Ca. 50 pts of the final is on the following new topics, whereas ca. 25 pts is on material from topics covered on the first two exams.

**Topic 10 – Algae**

Raven Chap. 12 regarding Cyanobacteria (pp. 236-266) and Chap. 15 regarding algae (pp. 317-358)

I. What is an alga?
   A. Any* photoautotroph not in Kingdom Plantae
   B. Characteristics of
   C. Where do you find them?
   D. Evolution?

II. Green Algae
   General characteristics of...
   A. Unicellular
      1. *Chlamydomonas*
      2. *Chlorella*
      3. *Acetabularia*
   B. Colonial
      1. *Volvox*
   C. Filamentous
      1. *Spirogyra*
      2. *Oedogonium*
   D. Planar/Thalloid
      1. *Ulva*

III. Red Algae
    General characteristics of...
    A. Economic Botany

IV. Brown Algae & Diatoms
    General characteristics of...
    A. Browns
       General characteristics of...
       1. General Morphology
       2. Economic Botany
    B. Diatoms
       General characteristics of...
       1. General Morphology
       2. Ethnobotany

V. Dinoflagellates
   General characteristics of...

VI. Euglenoids
    General characteristics of...

VII. Cyanobacteria
    General characteristics of...
    A. Economic Botany
General Introduction to Kingdom Plantae
Meaning of Free-sporing

I. Bryophytes
   Characteristics of...
   A. Liverworts
   B. Mosses

II. Pteridophytes
   Characteristics of...
   A. Rhyniophytes & Psilotophytes
   B. Lycopods
   C. Horsetails & Scouring-rushes
   D. Ancient Coal Swamps
   E. Ferns

Topic 12 – Gymnosperms
Raven Chap. 18

I. Characteristics of
   A. Sporophytes
   B. Gametophytes
   C. Life cycle
   D. Naked seed plants
   E. Three groups to know

II. Cycads
   A. Vegetative Morphology
   B. Reproductive Morphology
   C. Economic Botany
   D. Biogeography & Conservation
   E. Cycads & Guam Dementia

III. Conifers
   A. Vegetative Morphology
   B. Reproductive Morphology
   C. Economic Botany
   D. Biogeography & Ecology

IV. Ginkgos
   A. Vegetative Morphology
   B. Reproductive Morphology
   C. Economic Botany
Topic 13 – Angiosperms

I. Characteristics of Angiosperms
   A. Vessels & Fibers in Wood
   B. Sieve Tubes
   C. Flowers
   D. Angiospermous: carpels (megasporophylls) & fruits
   E. Endosperm (& Double Fertilization)

II. Pollination
   A. Bee Pollination
   B. Bird Pollination
   C. Bat Pollination
   D. Wind Pollination
   E. Deceptive Pollination

III. Angiosperm Diversity
   A. Primitive Dicots
   B. Monocots
   C. Eudicots