BIOL 1114, Introductory Biology
FINAL EXAMINATION
Spring 1999

Instructions:
• Mark “NO STAR FORM” at the top left of your NCS answer sheet.
• There are 70 questions worth 3 points each. Make sure you have all pages before you begin.
• Read questions carefully
• The arrows in the left margins and double lines enclose groups of questions that go together and have a common introductory paragraph.

Use this information for the following group of questions: Lake Ohimchokin might be located along the border of OK-CO-NM. In an effort to aid economic develop, Warner Brothers establishes a huge rabbit farm on a creek feeding into the lake. Over the last few years, a new alga has appeared that produces a large quantity of phycocyanin pigment and seems to be killing fish.

1) Based on the graph to the right, the phycocyanin pigment is
   a) Violet-Blue
   b) Blue-Green
   c) Green-Yellow
   d) Orange-Red
   e) Violet-Red

2) A scientist decides to determine the limiting factor for algal growth. She collects algal samples from Lake Ohimchokin, sets up experiments in which she increases the levels of several different factors, and measures average numbers of algae present/microliter. Based on the data presented below, which factor limits the growth of this alga in the lake at present?
   a) Carbon
   b) Nitrogen
   c) Oxygen
   d) Phosphorus

<table>
<thead>
<tr>
<th></th>
<th>None added (average number of algae/microliter)</th>
<th>Level 1 (average number of algae/microliter)</th>
<th>Level 2 (average number of algae/microliter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>150</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>Oxygen</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>150</td>
<td>150</td>
<td>150</td>
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</tbody>
</table>
3) Another scientist is interested in determining the possible cause of death for fish exposed to these algae. She exposes the fish to very low doses of an extract of the algae. Examine the data below and select the best hypothesis for the most likely cause of death.

a) It is an ATP synthase inhibitor, so fish die because cellular respiration is blocked
b) It causes paralysis because it prevents the synthesis or release of acetylcholine
c) It causes convulsions because it inhibits the removal of acetylcholine from synapses
d) It causes paralysis because it holds Na/K gates open
e) It inhibits ATP production because it blocks transfer of H⁺ into thylakoid spaces

<table>
<thead>
<tr>
<th></th>
<th>ATP production (millions per cell per second)</th>
<th>Level of Acetylcholine in synapses</th>
<th>Level of Acetylcholinesterase Activity</th>
<th>Ratio of Na/K inside and outside cells at resting potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexposed fish</td>
<td>10.3 normal</td>
<td>Normal</td>
<td>Normal</td>
<td>3/2</td>
</tr>
<tr>
<td>Exposed fish</td>
<td>10.4 low</td>
<td>Normal</td>
<td>Normal</td>
<td>3/2</td>
</tr>
</tbody>
</table>

4) What are alleles?
   a) Genes for different traits, such as flower color or seed color.
   b) Alternative forms of a gene for a single trait such as flower color.
   c) Different gametes produced by an individual.
   d) Various forms of a cell characteristic such as cell shape.
   e) None of the above.

5) In which cycle are bacteria important for processes other than decomposition?
   a) nitrogen cycle
   b) hydrologic cycle
   c) carbon cycle
   d) phosphorous cycle
   e) energy cycle

6) Cellular respiration occurs in:
   a) Plants.
   b) Animals.
   c) Bacteria.
   d) All the above.
   e) None of the above.

7) Most plants get nitrogen from ____________.
   a) Nitrogen-containing compounds in the soil
   b) Nitrogen gas (N₂) in the air
   c) Sugars
   d) Rocks
   e) Rainfall

8) There are usually only 3 or 4 of trophic levels in food webs. Choose the one reasonable hypothesis for why this should be.
   a) There is not enough energy to support another consumer level
   b) There is not enough energy to support another producer level
   c) Top carnivores do not eat much
9) A nutritional disease, rickets, is normally cured by vitamin D supplements. However, some individuals have an X-linked dominant trait that makes them unresponsive to vitamin D. Using the letters D and d as allele designations, which one or more of the following would be the correct genotype(s) for a female with this disorder?
   a) \( X^D X^D \)
   b) \( X^D X^d \)
   c) \( X^d X^d \)
   d) \( X^D Y^d \)
   e) Both a and b.

