

EXAMINATION #3 (PART 1)

Name _____

Date _____

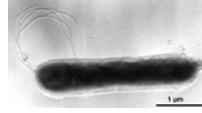
MULTIPLE CHOICE.—For the following multiple choice questions circle the letter in front of the response that best answers the question or completes the sentence. (20%, 2% each)

1. Which of the following **IS** an assumption of scientific philosophy?
 - a. Different events must be caused uniquely.
 - b. Hypotheses can be proven True.
 - c. Sense experience consistently represents reality.
 - d. The universe is chaotic.
 - e. None of the above. (None are assumptions of scientific philosophy)
2. Which of the following is the **Kingdom** to which the model organism *Neurospora crassa* belong?
 - a. Alveolata
 - b. Euglenozoa
 - c. Fungi
 - d. Stramenopila
 - e. None of the above
3. Which of the following best describes the association of a **dermatophyte** with a human?
 - a. Amensalistic
 - b. Commensalistic
 - c. Mutualistic
 - d. Parasitic
 - e. Saprobic
4. Which of the following is when a bacterium takes in DNA (as a plasmid) directly **from the environment**?
 - a. binary fission
 - b. conjugation
 - c. transcription
 - d. transformation
 - e. None of the above
5. Which of the following is when a bacterium causes severe disease symptoms **due to production of a damaging chemical**?
 - a. high invasiveness
 - b. high toxigenicity
 - c. low invasiveness
 - d. low toxigenicity
 - e. low xylicity
6. A bacterium that obtains its energy from light and its carbon from carbon dioxide is
 - a...
 - a. chemoautotroph.
 - b. chemoheterotroph.
 - c. photoautotroph.
 - d. photoheterotroph.
 - e. None of the above.
7. Which of the following is the **Kingdom** to which the **brown algae (like kelp)** belong?
 - a. Alveolata
 - b. Chlorophyta
 - c. Euglenozoa
 - d. Stramenopila
 - e. None of the above
8. Which of the following is **TRUE** about **coniferophyte gametophytes**?
 - a. They are the dominant generation.
 - b. They make gametes by meiosis.
 - c. They make spores by mitosis.
 - d. They do not undergo photosynthesis.
 - e. None of the above (All are false.)
9. If a population of 1,000 is undergoing **logistic growth** with a yearly intrinsic rate of increase of 0.10, and a carrying capacity of 10,000 then what is the size of the population after **2 years**?
 - a. 1150
 - b. 1176
 - c. 1180
 - d. 1187
 - e. 1200
10. Given the following genotypes in a population: **10AA, 82Aa, 8aa**. Is this **population evolving** with respect to the "A" gene?
 - a. No
 - b. Yes
 - c. Cannot determine with the information given.

FILL-IN-THE-BLANK.—For the following exercises write the appropriate word or words in the available space, sketch, or label as appropriate. (10%)

1. In the space below sketch and label a “typical” **eukaryotic cell**. Be certain to label at least four things. (5%)

2. What shape term best describes each bacterium below. (2%)



3. *Hypothesis*: There will be higher species richness of fungi on the top surface of oak leaves than on the under surface.

Data Based on Quadrat Samples

mean # fungal species per cm² top = 3.33

mean # fungal species per cm² bottom = 6.05

P-value = 0.001

Hypothesis supported or rejected? (1%)

Explain why ↑. (2%)

DEFINITIONS.—For the following BIOLOGICAL words or phrases define them as accurately and concisely as possible. (20%, 4% each)

1. Carpel:

2. Endosperm:

3. Endosymbiotic Theory of Eukaryotic Origins:

4. Genetic Drift:

5. Hyphae (singular = hypha):

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FREE RESPONSE QUESTIONS/PROBLEMS.—For the following, address each in as concise and lucid a manner as possible. Do NOT exceed the space provided. (50%)

1. Fill in the data in the table, then use the data in the table to construct a phylogenetic tree of the species in the left column. Show the **derived traits** on your phylogenetic tree. OG = Outgroup (15%)

	flowers present or absent	seeds present or absent	dominant life cycle generation	heterosporous or homosporous	resin canals present or absent
tulip					
rose					
pine tree					
spruce tree					
fern					
TRUE MOSS OG					

2. Describe/explain the life cycle of a member of **Phylum Bryophyta**. Include all *life cycle stages*, *relevant unique structures*, and label their *ploidy*. Also indicate all *cellular processes* that occur. Indicate the life cycle generation that is considered to be dominant and how or if life cycle generations are nutritionally dependent upon each other. (15%)

(Feel free but do not feel obliged to use labeled illustrations for your answer.)

3. People infected with **drug resistant strains of the HIV virus** were taken off of anti-HIV drugs for a period of time. Later, the patients were given the same anti-HIV drugs. These drugs then greatly reduced a newly drug-susceptible HIV population. *Why did the virus population become susceptible to anti-HIV drugs after patients stopped taking the drugs?* Provide a brief evolutionary explanation. (10%)

4. To reduce **the evolution of antibiotic resistance in bacteria**, biologists and epidemiologists recommend that physicians do not prescribe the same antibiotic repeatedly and that patients take their antibiotics (when prescribed) for the full time period. (a.) Explain why re-using the same antibiotic encourages the evolution of antibiotic resistance in bacteria and rotating use of antibiotics discourages this. (5%)

(b.) In a sentence or two, explain why not taking an antibiotic for the full prescribed period encourages the evolution of antibiotic resistance in bacteria and why taking it for the full period discourages this. (5%)