NAME_____

(31)

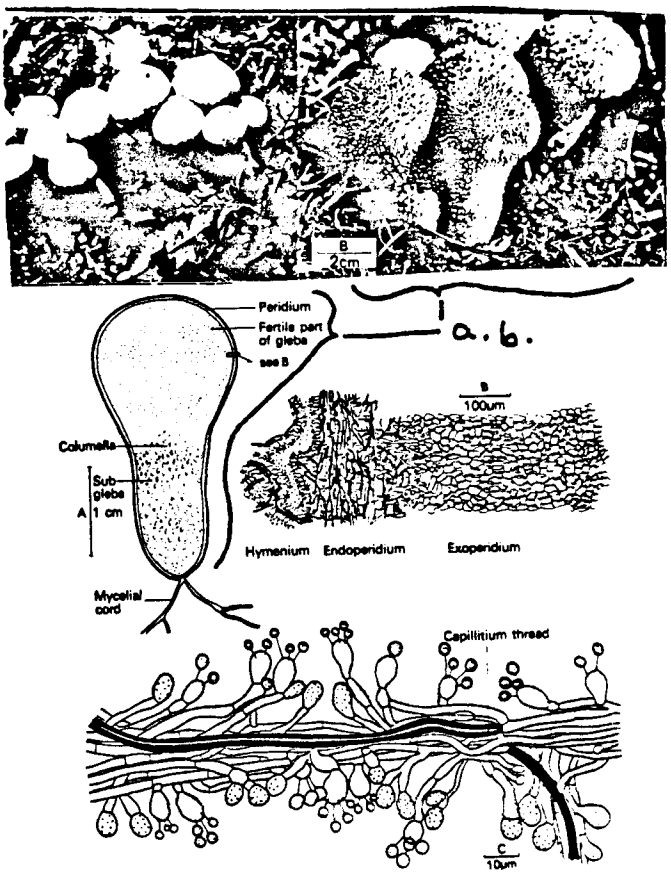
EXAM III
April 30, 1993
MIC 321

Directions: All explanations, definitions, and descriptions should be presented in good ~~English~~ Spanish. This means complete sentences should be used except when lists or fill-in-the-blanks are required. Spelling of mycological terms should be accurate. Slight misspellings may be overlooked, but major misspelling will result in wrong answers.

(1 point per blank; 25 pts total)

1. Identifications of structures, their essential basic function and/or their taxonomic significance. In the blanks provided identify, if requested, and with no more than one or two mycological terms, each structure (or structure indicated by arrow(s)), and then with a short phrase describe its function (e.g. cytokinesis; asexual reproduction, meiosporangium, etc.) and/or its relevance to phylogeny (classification) at the rank requested.

A.



a. common (laypersons) name of these macroscopic structures

_____

b. mycological name of the multihyphal aggregates

_____

c. function _____

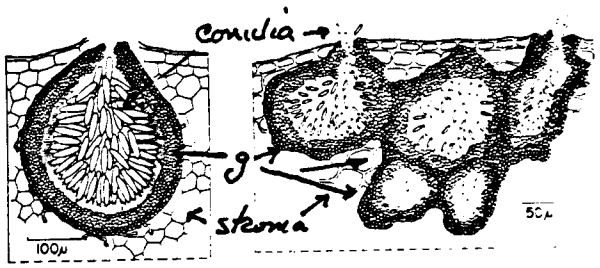
d. Subphylum _____

e. Class _____

f. Order _____

NAME _____

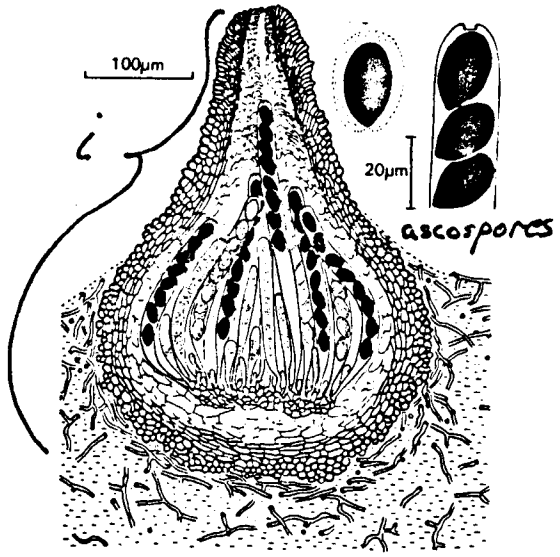
B.