10) Hemophilia is an X-linked recessive trait. Using H and h as allele designations which one or more of the following would be the correct genotype for a male with this disorder?
   a) \( X^H X^h \)
   b) \( X^H Y^h \)
   c) \( X^h Y \)
   d) \( X^h Y^h \)
   e) Both c and d

Use this information for the following group of questions: Gwen and Lance belong to the species Peromyscus maniculatus, the white-footed mouse, a small mammal that has a diploid number of 48 chromosomes. Its sex determination system is the same as for humans – X and Y chromosomes. Gwen and Lance meet one day while eating berries in the meadow. Like all mice their age they establish a nest and go about producing babies.

11) In order to reproduce they both must produce gametes. This requires a specialized type of cell division – meiosis - in their ovaries (Gwen) and testes (Lance). Meiosis results in
   a) Genetically identical daughter cells that are haploid
   b) Genetically identical daughter cells that are diploid
   c) Haploid daughter cells that are not genetically identical
   d) Diploid daughter cells that are not genetically identical

12) Each gamete produced by Gwen and Lance would contain
   a) 96 chromosomes
   b) 48 chromosomes
   c) 24 chromosomes
   d) 12 chromosomes

13) Lance and Gwen successfully reproduce and now must build a nest. Lance is a very daring and resourceful mouse and mistakenly gets too close to a hungry cat in an attempt to acquire nesting material. He narrowly escapes capture but loses some skin off of his tail. This skin will be replaced by a specialized form of cell division called mitosis. Mitosis in Lance’s skin results in
   a) Genetically identical daughter cells that are haploid
   b) Genetically identical daughter cells that are diploid
   c) Haploid daughter cells that are not genetically identical
   d) Diploid daughter cells that are not genetically identical

14) How many homologous pairs of chromosomes does Lance have in each of the cells of his tail?
   a) 96
   b) 48
   c) 24
   d) 12
15) Each one of the new skin cells will contain
   a) 96 chromosomes
   b) 48 chromosomes
   c) 24 chromosomes
   d) 12 chromosomes

16) We learned about Donna and Frank in the Family Reunion scenario. Their daughter Jessica has cystic fibrosis – a recessive trait. They also have another child that does not suffer from cystic fibrosis. If Donna and Frank decided to have a third child what would be the probability (chance) of that child also having cystic fibrosis?
   a) ¼
   b) ½
   c) ¾
   d) none – they already have one child with cystic fibrosis

17) Gametes are
   a) Haploid sperm and egg cells
   b) Diploid spermatogonia and centromeres
   c) Mitotic spindles and fibers
   d) Homologous chromosomes
   e) Recessive, dominant centromeres

18) The thylakoid disk shown on the right has been kept in the dark.
    If you expose it to sunlight, the concentration of H+ on the inside would
    a) Increase
    b) Decrease
    c) Stay the same

19) The thylakoid disk shown on the right has been kept in the dark.
    If you expose it to sunlight, ATP synthesis would
    a) Increase
    b) Decrease
    c) Stay the same

20) Henry VIII, King of England (1509-1547), had the nasty habit of beheading his wives (he was married 6 times) because they kept having girl babies instead of boys. What was wrong with his logic concerning the problem of sex determination in offspring?
   a) Nothing: each parent can determine the sex of each baby by contributing either X or Y chromosomes.
   b) Nothing: the mother determines the sex of the offspring by contributing X bearing eggs or Y bearing eggs.
   c) He didn’t understand that he was the one who determined the sex of the offspring by randomly contributing X or Y bearing sperm to each fertilization event.
   d) He didn’t understand that the baby determined its own sex.

21) Leptin is synthesized and secreted by:
   a) liver cells
   b) gall bladder cells
   c) fat cells
   d) sperm cells
   e) egg cells
Use this information for the following group of questions: In a mainland population of about 20,000 seals (a fat marine mammal), scientists identify 3 fur color phenotypes: black, grey, and white. The seals come ashore to breed along beaches that contain a combination of light and dark colored rocks and white sand. One male defends each stretch of beach and attempts to maintain exclusive breeding rights to the females on his stretch of beach. The coastal waters are quite cold. Sea eagles prey on baby seals on the shore while their mothers are at sea feeding. As a result of a storm, 8 seals are carried to a distant island and become a founder population.

22) If you were observing sexual behavior, you would correctly predict
   a) The males defending the beach would be the smallest
   b) The females would be attracted to any male they saw
   c) The females would mate with males before coming to shore
   d) Males not in control of the beach would still attempt to mate with females
   e) Females would choose males that are the thinnest.

