

NAME \_\_\_\_\_

MCB 2004 - MICROBIOLOGY  
TEST #2A; March 2, 2001; R. H. REEVES

IN THIS PART THERE ARE **FORTY-FIVE** QUESTIONS WORTH TWO POINTS EACH. THERE IS ONLY ONE CORRECT ANSWER FOR EACH QUESTION. PLEASE CIRCLE THE CORRECT LETTER OR PLACE THE CORRECT LETTER JUST TO THE LEFT OF THE QUESTION NUMBER. THEN TRANSFER ALL YOUR ANSWERS TO THE "ACCU-SCAN."

1. THE THREE "DOMAINS" OF ORGANISMS DEFINED BY 16S rRNA GENE SEQUENCING ARE
- A. EUCARYA, PROTISTA AND ARCHAEA
  - B. BACTERIA, PROTISTA AND ARCHAEA
  - C. EUCARYA, MONERA AND BACTERIA
  - D. EUCARYA, MONERA AND ARCHAEA
  - E. BACTERIA, EUCARYA AND ARCHAEA

KEY FOR QUESTIONS 2-10. THERE IS ONLY ONE CORRECT ANSWER, BUT EACH ANSWER MAY BE USED MORE THAN ONCE (OR NOT AT ALL).

- A. CHLAMYDIA TRACHOMATIS
  - B. CLOSTRIDIUM TETANI
  - C. NEISSERIA GONORRHOEAE
  - D. PSEUDOMONAS AERUGINOSA
  - E. TREPONEMA PALLIDUM
- \_\_\_ 2. HAS A THICK PEPTIDOGLYCAN CELL WALL
- \_\_\_ 3. THIS BACTERIUM IS A MEMBER OF THE *beta*-PROTEOBACTERIA
- \_\_\_ 4. MOST CLOSELY RELATED TO THE BACILLUS AND MYCOPLASMA
- \_\_\_ 5. MOST CLOSELY RELATED TO ESCHERICHIA COLI
- \_\_\_ 6. DISPLAYS TWO FORMS, THE ELEMENTARY BODY AND THE RETICULATE BODY
- \_\_\_ 7. MOST CLOSELY RELATED TO BORRELIA BURGDOFERI
- \_\_\_ 8. AN OBLIGATELY ANAEROBIC, ENDOSPORE-FORMING BACTERIUM
- \_\_\_ 9. HAS A SHEATH AND AXIAL FILAMENTS
- \_\_\_ 10. AN OBLIGATE INTRACELLULAR PARASITE

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11. HUMAN PRION DISEASES INCLUDE
- A. PARKINSON'S DISEASE
  - B. CREUTZFELDT-JAKOB DISEASE
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE
12. ALL VIRUSES
- A. CONTAIN BOTH RNA AND DNA
  - B. CONTAIN AN ENVELOPE
  - C. CONTAIN A CAPSID
  - D. CONTAIN VIRAL-CODED SPIKES OR PEPLomers (GLYCOPROTEINS)
  - E. CONTAIN HOST PROTEINS
13. CIRCULAR DNA IS FOUND IN THE VIRION (MATURE VIRUS PARTICLE) OF
- A. PICORNAVIRUSES
  - B. PAPILLOMA VIRUSES
  - C. TOGAVIRUSES
  - D. ADENOVIRUSES
  - E. INFLUENZA VIRUSES

KEY FOR QUESTIONS 14-19. THERE IS ONLY ONE CORRECT ANSWER BUT EACH KEY WORD MAY BE USED MORE THAN ONCE (OR NOT AT ALL).

- A. RHINOVIRUS
  - B. HUMAN ADENOVIRUS-2
  - C. MUMPS VIRUS
  - D. HUMAN PAPILLOMA VIRUS
  - E. SMALLPOX VIRUS
- \_\_\_\_\_ 14. THIS VIRUS IS ASSOCIATED WITH A SEXUALLY-TRANSMITTED CANCER
- \_\_\_\_\_ 15. ONE OF THE SMALLEST HUMAN RNA VIRUSES
- \_\_\_\_\_ 16. THIS VIRUS, DUE TO EFFORTS OF THE WORLD HEALTH ORGANIZATION, NO LONGER INFECTS MAN
- \_\_\_\_\_ 17. THIS VIRUS CONTAINS A SINGLE MINUS-STRAND OF RNA
- \_\_\_\_\_ 18. GENOME IS AN mRNA WHICH CODES FOR A SINGLE POLYPROTEIN
- \_\_\_\_\_ 19. THE VIRUS HAS A DOUBLE-STRANDED, LINEAR, DNA GENOME WITH A PROTEIN BOUND TO THE 5'-END

