C) The vagina
 - D) None of these
33. The complement system is a collection of ____ molecules.
- A) Lipid
 - B) Carbohydrate
 - C) Protein
 - D) None of these
34. Interferons are a collection of molecules which serve as ____.
- A) Enzymes to destroy viruses
 - B) Antibodies to destroy viruses
 - C) Chemical messengers
 - D) None of these
35. Pyrogens have the ability to induce ____ in the body.
- A) Anaerobic conditions
 - B) Reduced heart beat
 - C) Fever
 - D) None of these
- 36 Genetic changes or mutations can ultimately be traced to changes in ____ molecules that are found in microbial cells.
- A) Sugar
 - B) Nucleic acid
 - C) Lipid
 - D) None of these
37. There was a discussion concerning the so-called SOS system that is found in some microbial cells. This system leads to ____.
- A) A decrease in the number of mutations found in the cells
 - B) A decrease in the size of the cells
 - C) An increase in the number of mutations found in the cells
 - D) none of these
38. Silent mutations involve the production of ____.
- A) Lethal mutations
 - B) Mutations which lead to no change in the protein produced by the affected gene
 - C) Mutations which can not be detected
 - D) None of these

39. The type of ELISA procedure that you conducted in the laboratory is what is known as a ___ ELISA.
- A) Isotopic
 - B) Direct
 - C) Indirect
 - D) None of these
40. There are ___ different antibodies utilized in an ELISA procedure.
- A) 2
 - B) 3
 - C) 4
 - D) None of these
41. Positive ELISA procedures are indicated by the development of ____.
- A) Brown gases emitted from the test wells
 - B) Clumping in the test wells
 - C) Color changes in the test wells
 - D) None of these
42. Your attention was called to the fate of the French army in Russia in 1812. Which disease has been cited by many historians as playing a significant role the loss of life suffered by this army?
- A) Cholera
 - B) Bubonic plague
 - C) Epidemic typhus
 - D) None of these
43. The person who is usually given credit for introducing the idea of phagocytosis as a defense mechanism (The father of Phagocytosis) is ____.
- A) Wilson
 - B) Mayer
 - C) Metchnikoff
 - D) None of these
44. Diapedesis is a phenomenon which is associated with ____.
- A) The production of white blood cells
 - B) A kill mechanism which white blood cells use in dealing with microbes
 - C) The exit of white blood cells from the circulatory system
 - D) None of these
45. There are so 5 major groups of white blood cells found in the circulating blood. The most numerous of these groups under normal circumstances are the ____.
- A) Lymphocytes
 - B) Eosinophils
 - C) Basophils
 - D) None of these.

46. According to the article dealing with Malaria, the African continent collectively spends about ___ dollars per year on malaria control.
- A) 6 billion
 - B) 12 billion
 - C) 24 billion
 - D) None of these
47. Of the 4 recognized human species of the malaria parasite, the most dangerous one is *Plasmodium* ____.
- A) *Ovale*
 - B) *Vivax*
 - C) *Falciparium*
 - D) None of these
48. One of the major sources of funding for anti-malarial programs is the Bill and Melinda Gates Foundation. This foundation has put forth about ___ millions dollars to support anti-malarial campaigns in recent years.
- A) 50
 - B) 100
 - C) 150
 - D) None of these
49. Which stage in the life of the malarial parasite is the normal infective form for man?
- A) Heterocyst
 - B) Microcyst
 - C) Sporozoite
 - D) None of these
50. Mark answer A. This is a free question

Students:

- 1. The following portion of the examination has a point value of 19.5 points.**
- 2. Each question has its point value indicated at its end.**
- 3. You may use either pencil or pen in answering this section of the examination.**
- 4. If you are to list items, for your own protection, list only the number that is being requested.**
- 5. Please use complete sentences where appropriate**
- 6. Please print the wording of your answer.**
- 7. Lastly, reread your answers before turning in your paper. Remember, I can only read and grade what you have actually written, not what you wanted to write.**

1. The MPN procedure that you conducted in the laboratory consisted of 3 levels of testing. What were those levels? **(1.5pts)**

1.
2.
3.

2. What are the 3 classic hemolytic reactions seen on blood agar? Describe each. **(3pts)**

Name of reaction	Description of agar around colony

3. Show me how to create a 100,000,000 dilution of the milk **(2pts)**

Milk

4. Place the dilution factors on each of the Petri Dishes shown in the scheme that is presented below. **(3pts)**

Milk

5. If the RNA codon on a (-) RNA strand is UAC, what is the codon on the following?
(1.5 pts)

- a. The (+) RNA strand

- b. The (-) DNA strand

- c. The (+) DNA strand

6. Cite 3 different ways that your normal flora can protect you from invading microorganisms. **(3pts)**

1.
2.
3.

7. What are the 4 characteristics of inflammatory reactions? **(2pts)**

1.	3.
2	4,.

8. The article dealing with malaria (from Scientific American) noted that 5 major problems cause problems for malarial control on this continent. Cite 3 of those factors. **(1.5pts)**

1.
2.
3.

9. Cite 2 different means or methods that microbes make use of to confer upon themselves resistance to antibiotics. **(1pt)**

1.
2.

10. Describe 2 of the 3 “kill mechanisms” that were noted in class as being used by phagocytic cells to handle phagocytized bacteria. **(1pt)**

1.
2.