

Dr. Bidlack's PRACTICE EXAMS BIO 1114 - General Biology

Revised 8 June 1998



**A supplementary guide to assist students
with sample questions from previous exams**

A NOTE TO STUDENTS

It has been my experience that acquiring knowledge is achieved more efficiently through active learning. Writing, drawing, gesturing, verbalizing, organizing, outlining, etc., may all be interpreted as active learning techniques. Perhaps the best technique for learning is through question and answer. Sometimes we learn by making a mistake and being corrected. Some of the biggest mistakes I have made on exams are the most remembered. Perhaps you have made a mistake on an exam and shortly thereafter, felt that you could have gotten the right answer. Wouldn't it be great if you could do that before the exam?

Sample questions can provide students with a better idea of what type of questions to expect on actual exams taken during the semester. The sample questions provided in this packet are being provided to help students study for BIO 1114 (General Biology) exams. However, these sample questions should be used as a study guide and not as the sole source for exam preparation. For best performance on exams, it is recommended that you review your notes and the book thoroughly and THEN test your knowledge using these practice exams.

There are three samples provided in this packet for each of the four lecture exams you will be taking in BIO 1114 (General Biology). This is to provide you with multiple opportunities to simulate the exam experience before taking the actual exam. These exams are designed to take about 45 minutes - the same amount of time allotted for each exam you will be taking in class. There are no examples of the final exam.

While some of the sample questions may be very similar to those you encounter in lecture exams, be careful. The wording of questions may be changed enough to cause a different answer. The key is to *understand* the question in order to get the right answer.

Jim Bidlack, Ph.D.
University of Central Oklahoma

EXAM I
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section (10:30 or 11:30) _____

50 questions @ 2pts. each = 100 pts. total

Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You MUST WRITE THE LETTER of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

- _____ 1. The level of organization of life discussed in lecture which is placed at or follows the level, molecule, and precedes organelle is: a) atom b) tissue c) protein d) cell e) population
- _____ 2. Smallest unit of life that can exist as a separate entity is a) a multicellular organism b) an organ c) an atom d) a cell e) an enzyme
- _____ 3. An example of homeostasis is a) ability to make progeny without sexual reproduction b) interaction between an angry cat and a mad dog c) maintenance of body temperature d) survival of the fittest e) entropy
- _____ 4. A proper sequence of topics in scientific papers is (I= introduction, L= literature cited, M= materials & methods, R= results & discussion, T=title) a) I-L-M-R-T b) T-R-I-L-M c) T-L-M-I-R d) T-I-M-R-L e) T-M-R-L-I
- _____ 5. Darwin's Theory supports all of the following EXCEPT a) thought-invoked mutations b) mutations which improve chances of survival c) heritable variation d) differential reproduction e) survival of the fittest
- _____ 6. The copperhead snake (Agkistrodon contortrix) belongs to which Phylum? a) Reptilia b) Chordata c) Animalia d) Mammalia e) Carnivora
- _____ 7. Members of the Kingdom Monera are distinguished from all the other Kingdoms because they are a) autotrophic b) heterotrophic c) photosynthetic d) procaryotic e) eucaryotic
- _____ 8. Organisms which are multicellular, eucaryotic, heterotrophic, and often plant or meat eaters are classified in which Kingdom a) Animalia b) Protista c) Fungi d) Plantae e) Monera
- _____ 9. Elements are composed of all of the following EXCEPT a) electrons b) photons c) neutrons d) protons e) charged particles
- _____ 10. The type of bond described as a sharing of electrons is a) covalent b) ionic c) hydrogen d) Van der Waal e) salt
- _____ 11. An abundance of ions in a chemical system which provide resistance to change in pH is an example of what chemical phenomena? a) solubility b) buffering capacity c) ion availability d) oxidation-reduction e) none of the above

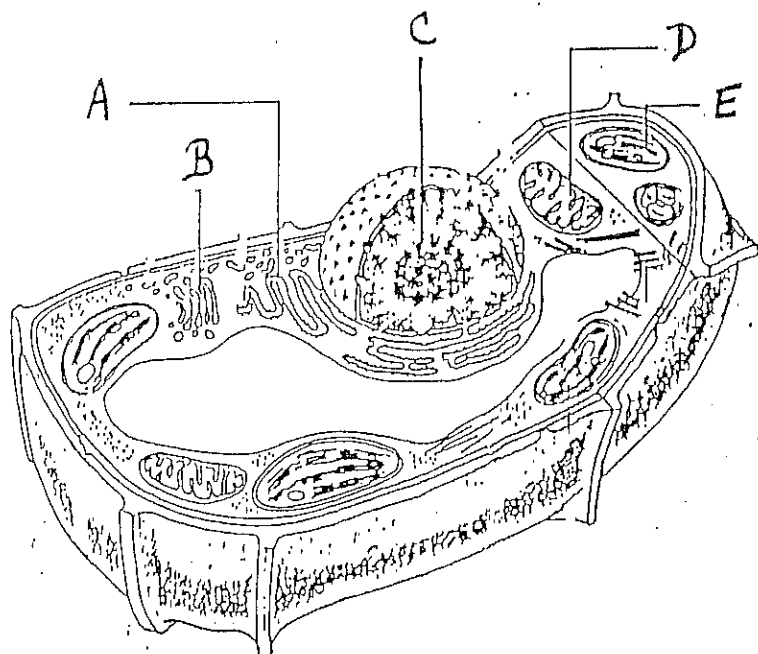
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- ___ 12. Addition of weak acid or base to purple cabbage (water-soluble) extract results in a color change because a) chlorophyll is sensitive to pH b) chlorophyll is sensitive to the redox potential of the surrounding solution c) anthocyanin is sensitive to pH d) proteins in cabbage denature upon addition of acid or base e) it doesn't really change color
- ___ 13. A solution with an H^+ concentration of $10^{-8.97}$ is a) acidic b) basic c) neutral
- ___ 14. The reaction, acetaldehyde + $2H^+$ + 2 electrons \implies ethanol, represents a) an oxidation of acetaldehyde b) a reduction of acetaldehyde
- ___ 15. Chemicals can be found in which portion of the cell? a) cell wall b) nucleolus c) lysosome d) chloroplast e) everywhere
- ___ 16. A characteristic of plant and animal eucaryotes which make them unique from procaryotes is a) presence of chloroplasts b) absence of a cell wall c) a true nucleus d) absence of DNA e) presence of DNA

Questions 17-21: Write the letter to the left of the item which corresponds to the figure depicted below:

- ___ 17. Nucleolus
- ___ 18. Chloroplast
- ___ 19. Mitochondrion
- ___ 20. Golgi apparatus (dictyosome)
- ___ 21. Endoplasmic reticulum



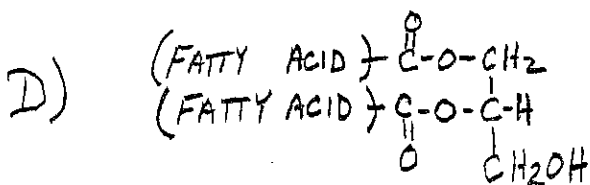
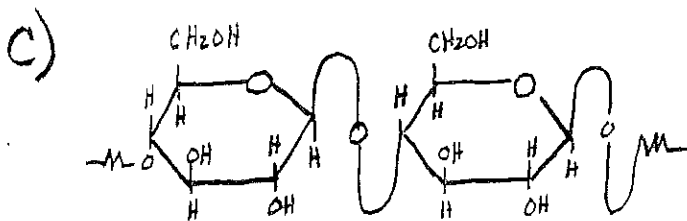
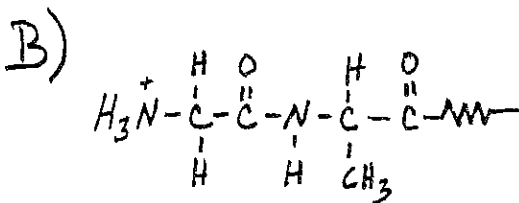
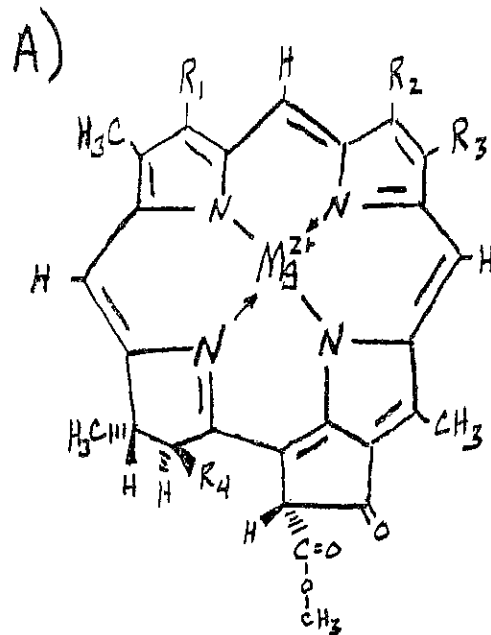
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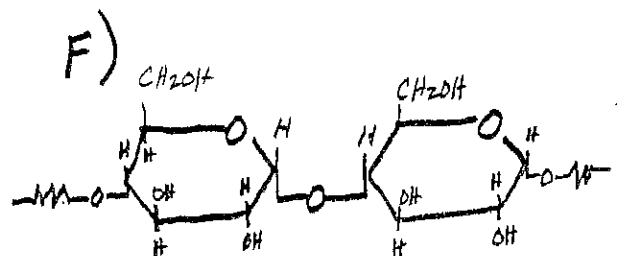
- ___ 22. Plants can generally be distinguished from animals because they have a) chloroplasts b) a nuclear envelope c) a cell wall d) a and c only e) a, b, and c
- ___ 23. An organelle which functions as the primary site of cellular respiration is the a) nucleus b) nucleolus c) chloroplast d) mitochondrion e) endoplasmic reticulum
- ___ 24. Starch and cellulose are composed of a) glucose b) fructose c) a and b d) ribose e) all of the above
- ___ 25. Porphyrins are molecules which play a major role in a) photosynthesis (chlorophyll) b) oxygen transport (hemoglobin) c) fat storage (glycerol) d) a and b e) all of the above
- ___ 26. Which class of biological molecules are distinguished from the others because they contain peptide bonds? a) proteins b) carbohydrates c) lipids d) porphyrins e) nucleic acids

Questions 27-32: Write the letter to the left of the item which corresponds to the structure or compound name depicted below:

- ___ 27. Starch
- ___ 28. Cellulose
- ___ 29. Lipid
- ___ 30. Protein
- ___ 31. Nucleic acid
- ___ 32. Chlorophyll



E) THYMINE



- _____ 33. Which of the following combinations is (are) considered to be acceptable for pairing in the DNA molecule? a) purine with purine b) adenine with guanine c) pyrimidine with pyrimidine d) thymine with cytosine e) adenine with thymine
- _____ 34. Conservation of energy is described in a) Darwin's Theory b) The First Law of Thermodynamics c) The Second Law of Thermodynamics d) The Third Law of Thermodynamics
- _____ 35. Enzymes function a) as suppliers of energy b) by lowering the activation energy of a reaction c) as catalysts d) b and c e) all of the above
- _____ 36. Which of the following can change enzyme activity? a) pH b) temperature c) an allosteric site d) presence or absence of cofactors e) a and b only f) a, b, c, and d
- _____ 37. The universal "currency" of free energy in the cell is a) glucose b) DNA c) RNA d) CO₂ e) ATP
- _____ 38. In photosynthesis, light energy is converted into _____ (and) _____, which is used to fix _____ (to form) _____.
- Sugars and ATP; NADPH to form Carbohydrates
 - Protons and Neutrons; ATP to form NADH
 - ATP and NADPH; CO₂ to form Carbohydrates
 - Photons and ATP; O₂ to form Water
 - Energy and Water; ATP to form Carbohydrates
- _____ 39. When chlorophyll captures a unit of light energy it a) becomes excited b) fixes CO₂ c) oxidizes glucose d) degrades e) produces ATP
- _____ 40. Cyclic and non-cyclic photophosphorylation can be distinguished from each other on the basis of a) ATP production b) NADPH production c) a and b d) none of the above
- _____ 41. Use of energy from non-cyclic photophosphorylation to fix CO₂ into carbohydrates is known as a) the TCA cycle b) the Krebs cycle c) glycolysis d) the dark reactions of photosynthesis e) the light reactions of photosynthesis
- _____ 42. Why is photosynthesis important? a) it harvests light energy and uses it to fix CO₂ into foodstuffs for other organisms b) it provides oxygen for respiratory organisms c) it is essential for life on earth d) a and b only e) a, b, and c
- _____ 43. After photosynthesis, carbohydrates are often directed through what sequence of events to obtain a good supply of ATP? a) oxidative phosphorylation, reduction, glycolysis b) glycolysis, Krebs cycle, oxidative phosphorylation c) Krebs cycle, glycolysis, oxidative phosphorylation d) glycolysis, oxidative phosphorylation, Krebs cycle e) glycolysis, reduction, Krebs cycle
- _____ 44. Which of the following is not a component of respiration? a) oxidative phosphorylation b) Calvin cycle c) citric acid cycle d) glycolysis e) Krebs cycle
- _____ 45. Respiration occurs in what part(s) of the cell? a) cytosol b) mitochondrion c) chloroplast d) a and b e) b and c f) a, b, and c

- _____ 46. Why is ethanol production a poor alternative for cellular respiration? a) ethanol makes the cell sluggish b) ATP yield from glucose is relatively low when ethanol is produced c) cells cannot metabolize ethanol d) ethanol can spontaneously burst into flames when oxygen is present e) none of the above
- _____ 47. Oxidative phosphorylation is important to metabolism because it a) phosphorylates proteins to give them energy b) provides an alternative to cyclic photophosphorylation c) couples electron transport and an H^+ gradient to make ATP d) releases oxygen
- _____ 48. Where is CO_2 released in respiration? a) glycolysis b) Krebs cycle c) somewhere between glycolysis and Krebs cycle d) b and c e) a, b, and c
- _____ 49. Which of the following organisms "respire?" a) plants b) animals c) a and b d) neither a nor b
- _____ 50. Scientists perform this last step as a part of the scientific method a) repeat the test b) make a conclusion c) examine alternative hypotheses d) predict what will happen e) summarize the data

EXAM I
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

MULTIPLE CHOICE AND MATCHING (86%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

MATCHING (14%): Match the letter corresponding to the metabolic title, metabolite, or metabolic event depicted in the figure.

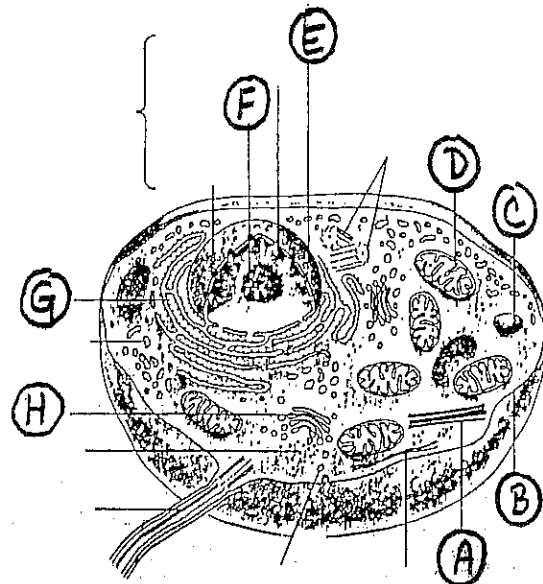
SECTION I: MULTIPLE CHOICE AND MATCHING (43 questions at 2 points each = 86 points).