g. _____

h. if only structures observed, fungus is assigned to the class _____

C.



i. mycological name for whole structure

_____

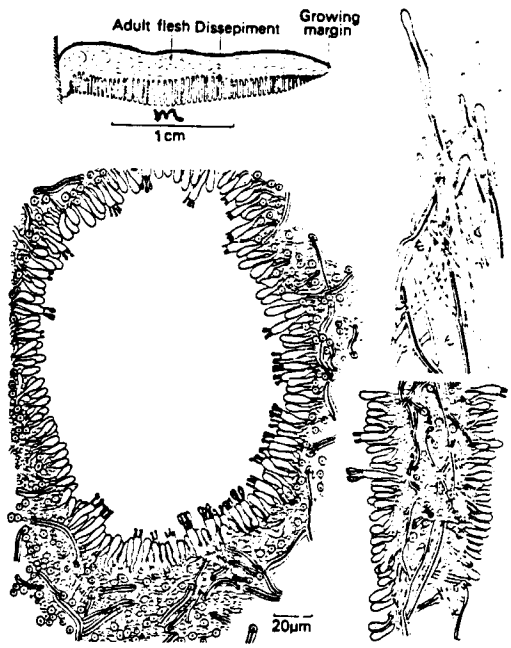
j. Subphylum _____

k. Class _____

l. Order, if *Neurospora crassa*

_____

D.



m. Common (laypersons) name of these macroscopic structures

_____

n. Subphylum _____

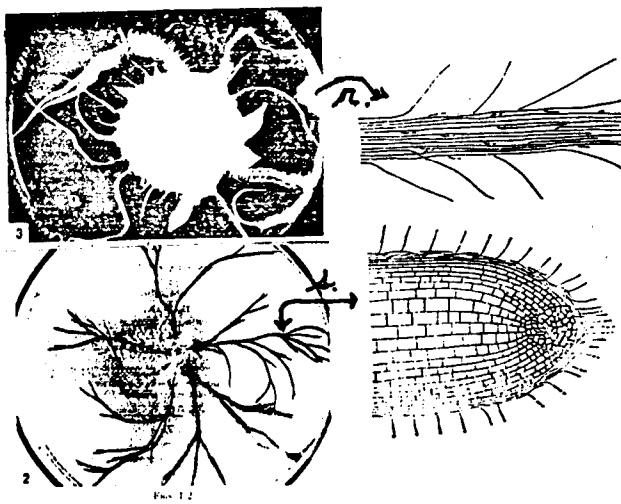
o. Class _____

p. Order _____

q. Family _____

NAME _____

E.



r. _____

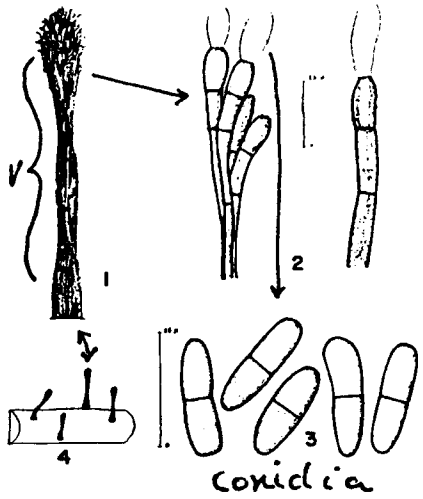
s. _____

t. function _____

F.

u. Class _____

G.