23) In these seals at the beginning of the breeding season, you would expect to find:
   a) Extensive fat reserves that might serve as insulation.
   b) Limited fat reserves because they feed in the sea.
   c) Limited fat reserves in females that would be preparing to remain on shore to nurse.
   d) No fat reserves in males that control beaches.
   e) No fat reserves in males that do not control beaches.

24) On the distant island mentioned above, the beaches are made of black volcanic sand. You would predict that in the founder population:
   a) The seals would be unable to reproduce.
   b) Natural selection would favor a light coat color to reflect heat.
   c) Natural selection would favor dark coat colors if sea eagles were present.
   d) Sexual selection would be unimportant on dark beaches.
   e) The sea lions would be unable to find food.

25) When on shore and chasing other seals along the beach, you would expect that the seals’ O₂ consumption
   a) Would be higher than when resting
   b) Would be lower than when resting
   c) Would be lower than females nursing
   d) Would be the same as when resting

26) Over thousands of years, the tails of male peacocks have gotten longer and more brightly colored. Females prefer to mate with males who have the longest, brightest tails. This is an example of:
   a) Sexual selection.
   b) Mate selection
   c) Evolution.
   d) All the above.
27) Recently, a man whose severed hand was replaced by a hand from a dead person threw the first baseball onto the field for opening day. After the transplant, he was given drugs to suppress his immune response. Why?
   a) The cells on his new hand have antigens on the surface that cause an immune response which may result in his body rejecting the hand
   b) The cells on his new hand have antibodies on the surface that cause an immune response which may result in his body rejecting the hand.
   c) His B cells have antigens on their surface that reject the hand
   d) The drugs reduce anxiety.
   e) Getting a bacterial infection while recovering from a transplant is considered a positive thing.

28) The ideal transplant donor would be an identical twin brother. Why?
   a) They would both have the same DNA sequence in cell nuclei.
   b) They would both have the same proteins synthesized and expressed on cell surfaces.
   c) They would both have the same blood group phenotype.
   d) They would both have the same blood group genotype.
   e) All of the above.

29) Cystic fibrosis patients have frequent bacterial infections in their lungs. As a result of many antibiotic treatments over time, they develop resistant strains of bacteria that do not respond to existing antibiotic treatments. If a drug company develops a new antibiotic chemical that prevents mRNA from binding with ribosomes, which one or more will be the cellular consequences?
   a) This antibiotic slows bacterial growth by stopping replication.
   b) This antibiotic slows bacterial growth by stopping translation.
   c) This antibiotic slows bacterial growth by stopping transcription.
   d) This antibiotic slows bacterial growth by stopping protein synthesis.
   e) Both b and d

30) Jane is colorblind. An X-linked recessive gene codes for this trait. Jane must have received the gene(s)/allele(s) for this trait from
   a) Her mother only
   b) Her father only
   c) Both her mother and father
   d) Either her mother or father

31) Godfrey has the same type of colorblindness as Jane. He must have received the gene(s)/allele(s) for this trait from
   a) His mother only
   b) His father only
   c) Both his mother and father
   d) Either his mother or father

32) If a child has Type AB blood and its mother has Type B blood, which one of the following represents all possible genotypes for the father of this child? Recall that the A and B alleles are codominant and each is dominant to the o allele.
   a) Men with the genotypes BB and AA
   b) Men with the genotypes Ao, AA, and AB
   c) Men with the genotypes oo, Ao, AA, and AB.
   d) Men with the genotypes AA and AB
   e) Men with the genotypes Ao and AA
Use this information for the following 2 questions: Hog and chicken production systems in which thousands of animals are confined together in a single building present several problems. What to do with waste is just one of them.