- _____ 1. The level of organization of life discussed in lecture which follows the level, organelle, and precedes tissue is: A)organ B)organ system C)molecule D)cell E)atom
- _____ 2. According to the definition of life, a virus is A)living B)non-living
- _____ 3. Genetic material responsible for inheritance and transmission from parent to offspring is called A)water B)enzyme C)RUBISCO D)DNA E)glucose
- _____ 4. What aspect of life is responsible for energy transfer and is defined as the summation of a cell's chemical processes? A)metabolism B)reproduction C)oxidation D)photosynthesis E)mitosis
- _____ 5. Smallest unit of life that can exist as a separate entity is A)a multicellular organism B)an organ C)an atom D)a cell E)an enzyme
- _____ 6. Another name for hypothesis is A)question B)induction C)deduction D)test E)conclusion F)a and c only
- _____ 7. Who devised the Theory of Natural Selection? A)Watson and Crick B)Linus Pauling C)George Bush D)Gregor Mendel E)Charles Darwin
- _____ 8. Man, dog, and rabbit belong to A)Kingdom Animalia B)Phylum Chordata C)Class Mammalia D)Order Carnivora E)a and b only F)a, b, and c only G)a, b, c, and d
- _____ 9. The scientific name of the redbud tree is: A) C. canadensis B)canadensis C)Cercis canadensis D)Cercis canadensis E)Cercis canadensis F)a, b, and c only G)a, b, c, d and e
- _____ 10. Organisms that are almost always photosynthetic autotrophs are members of the Kingdom A)Monera B)Protists C)Fungi D)Plantae E)Animalia
- _____ 11. The Kingdom Protista can include A)worms B)bacteria C)slime molds D)some algae E)a and c only F)a, b, and c only G)c and d only H)a, c, and e only

- ___ 12. The type of bond in which a partial negative charge of oxygen is attracted to a partial positive charge of hydrogen is called A)salt B)Van der Waal C)covalent D)hydrogen E)ionic
- ___ 13. What element(s) constitute(s) 96% of human weight? A)hydrogen B)nitrogen C)oxygen D)carbon E)a and c only F)a and b only G)a and d only H)a, c and d only I)b, c, and d only
- ___ 14. A solution with an H^+ concentration of $10^{-4.23}$ is A)acidic B)basic c) neutral
- ___ 15. The reaction, acetaldehyde + $2H^+$ + 2 electrons \implies ethanol, represents A)an oxidation of ethanol B)a reduction of ethanol
- ___ 16. Which of the following is (are) NOT important for cell metabolism? A)molybdenum B)zinc C)magnesium D)helium E)a and c only F)b and c only
- ___ 17. A characteristic of plant and animal eucaryotes which make them unique from procaryotes is A)presence of chloroplasts B)absence of a cell wall C)a true nucleus D)absence of DNA E)presence of DNA

Questions 18-23: Write the letter to the left of the item which corresponds to the figure depicted below. Answers may be used only once; not all answers are used.

- ___ 18. Processing of DNA to make RNA (transcription)
- ___ 19. Protein synthesis
- ___ 20. Cellular respiration and ATP formation
- ___ 21. Regulation of substances moving in and out of cell
- ___ 22. Intracellular digestion (break-down of unwanted materials)
- ___ 23. Packaging of proteins for eventual transport



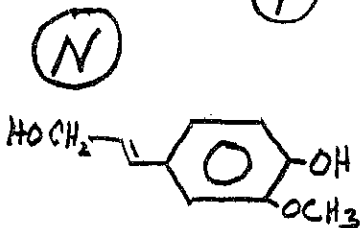
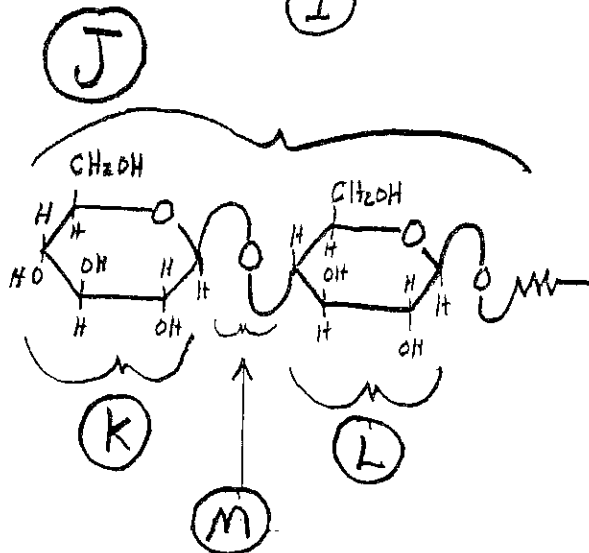
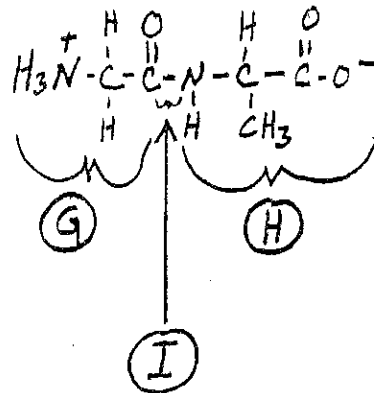
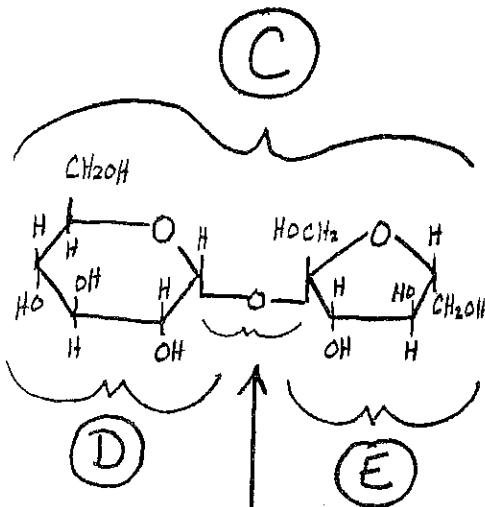
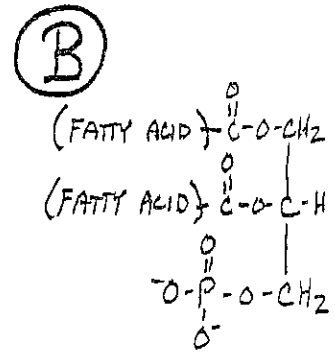
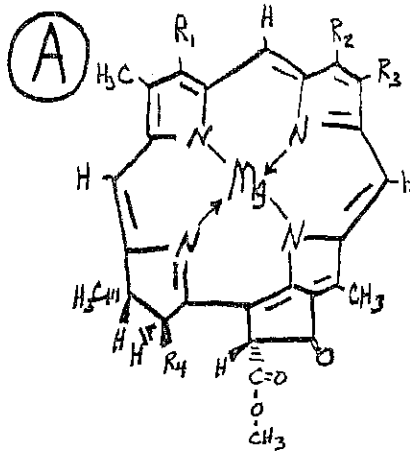
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- ___ 24. Plants can generally be distinguished from animals because they have
 A)chloroplasts B)a nuclear envelope C)a cell wall D)a and c only E)a, b, and c
- ___ 25. Starch and cellulose are composed of A)glucose B)fructose C)ribose D)a and b only E)a, b, and c

Questions 26-33: Write the letter to the left of the item which corresponds to the structure or compound name depicted below. Answers may be used only once; not all answers are used.

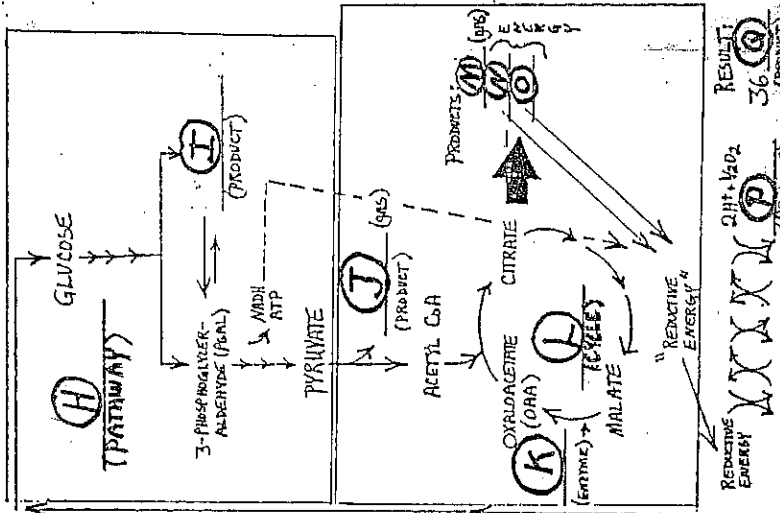
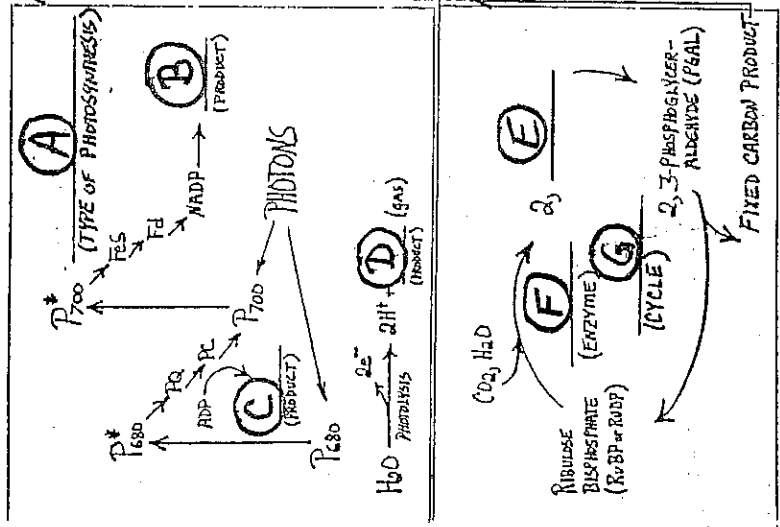
- ___ 26. Sucrose
 ___ 27. Cellulose
 ___ 28. α -D-Glucose
 ___ 29. Peptide bond
 ___ 30. β (1 \rightarrow 4) linkage
 ___ 31. Chlorophyll
 ___ 32. Phospholipid
 ___ 33. Phenolic



- _____ 34. What is another name for a protein that catalyzes metabolic reactions? A)sugar B)sucrose C)ATP D)cofactor E)enzyme
- _____ 35. Which of the following combinations is considered to be acceptable for pairing in the DNA molecule? A)purine with purine B)adenine with guanine C)pyrimidine with pyrimidine D)thymine with cytosine E)adenine with thymine
- _____ 36. Entropy is described in A)Darwin's Theory B)The First Law of Thermodynamics C)The Second Law of Thermodynamics D)The Third Law of Thermodynamics
- _____ 37. The universal "currency" of free energy in the cell is A)glucose B)DNA C)RNA D)CO₂ E)ATP
- _____ 38. In photosynthesis, light energy is converted into _____ (and) _____, which is used to fix _____ (to form) _____.
- A) Sugars and ATP; NADPH to form Carbohydrates
 B) Protons and Neutrons; ATP to form NADH
 C) ATP and NADPH; CO₂ to form Carbohydrates
 D) Photons and ATP; O₂ to form Water
 E) Energy and Water; ATP to form Carbohydrates
- _____ 39. When chlorophyll captures a unit of light energy it A)becomes excited B)fixes CO₂ C)oxidizes glucose D)degrades E)produces ATP
- _____ 40. Cyclic and non-cyclic photophosphorylation can be distinguished from each other on the basis of A)ATP production B)NADPH production C)a and b D)neither a nor b
- _____ 41. Use of energy from non-cyclic photophosphorylation to fix CO₂ into carbohydrates is known as A)the TCA cycle B)the Krebs cycle C)glycolysis D)the dark reactions of photosynthesis E)the light reactions of photosynthesis
- _____ 42. Why is photosynthesis important? A)it harvests light energy and uses it to fix CO₂ into foodstuffs for other organisms B)it provides oxygen for respiratory organisms C)it is essential for life on earth D) a and b only E) a, b, and c
- _____ 43. What sequence of events is essential for enabling hereditary material to make you "do the things you do?" A)RNA makes DNA makes protein B)protein makes DNA makes RNA C)DNA makes RNA makes protein D)RNA makes protein makes DNA E)DNA makes protein makes RNA

SECTION II. MATCHING (14 questions at 1 point each = 14 total points). More than one answer may be correct for each question.

1. Glycolysis
2. Calvin cycle
3. Krebs cycle (also called TCA)
4. Non-cyclic photophosphorylation
5. ATP
6. NADPH
7. $FADH_2$
8. CO_2 (carbon dioxide)
9. O_2 (oxygen)
10. H_2O (water)
11. 3-PGA (3-phosphoglyceric aldehyde)
12. DHAP (dihydroxyacetone phosphate)
13. RUBISCO (ribulose biphosphate carboxylase / oxygenase)
14. MDH (malate dehydrogenase)



EXAM I
General Biology 1114
 (Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

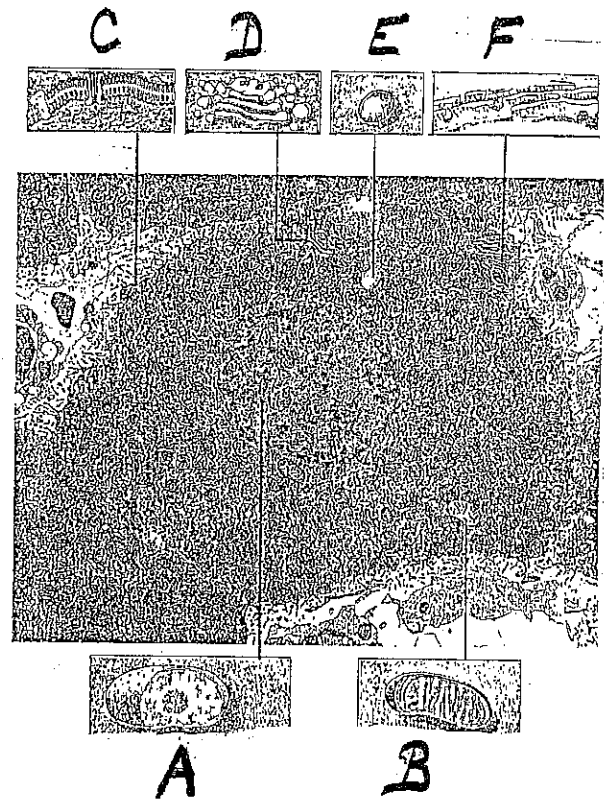
MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

- _____ 1. Which of the following is (are) living? A)rock B)frog C)bacterium D)virus E)b and c only F)b and d only
- _____ 2. Genetic material responsible for inheritance and transmission from parent to offspring is called A)DNA B)enzyme C)RUBISCO D)ATP E)glucose
- _____ 3. Cyclic and non-cyclic photophosphorylation can be distinguished from each other on the basis of A)ATP production B)NADPH production C)a and b D)neither a nor b
- _____ 4. Respiration occurs in what part(s) of an animal cell? A)cytoplasm B)mitochondrion C)chloroplast D)a and b only E)b and c only F)a, b, and c
- _____ 5. Smallest unit of life that can exist as a separate entity is A)a multicellular organism B)an organ C)an atom D)a cell E)an enzyme
- _____ 6. What term associated with pH means "resistance to change?" A)acidity B)basicity C)stubborn D)buffering capacity E)redox potential F)oxidation
- _____ 7. A cell which lacks a true nucleus is called A)impossible B)eucaryotic C)autotrophic D)heterotrophic E)procaryotic
- _____ 8. What organelle is responsible for photosynthesis? A)golgi apparatus B)nucleus C)chloroplast D)mitochondrion E)ribosome
- _____ 9. Polar substances are _____; nonpolar substances are _____.
 A)hydrophilic; also hydrophilic
 B)hydrophilic; hydrophobic
 C)hydrophobic; also hydrophobic
 D)hydrophobic; hydrophilic
- _____ 10. Name the CLASS to which both dog and man belong A)primates B)carnivora C)mammalia D)chordata E)animalia
- _____ 11. Organisms that are prokaryotic belong to the Kingdom A)Monera B)Protista C)Fungi D)Plantae E)Animalia

- _____ 12. The type of bond common in salts in which opposite charges attract is called
A)repulsion-attraction B)Van der Waal C)covalent D)hydrogen E)ionic
- _____ 13. The Calvin-Benson cycle begins when A)light is available B)light is not available
C)carbon dioxide is attached to RuBP D)electrons leave a photosystem
- _____ 14. What element(s) constitute(s) 75 to 85% of a cell's weight? A)hydrogen B)nitrogen
C)oxygen D)chromium E)a and c only F)a and b only G)a and d only H)a, c and d
only I)b, c, and d only

Questions 15-19: Write the letter to the left of the item which corresponds to the figure depicted below. Answers may be used only once.

