Reproduction and Evolution

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Asexual reproduction
   a. involves only the last phase of mitosis.
   b. produces clones.
   c. is more like yourosis than mitosis.
   d. leads to increased variation in offspring.
   e. involves episodes of crossing over.

2. Typical methods of asexual reproduction include which of the following?
   a. Parthenogenesis
   b. Spontaneous fission
   c. Budding
   d. Propagation
   e. all of the above.

3. Sessile (non-motile) aquatic organisms
   a. invest most resources toward finding mates
   b. can only reproduce asexually
   c. produce few offspring
   d. allocate few resources toward gamete production
   e. are often broadcast spawners

4. Animals that give birth to fully developed offspring are referred to as
   a. ovuliparous
   b. oviparous
   c. ovipositters
   d. viviparous

5. Which of the following statements is NOT an advantage of asexual reproduction?
   a. Asexual reproduction is more efficient than sexual reproduction.
   b. An individual organism can reproduce asexually by itself.
   c. Asexual reproduction promotes variation.
   d. Asexual reproduction produces fewer offspring than sexual reproduction.
   e. Asexual reproduction does not require the searching for a reproductive partner.

6. Which of the following is NOT one of the factors contributing to the high cost of sexual reproduction?
   a. specialized reproductive structures
   b. production of excessive numbers of gametes
   c. development of elaborate courtship rituals
   d. production of a few clonal cells
   e. nourishment of offspring

7. Which of the following animals would fit this description: "Eggs fertilized outside the body, minimum of yolk, rapid development."
   a. bird
   b. sea urchin
   c. bony fish
   d. reptile
   e. human
8. Monoeocious plants
   a. cannot produce sex cells
   b. arise from cells within the flowers of other plants
   c. have both male AND female flowers on the same plant
   d. produce only microspores
   e. are smaller than dieocious plants

9. K-selected species exhibit
   a. delayed and repeated reproduction, but produce few offspring
   b. larger body size
   c. slower development
   d. long life spans
   e. all of the above

10. Organisms who’s life histories are termed “r-selected”
    a. are typically small and short-lived
    b. inhabit unstable/unpredictable environments
    c. exhibit high reproductive rates and rapid development
    d. produce large numbers of offspring and provide minimal parental care
    e. all of these

11. A reproductive strategy in which an animal expends all of it’s energy in one suicidal event is
    a. hermaphroditism
    b. iteroparity
    c. semelparity
    d. parthenogenesis.
    e. budding

12. Which of the following is NOT an example of a clone?
    a. a pair of identical twins
    b. a group of rooted plant cuttings from a single plant
    c. the cells produced by the asexual reproduction of a single-celled organism
    d. the offspring produced by two parents
    e. the buds on a flowering plant

13. Which of the following distinguishes genotype from phenotype?
    a. Environment can readily alter some genotypes.
    b. Phenotype is the physical expression of genotype.
    c. Genetic variation is easier seen than phenotypic variation.
    d. Variation dies with individuals.
    e. Phenotype is unrelated to the genotype.

14. Introduction of previously nonexistent genes into a population may be accomplished by
    a. nonrandom mating.
    b. mutation.
    c. sexual recombination.
    d. the founder effect.
    e. the bottleneck effect.

15. New alleles arise by
    a. mutation.
    b. migration.
    c. genetic drift.
    d. random mating.
    e. independent assortment.
16. Whether a mutation is ultimately considered harmful, neutral, or lethal is often determined by
   a. phenotype.
   b. the will of the individual.
   c. the Hardy-Weinberg formula.
   d. environment.
   e. fate.

17. Directional selection occurs when
   a. the environment controls which organisms will survive.
   b. humans determine which organisms will survive.
   c. the extremes of the population have a lesser chance to survive.
   d. the extremes of the population have a better chance to survive.
   e. the organisms on one extreme of the population have a better chance to survive than those
      on the other extreme.

18. Stabilizing selection occurs when
   a. the environment controls which organisms will survive.
   b. humans determine which organisms will survive.
   c. the extremes of the population have a lesser chance to survive.
   d. the extremes of the population have a better chance to survive.
   e. the organisms on one extreme of the population have a better chance to survive than those
      on the other extreme.

19. Sexual dimorphism has arisen as a result of
   a. stabilizing selection.
   b. kin selection.
   c. sexual selection.
   d. directional selection.
   e. disruptive selection.

20. The evolutionary force that operates primarily through chance is
   a. natural selection.
   b. genetic drift.
   c. isolation.
   d. mating preference.
   e. sexual dimorphism.