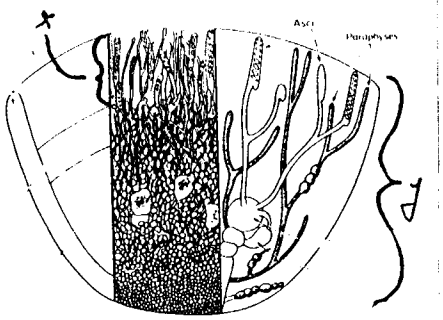


v. _____

w. if only structure observed, then fungus is assigned to the class

_____

NAME _____

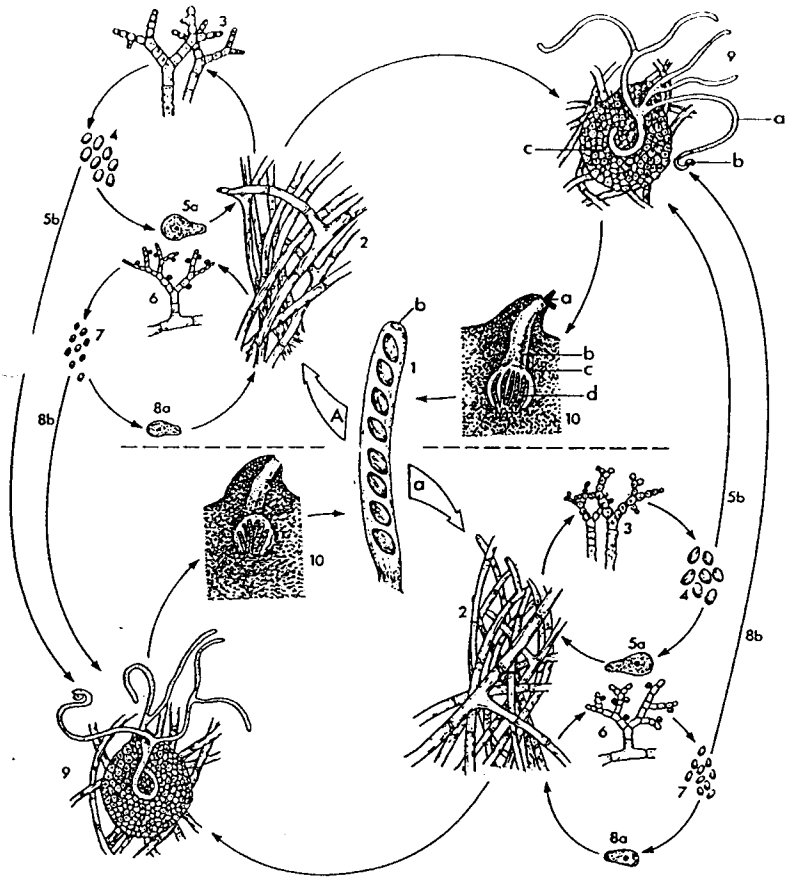


x. area _____

y. mycological name of multihyphal aggregate

_____

2. (20 pts total) Although your efforts to do a simple genetic cross with *Neurospora crassa* failed for a reason we are as yet unable to explain (ascospores would not grow on medium with all auxotrophic requirements although they did germinate and grow on other media), here you will be given a chance to show you have mastered the system at least at the comprehension level. Thus, first (5 pts) demonstrate that you are familiar with some relevant structures as identified by numbers by filling in the corresponding blanks beside the diagram. Next (5 pts) in a few sentences