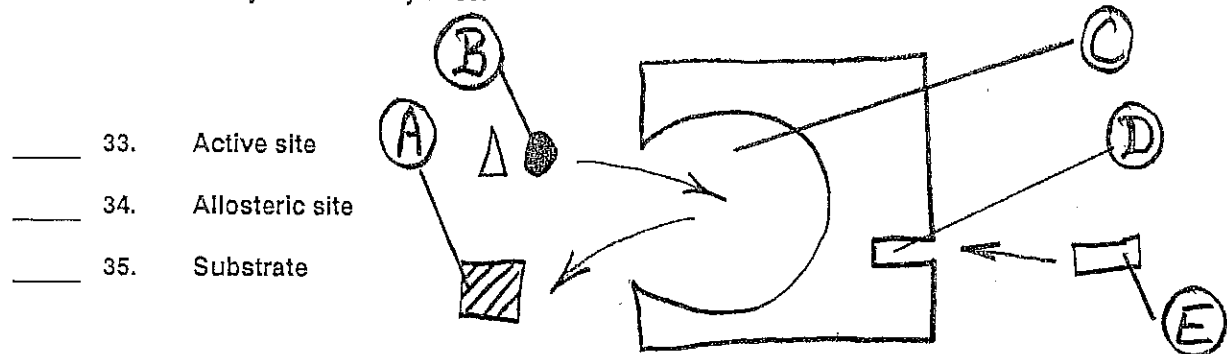
- _____ 15. Mitochondrion
- _____ 16. Plasma membrane
- _____ 17. Lysosome
- _____ 18. Golgi complex (Dictyosome)
- _____ 19. Nucleus



- _____ 20. What type of cell is depicted in the above figure? A)eucaryotic B)procaryotic
C)plant D)animal E)a and c only F)a and d only G)b and c only H)b and d only

- _____ 32. What is another name for a protein that catalyzes metabolic reactions? A)sugar
B)sucrose C)ATP D)cofactor E)enzyme

Questions 33-35: Write the letter to the left of the item which corresponds to that which is depicted below. Answers may be used only once.



- _____ 33. Active site
_____ 34. Allosteric site
_____ 35. Substrate
- _____ 36. The level of organization of life discussed in lecture which follows the level, molecule, and precedes organelle is: A)atom B)protein C)cell D)subatomic particle E)organ
- _____ 37. The definition of life includes the sum properties of all of the following EXCEPT A)growth B)irritability C)color D)reproduction E)movement F)metabolism
- _____ 38. When chlorophyll captures a unit of light energy it A)becomes excited B)fixes CO₂ C)oxidizes glucose D)degrades E)produces ATP
- _____ 39. In photosynthesis, light energy is converted into _____ (and) _____, which is used to fix _____ (to form) _____.
A) Sugars and ATP; NADPH to form Carbohydrates
B) Photons and ATP; O₂ to form Water
C) Energy and Water; ATP to form Carbohydrates
D) Protons and Neutrons; ATP to form NADH
E) ATP and NADPH; CO₂ to form Carbohydrates
- _____ 40. What is the most abundant and thought to be one of the most important enzyme on Earth? A)malate dehydrogenase (MDH) B) α -ketoglutarate dehydrogenase (α -KGDH) C)ribulose bisphosphate carboxylase/oxygenase (RUBISCO) D)phosphoenolpyruvate (PEP) carboxylase E)biology getanAase (BGAA)
- _____ 41. Why is lactic acid a poor alternative for cellular respiration? A)lactic acid makes the cell sluggish B)cells cannot metabolize lactic acid C)ATP yield from lactic acid is low D)lactic acid can spontaneously form milk and clog cell membranes E)none of the above
- _____ 42. What metabolite is the product of glycolysis? A)DHAP B)3-PGAL C)CO₂ D)pyruvate E)citric acid

- _____ 43. Which of the following organisms "respire?" A)plants B)animals C)a and b
D)neither a nor b
- _____ 44. What sequence of events is essential for enabling hereditary material to make you
"do the things you do?" A)RNA makes DNA makes protein B)protein makes DNA
makes RNA C)DNA makes RNA makes protein D)RNA makes protein makes DNA
E)DNA makes protein makes RNA
- _____ 45. That each of us has great, great, great, great, grandmothers and grandfathers is an
example of a unique property of life known as A)metabolism B)homeostasis
C)reproduction D)organization
- _____ 46. What sequence of events best defines the scientific method?
A)test, question, deduction, induction, repeat, conclude, alternative hypothesis
B)induction, question, test, deduction, repeat, conclude, alternative hypothesis
C)induction, test, question, deduction, repeat, alternative hypothesis, conclude
D)question, induction, deduction, test, repeat, conclude, alternative hypothesis
E)test, induction, question, deduction, repeat, conclude, alternative hypothesis
- _____ 47. The passive movement of a substance *through channel proteins* as it follows its
concentration gradient across a cell membrane is called A)osmosis B)active
transport C)diffusion D)facilitated diffusion
- _____ 48. Which of the following is *not* an aspect of metabolism?
A)breaking down large molecules into simpler ones
B)constructing large molecules from simpler ones
C)acquiring energy
D)using energy
E)none of the above
- _____ 49. The reaction, acetaldehyde + NADH + 2H⁺ + 2 electrons == => ethanol + NAD,
represents A)an oxidation of acetaldehyde B)a reduction of acetaldehyde
- _____ 50. The flow of _____ through channel proteins in the inner mitochondrial membrane
provide the energy to couple ADP and inorganic phosphate to form ATP.
A)electrons
B)hydrogen ions
C)NADH
D)FADH₂

EXAM II
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section (10:30 or 11:30) _____

MULTIPLE CHOICE, MATCHING, and TRUE/FALSE (90%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You MUST WRITE THE LETTER of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SHORT ANSWER (10%): Provide a complete answer with the appropriate words or symbols to receive credit.

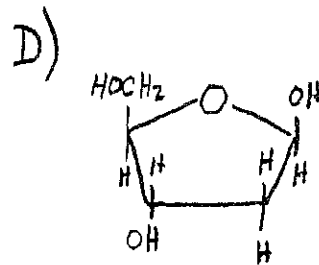
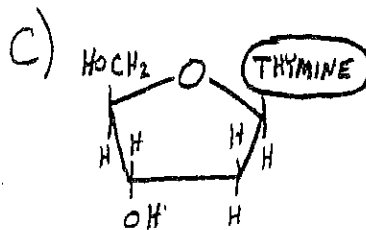
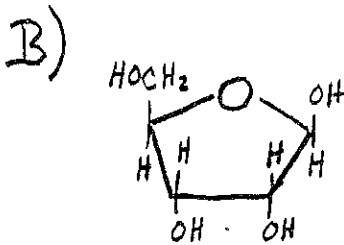
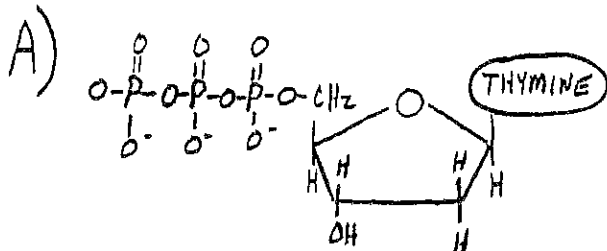
SECTION I: MULTIPLE CHOICE (45 questions at 2 points each = 90 points).

- _____ 1. Two scientists recognized for deducing the double helical structure of DNA are A) Oswald and Avery B) Franklin and Pauling C) Griffith and Pauling D) Wilkins and Avery E) Watson and Crick
- _____ 2. Linus Pauling is recognized for A) winning a two Nobel prizes B) deducing the double helical nature of DNA C) hypothesizing a DNA triple helix D) a and c E) a, b, and c
- _____ 3. An ornithologist, who had a "what is life?" approach to science, and who later became a prominent figure in deducing the structure of DNA is A) James Watson B) Linus Pauling C) Rosalind Franklin D) Fred Griffith E) Salvador Luria
- _____ 4. DNA can be composed of all of the following EXCEPT A) phosphates B) purines C) glucose D) thymine E) deoxyribose
- _____ 5. Semiconservative replication refers to A) translation B) transcription C) synthesis of two daughter DNA stands from two mother DNA strands D) protein synthesis E) a and d
- _____ 6. Bonds which hold strands of DNA together in the double helix are called A) covalent B) ionic C) hydrogen D) nucleotide E) nucleoside
- _____ 7. How many sites does DNA replication begin on in bacteria and viruses? A) millions B) thousands C) hundreds D) one E) DNA does not replicate in procaryotes
- _____ 8. What enzymes catalyze the step-by-step addition of units to the DNA chain and proofread newly synthesized strands? A) Okazaki B) DNA polymerases C) non-catalytic D) synthases E) RNA polymerases
- _____ 9. A phenomenon associated with unwinding DNA that results in "kinks" and double coils in the chain is called A) complex coiling B) double coiling C) supercoiling D) backcoiling E) kinking
- _____ 10. In order for replication to proceed properly, DNA must be unwound by the enzyme A) helicase B) unwindase C) gyrase D) catalase E) replicase

- _____ 11. RNA contains all of the following EXCEPT A) thymine B) adenine C) uracil D) cytosine E) guanine
- _____ 12. A type of RNA associated with matching proteins with triplets on chain is called A) matching RNA B) messenger RNA C) transfer RNA D) ribosomal RNA E) protein RNA
- _____ 13. Transcription differs from DNA replication because A) RNA polymerases function instead of DNA polymerases B) several strands of RNA can be synthesized at one time as opposed to a single stand of DNA C) only one strand of DNA is transcribed while replication involves both stands of DNA D) a and b E) a, b, and c
- _____ 14. A promoter in transcription is usually associated with the base sequence, A) AUG B) TATA C) AAAAAAAAAA D) cap E) ATAT
- _____ 15. Transcription takes place A) on the ribosomes B) in the endoplasmic reticulum C) in the nucleus D) in the golgi apparatus E) a and b
- _____ 16. Translation takes place A) on the ribosomes B) in the nucleus C) in the cell wall D) in the golgi apparatus E) in the middle lamella
- _____ 17. The proper sequence of events in translation is A) initiation, transcription, termination B) chain elongation, initiation, termination C) initiation, chain elongation, chain termination D) initiation, transcription, chain elongation E) transcription, chain elongation, chain termination
- _____ 18. A section of DNA which encodes a specific trait is called a(n) A) chromosome B) initiator C) gene D) activator E) protein

Choose from the figures below (A, B, C, and D) to answer questions 19 through 21:

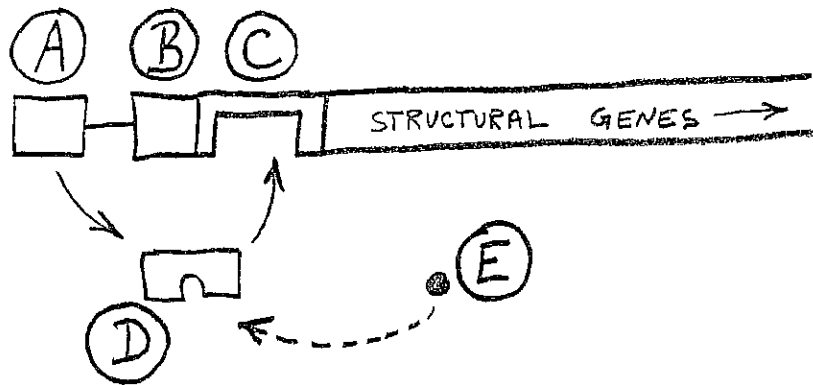
- _____ 19. Deoxyribose
- _____ 20. A nucleoside
- _____ 21. A nucleotide



- _____ 22. The proper sequence of events in transcription is (M = modification P = promotion, R = release T = transcription) A) M-P-R-T B) R-T-M-P C) P-T-R-M D) R-P-T-M E) P-M-R-T
- _____ 23. Transcript modification in eucaryotes involves A) exon removal B) intron removal C) cap D) tail E) a and c F) b, c, and d

Use the letters corresponding to items on the operon model depicted below to answer questions 24 through 27:

- _____ 24. Regulator gene
- _____ 25. Repressor
- _____ 26. Operator
- _____ 27. Promoter



- _____ 28. A type of natural recombination which refers to genes that "jump" from one region of DNA to another is called A) transposition B) rearrangement C) crossing over D) mutation E) microinjection
- _____ 29. Targeted DNA manipulation by recombinant DNA technology has potential to A) alter proteins of interest in living organisms B) transfer DNA encoding unique traits from one organism to another organism C) remove undesirable traits from living organisms D) a and b only E) a, b, and c
- _____ 30. Which phase of the cell cycle is NOT a part of mitosis? A) anaphase B) interphase C) telophase D) metaphase E) prophase
- _____ 31. Cytokinesis is associated with which phase(s) of the cell cycle? A) interphase B) late anaphase C) telophase D) a and b E) b and c
- _____ 32. The phase in which homologous chromosomes line up on an equilateral plane in different combinations is called A) telophase I B) telophase II C) metaphase I D) metaphase II E) anaphase II

- _____ 33. In plants, meiosis directly produces A) egg and sperm B) ovary and pollen C) gametes D) megaspores and microspores E) a and c
- _____ 34. Sex chromosomes are A) brother chromatids B) homologous C) sister chromatids D) centromeres D) kinetochores
- _____ 35. What type of cell division leads to variation of species? a) fission b) meiosis I c) meiosis II d) interkinesis e) mitosis
- _____ 36. If "A" designates the dominant allele (free ear lobes) and "a" designates the recessive allele (fused ear lobes), then what does the allelic combination, "Aa" designate? A) one ear fused and the other ear free B) both ears fused C) both ears free D) both ears partially free
- _____ 37. When two heterozygous (Aa) individuals mate to produce offspring, the result is
A) 50% homozygous & dominant, 50% homozygous & recessive
B) 25% homozygous & dominant, 50% heterozygous (expressing dominant), 25% homozygous & recessive
C) 50% homozygous & dominant, 25% heterozygous (expressing dominant), 25% homozygous & recessive
D) 33% homozygous & dominant, 33% heterozygous (expressing dominant), 33% homozygous & recessive
- _____ 38. Epistasis is associated with A) one gene pair masking expression of another B) expression of a gene on some unrelated phenotypic trait C) climate affecting expression of a gene D) sickle-cell anemia E) b and d
- _____ 39. The following statement, "individuals do not evolve; populations do," is A) true B) false
- _____ 40. Who worked with mice and bacteria to show that instruction from a dead cell could successfully be transferred to a live cell? A) James Watson B) Fred Griffith C) Linus Pauling D) Rosalind Franklin E) Maurice Wilkins
- _____ 41. Random fluctuation in allele frequencies as a result of random chance is called A) gene flow B) genetic drift C) mutation D) natural selection
- _____ 42. Five (5) homologous chromosomes can line up in how many different combinations during meiosis I? A) 10 B) 5 C) 16 D) 32 E) 64
- _____ 43. Phenotype is A) the same as genotype B) an interaction between genotype and environment C) amount of phenylalanine in an organism D) observable aspects of an individual E) b and d
- _____ 44. What molecule(s) contain(s) (the) genetic information which makes you a unique individual? A) protein B) enzymes C) DNA D) glucose E) a and b
- _____ 45. A set of three nucleotides in mRNA is called A) a triplet B) a codon C) an anticodon D) DNA E) confusing

SECTION II. FILL-IN-THE-BLANK (3 questions at 1 point each = 3 total points)

1. _____ ^{transcription} =====> 2. _____ ^{translation} =====> 3. _____

=====>
 =====>
 =====>

M
E
T
A
B
O
L
I
S
M

SECTION III. Depicted below is a DNA molecule which needs to be transcribed and translated. Transcribe this molecule and then use the table on the next page to translate it into an abbreviated protein product (7 total points).

