

The following are a few practice questions to illustrate the style of my exam questions. The mid-term exam itself will have 33 such questions, spanning lectures 1-12.

Good luck!

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1. On which of the following points was Darwin incorrect:
 - A. Sexual selection often operates through female choice.
 - B. Relationships among taxa can be estimated from shared-derived traits.
 - C. Ecologically diverse but related species on island archipelagos often represent adaptive radiation from a common ancestor derived from adjacent continents.
 - D. Missing transitional forms in the fossil record will be discovered with further collecting and analysis.
 - E. Inheritance works through blending of heritable factors.
2. “Descent with modification” as illustrated in the “*Origin of the species*” refers to:
 - A. A phylogeny estimated using morphological characters in the fossil record.
 - B. Speciation without extinction.
 - C. Effects of directional selection within a single lineage.
 - D. Diversification of phenotypically distinct forms via natural selection and from a common ancestor.
 - E. Effects of environmental variation during development on adult phenotype.
3. Which of the following best defines a monophyletic group?
 - A. A taxonomic group that contains the descendants of an ancestor, but not the ancestor itself.
 - B. A taxonomic group that contains the ancestor and some of its descendants.
 - C. A taxonomic group that contains the ancestor and all of its descendants.
 - D. A taxonomic group characterized by numerous shared derived characters.
 - E. A taxonomic group that contains the ancestor, but none of its descendants.
4. A formerly large, random-mating population switches to a high rate of inbreeding. As a consequence:
 - A. The frequency of disadvantageous, recessive alleles will increase.
 - B. Migration rates will decrease.
 - C. Genetic drift will be stronger.
 - D. Recessive, deleterious traits are more evident in the population.
 - E. Dominant traits will be selected against.
5. What sequence of events led to the “neo-Darwinian synthesis:
 - A. Mendel’s principles of inheritance and (ii) discovery of the structure of DNA
 - B. Development of the concept of descent with modification through natural selection and (ii) Mendel’s principles of inheritance.
 - C. Discovery of the structure of DNA and (ii) sequencing of the human genome

- D. Mendel's principles of inheritance and (ii) sequencing of the human genome
 - E. Development of the concept of descent with modification through natural selection and (ii) discovery of the structure of DNA
6. Directional selection differs from stabilizing selection in that:
- A. Directional selection operates only in small populations whereas stabilizing selection is effective in both small and large populations
 - B. Directional selection favors intermediate over extreme phenotypes, whereas stabilizing selection favors one end of the phenotype distribution
 - C. Directional selection favors one end of the phenotype distribution, whereas stabilizing selection favors intermediate over extreme phenotypes
 - D. Directional selection requires new mutations whereas stabilizing selection operates on existing variation
 - E. Directional selection operates on existing variation, whereas stabilizing selection operates on existing variation.
7. Antagonistic co-evolution:
- A. Applies when kin-selection does not favor altruistic behaviors
 - B. Occurs if one species affects the evolution of another, but not vice-versa
 - C. Can result in increased fitness as a phenotype involved in species interactions becomes rare
 - D. Is the direct result of conflict among males for access to females
 - E. Is responsible for melanism of mice living on dark lava flows
8. Relative to asexual (eg. "parthenogenetic" or "apomictic") reproduction, sexual reproduction increases genetic diversity within populations by:
- A. Increasing mutation rate.
 - B. Promoting sexual selection.
 - C. Increasing mutation rate and recombination.
 - D. Independent assortment and recombination.
 - E. Sexual selection and recombination.
9. In the marsupial mouse (*Antechinus*), multiply mated females tend to have a higher proportion of surviving offspring than those that mate just once. This illustrates:
- A. Sperm competition and indirect benefits of female choice.
 - B. The principle of natural selection.
 - C. Reduced fecundity (# ova) in females that mate just once.
 - D. Limitations on fertilization success.
 - E. Good luck.
10. The diversity of species concepts arises because:
- A. Botanists favor the Biological species concept (BSC) whereas Zoologists are focused on the Phylogenetic species concept (PSC);
 - B. Prezygotic isolation (BSC) evolves before the evolution of distinct character states (PSC)
 - C. Distinct character states (PSC) evolve before prezygotic isolation (BSC)

- D. Of inherent difficulty in unambiguously recognizing distinct evolutionary lineages during early stages of divergence
 - E. Evolutionary biologists are clueless
11. As seen in the *Ensatina* salamanders, secondary contact between previously isolated lineages can result in a stable hybrid zone. This reflects:
- A. Complete speciation.
 - B. Reinforcement.
 - C. Hybrid speciation.
 - D. Fusion of previously separated lineages.
 - E. A balance between immigration from parental populations and selection against hybrids.
12. Which of the following best describes the unique importance of the fossil record:
- A. It provides the only source of information on relationships among living taxa
 - B. It provides the only source of information on divergence times of living taxa
 - C. It provides the only source of information on phenotypes of extinct taxa
 - D. It provides the only source of information on evolutionary trends over time
 - E. It provides the only source of information on population sizes over time
13. The hominin lineage
- A. Includes modern humans and our descendants after the split with the chimpanzee lineage, and diversified rapidly in Africa between 2 and 4 million years ago
 - B. Includes modern humans and our descendants after the split with the chimpanzee lineage, and diversified rapidly in Africa about 100,000 years ago
 - C. Includes humans, chimpanzees and gorillas and their descendants from a common ancestor
 - D. Is paraphyletic in relation to chimpanzees and gorillas
 - E. Excludes modern humans

Answer key to practice questions:

1. E
2. D
3. C
4. D
5. B
6. C
7. C
8. D
9. A
10. D
11. E
12. C
13. A