20. A MAJOR DIFFERENCE BETWEEN THE GROWTH OF VIRUSES AND CELLS IS THAT ALL VIRUSES
- A. REPLICATE BY BINARY FISSION
  - B. ARE OBLIGATE INTRACELLULAR PARASITES
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE
21. ALL OF THESE VIRUSES HAVE ICOSAHEDRAL SYMMETRY
- A. POLIOVIRUS, ADENOVIRUS AND HERPES SIMPLEX VIRUS
  - B. MUMPS VIRUS, SMALLPOX VIRUS AND PAPILLOMA VIRUS
  - C. INFLUENZA VIRUS, MEASLES VIRUS AND RABIES VIRUS
  - D. SMALLPOX VIRUS, POLIOVIRUS AND HERPES SIMPLEX VIRUS
  - E. ADENOVIRUS, SMALLPOX VIRUS AND RABIES VIRUS
22. ALL OF THESE VIRUSES HAVE ENVELOPES (MEMBRANE LAYERS)
- A. POLIOVIRUS, ADENOVIRUS AND HERPES SIMPLEX VIRUS
  - B. MUMPS VIRUS, SMALLPOX VIRUS AND PAPILLOMA VIRUS
  - C. INFLUENZA VIRUS, MEASLES VIRUS AND RABIES VIRUS
  - D. SMALLPOX VIRUS, POLIOVIRUS AND HERPES SIMPLEX VIRUS
  - E. ADENOVIRUS, SMALLPOX VIRUS AND RABIES VIRUS
23. THIS VIRUS HAS A SEGMENTED RNA GENOME THAT CODES FOR 10 PROTEINS
- A. MEASLES VIRUS
  - B. EPSTEIN-BARR VIRUS
  - C. POLIOVIRUS-1
  - D. RABIES VIRUS
  - E. INFLUENZA VIRUS A
24. IF SYMPTOMS DEVELOP, THE DISEASE CAUSED BY THIS VIRUS IS ALWAYS FATAL
- A. POLIOVIRUS
  - B. SMALLPOX VIRUS
  - C. MUMPS VIRUS
  - D. RABIES VIRUS
  - E. INFLUENZA VIRUS
25. IN A COMMENSALISTIC RELATIONSHIP BETWEEN A MICROBE AND A HOST
- A. THE MICROBE BENEFITS
  - B. THE HOST BENEFITS
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE

26. BACTERIA THAT MAKE UP THE NORMAL FLORA ARE
- A. USUALLY COMMENSALS
  - B. USUALLY FOUND IN THE BLOOD
  - C. VIRULENT PATHOGENS
  - D. ALL PARASITES
  - E. NEVER OPPORTUNISTS
27. ONE OF THE MEMBERS OF THE NORMAL FLORA OF THE SKIN IS
- A. ESCHERICHIA COLI
  - B. CLOSTRIDIUM PERFRINGENS
  - C. BACILLUS SUBTILIS
  - D. STAPHYLOCOCCUS EPIDERMIDIS
  - E. CANDIDA ALBICANS
28. BACTERIA THAT ARE NORMAL FLORA OF THE SKIN ARE ABLE TO TOLERATE
- A. HIGH pH (GREATER THAN pH 8.0)
  - B. THE PRESENCE OF FATTY ACIDS
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE
29. NON-SPECIFIC DEFENSES AGAINST INFECTION INCLUDE
- A. THE pH OF THE STOMACH
  - B. LYSOZYME IN TEARS
  - C. FATTY ACIDS ON THE SKIN
  - D. LAVAGING BY TEARS, URINE AND MUCOUS
  - E. ALL OF THE ABOVE
30. THE TWO MAJOR TYPES OF PHAGOCYTES AGAINST BACTERIA ARE
- A. MACROPHAGE AND NEUTROPHILS
  - B. LYMPHOCYTES AND MACROPHAGE
  - C. THROMBOCYTES AND MONOCYTES
  - D. ERYTHROCYTES AND MONOCYTES
  - E. LYMPHOCYTES AND THROMBOCYTES
31. THE MAJOR EFFECTS OF ACTIVATED COMPLEMENT ARE
- A. CYTOLYSIS
  - B. OPSONIZATION
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE

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32. FEVER DURING INFLAMMATION IS INDUCED BY
- A. COMPLEMENT
  - B. OPSONIZATION
  - C. INTERLEUKIN-1
  - D. INTERFERONS
  - E. O<sub>2</sub> REACTIONS
33. AN EXAMPLE OF ARTIFICIALLY ACQUIRED ACTIVE IMMUNITY IS
- A. DEVELOPING ANTIBODIES TO INJECTION OF A VACCINE
  - B. RECEIVING HORSE ANTISERUM TO A TOXIN (ANTITOXIN)
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE
34. THE CELLS THAT ACTIVELY MAKE ANTIBODIES ARE
- A. NEUTROPHILS
  - B. T-CELLS
  - C. PLASMA CELLS
  - D. MACROPHAGE
  - E. B-MEMORY CELLS

KEY FOR QUESTIONS 35-40. THERE IS ONLY ONE CORRECT ANSWER, BUT EACH ANSWER MAY BE USED MORE THAN ONCE (OR NOT AT ALL).

- A. TRANSDUCTION
  - B. TRANSLATION
  - C. TRANSCRIPTION
  - D. TRANSFORMATION
  - E. REPLICATION
- \_\_\_\_\_ 35. PURE DNA ISOLATED FROM ONE CELL IS TAKEN UP BY ANOTHER
- \_\_\_\_\_ 36. POLYMERIZATION OF AMINO ACIDS DIRECTED BY mRNA
- \_\_\_\_\_ 37. TRANSFER OF DNA FROM ONE CELL TO ANOTHER VIA A VIRUS
- \_\_\_\_\_ 38. tRNA and rRNA ARE REQUIRED FOR THIS PROCESS
- \_\_\_\_\_ 39. DOUBLE-STRANDED DNA IS COPIED INTO TWO DOUBLE-STRANDED DNAs
- \_\_\_\_\_ 40. RNA POLYMERASE MAKES RNA FROM A DNA TEMPLATE

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41. HEMOLYTIC REACTIONS OF THE STREPTOCOCCUS ARE DUE TO
  - A. THEIR CAPSULE
  - B. PRODUCTION OF ADHESIONS
  - C. PRODUCTION OF EXTRACELLULAR ENZYMES
  - D. PRODUCTION OF ENDOTOXIN
  - E. THE PRESENCE OF SPECIFIC PILI (FIMBRIAE)
  
42. THE FOLLOWING BACTERIUM GROWING IN THE BLOOD CAN CAUSE ENDOTOXIC (SEPTIC) SHOCK
  - A. PSEUDOMONAS AERUGINOSA
  - B. TREPONEMA PALLIDUM
  - C. BACILLUS SUBTILIS
  - D. STAPHYLOCOCCUS AUREUS
  - E. MYCOBACTERIA LEPRAE
  
43. MOST BIPARTITE EXOTOXINS
  - A. CONTAIN A CELL-BINDING COMPONENT
  - B. ARE COMPOSED OF CARBOHYDRATE
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE
  
44. VIRULENCE FACTORS INCLUDE
  - A. ENDOTOXIN
  - B. CAPSULES
  - C. FIMBRIAE (PILI)
  - D. COLLAGENASES
  - E. ALL OF THE ABOVE
  
45. COMPONENTS OF THE LACTOSE OPERON INCLUDE:
  - A. AN OPERATOR SITE
  - B. THE Z ( $\beta$ -GALACTOSIDASE) GENE
  - C. BOTH OF THE ABOVE
  - D. NEITHER OF THE ABOVE

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SHORT ANSWER QUESTIONS: ANSWER **ONE** OF THE THREE QUESTIONS  
10 POINTS

46. DESCRIBE **FIVE** MAJOR DIFFERENCES BETWEEN ESCHERICHIA COLI AND CHLAMYDIA PSITTACI. [THESE DIFFERENCES CAN INCLUDE CELL MORPHOLOGY, METABOLISM, GROWTH CONDITIONS, ETC.]
47. DRAW AND LABEL DIAGRAMS OF BOTH IgG AND IgA. THESE ARE THE TWO MAJOR ANTIBODY TYPES FOUND IN HUMANS. HOW DO THEY DIFFER IN FUNCTION?
48. DESCRIBE THE DIFFERENCE BETWEEN A VIROID AND A PRION. HOW DO THEY DIFFER STRUCTURALLY? WHAT TYPE OF ORGANISM DOES EACH OF THESE AGENTS INFECT AND WHAT GENERAL TYPE OF DISEASE IS PRODUCED?