5' ATG GGT GAC GAT CCA GAT TAG 3'
 3' TAC CCA CTG CTA GGT CTA ATC 5'

RNA: 5' _____ 3'

Protein: _____

First Letter	Second Letter				Third Letter
	U	C	A	G	
U	phenylalanine	serine	tyrosine	cysteine	U
	phenylalanine	serine	tyrosine	cysteine	C
	leucine	serine	stop	stop	A
	leucine	serine	stop	tryptophan	G
C	leucine	proline	histidine	arginine	U
	leucine	proline	histidine	arginine	C
	leucine	proline	glutamine	arginine	A
	leucine	proline	glutamine	arginine	G
A	isoleucine	threonine	asparagine	serine	U
	isoleucine	threonine	asparagine	serine	C
	isoleucine	threonine	lysine	arginine	A
	(start) methionine	threonine	lysine	arginine	G
G	valine	alanine	aspartate	glycine	U
	valine	alanine	aspartate	glycine	C
	valine	alanine	glutamate	glycine	A
	valine	alanine	glutamate	glycine	G

Figure 16.8 The genetic code by which an mRNA molecule, with its linear array of codons, is transcribed from a gene region of DNA.

EXAM II
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

FILL-IN-THE-BLANK (20%): Provide an accurate answer for each question by choosing from the list of terms provided.

MULTIPLE CHOICE, MATCHING, and TRUE/FALSE (70%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SHORT ANSWER (10%): Provide a complete answer with the appropriate words or symbols to receive credit.

SECTION I: FILL-IN-THE-BLANK (10 questions at 2 points each = 20 points). Choose from the following terms:

Fred Griffith
James Watson
Francis Crick
Linus Pauling
Maurice Wilkins

Deoxyribose
Ribose
Phosphate
Base (A,T,G, or C)
Helix

Helicase
Gyrase
mRNA
rRNA
tRNA

DNA Polymerase
RNA Polymerase
Adenine
Guanine
Uracil

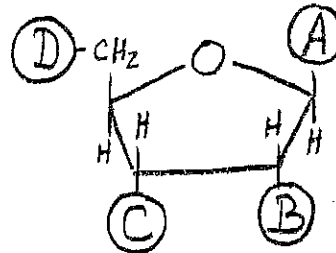
1. _____ . After leaving the Navy to study biology, this Noble Prize Recipient studied the chemical physics of biology because it interested him.
2. _____ . An enzyme responsible for removing positive supercoiling during DNA replication.
3. _____ . A main component of DNA that can be a purine or a pyrimidine.
4. _____ . This type of RNA carries the "blueprint" of DNA to the ribosomes.
5. _____ . A Nobel Prize Recipient who, with an unusual haircut and a "what is life" approach to science, worked with others to deduce the structure of DNA.
6. _____ . The base that replaces thymine in RNA.
7. _____ . An individual who worked with mice and bacteria to show that information could be transferred from one organism to another.
8. _____ . A hydrophilic portion of the DNA molecule that can be found to the outside of the molecule and connects sugars to each other.
9. _____ . This individual shared the Nobel Prize with others because of his work with X-rays to deduce the structure of DNA.
10. _____ . The main sugar component of DNA.

SECTION II: MULTIPLE CHOICE, MATCHING, AND TRUE/FALSE (35 questions at 2 points each = 70 points).

- _____ 1. The most brilliant and productive physical chemist of the century who won a Nobel Prize for the nature of the chemical bond and a Nobel Peace Prize for a march against atomic explosives is A)Francis Crick B)Saddam Hussein C)Rosalind Franklin D)Linus Pauling E)Cecie Starr
- _____ 2. Production of two half-old mother strands and two half-new daughter strands is A)observed in DNA replication B)called semiconservative replication C)enabled by several DNA replicating enzymes D)a and b only E)a, b, and c
- _____ 3. Okazaki fragments A)enable elongation to proceed in the proper direction on the "other" strand B)open the DNA double helix C)remove positive supercoiling D)a and b only E)a, b, and c
- _____ 4. Bonds which hold strands of DNA together in the double helix are called A)Okazaki B)nucleoside C)covalent D)hydrogen E)nucleotide F)phosphate
- _____ 5. How many sites does DNA replication usually begin on in bacteria? A)DNA does not replicate in procaryotes B)one C)two D)hundreds E)millions
- _____ 6. What enzymes catalyze step-by-step addition of base units to the DNA chain and proofread newly synthesized strands? A)synthases B)non-catalytic C)helicases D)RNA polymerases E)DNA polymerases

Use the figure depicted below to answer questions 7 through 9:

- _____ 7. Position where a hydroxyl group (OH) is removed to make deoxyribose
- _____ 8. Position where a base is attached to make a sugar into a nucleoside
- _____ 9. Position where one or more phosphate group(s) are attached to convert a nucleoside into a nucleotide

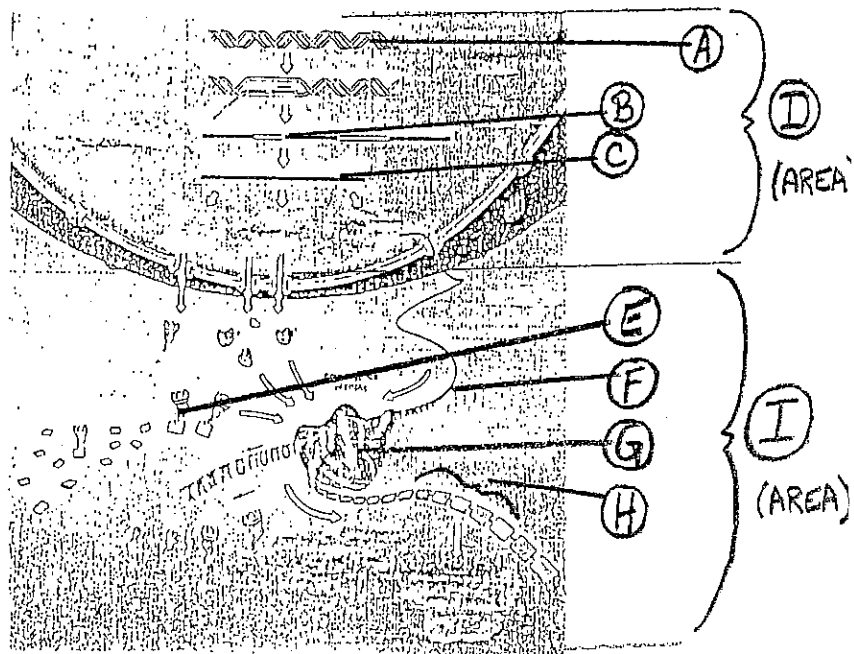


- _____ 10. Transcription differs from DNA replication because A)RNA polymerases function instead of DNA polymerases B)only one strand of DNA is transcribed while replication involves both strands of DNA C)only one strand of RNA can be synthesized in transcription while millions of DNA are always synthesized in replication D)a and b only E)a, b, and c

- ___ 11. RNA contains all of the following EXCEPT A)uracil B)adenine C)cytosine D)thymine E)guanine
- ___ 12. Transcription takes place A)on the ribosomes B)in the nucleolus C)in the nucleus D)in the golgi apparatus E)b and c only
- ___ 13. A promoter in transcription is usually associated with the base sequence A)AUG B)AAAAAAAA C)TATA D)cap E)TTTTTTTT
- ___ 14. The proper sequence of events in transcription is A)modification, release, promotion, synthesis B)release, modification, synthesis, promotion C)promotion, synthesis, modification, release D)modification, promotion, synthesis, release E)promotion, synthesis, release, modification

Use the figure depicted below to match items with terms in questions 15 through 20:

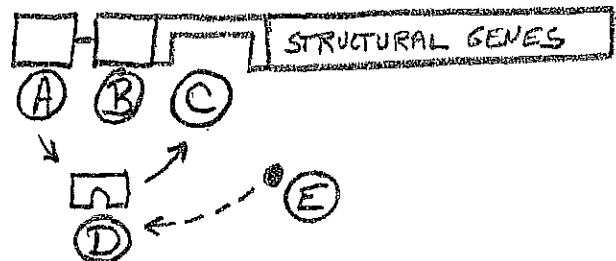
- ___ 15. Ribosomal subunit
- ___ 16. messenger RNA
- ___ 17. transfer RNA
- ___ 18. Newly-translated protein
- ___ 19. Nucleus
- ___ 20. Cytoplasm



- ___ 21. Synthesis of protein is also referred to as A)translation B)replication C)transcription D)catalysis E)b and d only F)b, c, and d only
- ___ 22. The proper sequence to events in translation is A)initiation, transcription, termination B)chain elongation, initiation, termination C)initiation, chain elongation, termination D)initiation, transcription, chain elongation E)transcription, chain elongation, termination

- _____ 23. Adjacent amino acids become aligned and form peptide bonds during
A)transcription B)chain termination C)initiation D)chain elongation E)a and b only
- _____ 24. A type of RNA responsible for matching proteins with triplets on a chain is called
A)transfer RNA B)messenger RNA C)matching RNA D)ribosomal RNA E)DNA RNA
- _____ 25. A section of DNA that encodes for a specific trait is called a(n) A)activator B)operon
C)protein D)gene E)chromosome

Use letters corresponding to items on the operon model depicted below to answer questions 26 through 27:



- _____ 26. Operator
- _____ 27. Activator protein
- _____ 28. Which of the following is (are) (a) form(s) of natural variation? A)crossing over
B)transposition C)recombination D)a and c only E)a and b only F)a, b, and c
- _____ 29. A diploid cell undergoing mitosis and the cell cycle results in A)two haploid cells
B)one haploid cell C)two diploid cells D)one diploid cell
- _____ 30. Cytokinesis is associated with which phase(s) of the cell cycle? A)interphase B)late
anaphase C)telophase D)a and b only E)b and c only
- _____ 31. The phase of meiosis in which homologous chromosomes line up on an equilateral
plane in different combinations is called A)anaphase I B)metaphase II C)prophase I
D)prophase II E)metaphase I
- _____ 32. What type of cell division leads to variation of species? A)meiosis I B)meiosis II
C)fission D)interkinesis E)mitosis
- _____ 33. Phenotype is A)interaction of genotype and environment B)how the organism looks
C)amount of phenylalanine in an organism D)a and b only E)a, b, and c
- _____ 34. When a heterozygous (Aa) male mates with a homozygous dominant female (AA),
the result is
A) All offspring demonstrate dominant traits
B) 50% of the offspring demonstrate dominant traits and 50% demonstrate
recessive traits
C) 75% of the offspring demonstrate dominant traits and 25% demonstrate
recessive traits
D) All offspring demonstrate recessive traits
- _____ 35. Speciation due to structure of reproductive organs is called A)behavioral
B)mechanical C)gamete isolation D)hybrid inviability E)time isolation

SECTION III. SHORT ANSWER (10 points)

Depicted below is a DNA molecule that needs to be transcribed and translated. Transcribe this molecule and then use the table on the next page to translate it into an abbreviated protein product.

5' ATG TTA CCG ATC TAG 3'
3' TAC AAT GGC TAG ATC 5'

RNA: 5' _____ 3'

Protein: _____

First Letter	Second Letter				Third Letter
	U	C	A	G	
U	phenylalanine	serine	tyrosine	cysteine	U
	phenylalanine	serine	tyrosine	cysteine	C
	leucine	serine	stop	stop	A
	leucine	serine	stop	tryptophan	G
C	leucine	proline	histidine	arginine	U
	leucine	proline	histidine	arginine	C
	leucine	proline	glutamine	arginine	A
	leucine	proline	glutamine	arginine	G
A	isoleucine	threonine	asparagine	serine	U
	isoleucine	threonine	asparagine	serine	C
	isoleucine	threonine	lysine	arginine	A
	(start) methionine	threonine	lysine	arginine	G
G	valine	alanine	aspartate	glycine	U
	valine	alanine	aspartate	glycine	C
	valine	alanine	glutamate	glycine	A
	valine	alanine	glutamate	glycine	G

29

Figure 16.8 The genetic code by which an mRNA molecule, with its linear array of codons, is transcribed from a gene region

S91

EXAM II
General Biology 1114
 (Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

MULTIPLE CHOICE, MATCHING, and TRUE/FALSE (86%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SHORT ANSWER (14%): Provide a complete answer with the appropriate words or symbols to receive credit.

SECTION I: MULTIPLE CHOICE, MATCHING, AND TRUE/FALSE (43 questions at 2 points each = 86 points).

- _____ 1. Who was the crystallographer hired in part by Maurice Wilkins that provided essential evidence for deducing the structure of DNA? A)Oswald Avery B)Rosalind Franklin C)James Watson D)Fred Griffith
- _____ 2. What was one of James Watson's main interests while attending the University of Chicago as an undergraduate? A)ants B)worms C)birds D)lizards E)cows
- _____ 3. Who shared the Noble Prize with Watson and Crick for deducing the structure and replication of DNA? A)Rosalind Franklin B)Linus Pauling C)George Bush D)Maurice Wilkins E)Oswald Avery
- _____ 4. What are the three main components of the DNA molecule? A)sugar, base, and phosphate B)deoxyribose, base, phosphate C)ribose, base, phosphate D)sugar, hydrogen bonds, water E)a and b only F)a and c only

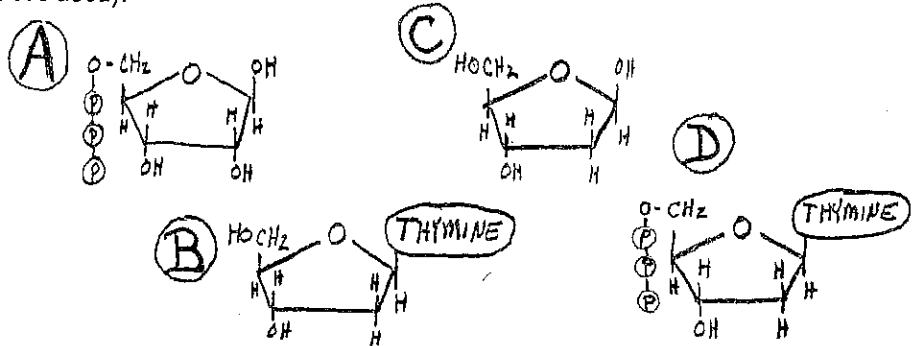
Questions 5 through 9: Match terms related to protein building appropriately.

