

BIOS 100 - Exam 5 - Fall, 2005
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Name: _____

TA: _____

The exam consists of 52 multiple guess questions and six pages. Please bubble in your name, last name first. Please be sure you use the name with which you are registered here at UIC and not a nickname. If you only learn one thing from college, please learn that whenever you fill out one of these forms, you should use a #2 pencil. Pen just won't work. Really, it won't. Good luck! Oh, the answer to question 27 is C. Some people did comment on exam four's freebies - thanks!

1. Which of the following statements (A-D) about the process of science is FALSE. If statements A-D are true, then choose E.
 - A. A good scientist is always trying to disprove their hypotheses
 - B. Science is a dynamic process, with many ideas constantly changing in light of new ideas and data.
 - C. Hypotheses and theories can never be known to be true
 - D. Science involves both inductive and deductive reasoning
 - E. All of the above statements about science are TRUE

2. Which of the following is NOT a property of water?
 - A. Ice is less dense than liquid water
 - B. Water is a polar molecule (OK, if you choose this one, I will fail you! :)
 - C. Water has a low specific heat
 - D. Water has high surface tension
 - E. Water has strong adhesive and cohesive properties

3. In the small intestine, chymotripsin is an enzyme that breaks down proteins into amino acids. This type of reaction is called:
 - A. Hydrolysis
 - B. Condensation
 - C. Peptolysis
 - D. Catabolysis

4. Chitin, starch, and cellulose are all examples of:
 - A. Polysaccharides
 - B. Lipids
 - C. Nucleic Acids
 - D. Proteins

5. Which of the following properties of enzymes is FALSE?
 - A. Enzymes function by lowering the activation energy of the reaction
 - B. Enzymes only catalyze the forward reaction - they have no effect on the reverse reaction
 - C. Allosteric inhibitors change the enzyme shape, which lowers enzyme activity
 - D. Most enzymes are sensitive to external temperature and pH
 - E. The active site is where substrates bind to enzymes

6. Which of the following statements about feedback inhibition is FALSE?
 - A. Feedback inhibition often involves allosteric inhibition
 - B. Feedback inhibition is a common mechanism utilized by cells
 - C. During feedback inhibition, the products of a reaction sequence can inhibit the activity of an enzyme
 - D. Isoleucine is an enhancer of the enzyme threonine deaminase

- A. O₂ B. CO₂ C. NADPH D. ATP E. All are used
16. During photorespiration, what is being added to RuBP by Rubisco?
 A. CO₂ B. NH₃ C. O₂ D. H₂O E. None of the above
17. Which process produces the most ATP?
 A. Glycolysis B. Conversion of pyruvate to Acetyl CoA
 C. Krebs Cycle D. Oxidative phosphorylation
18. During oxidative phosphorylation, what is the final electron acceptor?
 A. NADH B. O₂ C. CO₂ D. ATP E. H₂O
19. Which of the following statements is FALSE?
 A. Alcohol fermentation produces CO₂ but no ATP
 B. Lactic acid fermentation oxidizes NADH to NAD⁺
 C. Glycolysis is performed by all life on earth
 D. The Krebs cycle produces all of the CO₂ that you exhale
 E. Oxidative phosphorylation utilizes NADH as a source of electrons
20. Which enzyme is incorrectly matched with its function?
 A. Topoisomerase – removes supercoils
 B. Ligase – cuts DNA
 C. Helicase – unwinds DNA
 D. DNA polymerase – “reads” DNA and forms a complement in a 5' to 3' direction
 E. Primase – creates an RNA primer
21. Which statement about DNA is false?
 A. DNA polymerase contains proofreading functions
 B. DNA polymerase cannot synthesize DNA *de novo* - it must have a primer
 C. Telomeres are present on the ends of chromosomes in bacteria and eukaryotes
 D. In DNA, A pairs with T and C pairs with G
 E. DNA is more stable than RNA
22. What is the start codon in a mRNA?
 A. 5' AGU 3' B. 5' GUA 3' C. 5' UGA 3' D. 5' AUG 3'
23. During translation, where does the charged tRNA enter the ribosome?
 A. The P site B. The A site C. The E site
24. In the *lac* operon, what binds to the operator to turn the operon off?
 A. The repressor protein B. Lactose C. The promoter D. RNA polymerase