33) Disease may be quickly transmitted through the population causing huge financial loss. Disease is
   a) A density dependent population control
   b) A density independent population control
   c) Not a possibility under controlled conditions

34) If the farmer decides to provide antibiotics daily to combat this problem, the next risk is that
   a) Too many animals survive
   b) The animals become sickly and die from the antibiotics
   c) Pathogens (bacteria) become resistant to the antibiotics over time
   d) The pigs will die of convulsions
   e) There is no risk associated with the pigs getting antibiotics daily

35) If a scientist determines that a molecule of double-stranded DNA contains 30% adenine, which of the following is true?
   a) It will contain 30% uracil
   b) It will contain 20% thymine
   c) It will contain 20% guanine
   d) It will contain 30% cytocine
   e) It will contain 40% cytosine

36) In which of the following processes is surface-area-to-volume ratio NOT a factor?
   a) Cellular respiration
   b) Photosynthesis
   c) Thermoregulation
   d) Digestion
   e) Surface-area-to volume ratio is a factor in all of the above

37) Top predators (e.g., eagles, lions, wolves) tend to be fast and strong animals that use a lot of energy hunting, chasing, and killing their prey. However, the ecological or trophic pyramid shows that energy in a food web declines rapidly as nutrients are transferred to higher and higher feeding levels. Choose the one reasonable hypothesis.
   a) They use much more energy per animal than their prey
   b) Predators are not included in most ecological pyramids
   c) There are few predators compared to their prey
   d) There are many predators compared to their prey

38) After applying a pesticide around your house, you notice a cockroach lying on her back with her legs twitching wildly. You might reasonably hypothesize that the insecticide contains a toxin that
   a) Inhibits neurotransmission
   b) Blocks neurotransmission
   c) Inhibits neurotransmitter breakdown
   d) Destroys sodium-potassium pumps
39) A group of first-graders created a miniature ecosystem in a closed jar as their science fair project. They placed moist sterilized soil in the bottom, then introduced wheat plants, aphids, and ladybugs. Light was provided by a window in the classroom. Aphids get their food from wheat; ladybugs eat aphids. Two months later, the class measured the amount of energy contained in all of the wheat plants (W), aphids (A), and ladybugs (LB). Which of the following would you correctly predict based upon what you know about their trophic levels (position in the food chain)?

a) W=5 kilocalories, A=50 kilocalories, LB=75 kilocalories  
b) W=5 kilocalories, A=50 kilocalories, LB=500 kilocalories  
c) W=500 kilocalories, A=50 kilocalories, LB= 5 kilocalories  
d) W=500 kilocalories, A=5 kilocalorie, LB=50 kilocalories  
e) W=5 kilocalories, A=50 kilocalories, LB=150 kilocalories

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**Use this information for the following group of questions:** Dr. Brainwave inherited equipment from a fellow scientist. With his new cool stuff, he can detect concentrations of the following materials essential for life: oxygen (O$_2$), carbon dioxide (CO$_2$), sodium (Na$^+$), potassium (K$^+$), protons (H$^+$), ADP, and ATP. Ideas whirling in his brain, Dr. Brainwave sets out to perform a few simple experiments to support concepts presented in BIOL 1114. What results will Dr. Brainwave find when he uses each of his new probes under each of the conditions that follow?

40) Proton sensors located in the matrix and in the intermembrane compartment of a mitochondrion during **electron transport and oxidative phosphorylation** (electron transport coupled with ATP synthesis).

a) Higher proton concentration in the intermembrane compartment and lower proton concentration in the matrix  
b) Lower proton concentration in the intermembrane compartment and higher proton concentration in the matrix  
c) Equal proton concentrations in the intermembrane compartment and the matrix

41) O$_2$ sensor located in a flask containing bacteria known to conduct **aerobic respiration**.

a) O$_2$ concentration increases over time  
b) O$_2$ concentration decreases over time  
c) O$_2$ concentration stays the same over time

42) O$_2$ sensor located in a **well-lighted** flask containing bacteria known to conduct **photosynthesis** at a rate higher than necessary for cellular respiration to support cell growth and maintenance.

a) O$_2$ concentration increases over time  
b) O$_2$ concentration decreases over time  
c) O$_2$ stays the same over time

43) CO$_2$ sensor located in a flask **in the dark** containing bacteria capable of photosynthesizing.

a) CO$_2$ concentration increases over time  
b) CO$_2$ concentration decreases over time  
c) CO$_2$ concentration stays the same over time

44) ATP and ADP sensors located in a mitochondrion conducting **cellular respiration** within a living cell, **immediately** after cutting off the oxygen supply.

a) ATP and ADP concentrations increase over time  
b) ATP and ADP concentrations decrease over time  
c) ATP concentration increases and ADP concentration decreases over time  
d) ATP concentration decreases and ADP concentration increases over time  
e) None of these
Use this information for the following group of questions: Newsweek magazine recently reported that a George Washington University medical scientist conducted experiments in the treatment of chronic fatigue syndrome (CFS). CFS patients suffer from fatigue and general lack of energy. The experimental treatment was NADH, given as a dietary supplement to some CFS patients, while a placebo was given to others. Data collected by the researchers showed that the supplement caused a 31% decrease in symptoms (fatigue), compared to the placebo’s 8%. These results are statistically significant (unlikely to occur by chance alone).