- | | |
|--|--|
| _____ 5. Disrupts genetic instructions | A. interacting DNA control sites, regulatory proteins, enzymes, and hormones |
| _____ 6. Genetic code word | B. RNAs convert genetic messages into polypeptides |
| _____ 7. Transcription | C. Series of nucleotide bases |
| _____ 8. Translation | D. One DNA strand serves as the template |
| _____ 9. Gene expression | E. Gene recombination, changes in chromosome structure and number, gene mutation |

- _____ 10. What enzymes catalyze step-by-step addition of base units to the DNA chain and proofread newly synthesized strands? A) synthases B) non-catalytic C) helicases D) RNA polymerases E) DNA polymerases
- _____ 11. What enzymes are needed for DNA replication? A) gyrase B) helicase C) DNA polymerase D) a and b only E) a, b, and c
- _____ 12. The DNA of one species differs from others in its A) sugars B) phosphate groups C) base pair sequence D) all of the above
- _____ 13. DNA replication produces A) two half-old, half-new double stranded molecules B) two double stranded molecules, one with the old strands and one with newly assembled strands C) three new double-stranded molecules, one with both strands completely new and two that are discarded D) none of the above

Questions 14 through 15: Write the letter to the left of the item which corresponds to that which is depicted below (not all answers are used):

- _____ 14. Nucleotide
- _____ 15. Nucleoside
- _____ 16. Transfer RNA (tRNA) A) combines with proteins to form ribosomes B) carries the "blueprint" which is translated to protein C) carries proteins to the golgi apparatus D) matches proteins with triplets encoded by mRNA E) a and b only F) a, b, and c only
- _____ 17. RNA contains all of the following EXCEPT A) uracil B) adenine C) cytosine D) thymine E) guanine
- _____ 18. The proper sequence of events in translation is A) initiation, transcription, termination B) chain elongation, initiation, termination C) initiation, chain elongation, termination D) initiation, transcription, chain elongation E) transcription, chain elongation, termination
- _____ 19. Using the metabolic machinery of a bacterial cell to produce multiple copies of genes carried on hybrid plasmids is A) a way to create a DNA library B) bacterial conjugation C) mapping a genome D) DNA amplification
- _____ 20. Transcription differs from DNA replication because A) RNA polymerases function instead of DNA polymerases B) only one strand of DNA is transcribed while replication involves both strands of DNA C) only one strand of RNA can be synthesized in transcription while millions of DNA are always synthesized in replication D) a and b only E) a, b, and c



- _____ 21. Where does transcription take place? A)in the nucleus B)in the cell membrane C)on the ribosomes D)in the microtubule E)in the lysosome
- _____ 22. Which sequence probably encodes a promoter region for transcription? A)AAAAATAAAAAA B)GCTCCAUGAAUGAAAUG C)TATAA D)GCGCC E)CCCCG
- _____ 23. Which may benefit from recombinant DNA technology? A)households B)industry C)medicine D)agriculture E)all of the above
- _____ 24. Which of the following is (are) NOT (a) transcript modification(s) demonstrated in eucaryotic organisms? A)5' cap B)poly-G tail C)intron removal D)exon removal E)a and d only F)b and d only
- _____ 25. Where does translation take place? A)in the nucleus B)in the mitochondrion C)on the ribosomes D)on the golgi apparatus E)b and c only F)b, c, and d only
- _____ 26. Which phase is the longest phase of the cell cycle? A)telophase B)anaphase C)metaphase D)prophase E)interphase

Questions 27 through 30: Match each stage of mitosis with the following key events:

- | | |
|---------------------|---|
| _____ 27. metaphase | A. sister chromatids of each chromosome separate and move to opposite poles |
| _____ 28. prophase | B. threadlike chromosomes condense and a microtubular spindle forms |
| _____ 29. telophase | C. chromosomes decondense, daughter nuclei re-form |
| _____ 30. anaphase | D. all chromosomes become aligned at spindle equator |
- _____ 31. In the operon model of procaryotes, which of the following precedes structural genes and serves as the binding site for RNA polymerase? A)regulator gene B)promoter C)operator D)activator protein E)repressor
- _____ 32. Following mitosis, a daughter cell will end up with genetic instructions that are _____ and _____ chromosome number as the parent cell
- A)identical to the parent cell's; the same
 B)identical to the parent cell's; one-half the
 C)rearranged; the same
 D)rearranged; one-half the

- _____ 33. An event that leads to natural variation of species in which genes jump from one region of DNA to another is called A)transposition B)crossing over C)synapsis D)recombination E)fertilization
- _____ 34. In animals, the cleavage furrow is formed during A)fertilization B)mitosis C)cytokinesis D)interkinesis E)interphase
- _____ 35. Crossing over A)alters the chromosome alignments at metaphase B)occurs between sperm DNA and egg DNA at fertilization C)leads to genetic recombination D)occurs only rarely
- _____ 36. The net result of meiosis is that the _____ chromosome number is _____
 A)diploid; doubled
 B)diploid; halved
 C)haploid; doubled
 D)haploid; halved
- _____ 37. What type of cell division leads to variation of species? A)meiosis I B)meiosis II C)fission D)interkinesis E)mitosis
- _____ 38. Alleles are A)alternative molecular forms of a gene B)alternative molecular forms of a chromosome C)self-fertilizing, true-breeding homozygotes D)self-fertilizing, true-breeding heterozygotes
- _____ 39. A section of DNA that encodes for a specific trait is called a(n) A)activator B)operon C)protein D)gene E)chromosome
- _____ 40. The only source of new alleles is A)mutation B)genetic drift C)gene flow D)natural selection E)all of the above
- _____ 41. Speciation due to structure of reproductive organs is called A)behavioral B)mechanical C)gamete isolation D)hybrid inviability E)time isolation
- _____ 42. When a heterozygous (Aa) male mates with a homozygous dominant female (AA), the result is
 A) All offspring demonstrate dominant traits
 B) 50% of the offspring demonstrate dominant traits and 50% demonstrate recessive traits
 C) 75% of the offspring demonstrate dominant traits and 25% demonstrate recessive traits
 D) All offspring demonstrate recessive traits
- _____ 43. Speciation is A)the extinction of a distinct population B)the accumulation of environmental factors that cause geographic isolation C)the process whereby different species originate D)a means of altering gene frequencies in a population

SECTION II. FILL-IN-THE-BLANK (3 questions at 2 point each = 6 total points)

1. _____ transcription =====> 2. _____ translation =====> 3. _____
===== >
===== >
===== >

M
E
T
A
B
O
L
I
S
M

SECTION III. SHORT ANSWER (8 points)

Depicted below is a DNA molecule that needs to be transcribed and translated. Transcribe this molecule and then use the table on the next page to translate it into an abbreviated protein product.

3' ATG CCA GCA AAT TAG 5'
5' TAC GGT CGT TTA ATC 3'

RNA: 5' _____ 3'

Protein: _____

First Letter	Second Letter				Third Letter
	U	C	A	G	
U	phenylalanine	serine	tyrosine	cysteine	U
	phenylalanine	serine	tyrosine	cysteine	C
	leucine	serine	stop	stop	A
	leucine	serine	stop	tryptophan	G
C	leucine	proline	histidine	arginine	U
	leucine	proline	histidine	arginine	C
	leucine	proline	glutamine	arginine	A
	leucine	proline	glutamine	arginine	G
A	isoleucine	threonine	asparagine	serine	U
	isoleucine	threonine	asparagine	serine	C
	isoleucine	threonine	lysine	arginine	A
	(start) methionine	threonine	lysine	arginine	G
G	valine	alanine	aspartate	glycine	U
	valine	alanine	aspartate	glycine	C
	valine	alanine	glutamate	glycine	A
	valine	alanine	glutamate	glycine	G

EXAM III
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section (10:30 or 11:30) _____

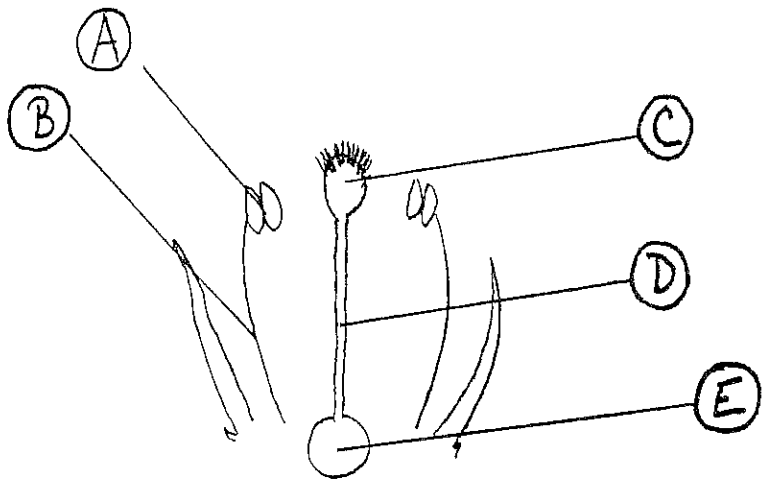
MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You MUST WRITE THE LETTER of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

- _____ 1. What type of reproductive isolating mechanism is associated with the structure of reproductive organs? A) hybrid inviability B) behavioral isolation C) time isolation D) gamete isolation E) mechanical
- _____ 2. A mode of speciation which is the most common and is associated with isolated locations (i.e., islands) is called A) sympatric B) parapatric C) allopatric D) isopatric E) exopatric
- _____ 3. Compounds from which carbon, nitrogen, and oxygen were derived to enable formation of amino acids during evolution of the Earth included all of the following EXCEPT A) sodium hydroxide B) methane C) ammonia D) water
- _____ 4. According to a hypothesis, what substance(s) functioned to assemble proteins during the evolution of life? A) Adam and Eve B) snakes C) bacteria D) plastic E) clay particles
- _____ 5. What process(es) is(are) hypothesized to have enriched Earth's oxygen supply during evolution of life? A) amino acid synthesis B) respiration C) photosynthesis D) glycolysis E) b and d only
- _____ 6. The hypothesis discussed in lecture which explained how cells obtained mitochondria claimed that A) cells engulfed ("ate") mitochondria B) cells synthesized mitochondria from proteins C) cells converted nuclei into mitochondria D) cells modified membranes to make mitochondria
- _____ 7. How many fertilization events occur in the typical life cycle of a flowering plant? A) one - to produce the zygote B) two - to produce the zygote and the endosperm C) three - to produce the roots, shoots, and leaves D) four - to produce the roots, shoots, leaves, and flowers
- _____ 8. What non-life entity affects the five living kingdoms by inflicting disease upon organisms? A) bacteria B) moneran C) virus D) fungus E) a and b only
- _____ 9. A T4 Phage (virus) consists of all of the following parts EXCEPT A) head B) flagella C) sheath D) tail fibers E) nucleic acids
- _____ 10. Which of the following viruses can lead to leukemia and AIDS? A) Herpes B) Rhinoviruses C) Retroviruses D) Influenza viruses

- _____ 11. Which organism(s) is (are) prokaryotic, has (have) a single chromosome, and reproduce(s) by binary fission? A) bacteria B) fungi C) protists D) monerans E) a and d only
- _____ 12. What term is used to identify an organism that uses sunlight as energy to drive synthesis of biological molecules? A) heterotroph B) chemosynthetic heterotroph C) photosynthetic heterotroph D) photosynthetic autotroph
- _____ 13. Single-celled eucaryotes can be found in the kingdom A) virusia B) mycota C) monera D) protista E) plantae
- _____ 14. The pressure-flow hypothesis explains A) source-sink relationships B) how sap moves in the phloem C) water movement up the plant D) a and b only
- _____ 15. A mushroom is an example of the kingdom A) mycota B) protista C) plantae D) fungi E) a and d only F) a and c only
- _____ 16. A heterotrophic organism that obtains its nutrition from dead organic matter is called a A) lichen B) symbiotic micorrhizae C) parasite D) saprophyte
- _____ 17. What compound is uniquely found in cell walls of bacteria? A) water B) cellulose C) chitin D) peptidoglycan E) cellulose
- _____ 18. Members of the kingdom plantae are usually A) monocots B) heterotrophs C) photosynthetic autotrophs D) parasites E) a and b only
- _____ 19. Dioecious means A) male and female parts are on same plant B) male and female parts are on different plants
- _____ 20. Meiosis in flowering plants directly forms A) sperm and egg B) a zygote C) megaspores and microspores D) pollen grains E) seeds

Use the letters corresponding to items of the flower structure depicted below to answer questions 21 through 25:

- _____ 21. Anther
- _____ 22. Ovary
- _____ 23. Stigma
- _____ 24. Filament
- _____ 25. Style



- _____ 26. Vascular plants which reproduce by seeds but do not have "real" flowers are called
A)ferns B)dicots C)angiosperms D)gymnosperms E)fungi
- _____ 27. Name the structure of monocotyledonous plants that keeps water from between stem and sheath A)blade B)sheath C)auricle D)ligule E)collar
- _____ 28. Parenchyma tissue is associated with A)storage B)ground tissue C)vascular tissue
D)a and b E)a, b, and c
- _____ 29. Vessels are found in A)the phloem B)the xylem C)ground tissue D)epidermal tissue
- _____ 30. Which of the following is NOT associated with xylem? A)water B)passive C)down
D)tracheids E)dead
- _____ 31. Which of the following is the strongest type of tissue? A)parenchyma
B)chlorenchyma C)sclerenchyma D)collenchyma E)aerenchyma
- _____ 32. Meristematic tissue A)is a region of rapidly dividing cells B)gives rise to other
tissues C)is important in growth D)can be found in apical meristems E)all of the
above
- _____ 33. Plants grow from A)the base of shoots and roots B)the middle of roots and shoots
C)tips of roots and shoots
- _____ 34. The quiescent center is A)a region of rapid division B)a region where frequency of
mitosis is low C)in the root cap D)at the tip of the shoot
- _____ 35. Procambium produces A)cortex and pith B)parenchyma C)vascular tissue
D)epidermal tissue E)protoderm
- _____ 36. Roots hairs can be found in the A)apical meristem B)zone of cell elongation C)zone
of cell division D)zone of cell differentiation E)a and c only
- _____ 37. Dicots can be associated with A)ferns B)bryophytes C)vascular plants
D)angiosperms E)gymnosperms F)c and d only G)b, c, and d only
- _____ 38. The point above the youngest primordia is best defined as the A)apical meristem
B)shoot apex C)leaf D)stem E)meristematic tissue
- _____ 39. The apical meristem directly gives rise to all of the following EXCEPT A)protoderm
B)cuticle C) procambium D)ground meristem
- _____ 40. Epidermis of young stems can have all of the following EXCEPT A)cuticle
B)chloroplasts C)epidermal cells D)vascular tissue
- _____ 41. The region between procambial strands and epidermis of stems is called A)xylem
B)phloem C)cuticle D)pith E)cortex
- _____ 42. In a stem longitudinal section, which tissue is formed inside and discontinuously?
A)parenchyma B)phloem C)xylem D)collenchyma E)sclerenchyma

- _____ 43. Meristematic tissue in leaves which gives rise to mesophyll is called A)protoderm B)ground meristem C)procambium D)apical meristem E) a and c only
- _____ 44. The cohesion-adhesion-transpiration pull theory explains A)how phloem moves its sap throughout the plant B)how sugars are transported C)apical dominance D)water movement up the plant ~~D~~^Ea and b only
- _____ 45. Dancing or other reproductive rituals include which reproductive isolating mechanism(s)? A)hybrid inviability B)behavioral isolation C)mechanical D)gamete isolation E)c and d only

Use the plant sample distributed in class to answer questions 46 through 50:

- _____ 46. What is the name of the structure which connects the leaf to the stem and allows leaf movement? A)collar B)ligule C)petiole D)blade E)stipule
- _____ 47. The shape of the leaves on this plant is A)entire B)dentate C)lobed
- _____ 48. This plant is a representative of a A)fern B)gymnosperm C)dicot D)monocot
- _____ 49. The leaves on this plant are A)simple B)compound
- _____ 50. What type of leaf venation does this plant have? A)netted B)parallel

EXAM III
General Biology 1114
(Dr. Bidlack)

NAME _____

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Section _____

MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

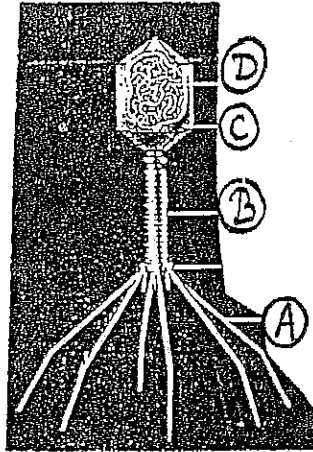
SECTION I: MULTIPLE CHOICE AND MATCHING (50 questions at 2 points each = 100 points).