4. _____

6. _____

9. _____

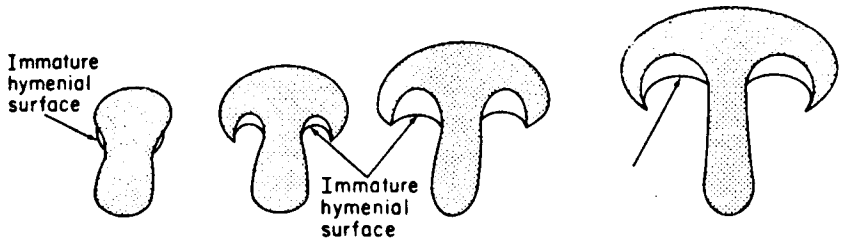
9a. _____

10a. _____

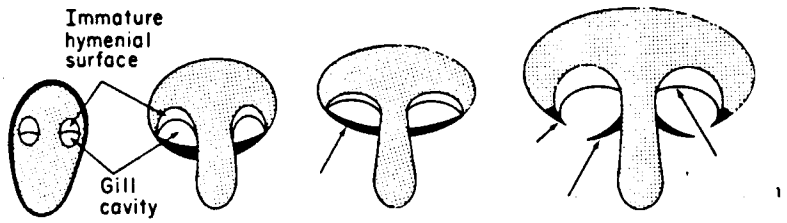
explain why *N. crassa* is said to be a heterothallic, dimictic, and hermaphroditic species, and finally diagram (10 pts) with labels how a mating of two single conidial cultures of *N. crassa*, which have opposite mating-type genes (a and A) and different alleles for ascospore color (B for black and b for albino) might give an ascus tetrad analysis of 1:1:1:1 when both factors are considered (in other words, your tetrad analysis revealed that the ascus you assayed had in order, from top to bottom 2 a B, 2 a b, 2 A B and 2 A b ascospores with regard to genotype). Your answer should be based on the fact that ascospore color and mating type genes are unlinked. Do not show any aspect of perithicium development or ascus development among your diagrams!

NAME _____

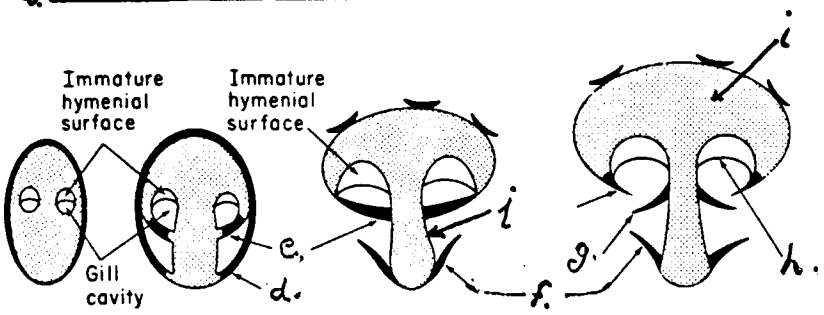
3a. (10 pts; 1 pt per blank) Homobasidiomycetous mushrooms seem superficially to look very similar at maturity, but in fact develop by three different modes as depicted by the diagrams below. Identify each developmental pattern by filling in the three blanks below each set of diagrams, and then identify each structure also indicated by a letter by filling in the blanks beside the diagrams.



a. _____ DEVELOPMENT



b. _____ DEVELOPMENT



c. _____ DEVELOPMENT

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

j. _____

3b. (5 pts) Now review the cartoon presented below and in a sentence or two tell me what you might do differently than dogs to identify a mushroom of the *Amanita* genus and why this dog might be assuming the best too soon.

NAME_____

4. (20 pts) You have two *ts cdc* mutant strains of *S. cerevisiae* having opposite mating types. Explain on the answer sheets how you might investigate the following:

   a. that they have mutations in different genes;

   b. that both mutations lead to 1st cycle arrest as opposed to non-first cycle arrest;

   c. that they each have a different execution point;

   d. that the mutations are in genes that control events in different pathways of dependent cell cycle events;

   e. that a haploid strain with mutations in two *CDC* genes, each of which controls events in different pathways of dependent events (as above), might exhibit a terminal phenotype at the restrictive temperature which is different than the terminal phenotype of haploid strains with only one or the other mutation. (NOTE: For this last part, first explain how you would get the double mutant haploid strain and then try and reason what you would get at the restrictive temperature if that strain was defective in *CDC 24* (*cdc 24* is inhibited in bud formation) and *CDC 8* (*cdc 8* is inhibited in DNA synthesis so that nuclear division is not completed.)

5. Definitions 2 pts each

   a. Homodiphoromixis

   b. reciprocal shift experiments

   c. acervulus

   d. cdc 2/cdc 28 serine/thrionine kinase

   e. constitutional dormancy