45) The control group ________________.
   a) Received the NADH supplement
   b) Received the placebo
   c) Did not have CFS
   d) Was the researchers

46) In this experiment, the scientists will consider _______________ as the independent or manipulated variable, and _______________ as the dependent or response variable.
   a) Time; fatigue symptoms
   b) NADH treatment; fatigue symptoms
   c) Fatigue symptoms; time
   d) Fatigue symptoms; NADH treatment
   e) It does not matter

47) If they present these data graphically, _______________ will be displayed on the x-axis (horizontal) and _______________ will be displayed on the y-axis (vertical).
   a) Time; fatigue symptoms
   b) NADH treatment, fatigue symptoms
   c) Fatigue symptoms; time
   d) Fatigue symptoms; NADH treatment
   e) It does not matter

48) NADH was considered as a way to treat CFS because:
   a) NADH contains glucose
   b) H atoms are added to ADP to form ATP
   c) NADH donates electrons to the electron transport chain to make FADH2 in mitochondria
   d) NADH supplies electrons and protons to create a proton gradient which powers ATP production
   e) It was a lucky guess

49) An oil rig accident results in a man’s hand being severed from his arm. Paramedics arriving first on the scene place the severed hand in ice. The man and his hand are flown to a hospital where doctors successfully reattach the hand to his arm. Why did placing the hand in ice improve the chances of saving it?
   a) Cooling enzymes in hand cells causes metabolic rate to increase, thus extending cell lifetime without additional blood and oxygen supply.
   b) Cooling enzymes in hand cells causes metabolic rate to decrease, extending cell lifetime without additional blood and oxygen supply.
   c) Cooling the hand results in faster cellular respiration, prolonging the life of cells.
   d) Cooling the hand stimulates mitosis.
50) When sprayed on crops, pesticides such as DDT often cause problems in higher trophic levels (carnivores) because:
   a) The DDT is concentrated in organisms at higher trophic levels
   b) DDT was made specifically to kill these organisms.
   c) DDT is broken down easily and dissipates rapidly.
   d) The insects that are killed by the DDT pile up and become health hazards.
   e) Insects not killed by the DDT out compete these organisms for food.

51) Plants that produce toxic secondary metabolites such as nicotine have more protection from herbivores than those plants that do not. This kind of relationship involves all of the following except:
   a) Mutation
   b) Coevolution
   c) Natural selection
   d) PCR
   e) Fitness

52) During the generation of an action potential, opening sodium channels is **immediately** followed by:
   a) Closing of potassium channels
   b) Secretion of neurotransmitter
   c) Movement of sodium ions into the nerve cell
   d) Movement of potassium ions into the nerve cell

53) Tenkiller Lake in eastern Oklahoma used to have very clear water, but over the last 20 years it has become increasingly eutrophic. Over this same period there has been an increase in the nearby human population and agriculture. What is the best hypothesis for the **cause(s)** of eutrophication in Tenkiller Lake?
   a) Poisonous chemicals produced by industry.
   b) Herbicides (chemicals used to kill plants) applied to croplands and people's lawns.
   c) Nitrogen and phosphorus from agriculture and human sewage.
   d) Sediments from construction sites and croplands.
   e) All of the above (a-d).

54) The best way to ensure enough food calories (energy) for the 6 billion (and growing) global human population in the future is to _________________.
   a) genetically engineer livestock to improve meat flavor and texture.
   b) emphasize vegetables and grains as the main source of calories.
   c) emphasize meat as the main source of calories.
   d) increase the use of antibiotics in livestock so they don't die.
   e) develop a single superior genotype of one crop to be grown all over the world.