- _____ 1. Allopatric speciation often occurs A)at an isolated location B)between mountains and bottomlands C)as a result of gamete isolation D)b and c only
- _____ 2. Three compounds abundant during early earth that combined with energy to make amino acids were A)CO₂, water, and nitrogen B)methane, water, and ammonia C)oxygen, water, and nitrogen D)carbon dioxide, water, and nitrogen E)a and d only
- _____ 3. What type of crystals or particles are hypothesized to have served as templates for protein synthesis during early earth? A)diamond B)quartz C)gold D)clay E)water F)ice
- _____ 4. During the evolution of life, lipids were attracted to protein and surrounded it to for the first A)nucleus B)cell wall C)membrane D)ribosome E)vacuole
- _____ 5. According to a theory, how did the first cell acquire a mitochondrion? A)it converted its nucleus into a respiratory organelle B)it changed a chloroplast into a mitochondrion C)it ate (engulfed) a mitochondrion D)it assembled microtubules to make new organelles E)a and b only F)a, b, and d only
- _____ 6. A virus is A)living B)non-living
- _____ 7. What type of virus is the common cold? A)RNA virus B)DNA virus C)rhinovirus D)retrovirus E)a and c only F)b and c only G)a and d only H)b and d only
- _____ 8. A relationship in which both organisms benefit from each other is called A)saprophytic B)parasitic C)symbiotic D)heterotrophic E)autotrophic
- _____ 9. How many fertilization events usually occur in the ovary of plants? A)millions B)thousands C)hundreds D)five E)two F)one
- _____ 10. Name the type of plant that reproduces by seeds but that does not have true flowers A)dicot B)monocot C)legume D)gymnosperm E)angiosperm F)fern
- _____ 12. What type of reproductive isolating mechanism is characterized by dancing or other reproductive ritual? A)mechanical B)gamete isolation C)time isolation D)behavioral isolation E)hybrid inviability.

- _____ 12. Collenchyma tissue gives the plant A)storage B)support C)strength D)tail fibers E)xylem and phloem
- _____ 13. A T4 Phage (virus) consists of all of the following parts EXCEPT A)head B)flagella C)sheath D)tail fibers E)nucleic acids

Questions 14-17: Write the letter to the left of the term that corresponds to the figure depicted below. Answers may be used only once

- _____ 14. DNA
- _____ 15. Head
- _____ 16. Sheath
- _____ 17. Tail fiber

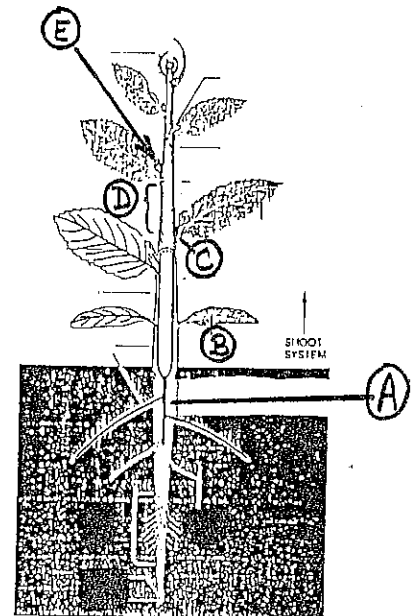
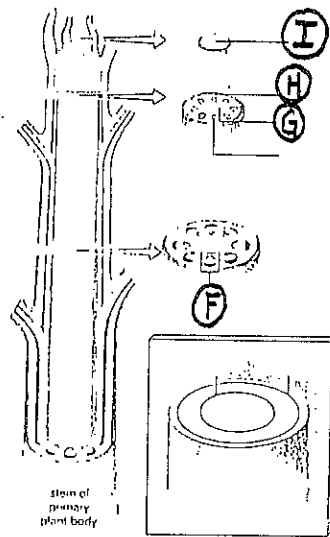


- _____ 18. Which sequence of living kingdoms demonstrates the best representation of evolutionary events?
 A)Fungi, Monerans, Protistans == => [Plants and Animals]
 B)Monerans, Protistans == => [Fungi, Plants, and Animals]
 C)Protistans, Monerans, Fungi == => [Plants and Animals]
 D)Protistans, Monerans, Fungi, Plants, and Animals
 E)Protistans, Fungi, Monerans, Animals, and Plants
- _____ 19. Which organism(s) is (are) procaryotic, has (have) a single chromosome, and reproduce(s) by binary fission? A)bacteria B)fungi C)protistans D)monerans E)a and d only
- _____ 20. What term is used to identify an organism that uses inorganic chemicals as energy to drive synthesis of biological molecules? A)heterotroph B)chemosynthetic autotroph C)photosynthetic heterotroph D)photosynthetic autotroph
- _____ 21. Single-celled eucaryotes can be found in the kingdom A)virusia B)mycota C)monera D)protista E)plantae
- _____ 22. Bread mold is an example of the kingdom A)mycota B)protista C)plantae D)fungi E)a and d only F)a and c only
- _____ 23. A heterotrophic organism that obtains its nutrition from dead organic matter is called a A)lichen B)symbiotic micorrhizae C)parasite D)saprophyte
- _____ 24. What compound is uniquely found in cell walls of fungi? A)water B)cellulose C)chitin D)peptidoglycan E)cellulose

- _____ 25. Members of the kingdom plantae are usually A)procaryotic B)heterotrophs C)photosynthetic autotrophs D)parasites E)a and b only
- _____ 26. Which of the following should NOT be classified as a plant? A)blue-green algae B)venus flytrap C)pine tree D)moss E)dicot
- _____ 27. Monoecious means A)male and female parts are on same plant B)male and female parts are on different plants

Questions 28-34: Write the letter to the left of the term that best describes items depicted on the figures below. Answers may be used only once; not all answers are used.

- _____ 28. Vascular bundle
- _____ 29. Protoderm
- _____ 30. Node
- _____ 31. Internode
- _____ 32. Ground meristem
- _____ 33. Bud
- _____ 34. Primary root



- _____ 35. Meiosis in flowering plants directly forms A)sperm and egg B)a zygote C)megaspores and microspores D)pollen grains E)seeds
- _____ 36. The pistil is composed of all of the following EXCEPT A)stamen B)ovary C)stigma D)style E)a and b only F)a, b, and c only G)a, b, c, and d

- _____ 37. Name the structure of monocotyledonous plants that forms a collar at the base of the blade A)blade B)sheath C)auricle D)ligule E)collar
- _____ 38. Sieve cells are found in A)the phloem B)the xylem C)ground tissue D)epidermal tissue
- _____ 39. Which of the following is NOT associated with xylem? A)water B)passive C)down D)tracheids E)dead
- _____ 40. Which of the following is the strongest type of tissue? A)parenchyma B)chlorenchyma C)sclerenchyma D)collenchyma E)aerenchyma
- _____ 41. Meristematic tissue A)is a region of rapidly dividing cells B)gives rise to other tissues C)is important in growth D)can be found in apical meristems E)all of the above
- _____ 42. Procambium produces A)cortex and pith B)parenchyma C)vascular tissue D)epidermal tissue E)protoderm
- _____ 43. Roots hairs can be found in the A)apical meristem B)zone of cell elongation C)zone of cell division D)zone of cell differentiation E)a and c only
- _____ 44. Dicots can be associated with A)ferns B)bryophytes C)vascular plants D)angiosperms E)gymnosperms F)c and d only G)b, c, and d only
- _____ 45. In a stem longitudinal section, which tissue is formed inside and discontinuously? A)parenchyma B)phloem C)xylem D)collenchyma E)sclerenchyma
- _____ 46. Meristematic tissue in leaves which gives rise to mesophyll is called A)protoderm B)ground meristem C)procambium D)apical meristem E) a and c only
- _____ 47. The cohesion-adhesion-transpiration pull theory explains A)how phloem moves its sap throughout the plant B)how sugars are transported C)apical dominance D)water movement up the plant D)a and b only
- _____ 48. The pressure-flow hypothesis explains A)source-sink relationships B)how sap moves in the phloem C)water movement up the plant D) a and b only
- _____ 49. Identify the sample being passed around class A)gymnosperm B)angiosperm C)monocot D)dicot E)a and c only F)b and c only G)b and d only H)b and c only
- _____ 50. Secondary growth can often be observed in A)grasses B)monocots C)oak trees D)dicots E)a and b only F)b and c only G)c and d only

EXAM III
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You MUST WRITE THE LETTER of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SECTION I: MULTIPLE CHOICE AND MATCHING (50 questions at 2 points each = 100 points).

- _____ 1. An example of a DNA virus is A)the common cold B)an influenza C)a retrovirus D)AIDS E)herpes type II
- _____ 2. What type or reproductive isolating mechanism is demonstrated by dancing or other reproductive ritual? A)mechanical B)gamete isolation C)time isolation D)behavioral E)hybrid inviability
- _____ 3. Another term for the genotype X environment interaction is A)mutation B)phenotype C)how an organism looks D)a and b only E)b and c only
- _____ 4. What type of speciation might have occurred as a result of rapid environmental change? A)cladistic B)extinction C)gradualism D)punctualism E)a and b only
- _____ 5. The energy source during "Early Earth" theorized to have enabled combining of methane, ammonia, and water to make protein is A)fire B)mechanical C)lightning D)solar E)cosmic
- _____ 6. What substance is theorized to have functioned as a template for protein synthesis during "Early Earth?" A)clay B)water C)rock D)algae E)rubber
- _____ 7. What term best defines the shape of a protein in its natural state? A)microsphere B)linear C)helical D)square E)triangular
- _____ 8. The process that changed the surface of the Earth by providing it with oxygen is A)respiration B)transcription C)translation D)replication E)photosynthesis
- _____ 9. The common cold is A)a DNA virus B)an RNA virus C)a retrovirus D)a and c only E)b and c only
- _____ 10. What term(s) best define an organism that uses sunlight as energy to drive synthesis of biological molecules? A)photosynthetic B)autotroph C)heterotroph D)a and b only E)b and c only
- _____ 11. Which of the following is NOT a protistan? A)single-celled eucaryote B)mushroom C)slime mold D)euglenid E)protozoan
- _____ 12. What stage in the life cycle of a mushroom intervenes between cytoplasmic fusion and fusion of gametes? A)mitotic B)meiotic C)dikaryotic D)diploid E)haploid

Questions 13 through 17: Use the following scheme to match letters with that which is depicted below:

- ___ 13. Plantae
 - ___ 14. Monera
 - ___ 15. Mycota
 - ___ 16. Protista
 - ___ 17. Animalia
- E
====>
D
====>
C
(mushroom)

B
(oak tree)

A
(lizard)

Single cells =====> Multicellularity

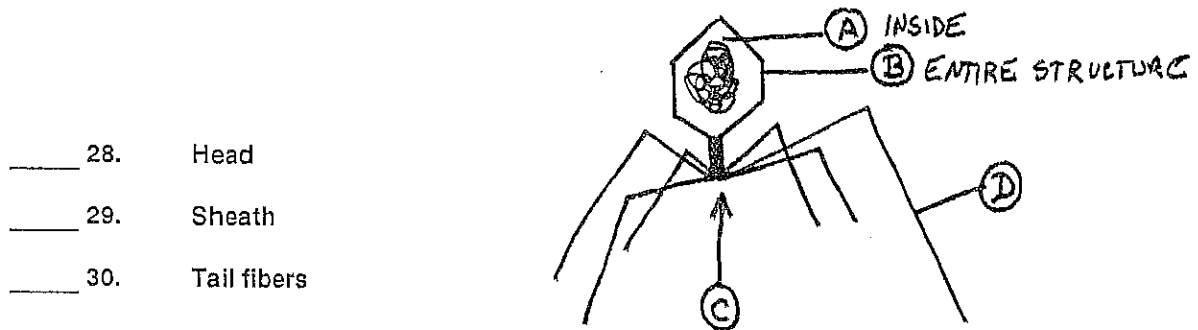
Questions 18 through 24: Use the following statement to appropriately match terms referring to plant reproductive anatomy:

The male part of the plant is referred to as the E and consists of the D and the C; the female part of the plant is referred to as the B and consists of the A, E, and D.

- ___ 18. Style
- ___ 19. Pistil
- ___ 20. Anther
- ___ 21. Ovary
- ___ 22. Stamen
- ___ 23. Filament
- ___ 24. Stigma

- _____ 25. Monoecious refers to A)only male parts B)only female parts C)male and female parts on the same plant D)male and female parts on different plants E)absence of both male and female parts
- _____ 26. How many fertilization events occur during the life cycle of a typical flowering plant? A)one B)two C)eight D)nine E)more than 1,000,000,000
- _____ 27. What is the function of the ligule? A)it attaches the leaf to the stem B)it attaches the blade to the sheath C)it keeps water out D)it eventually make fruit E)nothing - it just looks really cool

Questions 28 through 30: Write the letter to the left of the item to that which is depicted below (not all answers are used):



- _____ 31. The strongest type of ground tissue that contains lignin and functions in providing strength is A)sclerenchyma B)collenchyma C)parenchyma D)phloem E)meristematic
- _____ 32. What meristematic tissue gives rise to mesophyll in leaves? A)ground meristem B)procambium C)protoderm D)vascular E)collenchyma
- _____ 33. Water is pulled up through the roots to the leaves by what process? A)active transport B)ion exchange C)precipitation D)respiration E)transpiration
- _____ 34. Ions probably move into the roots by A)all active transport B)all passive transport (bulk flow) C)mostly active transport; some passive transport D)mostly passive transport; some active transport E)dancing through the Casparian Strip
- _____ 35. The cohesion-adhesion-tension hypothesis explains how A)water moves through the xylem B)sap goes from the leaf to the fruit C)photosynthesis works D)sugars are made in the palisade layer E)students feel after taking an exam
- _____ 37. Sugars move through the phloem according to A)the cohesion-adhesion-tension hypothesis B)source to sink directionality C)the pressure-flow hypothesis D)a and c only E)b and c only

