

## Bio. 103, Study Questions from Text

### Chap. 1

1. Flowering plants are technically placed in what category or group? A flower has several parts - what are the 2 parts directly involved with reproduction?
2. Carbohydrates can be separated into 3 categories called.....? Name an example in each of these 3 categories. If the complex ones are composed of the same constituent building blocks, what makes them different?
3. Proteins are composed of what? How many naturally occurring ones are there?
4. Lipids, such as triglycerides, are composed of what building blocks?
5. What is a secondary chemical product produced by a plant? There are 4 categories named by the text authors - what are they?

### Chap. 5

1. What is the floral stigma? What is an ovule?
2. What is so special about tulips?
3. What is a complete flower? What is an incomplete flower? What is a perfect flower? What is an imperfect flower? What is a monoecious plant? What is a dioecious plant?
4. In the life cycle of a flowering plant, when does meiosis take place? What does it accomplish? Another name for the plant which produces flowers, (and the name describes what the plant makes in its flowers), is what?
5. How many cells are produced at the end of meiosis from one original cell? Look at the illustration on P. 77 and follow it around. Know these terms: stigma, ovary, ovule, megaspore, female gametophyte, male gametophyte, egg, polar nuclei, zygote, endosperm, embryo, and fruit.
6. What makes pollen useful to fields of study such as archaeology, etc.?
7. Name a few animal pollinators. What attracts those you named? What is an essential oil? How are they used by humans? What is "enfleurage"?
8. What 2 general characteristics do wind-pollinated flowers have?
9. Why is the term "double fertilization" used by the authors?

### Chap. 6

1. What does indehiscent mean? What kind of fruit is a tomato? A peach? An apple? A pea pod?
2. Where are tomatoes native? In what plant family is it classified? Why did this give tomatoes a bad "rap"? Why are some tomatoes called "heirloom"?
3. What do plant hormones do? Which hormone would you use for fruit ripening? Which hormone would you use to prevent premature fruit drop?
4. Where are apples native? What do they have to do with the Old Testament of the bible? What are scion and rootstock used to do? When you eat an apple, the flesh you eat develops from where?

5. Where did sweet orange plants probably come from? Other citrus plants probably came from where?
6. Which type of orange is parthenocarpic? One of the newest types of orange is called the \_\_\_\_\_ orange and the largest of the citrus fruits is the \_\_\_\_\_ and is native to where? It is also famous as one of the ancestors of the \_\_\_\_\_. The juice of that fruit can cause problems with what?
7. Chestnut species are found native in many places in the world and the one in N. America was used, historically, in what several ways? What happened to the chestnut trees in American forests, why, and in what time period?
8. How did the kiwi fruit get its name? What type of chemical compounds is responsible for the durian's bad smell?

## Chapter 8

1. What is an herbal? What kind of plants is associated with them?
2. What is the name of the Swedish botanist who developed a system of biological naming? What was his greatest accomplishment? What is "wrong" with the way this name is shown here: *pinus Alba* (there are 3 errors). Can you tell what these common scientific epithets mean? 1. *acidus*, 2. *arabicus*, 3. *deliciosus*, 4. *hirsutus*. 5. *vulgaris*.
3. There is a generally accepted biological species concept, which is what? Why is this definition a problem in the plant world?
4. What is systematics? Why is it important to biodiversity? What is the connection between biodiversity and genetic engineering? You can skip the section on Darwin and Natural Selection.
5. What does a genetic barcode consist of, in general?

## Chap. 9 - only these topics:

1. Look at Box Fig. 9.1; it generalizes the alternation of generation plan of plant life cycles, including flowering plants.
2. Read about amber. What is it? Where are the most prolific sites for finding it? What can be found embedded in it?

## Chap. 10

1. What are the 3 macronutrients? What are the 2 categories of micronutrients?
2. What is kwashiorkor? What is marasmus? If you calculate a person's body weight divided by height squared, times 703, what are you determining? Do you know your own number?
3. Why is obesity a risky state to be in? Is there any benefit in being obese? What are the 2 types of dietary fiber?
4. How many of the necessary amino acids can you make yourself? Why are some proteins said to be incomplete? Generally, are these from plants or animals?
5. What category of chemicals is gluten? What is the connection between gluten and celiac disease?

