

MIAMI DADE COLLEGE-WOLFSON CAMPUS
MCB2010 - MICROBIOLOGY
Dr. Edwin Ginés-Candelaria
EXAM II REVIEW

Name _____

Instructions: **READ** each question **CAREFULLY** before answering. Then , **SELECT** the **BEST** answer and write it on the scantron sheet. Only answers that are written on the scantron sheet will be used for computation of your exam score. Please ensure that you select the appropriate choice before you transfer it to the scantron sheet. For True/False questions, please answer choice "A" if the statement is true, or choice "B" if it is false. Remember that **UNDERSTANDING** the instructions is an integral part of taking this examination. Each question is worth 4 points. There are 8 extra credit points in this exam. Work at a steady pace and you should have ample time to complete it. **BEST WISHES!**

28. Which of the following characteristics would NOT apply to prokaryotes?
- A. Often lack a cell wall
 - B. Multicellular
 - C. Includes the Domain Bacteria
 - D. Includes the Domain Archaea
 - E. more than one of these
29. Which statements about prokaryotic cells is (are) true?
- A. They sexually reproduce by meiosis.
 - B. Cell walls underlie the plasma membrane.
 - C. They synthesize proteins with the help of ribosomes.
 - D. Fimbriae are used for motility.
 - E. Archaea and Bacteria can be classified using the Gram stain.
30. Certain bacteria can form endospores in order to _____.
- A. reproduce
 - B. survive harsh conditions
 - C. cause recurrent infections
 - D. adhere to host tissues
 - E. avoid the immune system of a host
31. Which of the following characteristics regarding prokaryotic ribosomes supports the endosymbiotic theory?
- A. Prokaryotic ribosomes are 80S just like eukaryotic ribosomes.
 - B. Prokaryotic ribosomes are 70S just like mitochondrial ribosomes.
 - C. Prokaryotic ribosomes make proteins in a similar manner to eukaryotic ribosomes.
 - D. Prokaryotic ribosomes have two subunits like eukaryotic ribosomes.
 - E. Prokaryotic ribosomes are intracellular structures like eukaryotic ribosomes.
32. Glucose is often present in very low concentrations in environments populated by microorganisms. To import the maximum amount of available glucose, cells use:
- A. Simple diffusion
 - B. Facilitated diffusion
 - C. Active transport
 - D. Osmosis
 - E. Receptor-mediated endocytosis
33. The use of antibiotics that inhibit or inactivate cellular ribosomes will result directly in the loss of which of the following functions:
- A. ATP production
 - B. DNA replication
 - C. Cell division
 - D. Protein synthesis
 - E. Phagocytosis

34. Polyphosphate and sulfur are stored in bacterial cells in structures called:

- A. Endospores
- B. Glycocalyx
- C. Mesosomes
- D. Nucleoids
- E. Inclusions

35. Bacterial fimbriae present on the outer cell surface are used for:

- A. Cellular motility
- B. Sexual reproduction
- C. Cell wall synthesis
- D. Adherence to surfaces
- E. Adherence and exchange of genetic information

36. The association of endotoxin in Gram-negative bacteria is a result of the presence of:

- A. Peptidoglycan
- B. Lipopolysaccharide
- C. Polypeptide
- D. Steroids
- E. Calcified proteins

37. The bacterial cytoskeleton _____.

- A. transports vesicles
- B. helps determine cell shape
- C. is organized identical to its eukaryotic counterpart
- D. centers the nucleoid

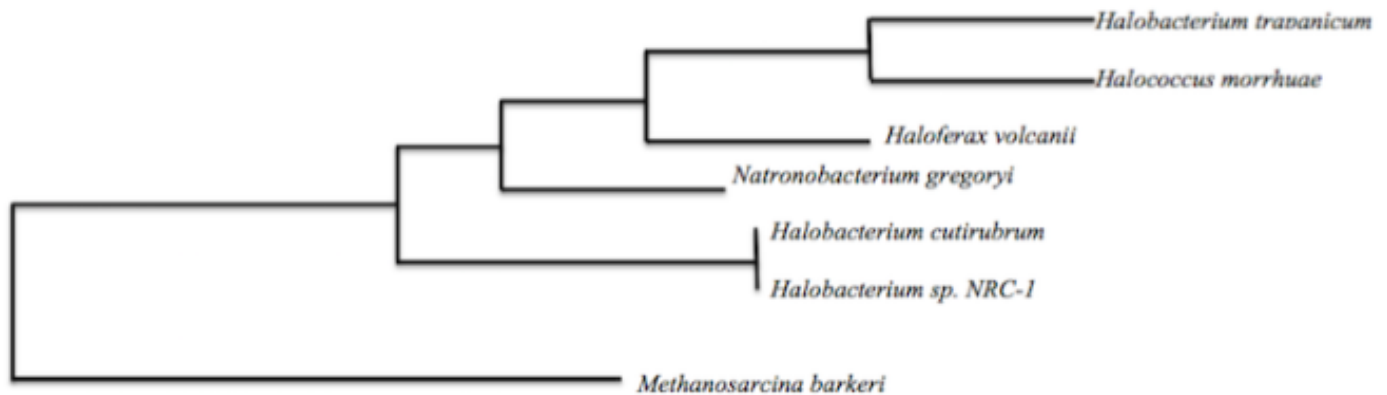
38. A bacterial arrangement in packets of eight cells is described as a _____.