- _____ 38. Which element is essential for plants to enable proper functioning of the oxygen evolving complex (OEC)? A)zinc B)chlorine C)iron D)boron E)copper
- _____ 39. Xylem A)is living B)contains sieve cells C)transports sugars D)is part of the apoplast E)moves substances down the plant
- _____ 40. Biologists generally agree that there (is) are _____ kingdom(s) of life. A)one B)two C)three D)four E)five
- _____ 41. Age of a tree can be estimated by the number of "rings" which consist mostly of what tissue? A)vascular B)xylem C)phloem D)parenchyma E)a and b only
- _____ 42. Which of the following is NOT a true plant? A)blue-green algae B)fern C)gymnosperm D)monocot E)dicot
- _____ 43. Rapidly dividing tissue can be found A)at the tip of a shoot B)at apical meristems C)at the base of a root D)a and b only E)a, b, and c
- _____ 44. The three main types of ground tissue are A)dermis, epidermis, and periderm B)vascular, xylem, and phloem C)dermal, ground, and vascular D)tracheids, vessels, and sieve cell tissue E)parenchyma, collenchyma, and sclerenchyma
- _____ 45. Viruses are A)the simplest living organisms B)agents of infection C)nonliving D)a and b only E)b and c only
- _____ 46. Fungi are A)photosynthetic autotrophs B)chemosynthetic autotrophs C)heterotrophs D)a and b only
- _____ 47. The two classes of flowering plants are A)angiosperms and gymnosperms B)monocots and dicots C)shrubs and trees D)herbs and shrubs E)fun and games
- _____ 48. _____ cells are thin-walled, alive at maturity, and function in photosynthesis, storage, and other tasks. A)parenchyma B)sclerenchyma C)collenchyma D)epidermis E)vascular
- _____ 49. In plant metabolism, mineral ions have roles in A)metabolic activities B)establishing solute concentration gradients across cell membranes C)water movement into cells D)maintaining cell shape and growth E)all of the above
- _____ 50. During the day, plants lose _____ and take up _____.
 A)carbon dioxide; water
 B)water; oxygen
 C)oxygen; water
 D)water; carbon dioxide
 E)confidence; classes at UCO

EXAM IV
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section (10:30 or 11:30) _____

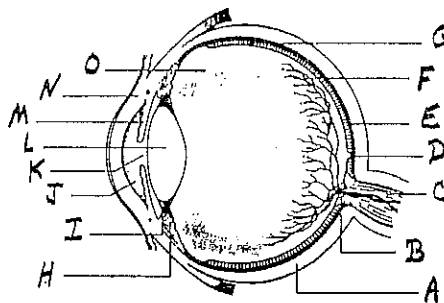
MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

- _____ 1. Which sequence of living kingdoms demonstrates the best representation of evolutionary events?
A)Fungi, Monerans, Protistans == => [Plants and Animals]
B)Monerans, Protistans == => [Fungi, Plants, and Animals]
C)Protistans, Monerans, Fungi == => [Plants and Animals]
D)Protistans, Monerans, Fungi, Plants, and Animals
E)Protistans, Fungi, Monerans, Animals, and Plants
- _____ 2. Cephalization is a term used to indicate the presence of a distinct A)head B)tail
C)spinal cord D)mouth E)body segment
- _____ 3. Which of the following is NOT a reptile? A)crocodile B)lizard C)turtle D)toad
E)snake
- _____ 4. Mammals usually have A)milk-secreting glands B)hair C)a four-chambered heart
D)a and b only E)a, b, and c
- _____ 5. Man belongs to the Family A)Chordata B)Mammalia C)Animalia D)Hominidae
E)Primates
- _____ 6. Gibbons, orangutans, gorillas, chimpanzees, and man are A)prosimians
B)arthropods C)lesser apes D)anthropoids E)tarsiers
- _____ 7. Trends in primate evolution probably include A)less reliance on sight and more
reliance on smell B)from quadrapedalism to bipedalism C)from specialized to
omnivorous feeding behavior D) a and b only E)b and c only
- _____ 8. Which of the following may have enabled man to survive during the Ice Ages? A)use
of fire B)development of sophisticated tools C)making of shelters D)a and b only
E)a, b, and c
- _____ 9. Preliminary animal tissue which gives rise to muscle, some organ, and connective
tissues is A)procambium B)mesoderm C)endoderm D)ectoderm E)protoderm
- _____ 10. What type of tissue is responsible for contraction and can be found in blood vessels,
biceps, and heart? A)epithelial B)connective C)nerve D)muscle E)lymphatic
- _____ 11. The organ system responsible for detection of stimuli, coordination, and responses
is A)nervous B)endocrine C)circulatory D)urinary E)skeletal

- _____ 12. Positive feedback of the homeostatic control mechanism is exemplified by A) pulling your hand away from a pot of boiling water B) sexual arousal in response to a stimulus C) vomiting to remove toxic substances D) a and c only E) a, b, and c
- _____ 13. The basic unit of the nervous system is the A) neuron B) nerve cell C) brain D) a and b only E) a, b, and c
- _____ 14. Eyes have what class of nerve cells that enable them to function as receptors? A) interneurons B) sensory neurons C) motor neurons D) integrators E) a, b, c, and d
- _____ 15. Another name for the output zone of the neuron is called the A) dendrite B) trigger zone C) axon D) axon terminal E) interneuron
- _____ 16. Use the following numbers to determine the proper sequence of events for the neuron mechanism:
 1 = synapse
 2 = gradient moves along the axon to axon terminal
 3 = receptor senses something
 4 = sodium channels open
 5 = inside of membrane gets charged
 A) 1-2-3-4-5 B) 3-4-5-2-1 C) 1-4-3-2-5 D) 1-3-2-4-5 E) 5-4-3-2-1
- _____ 17. The hypothalamus is responsible for regulating A) heart rate B) breathing C) thirst, hunger, and sex D) reflexes E) a and b only
- _____ 18. The right side of the brain is the center for control of all of the following EXCEPT A) spatial perception B) left ear C) left eye D) left nostril E) left toe
- _____ 19. The master gland that exerts major control over the rest of the endocrine system is called the A) testis B) ovary C) pituitary D) thyroid E) thymus
- _____ 20. Which gland regulates the immune response? A) parathyroid B) thyroid C) thymus D) adrenal cortex E) pancreas
- _____ 21. Steroids function A) by altering transcription B) by making uniquely different RNAs from DNA C) by activating cyclic AMP D) a and b only E) b and c only

Use letters corresponding to items of the eye structure depicted below to answer questions 22 through 24 (not all letters are used):

- _____ 22. Sclera
- _____ 23. Pupil
- _____ 24. Retina



- _____ 25. Photoreceptors detect A)radiant energy B)photon energy C)mechanical energy D)chemical energy
- _____ 26. What part of the ear is responsible for balance? A)cochlea B)malleus C)semicircular canals D)tympanum E)stapes
- _____ 27. Which cells originate in the bone marrow? A)red blood cells B)white blood cells C)epidermal cells D)a and b only E)a, b, and c
- _____ 28. Erythrocytes A)are white blood cells B)function in O₂ and CO₂ transport C)lack a nucleus and mitochondria D) are red blood cells E)a, b, and c F)b, c, and d only
- _____ 29. Cells that function in day-to-day housekeeping and defense A)are also called erythrocytes B)are also called leukocytes C)have a nucleus D)a and c only E)b and c only F)a, b, and c
- _____ 30. Which are the most abundant cells of the circulatory system? A)leukocytes B)phagocytes C)erythrocytes D)white blood cells
- _____ 31. Circulation responsible for taking O₂-deficient blood to the lungs is called A)body B)systemic C)pulmonary D)a and b only E)a, b, and c
- _____ 32. Nonspecific defense responses include all of the following EXCEPT A)microbes of the vagina and gut B)removal of foreign substances by ciliated mucus membranes C)intact skin D)antigen-antibody interactions E)stomach acid
- _____ 33. A foreign body that lacks the major histocompatibility complex (MHC) is called a(n) A)antigen B)phagocyte C)leukocyte D)antibody E)erythrocyte
- _____ 34. What is the most abundant component of the Earth's "air?" A)oxygen B)nitrogen C)argon D)carbon dioxide E)helium
- _____ 35. What facilitates CO₂ transport in the circulatory system of humans? A)hemoglobin B)ribulose biphosphate carboxylase/oxygenase C)temperature D)carbonic anhydrase E)a and b only
- _____ 36. What structure covers the larynx during swallowing of food? A)larynx B)glottis C)trachea D)esophagus E)epiglottis
- _____ 37. What is the proper sequence in the flow of air in mammals?
 A)nasal cavities, larynx, pharynx, bronchi, trachea
 B)nasal cavities, pharynx, bronchi, larynx, trachea
 C)nasal cavities, pharynx, larynx, trachea, bronchi
 D)nasal cavities, larynx, pharynx, trachea, bronchi
 E)nasal cavities, bronchi, larynx, trachea, pharynx
- _____ 38. The last mammalian structure that air moves through before the alveoli is the A)larynx B)glottis C)bronchioles D)trachea E)pharynx
- _____ 39. Nutrition includes all of the following EXCEPT A)digestion B)excretion C)intake D)absorption E)utilization

- _____ 40. Mechanical breakdown, mixing of ingested foods, passage, and elimination are all part of what function of digestion? A) motility B) secretion C) digestion D) absorption E) b and c only
- _____ 41. The process that moves nutrients into the blood or lymph is A) absorption B) assimilation C) digestion D) ingestion E) a, b, c, and d
- _____ 42. What is the proper sequence for the passage of food in humans?
A) mouth, esophagus, stomach, small intestine, large intestine, rectum, anus
B) mouth, esophagus, stomach, large intestine, small intestine, rectum, anus
C) mouth, stomach, esophagus, large intestine, small intestine, anus, rectum
D) mouth, stomach, large intestine, small intestine, esophagus, anus, rectum
E) mouth, esophagus, stomach, small intestine, large intestine, anus, rectum
- _____ 43. The first part of the small intestine is the A) ileum B) duodenum C) colon D) cecum E) jejunum
- _____ 44. Where does most of nutrient absorption occur? A) stomach B) mouth C) small intestine D) large intestine E) esophagus
- _____ 45. Insulin A) is a laxative B) releases sugar into the bloodstream C) takes blood sugar and puts it to work in cells D) is not necessary for normal metabolism
- _____ 46. Sperm production takes place in the A) ovaries B) vas deferens C) testis D) urethra E) ejaculatory duct
- _____ 47. Which of the following are haploid and non-duplicated? A) spermatids B) spermatogonia C) mature oocytes D) primary oocytes E) c and d only F) a and b only G) a and c only H) a, b, c, and d
- _____ 48. Which of the following occur(s) during sexual arousal in human females? A) increase in breast size B) erection of clitoris C) erection of labia minor D) moistening of the vagina E) b and d only F) a, b, c, and d
- _____ 49. Male orgasm includes all of the following EXCEPT A) sperm production B) muscle contractions C) ejaculation D) sensations of release E) sensations of warmth
- _____ 50. Where does fertilization usually occur? A) ovary B) vagina C) oviduct D) uterus E) clitoris

EXAM IV
General Biology 1114
(Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

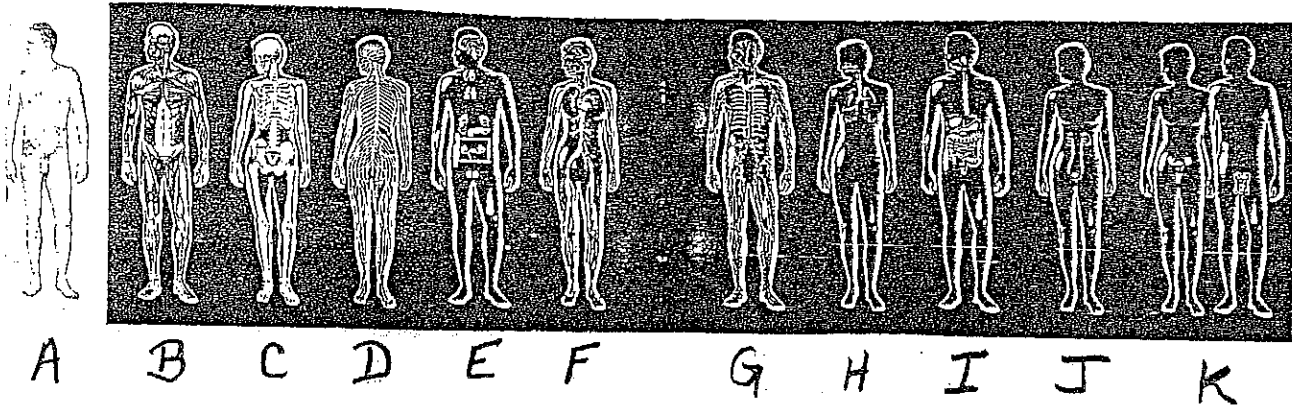
MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST** WRITE THE LETTER of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SECTION I: MULTIPLE CHOICE AND MATCHING (50 questions at 2 points each = 100 points).

- _____ 1. Cephalization is a term used to indicate the presence of a distinct A)head B)tail C)spinal cord D)mouth E)body segment
- _____ 2. What phylum do millipedes belong to? A)anthropoid B)mollusca C)arthropoda D)chordates E)mammalia
- _____ 3. A turtle is a(n) A)mammal B)reptile C)amphibian D)insect E)fish
- _____ 4. A good example of a prosimian is a A)gibbon B)orangutan C)chimpanzee D)lemur E)a and b only F)b and c only G)c and d only
- _____ 5. According to lecture, fire was best used by early man during the ice ages for what purpose? A)human sacrifices B)removal of excess vegetation C)warmth D)entertainment E)destruction
- _____ 6. Tissue that can be found as a lining of the stomach, outer skin, and the vagina is A)muscle B)mesoderm C)epithelial D)connective E)nerve
- _____ 7. What organ system is best described as "involved with hormones and control of bodily functions?" A)reproductive B)nervous C)lymphatic D)urinary E)endocrine
- _____ 8. Name the term associated with maintenance of bodily functions A)movement B)homeostasis C)equilibrium D)entropy E)enthalpy
- _____ 9. What term in primate classification includes monkeys, apes, and humans but not prosimians? A)Homo B)Homo sapiens C)arthropoda D)anthropoid E)a and c only F)a, b, and c only
- _____ 10. The brain is a good example of where you will find a(n) A)sensory neuron B)interneuron C)motor neuron D)hormone E)a and c only F)a and d only G)a, c, and d only
- _____ 11. Message transfer from one axon terminal to another neuron is called A)brain power B)a thought C)conduction D)synapse E)voltage F)relapse
- _____ 12. What part of the brain is responsible for automatic functions such as breathing and heart rate? A)cerebellum B)thalamus C)hypothalamus D)cerebrum E)medulla oblongata

- _____ 13. The "master" gland is the A)pituitary B)thyroid C)adrenal D)thymus E)ovary
- _____ 14. What type of hormone(s) have a signaling mechanism that requires a change in transcription? A)growth-stimulating B)parathormone C)non-steroid D)steroid E)a and b only F)a, b, and c only G)a, b, c, and d
- _____ 15. J. C. Mahan, during his guest lecture, had what color hair? A)orange B)bright purple C)blonde D)black E)none - he was bald

Questions 16-26: Match the letter corresponding to organ systems depicted below that best describes their function(s) in the human body. Answers may be used only once; all answers are used; only one correct answer corresponds to each description.