21. Genetic drift
   a. may lead to a loss of variation in a population.
   b. occurs among small populations.
   c. occurs in populations with the founder effect.
   d. may occur when conditions produce the bottleneck effect.
   e. all of these

22. The biological impact of the "founder effect" is based upon
   a. absence of gene flow.
   b. chance.
   c. migration.
   d. reduction of genetic diversity.
   e. all of these
23. Gene flow
   a. keeps separated populations genetically similar.
   b. speeds up the divergence of two populations.
   c. increases the genetic variation between populations.
   d. is promoted by isolating mechanisms.
   e. increases the likelihood of natural selection.

24. The convergence in external morphology of bats, birds, and insects is attributed to
   a. reduced genetic variability in these groups.
   b. selection pressures that are common to these groups.
   c. reproductive isolation of these groups.
   d. identical genes in all three groups.
   e. use and disuse of the limbs.

25. The fact that many vertebrate embryos are more similar to one another than their respective adult stages are to one another may ultimately be due to
   a. environment.
   b. hormones.
   c. microevolution.
   d. genes.
   e. speciation.

26. Which mutations are NOT subject to natural selection?
   a. lethal
   b. physiological
   c. neutral
   d. morphological
   e. beneficial

27. Neutral mutations
   a. are not subjected to selection.
   b. occur at different rates at different times during evolution.
   c. confer a disadvantage.
   d. do not occur; either a gene enhances survival or it does not.
   e. account for the difference between hemoglobin in normal blood and that found in sickle-cell anemia.

28. In the biological species concept, what aspect of a population is critical to determining a species?
   a. physical appearance
   b. similar behavior patterns
   c. interbreeding capabilities
   d. polyploidy
   e. similar genotypes

29. Speciation occurs
   a. after populations become reproductively isolated and diverge.
   b. when mutations generate observable differences.
   c. when transitional forms develop between different populations.
   d. when natural selection pressures reach their maximum.
   e. when humans intervene and establish new breeds.
30. Divergence may lead to
   a. genetic drift.
   b. speciation.
   c. balanced polymorphism.
   d. gene flow.
   e. genetic equilibrium.

31. The term "reproductive isolation mechanism" refers to
   a. specific areas where males compete or display for females.
   b. the process by which sexual selection evolves within a population.
   c. a blockage of gene flow between populations.
   d. the inability of a species to continue reproduction.
   e. sexual sterility.

32. Isolating mechanisms that take effect before or during fertilization could be classified as
   a. hybridizing.
   b. prezygotic.
   c. genetically divergent.
   d. postzygotic.
   e. persistent.

33. A difference in reproductive timing describes _?_ isolation
   a. behavioral.
   b. temporal.
   c. mechanical.
   d. gametic.
   e. ecological.

34. Allopatric speciation requires
   a. gradual evolutionary changes.
   b. geographic isolation or physical barriers.
   c. polyploidy.
   d. adaptive radiation.
   e. inbreeding.

35. Sympatric speciation occurs
   a. gradually.
   b. rapidly.
   c. in the same homeland.
   d. gradually and in the same homeland.
   e. rapidly and in the same homeland.

36. Parapatric speciation would be expected to occur most often
   a. in the same homeland.
   b. near a common border between two populations.
   c. within a group of interbreeding populations.
   d. across obvious geographical barriers.
   e. by divergence from a common interbreeding population.

37. Microevolution is the result of
   a. small changes in the genes of a population
   b. genetic drift.
   c. mutation.
   d. natural selection.
   e. all of these
38. Macroevolution results in
   a. large scale changes over geologic time
   b. homologous structures in organisms that share a common ancestor
   c. convergent evolution among organisms with different ancestors
   d. variation in form and function
   e. all of these

39. Alternation of generations most likely refers to the
   a. expression of recessive traits.
   b. presence of a diploid and a haploid generation in the life cycle of plants.
   c. presence of the different sexes in two different plants.
   d. occurrence of a sexually reproducing diploid stage followed by an asexually reproducing haploid stage during the life cycle of higher plants.
   e. rise and fall of life.

Matching

Answer the questions in reference to the microevolutionary processes listed below.
   a. mutation
   b. gene flow
   c. genetic drift
   d. natural selection

   ____ 40. involves chance
   ____ 41. original source of alleles
   ____ 42. preserves species cohesion
   ____ 43. Darwin's major evolutionary mechanism involving reproductive differences
   ____ 44. results from differential survival and reproduction
Reproduction and Evolution
Answer Section

MULTIPLE CHOICE

1. B
2. E
3. E
4. D
5. C
6. D
7. B
8. C
9. E
10. E
11. C
12. D
13. B
14. B
15. A
16. D
17. E
18. C
19. C
20. B
21. E
22. E
23. A
24. B
25. D
26. C
27. A
28. C
29. A
30. B
31. C
32. B
33. B
34. B
35. E
36. B
37. E
38. E
39. B

MATCHING

40. C
41. A
42. B
43. D
44. D