- A. micrococcus
- B. diplococcus
- C. tetrad
- D. sarcina
- E. staphylococcus

39. Gram-positive bacteria _____.

- A. have a thick cell wall, which retains crystal violet dye
- B. contain teichoic acids in their cell walls
- C. appear purple after Gram staining
- D. have an interbridge containing more amino acids between muramic acid residues in glycan polymers.
- E. all of these are correct.

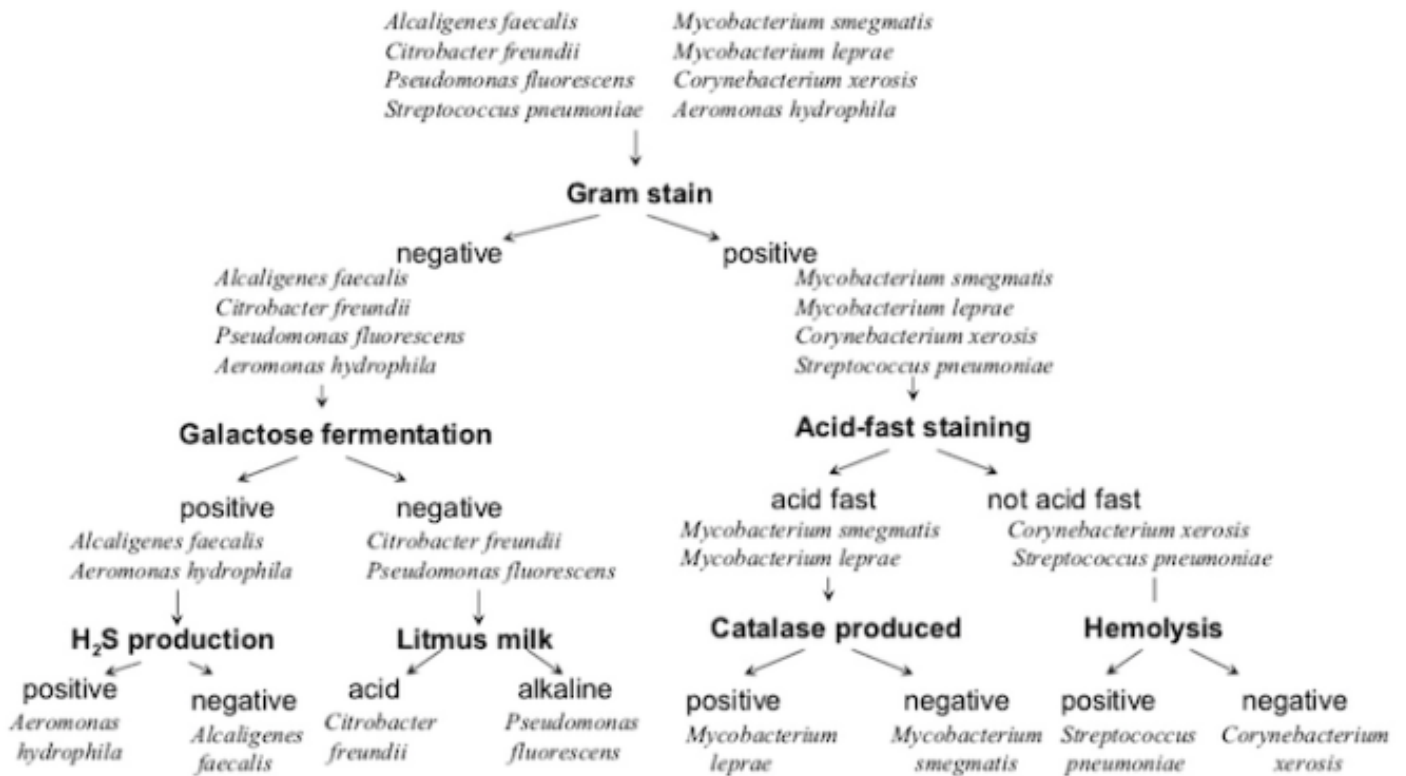
40. T F Active transport processes evolved from eukaryotes to prokaryotes.



41. T F *Halobacterium morrhuae* is distantly related to *Halobacterium sp. NRC-1*.

Use the following information to answer questions 42-44.