- _____ 16. Excretion of wastes
- _____ 17. Ingestion and absorption of food
- _____ 18. Detection of stimuli, coordination, and responses
- _____ 19. Defense against invaders
- _____ 20. Protection, regulation, excretion, and reception
- _____ 21. Production of gametes
- _____ 22. Control of bodily functions
- _____ 23. Movement, maintenance, and heat production
- _____ 24. Support, protection, muscle attachment, blood cell production
- _____ 25. Regulation of gas exchange
- _____ 26. Transport of gases, water, and food

- _____ 27. Another name for a red blood cell is A)hemoglobin B)white blood cell C)leukocyte D)erythrocyte E)pulmonary
- _____ 28. The following statement, "a red blood cell has a nucleus" is A>true B>false
- _____ 29. Which pump of the heart directs blood to the lungs A)systemic B)body C)valve D)pulmonary E)air
- _____ 30. Another name for a foreign body that lacks the major histocompatibility complex is A)antigen B)antibody C)white blood cell D)red blood cell E)leukocyte F)c and e only G)d and e only
- _____ 31. Members of the Kingdom Animalia are often A)single-celled B)chemotrophs C)photosynthetic D)autotrophs E)diploid
- _____ 32. Which of the following is NOT a mammal? A)mouse B)rat C)bird D)whale E)monkey
- _____ 33. Positive feedback of the homeostatic control mechanism is exemplified by A) pulling your hand away from a pot of boiling water B)sexual arousal in response to a stimulus C)vomiting to remove toxic substances D)a and c only E)a, b, and c
- _____ 34. The basic unit of the nervous system is the A)neuron B)nerve cell C)brain D)a and b only E)a, b, and c
- _____ 35. Use the following numbers to determine the proper sequence of events for the neuron mechanism:
 1 = synapse
 2 = gradient moves along the axon to axon terminal
 3 = receptor senses something
 4 = sodium channels open
 5 = inside of membrane gets charged
 A)1-2-3-4-5 B)3-4-5-2-1 C)1-4-3-2-5 D)1-3-2-4-5 E)5-4-3-2-1
- _____ 36. The hypothalamus is responsible for regulating A)heart rate B)desires C)breathing D)reflexes E)a and c only F)a, c, and d only
- _____ 37. The right side of the brain is the center for control of all of the following EXCEPT A)left nostril B)left ear C)spacial perception D)left eye E)left toe
- _____ 38. Cells that function in day-to-day housekeeping and defense A)are also called erythrocytes B)are also called leukocytes C)have a nucleus D)a and c only E)b and c only F)a, b, and c
- _____ 39. What is the most abundant component of the Earth's "air?" A)oxygen B)nitrogen C)argon D)carbon dioxide E)CO₂ F)d and e only
- _____ 40. What facilitates O₂ transport in the circulatory system of humans? A)hemoglobin B)ribulose bisphosphate carboxylase/oxygenase C)temperature D)carbonic anhydrase E)a and b only

- _____ 41. What is the proper sequence for the passage of food in humans?
A)mouth, esophagus, stomach, small intestine, large intestine, rectum, anus
B)mouth, esophagus, stomach, large intestine, small intestine, rectum, anus
C)mouth, stomach, esophagus, large intestine, small intestine, anus, rectum
D)mouth, stomach, large intestine, small intestine, esophagus, anus, rectum
E)mouth, esophagus, stomach, small intestine, large intestine, anus, rectum
- _____ 42. Where does most of nutrient absorption occur? A)stomach B)mouth C)small intestine D)large intestine E)esophagus
- _____ 43. Insulin A)is a laxative B)releases sugar into the bloodstream C)takes blood sugar and puts it to work in cells D)is not necessary for normal metabolism
- _____ 44. Which of the following are haploid and non-duplicated? A)spermatids B)spermatogonia C)mature oocytes D)primary oocytes E)c and d only F)a and b only G)a and c only H)a, b, c, and d
- _____ 45. Which of the following occur(s) during sexual arousal in human females? A)increase in breast size B)erection of clitoris C)erection of labia minor D)moistening of the vagina E)b and d only F)a, b, c, and d
- _____ 46. Male orgasm includes all of the following EXCEPT A)sperm production B)muscle contractions C)ejaculation D)sensations of release E)sensations of warmth
- _____ 47. Where does fertilization usually occur? A)ovary B)vagina C)oviduct D)uterus E)clitoris
- _____ 48. In the movie, "The Miracles of Life," you observed A)birth at the beginning of the movie B)birth at the end of the movie C)mutated sperm D)normal sperm E)a and c only F)b and d only G)a and d only H)a, b, and d only I)b, c, and d only
- _____ 49. According to a guest lecture by J.C. Mahan of John Paul Mitchell Systems®, which component of hair forms a canal but has not yet been found to have a specific physiological function? A)medulla B)cortex C)fiber D)gland E)follicle
- _____ 50. What type of hair "bonds" are broken to achieve a permanent "hair-do?" A)hydrogen B)disulfide C)ionic D)none

EXAM IV
General Biology 1114
 (Dr. Bidlack)

NAME _____

Social Security No. _____

Section _____

MULTIPLE CHOICE AND MATCHING (100%): Read each question carefully and write the letter of the best or most appropriate answer in the space to the left of each question. You **MUST WRITE THE LETTER** of the best answer on the left of each question to get credit. Illegible letters will be counted as incorrect. There is only one right answer for each question.

SECTION I: MULTIPLE CHOICE AND MATCHING (50 questions at 2 points each = 100 points).

- _____ 1. An insect belongs to A)Kingdom Animalia B)Phylum Mollusca C)Class Mammalia D)a and b only E)a, b, and c
- _____ 2. Mammals A)nourish their young through milk-secreting glands B)have lungs C)usually have hair D)a and b only E)a, b, and c
- _____ 3. Which of the following is a member of the Family Hominidae? A)lemur B)orangutan C)man D)a and b only E)a, b, and c
- _____ 4. According to lecture, fire was best used by early man during the ice ages for what purpose? A)human sacrifices B)removal of excess vegetation C)warmth D)entertainment E)destruction
- _____ 5. What type of preliminary tissue in animals leads to formation of muscle and tissues of the circulatory system? A)protoderm B)mesoderm C)endoderm D)ectoderm E)interderm
- _____ 6. Epithelial tissue is found in A)tendons B)neurons C)cartilage D)outer skin E)blood vessels
- _____ 7. What organ system functions to provide movement, maintenance, and heat production? A)circulatory B)integumentary C)respiratory D)skeletal E)muscular
- _____ 8. A turtle is a(n) A)mammal B)reptile C)amphibian D)insect E)fish
- _____ 9. Dentition is A)flexibility to response B)type, number, and size of teeth C)skeletal structure D)number of indentations in the skull
- _____ 10. The basic unit of the nervous system is the A)neuron B)nerve cell C)axon D)dendrite E)a and b only
- _____ 11. What part of the brain is responsible for controlling "desires" such as thirst, hunger, and sex? A)cerebrum B)thalamus C)hypothalamus D)cerebellum E)cerebellum

_____ 12. Use the following to describe the most appropriate sequence of events for nerve action:

- 1 = Inside membrane positively charged
- 2 = Inside membrane negatively charged
- 3 = Receptor senses something
- 4 = sodium channels open up
- 5 = gradient moves along axon

A)1-2-3-4-5 B)3-4-2-1-5 C)2-4-3-1-5 D)2-3-4-1-5 E)4-1-3-2-5

Use the following story below to answer questions 13 through 16:

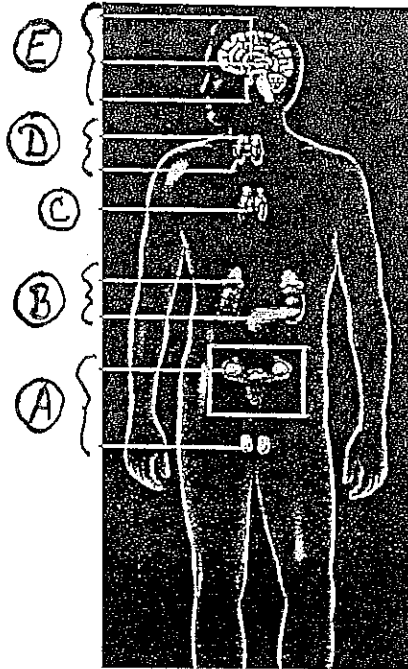
Bart and Bertha were enjoying a meal together. Just as Bart began to pour the wine, Bertha felt a trembling and aching pain originating from her lower abdomen. "Could this be love?" pondered Bertha, "or simply a wild case of the butterflies?" But then it happened... The event that neither Bart nor Bertha anticipated. It came out from Bertha's flowered dress like a shot gun. Blast after blast after blast - the loudest, longest, and most unusual fart anyone could have ever produced. "PFTFTFTFTFTFTFT...PFTFTFTFTFTFTFTFT...PFTFTFTFTFTFTFTFT!" sounded Bertha. And then the smell....It only took a few seconds for Bart's nose to detect the odoriferous stench drifting from where Bertha was sitting. His brain went wild as he tried to decide whether or not he should be polite and ignore it or simply move. Bertha was too close though, and subsequent farts continued to flow from within her. The decision had been made. Bart had to do something. Fortunately, there was a window and a fan next to the dinner table. He got up, opened the window, and turned on the fan. They were both relieved.

- _____ 13. Bertha's stinky fart is the A)response B)receptor C)stimulus D)integrator E)effector
- _____ 14. What is the receptor? A)Bertha's flowered dress B)Bart's nose C)Bart's brain D)the window E)the fan
- _____ 15. The effector is interpreted as A)Bertha's stinky fart B)Bart's brain C)Bart's muscles used to open the window D)Bertha's flowered dress E)Bart's nose
- _____ 16. What type of homeostatic mechanism is demonstrated in this story? A)negative feedback B)positive feedback C)intensification D)magnification E)neutral
- _____ 17. What gland of the endocrine system is responsible for growth and development? A)parathyroid B)adrenal cortex C)adrenal medulla D)thyroid E)thymus
- _____ 18. Transcriptional control of cellular metabolism is demonstrated by A)epinephrine B)insulin C)testosterone D)a and b only E)a, b, and c
- _____ 19. Insulin regulates sugar levels in the body by A)removing it from cells B)forcing sugar to be excreted through the urinary system C)putting it into cells for metabolism D)keeping it suspended as free sugar in the blood E)storing it all in the pancreas

- _____ 20. Erythrocytes A)are white blood cells B)have a nucleus C)lack mitochondria D)a and b only E)a, b, and c
- _____ 21. White blood cells A)are the most abundant cells of the blood B)vary in number depending of severity of infection C)lack a nucleus D)transport oxygen E)function exclusively in clotting
- _____ 22. Which of the following is (are) (a) nonspecific defense response(s)? A)intact skin B)ciliated mucus membranes C)stomach acid D)a and b only E)a, b, and c
- _____ 23. A foreign body that lacks the major histocompatibility complex (MHC) is called a(n) A)red blood cell B)white blood cell C)hemoglobin molecule D)antibody E)antigen

Questions 24 through 28: Write the letter to the left of the item which corresponds to that which is depicted below:

- _____ 24. Parathyroid and thyroid glands
- _____ 25. Ovaries and testes
- _____ 26. Location of master gland
- _____ 27. Adrenal glands and pancreas
- _____ 28. Thymus gland



- _____ 29. Oxygen will be released from the hemoglobin molecule when A)the blood is cooler B)pH is higher C)oxygen is need in surrounding tissues D)a and b only E)a, b, and c
- _____ 30. Carbonic anhydrase A)competes with CO₂ for oxygen B)enables CO₂ to be transported in the blood C)combines ammonia with CO₂ D)warms the blood E)cools the blood
- _____ 31. The covering that protects air passage during swallowing of food is called the A)esophagus B)epiglottis C)larynx D)trachea E)alveoli

- _____ 32. Which sequence of events best describes the flow of oxygen from the smallest lung unit to the hemoglobin molecule?
- A)from interstitial fluid, through alveoli, capillaries, red blood cells, to hemoglobin
 B)from capillaries, through interstitial fluid, alveoli, red blood cells, to hemoglobin
 C)from alveoli, through capillaries, interstitial fluid, red blood cells, to hemoglobin
 D)from red blood cells, through capillaries, interstitial fluid, alveoli, to hemoglobin
 E)from alveoli, through interstitial fluid, capillaries, red blood cells, to hemoglobin
- _____ 33. What enzyme of the stomach mucosa is secreted for digestion of proteins?
 A)amylase B)pepsin C)lipase D)peptidase E)chymotrypsin
- _____ 34. What is the proper sequence for the passage of food in humans?
 A)mouth, esophagus, stomach, small intestine, large intestine, rectum, anus
 B)mouth, esophagus, stomach, large intestine, small intestine, rectum, anus
 C)mouth, stomach, esophagus, large intestine, small intestine, anus, rectum
 D)mouth, stomach, large intestine, small intestine, esophagus, anus, rectum
 E)mouth, esophagus, stomach, small intestine, large intestine, anus, rectum
- _____ 35. Where does most of nutrient absorption occur? A)stomach B)mouth C)small intestine D)large intestine E)esophagus
- _____ 36. Which of the following can occur during sexual arousal in human females?
 A)moistening of the vagina B)erection of clitoris C)increase in breast size
 D)a and b only E)a, b, and c
- _____ 37. Which of the following is haploid and non-duplicated? A)spermatids
 B)spermatogonia C)secondary spermatocytes D)primary oocytes E)primary spermatocytes
- _____ 38. Male orgasm includes all of the following EXCEPT A)sperm production B)muscle contractions C)ejaculation D)sensations of release E)sensations of warmth
- _____ 39. Where does fertilization usually occur? A)ovary B)vagina C)oviduct D)uterus E)clitoris
- _____ 40. In the movie, "The Miracles of Life," you observed A)birth at the end of the movie
 B)normal sperm C)mutated sperm D)a and b only E)a, b, and c
- _____ 41. In the movie, "The Miracles of Life," the father at the end of the movie said,
 A)"WOW!!!" B)"It's a girl" C)"It's a boy" D)"Happy Birthday" E)"I love you"
- _____ 42. Cells in the animal body A)engage in metabolic activities that ensure their survival
 B)perform activities that contribute to the survival of the animal C)contribute to maintaining the extracellular fluid D)all of the above
- _____ 43. In terms of sheer numbers and distribution, _____ are the most successful animals. A)arthropods B)sponges C)snails and clams D)sea stars E)vertebrates

- _____ 44. In a simple reflex _____ directly signal _____, which act on muscle cells. A)sensory neurons; interneurons B)interneurons; motor neurons C)sensory neurons; motor neurons D)motor neurons; sensory neurons
- _____ 45. The hypothalamus produces two hormones that are released from the anterior lobe of the pituitary gland. One hormone, _____, affects kidney function; the other, _____, affects some reproductive events. A)ADH; oxytocin B)prolactin; ADH C)oxytocin; ADH D)ADH; prolactin
- _____ 46. In the pulmonary circuit, the _____ half of the heart pumps _____ blood to the capillary beds inside the lungs, then _____ blood flows back to the heart. A)left; oxygen-poor; oxygen-enriched B)right; oxygen-poor; oxygen-enriched C)left; oxygen-enriched; oxygen-poor D)right; oxygen-enriched; oxygen-poor
- _____ 47. Oxygen diffusing into pulmonary capillaries also diffuses into _____ and binds with _____. A)white blood cells; carbon dioxide B)red blood cells; carbon dioxide C)white blood cells; hemoglobin D)red blood cells; hemoglobin
- _____ 48. Which glands are *not* associated with digestion? A)salivary glands B)thymus gland C)liver D)gallbladder E)pancreas
- _____ 49. _____ and their products are the basis of the immune system A)Red blood cells B)Blood platelets C)White blood cells D)Antigens
- _____ 50. Sperm formation is controlled by A)testosterone B)LH C)FSH D)all of the above affect sperm formation

THE FINAL EXAM

**INFORMATION ABOUT THE FINAL EXAM WILL BE PROVIDED
IN CLASS TOWARD THE END OF THE SEMESTER**

TEST COLOR _____

NAME _____ SECRET CODE _____

COURSE & SECTION _____ TEST NO. _____

- | | |
|------------------------------------|------------------------------------|
| 1. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 26. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 2. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 27. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 3. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 28. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 4. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 29. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 5. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 30. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 6. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 31. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 7. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 32. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 8. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 33. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 9. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 34. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 10. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 35. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 11. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 36. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 12. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 37. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 13. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 38. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 14. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 39. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 15. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 40. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 16. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 41. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 17. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 42. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 18. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 43. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 19. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 44. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 20. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 45. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 21. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 46. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 22. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 47. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 23. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 48. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 24. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 49. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |
| 25. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) | 50. (A)(B)(C)(D)(E)(F)(G)(H)(I)(J) |

