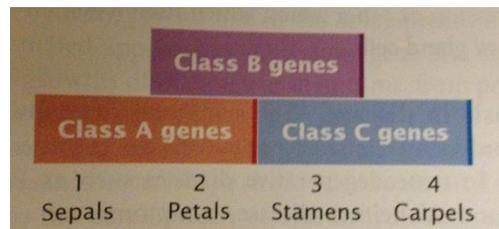


1. _____ occurs when one lineage splits into two or more groups of organisms.
 - a. Natural selection
 - b. Molecular evolution
 - c. Anagenesis
 - d. Cladogenesis
2. The following information concerning a population of organisms is given below. Find the genotypic frequency of the genotype "bb" represented in the population
BB- 715 individuals
Bb- 750 individuals
bb- 200 individuals
 - a. 0.12
 - b. 0.36
 - c. 0.43
 - d. 0.45
3. What is the allelic frequency of the dominant allele in the population described in question #2?
 - a. 0.35
 - b. 0.65
 - c. 0.43
 - d. 0.45
4. When a geographic barrier splits a population, which eventually results in the formation of two separate species?
 - a. Sympatric speciation
 - b. Allopatric speciation
 - c. Anagenesis
 - d. Cladogenesis
5. What gene is responsible for the formation of the morphogen proteins in body development.
 - a. Pair-rule genes
 - b. Homeotic genes
 - c. Gap genes
 - d. Egg-polarity genes
6. Cancer is caused by a single mutation.
 - a. True
 - b. False
7. _____ and _____ are normally present in cells but are typically mutated in cancer cells.
 - a. Proto-oncogenes; tumor suppressor genes
 - b. Oncogenes; tumor suppressor genes
 - c. Proto-oncogenes; silenced tumor suppressor genes
 - d. Oncogenes; silenced tumor suppressor genes
8. Proto-oncogenes function in _____.
 - a. The onset of cancer
 - b. Stimulating cell growth and division

- c. Inhibiting cell growth and division
 - d. Silencing tumor-suppressor genes
9. If a population has an allelic frequency of 0.6 for the allele "A", and has 4000 alleles total in the population, how many copies of "a" does the population contain?
- a. 800
 - b. 1200
 - c. 1600
 - d. 2400
10. For a continuous trait, typically _____ gene(s) are involved.
- a. Discrete
 - b. Nondiscrete
 - c. Multiple
 - d. Single
11. In a normal distribution curve, the majority of individuals exhibit _____ phenotypes.
- a. Dominant
 - b. Recessive
 - c. Intermediate
 - d. Extreme
12. The variance of a study
- a. Provides information about the center of a distribution
 - b. States how far the data values lie from the center of a distribution
 - c. Estimates the likelihood that the data is correct
 - d. Examines if a change in one characteristic is associated with a change in another characteristic
13. Cancer is a disease that would be best described as
- a. A disease in which only genes affect the phenotype of an individual.
 - b. A disease in which only the environment affects the phenotype of an individual.
 - c. A disease in which both genes and the environment play a role in producing the cancer phenotype.
 - d. A disease in which neither genes nor the environment play a role in producing the cancer phenotype.
14. P53 is an example of a(n)_____.
- a. Proto-oncogene
 - b. Oncogene
 - c. Tumor suppressor gene
 - d. Tumor suppressor protein
15. Because oncogenes exhibit _____ inheritance, most cancer cells typically have _____ mutated copy/ copies of the gene.
- a. Dominant; one
 - b. Recessive; two
 - c. Dominant; two
 - d. Recessive; one

16. Which of the following concepts are used to follow genetic variations in DNA sequences.
- Restriction-site variation
 - Microsatellite variation
 - DNA sequencing
 - All of the above
17. The _____ effect occurs due to random, dramatic reduction of the size of a population.
- Founder
 - Migratory
 - Bottleneck
 - Allopatric
18. All cancer cells
- Have a mutated version of P53
 - Contain oncogene ras
 - Are malignant
 - Proliferate uncontrollably
19. What is the process of programmed cell death in which DNA is first degraded by caspases and is then engulfed by macrophages?
- Necrosis
 - Apoptosis
 - Autophagy
 - Excitotoxicity
20. Which hypothesis of evolution supports natural selection?
- Neutral-mutation hypothesis
 - Balance hypothesis
 - Both A and B
 - Neither A or B
21. Explain how the development of the flower structures would be affected by the mutation of the following genes.



- Mutation of gene A-
- Mutation of gene B-
- Mutation of gene C-

22. Explain the three segmentation genes and their function.

23. Give an example of the different modes of speciation that include allopatric speciation and sympatric speciation.

24. Explain how both oncogenes and tumor-suppressor genes contribute to cancer.

25. Explain the following phylogenetic tree using the following terms: clade, common ancestor, node, branches, root, and whatever else you feel will help you accurately explain the purpose of the phylogenetic tree.

