

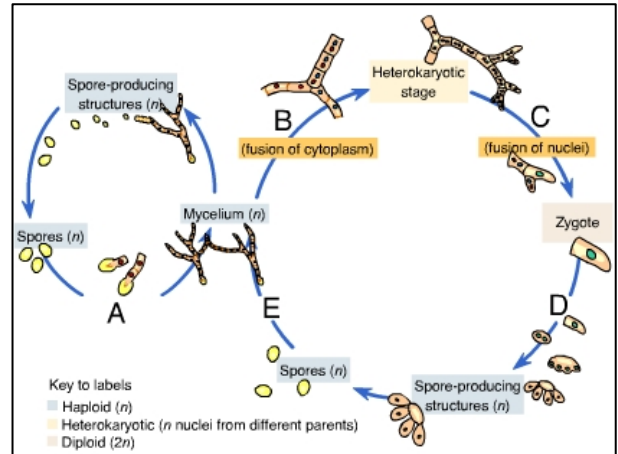
2. Tetrapolar mating systems are common in:
- zygomycetes
 - ascomycetes
 - basidiomycetes
 - both b and c
 - a, b, and c
3. A study of *Aspergillus nidulans* found that sexual reproduction in homothallic fungi is advantageous because it:
- created ascospores that were genetically different from the fungus' conidia
 - somehow "cleansed" the genome of some moderately harmful mutations
 - reduced the colony diameters of sexually reproducing lines in pure culture
 - increases the probability that parasexuality will occur

4. Consider the figure shown at right. Which stage represents plasmogamy?

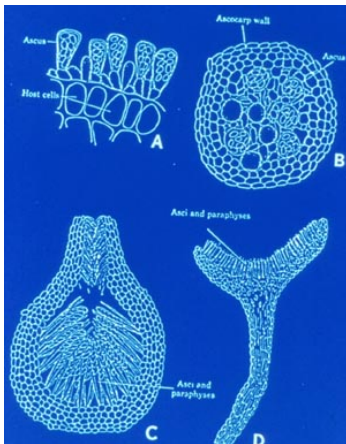
A B C D E

5. In the same figure, which represents karyogamy?

A B C D E



6. Draw a line from the structure in the figure with its name (you will not use all of the choices).



- | | |
|---|----------------|
| A | Holobasidium |
| B | "Naked" asci |
| C | Cleistothecium |
| D | Apothecium |
| | Pycnidium |
| | Perithecium |
| | Sporangium |
| | Sclerotium |

7. From the list below, circle ALL of the characteristics that slime molds share with zygomycetes, ascomycetes, and basidiomycetes:

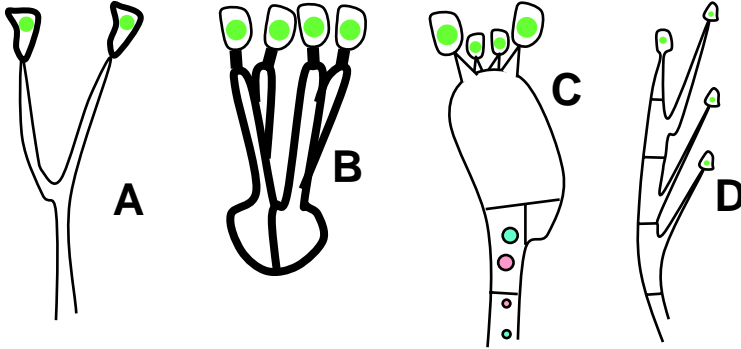
filamentous eukaryotic heterotrophic form sporangia amoeboid

8. Oomycetes such as *Saprolegnia*:

- produce asexual zoospores, each with two flagellad. all of the above are correct
- have diploid hyphae
- are classified with kelps and diatoms
- only b and c are correct

9. Which of the following statements about yeasts is FALSE?
- Some fungi can exist as either a filamentous form or as a yeast.
 - “Yeast” represents a single evolutionary lineage of fungi.
 - Yeasts reproduce either by budding or binary fission.
 - Physiological tests are generally more useful than cell morphology in identifying yeasts.
 - Plant surfaces house more yeasts than do humans.

10. Draw clear lines matching each basidium with its name.



- A Cruciately septate basidium
 B Holobasidium
 C Transversely septate basidium
 D Tuning fork basidium

Part IV: Compare and Contrast. Below are six pairs of terms or phrases. For ANY FOUR pairs, describe one similarity and one difference between the two members (16 points total). [NOTE: If you choose more than four pairs, I will grade only the first four.]

acellular slime mold (like *Physarum*) – cellular slime mold (like *Dictyostelium*) [NOTE: it won't count to say “one is cellular and the other is acellular”]

unitunicate ascus – bitunicate ascus

ascogonium – antheridium

hyphomycete -- coelomycete

hymenomycete – gasteromycete

parasexuality – meiosis

Total points (this page): _____

Part V: Short answer. Point values are indicated after each question.

1. Fill in the following table (6 points):

	oomycete	ascomycete	zygomycete	basidiomycete
Hyphae septate or aseptate?				
Sexual spore type				
Dikaryotic cells? (yes/no)				

2. A type of chytrid called *Coelomomyces* is used to control populations of the mosquitoes that spread malaria and yellow fever in humans. Say you isolate a fungus that you suspect is *Coelomomyces*, but you're not even sure if your unknown is a chytrid. Assuming you have access to all the equipment you need to make this determination, what is one feature you could use to verify that your fungus is a chytrid and not some other type of fungus? (2 points)
3. In a tetrapolar mating system, what do you think will happen if two individuals have *different* alleles at the "plasmogamy" locus, but *identical* alleles at the "clamp connection formation" locus? (3 pts)
4. Suppose you are a farmer, and you find a plant pathogen (a heterothallic ascomycete) in your fields. The local plant pathologist tests the mating types of many colonies collected from your field, and she finds that only one mating type is present.
- How many mating types are *possible* for a heterothallic ascomycete? _____ (2 pts)
 - What is the term for this type of mating system? _____ (2 pts)
 - The plant pathologist tells you that having just one mating type is better than having more than one. Using what you know about mating systems in heterothallic ascomycetes, explain why this is so. Be sure to include why outcrossing is advantageous to the fungus (4 points).
5. List three ways that ascomycetes disperse their ascospores (3 points).

Total points (this page): _____

6. List three differences between the spores and/or hyphae of ascomycetes and basidiomycetes (3 pts).
7. a. Sketch a mushroom that has both an annulus and a volva (4 points).
- b. Using additional sketches as needed, explain the origin of the volva in a mature mushroom (3 points)
8. What is the function of clamp connections? (3 points)
9. Explain the differences between the sexual phases of zygomycetes, ascomycetes, and basidiomycetes. Include in your answer the positions of plasmogamy, karyogamy, and meiosis in the life cycles (9 points).

Total points (this page): _____