

40 Points Total. Grade breakdown as follows:**Table 1: Characters and character states. 8 points.**

At least 10 binary characters must be selected, up to a maximum of 20 (use another sheet if more than 10 characters are used). The two states selected for each character must apply to all or most of the species; they must be properly described using precise terminology. Plesiomorphic states are scored as “0”. Apomorphic states must be scored as “1”. Designation of polarity is based on comparisons to the family Magnoliaceae; other rationale can also be used (but you need to be consistent in how you are polarizing your states). There must be a sufficient number of informative characters (apomorphic states found in two or more species) so that a moderately or fully-resolved tree can be produced. States restricted to a single taxon do not give information on relationships. One point off for each ambiguous character or state, inconsistent or erroneous establishment of polarity, or for each character less than 10.

Table 2: Character state by taxon data matrix. 8 points.

A complete table, filled in neatly. The scoring must correspond to the organisms, with no errors. Additional points off (5 points) for not enough informative characters (you should have had at least 5 informative characters; if not, there will be little resolution in your cladogram, or branches with no support).

Figure 1: Cladogram. 10 points.

A cladogram, in proper format, constructed using the method of maximum parsimony (i.e., finding the shortest tree that best explains the data). The tree should be dichotomous (although trichotomies will be accepted), and the species (or group of species) chosen as having retained the most ancestral features should be at or near the base of the tree. Reversals and parallelisms (homoplasy) must be properly described. All synapomorphies should be indicated. If the characters are chosen properly, the tree should be adequately resolved. Points will be deducted for messiness.

Classification. 10 points.

At least two families and four genera must be indicated. Each of these taxa must be monophyletic in a phylogenetic-based classification system. (There are many ways to do this!) Remember to italicize generic and specific epithets!!! For families, the proper “aceae” ending is required! For each group not monophyletic, 5 points deducted! For each genus less than four, two points deducted. You can indicate your classification directly on the tree or present it in text form below your tree.

Question 1: Suggest reasons why your cladogram and classification may be different from others. 2 points.

Many possible answers.

Question 2: When would you expect your own classification to change? 2 points.

Many possible answers.