

MCB-3421-Introduction to Molecular Evolution and Bioinformatics-SEC001-1188

Preview Test: Take-Home Exam number 5

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Test Information

Description This test is due Monday 10/29 before class (11.10)

Instructions

Multiple Attempts Not allowed. This test can only be taken once.

Force Completion This test can be saved and resumed later.

QUESTION 1

3 points

Saved

Darwin considered evolution as a slow, rigorous, and gradual process. Describe 3 processes that might lead to the rapid/increased evolution of an organism. Explain your reasoning.

For the toolbar, press ALT+F10 (PC) or ALT+FN+F10 (Mac).

Rich text editor toolbar with font (Arial), size (3 (12pt)), and other icons.

Allopolyploidization (two diploid closely related species (2n) hybridize but retain all of the chromosomes instantly creating a new species with 4n chromosomes)

Transfer of genes

Picking up new symbionts that provide access to new food sources

see more in the online version on huskyCT

Path: p

Words:36

QUESTION 2**1 points**

Saved

A paraphyletic group of organisms that is defined by which of the following?

- A. synapomorphy
- B. autapomorphy
- C. paraphyly
- D. polyphyly
- E. symplesiomorphy
- F. homoplasy

QUESTION 3**1 points**

Saved

A monophyletic group (sensu Hennig) of organisms that is defined by which of the following?

- A. synapomorphy
- B. autapomorphy
- C. paraphyly
- D. polyphyly
- E. symplesiomorphy
- F. homoplasy

QUESTION 4**1 points**

Saved

A polyphyletic group of organisms that is defined by which of the following?

- A. synapomorphy
- B. autapomorphy
- C. paraphyly
- D. polyphyly
- E. symplesiomorphy
- F. homoplasy (the character evolved independently in the two groups)

QUESTION 5**1 points**

Saved

According to Hennig a natural taxonomy should be based on which of the following?

- A. shared primitive characters.
- B. shared derived characters.
- C. homoplasies.
- D. non-shared derived characters.
- E. None of the above.

QUESTION 6**1 points**

Saved

Birds and bees both have wings. Which of the following is true?

- A. Wings are a homoplasy and a group comprised of birds and bees is a polyphyletic group
- B. Wings are a synapomorphy and a group comprised of birds and bees is a monophyletic group
- C. Wings are a homoplasy and a group comprised of birds and bees is a paraphyletic group
- D. Wings are a symplesiomorphy and a group comprised of birds and bees is a paraphyletic group

QUESTION 7**1 points**

Saved

In a phylogenetic tree, OTU can be synonymous with which of the following term(s)?

- A. Leaf
- B. Taxa
- C. Terminal Node
- D. Species
- E. All of the above

QUESTION 8**1 points**

Saved

Terrestrial tetrapods evolved from within the bony fish. Which of the following is true of a group of all of the bony fish, excluding terrestrial tetrapods?

- A. It is a grade
- B. It is a paraphyletic group
- C. It is NOT a proper taxonomic unit sensu Hennig
- D. All of the above

QUESTION 9**1 points**

Saved

In the principle component analysis, JALVIEW uses which of the following to define protein space?

- A. The presence or absence of a conserved sequence motif to define protein space.
- B. A tree based on percent identity to define groups that are close to each other in sequence space.
- C. Each alignment column as a dimension to define protein space.
- D. GC bias on the leading versus lagging strand.
- E. None of the above.

QUESTION 10**1 points**

Saved

In the evolutionary history leading to mammals several rounds of whole genome duplication occurred. What is the total number of duplication events that have occurred in the lineage leading humans?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

QUESTION 11**1 points**

Saved

In the evolutionary history leading to fish several rounds of whole genome duplication occurred. What is the total number of duplication events that have occurred in bony fish?

- A. 0
- B. 1
- C. 2
- D. 3

QUESTION 12**1 points**

Saved

True/False Both group 2 intron and spliceosomal introns form lariat loops.

- True
- False

QUESTION 13**1 points**

Saved

True/False For exon shuffling to work, the introns need to be in the same phase.

- True
- False

QUESTION 14**1 points**

Saved

True/False dotlet can do DNA-DNA comparisons

- True
- False

QUESTION 15**1 points**

Saved

True/False In human and plant genes introns occur frequently; however,

there are always slightly more nucleotides in the exon than in the intron sequences.

- True
 False

QUESTION 16**1 points**

Saved

Which organisms constitute the archaeplastida?

- A. Red, Green, and Brown Algae
 B. All photosynthetic Eukarya
 C. Glaucophytes, Red Algae, Green Algae (I & II), and Plants
 D. Everything that has a Red Algae endosymbiont
 E. Everything that has a Green Algae endosymbiont

QUESTION 17**1 points**

Saved

Which of the following refers to a group shown in an unrooted tree?

- A. Clade
 B. Clan
 C. Synapomorphy
 D. Monophyly group
 E. None of the above

Question Completion Status:

Which of the following is the closest phylogenetic neighbor to the mitochondrial endosymbiont?

- A. A protist
 B. An Archaeon
 C. The same as that of the nuclear genome from which the mitochondria came.
 D.

A cyanobacterium

- E. An Alpha-Proteobacterium

QUESTION 19**1 points**

Saved

Which of the following is the closest free living phylogenetic neighbor to the endosymbiont that evolved into the primary plastid?

- A. A protist
- B. An Archaeon
- C. The same as that of the nuclear genome from which the mitochondria came.
- D. A cyanobacterium
- E. An Alpha-Proteobacterium

QUESTION 20**6 points**

Saved

A cladogram depicts the relationships between OTU. Which of the following is true (possibly more than one)

- The length of the branches in a cladogram are scaled with respect to the number of evolutionary events that occurred along the branch.
- A cladogram requires (or implies) that one knows where the root of depicted relationships is.
- Groups in a cladogram are known as clans
- A cladogram can be created from shared derived characters.
- A cladogram uses the number of autapomorphies to identify fast evolving species.
- Groups in a cladogram are known as clades

QUESTION 21**4 points**

Saved

In the phylogenetic tree the connections between two nodes, or between a node and leaf also are known as

- splits

- hairs
 - OTUs
 - bipartitions
-

QUESTION 22**3 points**

Saved

in the rooted phylogenetic tree of vertebrates, the reptiles are (more than one may be correct)

- a polyphyletic group
 - a monophyletic group sensu Ashlock
 - a paraphyletic group
 - a monophyletic group sensu Hennig
-

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Save All Answers

Save and Submit