55) In any particular ecosystem, heavy rainfall, removal of plants after harvesting (rather than plowing them under), or deforestation may limit the amount of nitrogen or phosphorous available to the ecosystem. However, the amount of carbon available to the ecosystem is usually not a problem. Why?
   a) Organisms do not require much carbon.
   b) Plants can make their own carbon from sunlight and water.
   c) Plants are very good at absorbing carbon from the soil.
   d) Carbon is readily available to plants from the atmosphere (air).
   e) Bacteria help plants by capturing carbon
Use this information for the following group of questions: A mutant mouse with the phenotype “scrawny” is discovered and subjected to several tests. In each case the scientists measure the weight of the mice and report the average weight. The results are shown below.

<table>
<thead>
<tr>
<th>Mouse phenotype</th>
<th>Before experiment</th>
<th>Water injection</th>
<th>Water + leptin injection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>50g</td>
<td>50g</td>
<td>40g</td>
</tr>
<tr>
<td>Scrawny</td>
<td>15g</td>
<td>15g</td>
<td>15g</td>
</tr>
</tbody>
</table>

56) The control treatment(s) in the experiment is/are
a) Water injection
b) Water + leptin injection
c) Mouse weight
d) All of the above
e) b & c only

57) All offspring of crosses between scrawny mice and normal mice are scrawny. If this is controlled by a single gene, the allele for the scrawny phenotype is probably
a) Dominant.
b) Recessive.
c) Unknown.
d) Codominant

58) You would correctly predict that the Leptin levels of scrawny mice might be __________normal mice.
a) Higher than
b) Lower than
c) About the same as

59) You would expect that the surface-area-to-volume ratio of scrawny mice would be ________ normal mice.
a) Higher than
b) Lower than
c) About the same as

Use the following additional information for the next 2 questions: A mutant mouse with the phenotype “lethargic” has a mutation in a different gene than phenotype “scrawny”. The allele is recessive and results in a non-functioning leptin receptor.

60) These lethargic mice would be expected to have ________ normal mice.
a) More fat than
b) Less fat than
c) About the same amount of fat as
61) If normal mice, each of which had a **lethargic parent**, were crossed, their offspring would be expected to be
   a) All lethargic
   b) All normal
   c) 50% lethargic
   d) 25% lethargic
   e) 75% lethargic

62) Leptin is released by one organ or part of the body and causes a change in another organ or part of the body. That makes it a(n)
   a) Organelle
   b) Acetylcholinesterase inhibitor
   c) Antigen
   d) Antibody
   e) Hormone

63) Both DNA and RNA ________________.
   a) contain the same 4 nucleotides.
   b) contain both nitrogen (N) and phosphorus (P)
   c) are located only in the nucleus and not in other cellular compartments (in eukaryotes).
   d) are composed of amino acids.
   e) all of the above (a-d)

64) Human land-use practices such as agriculture and urban development potentially affect which one or more of the following biogeochemical cycles?
   a) water
   b) phosphorus
   c) nitrogen
   d) carbon
   e) all of the above (a-d)

65) In which one of the following situations would you expect the mating system to be monogamous?
   a) Voles – a small mammal. The females builds a nest, gives birth to the young, nourishes them with milk until they can feed on their own.
   b) Ring doves – The male and female bird build a nest together, share incubation duties and take turns feeding the virtually helpless babies from the time the eggs hatch until they fledge (leave the nest).
   c) The European cuckoo – The female bird lays each one of her eggs in a different bird’s nest. The young are incubated, hatched, and fed by other birds.
   d) The yellow-headed blackbird. Males defend large territories in which multiple females build nests and raise their young.
Use the diagram below for the following group of questions: The diagram shows a food web for a single ecosystem. The arrows indicate flows of energy; the letters indicate species.

66) Which one of the following species is the autotroph in the given food web?
   a) A  
   b) B  
   c) C  
   d) D

67) A fat-soluble toxic pollutant would probably reach the highest concentration in which one of the following?
   a) A  
   b) B  
   c) C  
   d) D

68) If C makes its predators sick, which species is most likely to benefit from being a mimic of C?
   a) A  
   b) B  
   c) C  
   d) D

69) Which species would you correctly predict to have the least biomass/energy in the ecosystem for which the web was drawn?
   a) A  
   b) B  
   c) C  
   d) D

70) Pick the most fit individual(s):
   a) A male who fails to reproduce but lives to old age  
   b) A sterile male  
   c) A male who reproduces once and dies  
   d) A male who dies before reproduction  
   e) All of the above
HAVE A GREAT SUMMER !!!