- A. From the source to the sink
 B. From the sink to the source
 C. From the roots to the leaves
 D. From the leaves to the roots
 E. None of the above
37. Why doesn't water fall down the xylem in a tall tree when the stomates are closed?
 A. Water molecules have low surface tension, which prevents the back flow of water
 B. The water molecules adhere to the cell walls of the xylem and to each other
 C. The Casparian Strip prevents water from flowing back down the xylem
 D. Water molecules have nowhere else to go, so they remain in the xylem
 E. Water does flow back down the xylem when the stomates are closed.
38. Which of the following statements about blood vessels is FALSE?
 A. Veins are thin-walled vessels with valves to prevent backflow
 B. Healthy arteries have thick, elastic walls
 C. Capillaries have thin walls and low blood velocity
 D. Blood pressure is greatest in the arterioles
 E. Gas and nutrient exchange typically takes place in the capillaries
39. In the heart, what chamber pumps blood to the aorta?
 A. Right Atrium B. Left Atrium C. Right Ventricle D. Left Ventricle
40. In which of the below is the concentration (partial pressure) of oxygen the least?
 A. Air B. Blood in the right atrium
 C. Blood in the body capillaries D. The body's tissues
41. Which of the following organs has the greatest surface area?
 A. Mouth B. Stomach C. Small intestine
 D. Large Intestine E. Rectum
42. Which of the following organs is responsible for almost all absorption of nutrients?
 A. Mouth B. Stomach C. Small intestine
 D. Large Intestine E. Rectum
43. Which statement about filtration of the blood by the nephron is FALSE?
 A. Blood plasma is squeezed out the glomerular capillaries and collected in the Bowman's capsule
 B. Na^+ is pumped from the epithelial cells of the proximal tubule into the filtrate
 C. The descending portion of the Loop of Henle is permeable to water
 D. The ascending portion of the Loop of Henle is impermeable to water but actively transports Na^+ and Cl^- into the medulla
 E. The collecting duct is responsive to Anti-Diuretic Hormone (ADH)
44. One of the primary functions of the kidney is maintaining osmotic homeostasis
 A. True B. False
45. The same hormone can have different effects on different target cells
 A. True B. True

46. Which portion of the cerebral cortex is responsible for personality and higher thought?
A. Frontal lobe B. Occipital Lobe C. Parietal Lobe D. Temporal Lobe
47. Which portion of the CNS is responsible for smoothing out motor control?
A. Pons B. Cerebrum C. Cerebellum D. Medulla Oblongata
48. Which of the following statements about a nerve firing is FALSE?
A. A nerve at rest is negative in the inside relative to the outside
B. This resting potential is generated by the actions of the Na^+ / K^+ pump
C. When a nerve fires, Na^+ channels open, allowing Na^+ to rush in
D. A nerve firing is all or none
E. At a synapse, Na^+ must cross the synaptic cleft to continue the impulse to the adjacent neuron.
49. During activation of a Cytotoxic T-Cell:
A. The Cytotoxic T-Cell must become activated by an Antigen Presenting Cell (APC)
B. The Cytotoxic T-Cell must become activated by an active Helper T-Cell
C. The Cytotoxic T-Cell must become activated by direct contact with the pathogen
D. A & B
E. B & C
50. During activation of a B-Cell:
A. The B-Cell must become activated by an Antigen Presenting Cell (APC)
B. The B-Cell must become activated by an active Helper T-Cell
C. The B-Cell must become activated by direct contact with the pathogen
D. A & B
E. B & C
51. Which cell type is incorrectly matched with its function?
A. Macrophages - Inform Helper T-Cells that a specific antigen is present
B. Helper T cells - produce and secrete chemicals which activate Cytotoxic T-Cells and B-Cells
C. Cytotoxic-T Cells - T lymphocytes that eliminate specific pathogens
D. B cells - produce antibodies
E. All of the above are correctly matched with their function
52. After a pathogen infestation has been eliminated, the body has memory Helper T-Cells, B-Cells, and Cytotoxic T-Cells. These memory cells will speed up the immune response should that same pathogen invade the body again.
A. True B. False

Like last exam, everyone will get 4 bonus points (added directly to their score). However, if you don't bubble in your last name first, I will take them away! Have a great break!