6. A triglyceride molecule is made from what 3 molecules? Are there any necessary fatty acids a human cannot manufacture?
7. Cholesterol is insoluble in the watery medium of blood, so how does it get transported?
8. What is the role in human physiology of most vitamins? What are the 2 groups of vitamins - that is, they are separated by 2 characteristics which are.....?
9. What is the origin of the term "limeys" for British sailors?
10. Which vitamin deficiency can lead to beriberi? Which vitamin deficiency can lead to pellagra?
11. Which is the most abundant mineral in the human body? Where in the body is the most important role of iron? For what is iodine required?
12. What are the positive benefits to being a vegetarian? Are there any negatives?

## Chapter 11

1. How long has our species been in existence? What did the early humans do for food? What are phytoliths and how can they be used? When did agriculture probably begin? What is a "midden?" What do the authors conclude about "Agriculture: Revolution or Evolution?" Where is the Fertile Crescent? What probably was the first crop domesticated there?
2. Where in the Far East did agriculture arise? What important plant (associated with Far East cuisine to this day) was among the first to be domesticated? Where else in the Old World did agriculture arise? Where in the New World did early agriculture start?
3. Domestication of a plant means what kind of change in that plant? (one word will do) What is an example among the grasses of such a change in a particular characteristic?
4. How would you define a center of domestication? Who was N. Vavilov? Who was Trofim Lysenko?
5. After Vavilov's time, what kind of modifications have been made to his original conclusions? Of what importance is knowing where a certain crop originated?

## Chap. 12

1. The grass family makes up what percentage of the world's vegetation? What kind of root system do grasses have? What is an adventitious root? What are the fruits of grass species called? The bracts that surround the grass flower are called..... The outer wall of the fruit fused to the seed coat is called the.....The embryo of the seed is called the .....What chemical makes up most of the endosperm? In whole-grain products, all but one item you named above is removed. What item is that? Why are whole-grain products more nutritious?
2. Where did domesticated wheat have its origin, and about how long ago? Bread wheat is placed in what genus, and what species? What is the basic chromosome number of all the wheats? Bread wheat is considered to be what kind of "...ploid?" What is the name of the protein in wheat flour that gives the flour elasticity? Of what significance is this elasticity? What is the species of wheat that is used to

make pasta? Growing conditions and protein content are used to categorize wheat cultivars. What's the difference between spring and winter wheats? What's the difference between hard and soft wheats? Most of the worst parasites of wheat belong to what group of plants?

3. Refined wheat, with bran and germ removed, result in the loss of 3 different vitamins which are.....How is this loss compensated for?
4. What are the 6 types of maize? Which one is the most widely type grown in the Corn Belt?
5. What are the Latin genus and species names for maize? What other name is used interchangeably in North America for this plant? Because of the way the staminate and carpellate flowers are produced, maize is .....oecious.
6. What are the 2 major characteristics introduced into hybrid maize? How is hybrid maize produced - that is what are the starting points? What is a transposon? What is the controversy, in general terms, concerning maize's ancestry?
7. For what is most maize used in the U.S.? What is the next highest (%) use for maize?
8. What is the genus and species names for rice? What is there about rice plants that allow them to survive in flooded soils? What is the name of the small, aquatic fern in the water where rice grows? Of what is its significance to the rice plants? What is a "paddy? Which is nutritionally better: white or brown rice? Why?
9. There are 2 main subspecies of rice:..... How could you tell the difference in a restaurant of food prepared with these 2 types of rice?
10. What was rye originally thought to be? What 2 qualities regarding the environment does it have that are valuable? Because of what, does rye flour have to be mixed with wheat flour in bread making? Why cross wheat with rye - what's the advantage? What is the common name of the hybrid?
11. What is the exact time and place where oats were domesticated? For what animal have oats been considered, for a long time, good food? In the mid-1980s, however, for what reason did oats become more popular for humans?
12. What is barley's claim to fame, historically speaking? Today, barley has 2 main uses, which are?
13. Sorghum is mostly used for what in the U.S.? Where is it native?
14. Millet in the U.S., is used mostly for what? In other parts of the world, it is much more important, and one of its basic growing characteristics, which is.....make it extremely useful.
15. Any vegetation consumed by domestic herbivorous animals is called what? The majority of the plants in this category are not grown for their seeds or grains, but rather for their.....
16. What 2 grass plants are the main sources for bioethanol in the U.S.? What is the nature of the controversy about using one of them (grown mostly in the U.S.) so extensively for ethanol production? What country exploits the other major plant source of bioethanol?
17. What is cellulosic ethanol, and what 2 plants are the most promising sources of bioethanol (one has a common name, one doesn't)?