1. A weed is assumed to be dispersed randomly in a meadow. What statistical distribution will describe the dispersion correctly?
   a. Binomial
   b. Negative Binomial
   c. Poisson
   d. Normal

2. An observation was made on a species experiencing three factors A, B and C in order to infer a density dependent population regulation by a factor. The following graph shows the relationship between the adverse effect of the factors in terms of number and population density.
   Based on the above observation, which of the following is correct?
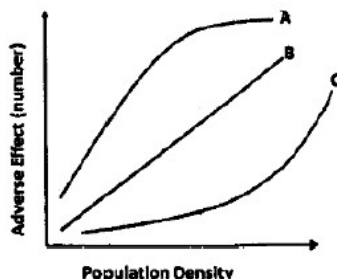

   a. A - Density independent; B = Density dependent; C - Inversely density dependent
   b. A - Inversely density dependent; B- Density independent; C - Density dependent
   c. A - Density dependent; B = Inversely density independent; C - Density independent
   d. A - Density dependent; B = Density independent; C - Inversely density dependent

3. Micro-evolution is the term used for changes in allele frequencies that occur over time.
   A) Within a population at species level
   B) within a community at genus level
   C) due to appearance of new genes infections
   D) due to mutation, natural selection, flow and genetic drift
   Which of the following combinations is NOT appropriate?
   a. A and C
   b. A and D
   c. B and C
   d. B and D

4. The first vertebrate animal appeared in which of the following geological ages?
   a. Paleozoic era
   b. Mesozoic era
   c. Ordovician period
   d. Cretaceous period
   e. Mississippian epoch
   f. Paleocene epoch

5. Which of the following combinations give the best answer?
   a. A, C and F
   b. A and F

c. B, D and E
d. A and C

1. Cladistic classification is based on
   a. sequential order in which branches arise from a phylogenetic tree
   b. the order of sequence divergence
   c. morphological features and skeleton of individuals
   d. cellular organization and cytoskeleton

2. In pre-industrial period in England, peppered moths had light coloration which effectively camouflaged' them against light coloured trees and lichens. During industrial revolution, many lichens died out and trees became blackened by soot from factories and interestingly, dark coloured moths were predominantly seen. This happened due to
   a. natural selection of dark coloured moths which were initially present in fewer numbers.
   b. new mutation which arose due to environmental pollution.
   c. macroevolution occurring due to environmental change.
   d. natural selection of the camouflaging mechanism or the moths.

3. The speciation in which a population splits into two geographically isolated populations experience dissimilar selective pressure and genetic drift is known as
   a. sympatric speciation.
   b. parapatric speciation.
   c. peripatric speciation.
   d. allopatric speciation

4. Evolution of multi-gene family occurs by
   a. only gene duplication.
   b. only unequal crossing-over.
   c. random mutations.
   d. both duplication and unequal crossing over

5. There are two mutant plants. One shows taller phenotype than wild type, whereas the other has the same height as the wild type. When these two mutations were brought in together by genetic crosses, the double mutant displayed even taller phenotype than the tall mutant plants. This genetic interaction is called
   a. antagonistic interaction.
   b. additive interaction.
   c. synergistic interaction.
   d. suppressive interaction.

6. Environmental conditions can influence accumulation of species in successional communities. Curves representing changes in forest species over time are given in the figure below. Which of
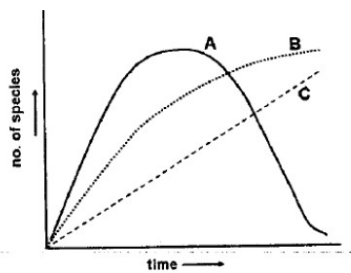
the following keys. is correct for the curves?
- a. A = xeric, B = mesic, C = intermediate
- b. A = intermediate, B = xeric, C = mesic
- c. A = intermediate, B = mesic, C = xeric
- d. A = mesic, B = intermediate, C = xeric

7. Three islands have identical habitat characteristics. On first island rodent species A is present at a density 325/km2. Second island has only species B at a density of 179/km2. On the third island, both A and B co-exist with densities 297/km2 and 150/km2, respectively. Which of the following can be inferred from this?
   - a. The two species do not compete with each other.
   - b. The intra-species competition is more intense than inter-species competition.
   - c. The inter-species competition is more intense than intra-species competition.
   - d. The inter .and intra species competition are of the same intensity.

8. The Galapagos finches were an important clue to Darwin's thinking about the origin of species. These finches are believed to have descended from a single ancestral species that colonized the Galapagos archipelago, America, over a short period of time. The Galapagos finches differ in their beak shape and size. Different species feed on seeds that vary in size and hardness. Which of the following is the most likely explanation for these patterns?
   - a. The finches represent an example of directional trend in beak size from small to big.
   - b. Beak shapes changed in response to different seed types and these changes were inherited by subsequent generations.
   - c. The ancestral finch already had all the beak variations and different lineages formed that were specialized to eat different seed
   - d. The finches represent an example of adaptive radiation in which beak variation was generated by mutation followed by selection by different seed types.

9. The following inferences were made from this tree.
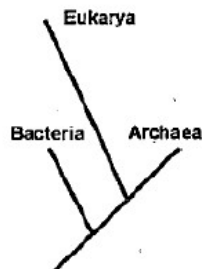
A. Bacteria are more closely related to Eukarya than to Archaea.
B. Bacteria and Archaea are more similar to each other than either is to Eukarya.
C. Archaea and Eukarya diverged from each other after their common ancestor diverged from bacteria.
D. cells from two different plants can be mixed together and forced to fuse.
Which of the following represents a combination of correct inferences?
   - a. (A), (B) and (C)
   - b. (A) and (B) only
   - c. (B) and (C) only
   - d. (A) and (C) only

10. Two species of plants were sampled in 32 quadrats in a forest. The mean and variance for the occurrence of species 1 were 16.2 and 48 and species 2 were 3.6 and 3.2 respectively. Which of

the following statements about the distribution of the two species in these quadrats is supported by these findings?

    a. Both species are distributed randomly.
    b. Species 1 is distributed randomly and species 2 is clustered.
    c. Species 1 is clustered and species 2 is distributed randomly.
    d. Both species are clustered.