MCDB 1150:Biofundamentals '2012 Midterm I Name: _____

1. Biology, and specifically the details of particular organisms, cannot be reduced to chemistry or physics because

- ❑ **A.** organisms are too complex
- ❑ **B.** organisms are historical
- ❑ **C.** organisms obey non-physical laws
- ❑ **D.** organisms do not obey physical laws ❑ **no idea**

____ **is incorrect because**

2. In the Linnaean classification system each organism is assigned to a genus, family, order, phylum, etc. In an evolutionary model, we would be justified to claim that

- ❑ **A.** organisms within the same order can have different common ancestors
- ❑ **B.** there is no relationship between ancestry and Linnaean classification
- ❑ **C.** all organisms within a particular order share a common ancestor
- ❑ **D** organisms in different orders do not necessarily share common ancestors ❑ **no idea**

____ **is incorrect because**

Points on this page _____

3. Spontaneous generation is unlikely to occur in the modern world because …

- ❑ **A.** the "new" organism would be unable to reproduce
- ❑ **B.** the origin of life requires special chemicals no longer present
- ❑ **C.** a special form of energy is required for life to begin
- ❑ **D.** the molecules required for life would be eaten by existing organisms ❑ **no idea**

____ is incorrect because

4. Following a genetic bottleneck, genetic drift becomes …

- ❑ **A.** directed
- ❑ **B.** weaker in its effects
- ❑ **C.** stronger in its effects
- ❑ **D.** disappears altogether ❑ **no idea**

____ is incorrect because

5. We conclude that convergent evolution is responsible for a particular trait if …

- ❑ **A.** functionally similar structures are built the same way
- ❑ **B.** functionally similar structures are built different ways
- ❑ **C.** the common ancestor of the two organisms compared had that trait

____ is incorrect because

6. Assume that you have two identical planets and that you "seed" each with the same type of "simple" organism - an organism similar to "LUCA" - the last universal common ancestor on earth. You come back a billion or so years later and find....

- ❑ **A.** only the original LUCA-like organisms
- ❑ **B.** lots of complex species, with the same species found on the two different planets
- ❑ **C.** lots complex species, but quite different species on the two different planets
- ❑ **D.** organisms that occupy completely different ecological niches ❑ **no idea**

____ is incorrect because

7. Consider a species in which <u>only</u> those males that can establish and defend a territory will breed and <u>only</u> those females that are selected by a male will produce offspring.

- ❑ **A.** natural selection affects males, sexual selection affects females
- ❑ **B.** natural selection affects females, sexual selection affects males
- ❑ **C.** only natural selection affects both males and females
- ❑ **D.** sexual selection affects neither males nor females ❑ **no idea**

____ is incorrect because

8. The observation that all known organisms use double-stranded DNA and a similar genetic code is evidence for ...

- ❑ **A.** convergent evolution of analogous features
- ❑ **B.** conservative evolution of homologous features
- ❑ **C.** non-adaption processes based on genetic drift and bottlenecks
- ❑ **D.** independent origins of major forms of life ❑ **no idea**

____ is incorrect because

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9. A population undergoes a dramatic reduction in numbers due to the appearance of a highly infectious disease. Resistance to the disease is due to the rare GFG by mutation ~50,000 generations ago. We look 100 generations after the appearance of the disease, we would expect to find...

- ❑ **A.** all organisms would have the same genotypes (same alleles at all loci)
- ❑ **B.** all organisms would have the GFG
- ❑ **C.** genetic drift would have lead to the loss of the GFG
- ❑ **D.** the GFG

____ **is incorrect because**

10. Given that a trait has appeared in the population, what limits the extent to which directed selection can act on it?

- ❑ **A.** the number of genes involved in producing the trait.
- ❑ **B.** the costs and benefits associated with a trait
- ❑ **C.** conservative selection
- ❑ **D.** sexual selection ❑ **no idea**

____ **is incorrect because**

11. There exist traits that involve self-sacrifice, which can negatively impact on a individual's reproductive success.

- ❑ **A.** such traits cannot be explained by evolutionary theory, since evolutionary theory only deals with individuals' reproductive success
- ❑ **B.** such traits can be selected if they increase the reproductive success of related individuals
- ❑ **C.** such traits are not selected, but occur because of bottlenecks and genetic drift
- ❑ **D.** such traits can appear, but are rapidly removed through natural selection ❑ **no idea**

____ **is incorrect because**

12. Speciation can occur via disruptive selection if ….

- ❑ **A.** mating with the population is completely random
- ❑ **B.** the environment remains uniform
- ❑ **C.** the effects of genetic drift are minimized by large population size
- ❑ **D.** selection for the "disruptive" trait has effects on mate choice ❑ **no idea**

____ is incorrect because

Please explain why a wrong choice is wrong