Dichotomous Key to Identifying Eight Bacteria



42. According to the strategy presented, to identify *M. smegmatis*, a student will need to perform (in order):
- Acid-Fast stain, Litmus milk, and Galactose fermentation test
 - Catalase, Gram stain, and production of H₂S
 - Gram stain, production of H₂S, and Catalase
 - Gram stain, Acid-Fast stain, Catalase
 - Catalase, Acid-Fast stain, Gram stain
43. An organism displaying a red-colored cell in the Gram stain, that utilizes galactose, but fails to produce hydrogen sulfide identifies
- Aeromonas hydrophila*
 - Mycobacterium smegmatis*
 - Citrobacter freundii*
 - Pseudomonas fluorescens*
 - Alcaligenes faecalis*
44. How many morphological and physiological characteristics are required to identify *Mycobacterium leprae* using the strategy in this figure?
- 1
 - 2
 - 3
 - 4
 - 5

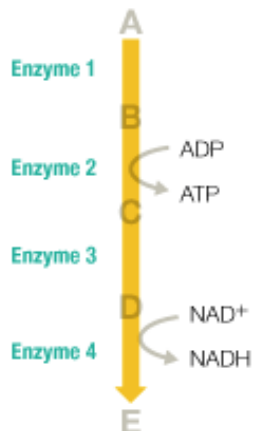
45. If an enzyme's active site becomes deformed, _____ inhibition was likely responsible.

- A. metabolic
- B. competitive
- C. noncompetitive
- D. cellular
- E. inhibition

46. Which statements about ATP are true?

- A. Substrate-level phosphorylation converts ATP to ADP.
- B. ATP is made using anabolic reactions.
- C. In cellular respiration the most ATP is made by glycolysis.
- D. ATP is used to jump-start cellular respiration.
- E. Catabolic reactions are used to make ATP.

Use the following information to answer questions 47-51.



Use the figure above to answer the questions that follow.

47. If you were to summarize this pathway, which of the following would most appropriately summarize the pathway?

- A. Pathway begins with substrate B and products include one molecule of ATP generated by substrate level phosphorylation, one molecule of final product E, and one molecule of reduced coenzyme NADH
- B. Pathway begins with substrate A and products include one molecule of ATP generated by substrate level phosphorylation, one molecule of final product D, and one molecule of reduced coenzyme NADH.
- C. Pathway begins with substrate A and products include one molecule of final product E, one molecule of ATP generated by substrate level phosphorylation and one molecule of reduced coenzyme NADH.
- D. Pathway begins with substrate A and products include one molecule of final product B, one molecule of ADP generated by substrate level phosphorylation and one molecule of reduced coenzyme NAD.
- E. Pathway begins with substrate A and products include one molecule of final product E, one molecule of ADP generated by substrate level phosphorylation and one molecule of reduced coenzyme NADH.

48. Which enzyme would be most likely regulated by feedback inhibition?

- A. Enzyme 1
- B. Enzyme 2
- C. Enzyme 3
- D. Enzyme 4
- E. all enzymes involved in this pathway.

49. Which enzymes carries out substrate level phosphorylation?

- A. Enzyme 1
- B. Enzyme 2
- C. Enzyme 3
- D. Enzyme 4
- E. all enzymes involved in this pathway.

50. Which is the end product of this pathway?

A. A

B. B

C. C

D. D

E. E

51. Which enzyme carries a redox reaction?

A. Enzyme 1

B. Enzyme 2

C. Enzyme 3

D. Enzyme 4

E. all enzymes in this pathway carry redox reactions

52. Rank the following from the most ATP that could be made to the least ATP that could be made:

1) 1 glucose molecule entering a fermentation pathway

2) A lipid made of glycerol and three 10-carbon fatty acid chains entering cellular respiration

3) 1 glucose molecule entering the Entner-Doudoroff pathway

4) 1 glucose molecule entering cellular respiration

A. 2, 4, 3, 1

B. 1, 2, 3, 4

C. 2, 3, 4, 1

D. 4, 3, 2, 1

E. 3, 4, 2, 1

53. Which of the following is true regarding the relationship between photosynthesis and respiration?

A. Respiration is the exact reversal of the biochemical pathway of photosynthesis.

B. Photosynthesis stores energy in glucose and respiration releases energy from glucose.

C. Photosynthesis occurs only in plants and respiration only occurs only in animals.

D. ATP molecules are produced in photosynthesis whereas respiration depletes ATP.

E. All of these are true.

54. Which one of the following is the correct sequence for the flow of electrons in the energy-fixing reactions of photosynthesis?

A. Water—photosystem I—photosystem II—NADPH

B. Photosystem I—NADPH—water—photosystem II

C. Water—photosystem II—photosystem I—NADPH

D. NADPH—photosystem II—photosystem I—water