Lashley's Essentials of Clinical Genetics in Nursing Practice 2nd edition Kasper Test Bank

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Instructor's Test Bank to Accompany

Lashley's Essentials of Clinical Genetics in Nursing Practice

Second Edition

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Chapter 2

CATEGORY: CHROMOSOMES

1. A species of fly has a diploid chromosome number of 12. How many chromosomes and chromatids will be present in a cell at the end of meiosis I?
   a. 12 chromosomes: 12 chromatids
   b. 12 chromosomes: 24 chromatids
   c. 6 chromosomes: 6 chromatids
   d. 6 chromosomes: 12 chromatids
   e. 24 chromosomes: 24 chromatids

   Answer: d.

CATEGORY: CELL CYCLE

2. Which of the following statements regarding the cell cycle is *correct*?
   a. All cells are continually moving through the phases of the cell cycle.
   b. The cell in inactive during gap phases G_1 and G_2.
   c. DNA is replicated during M phase.
   d. Loss of cell cycle checkpoints can lead to cancer.
   e. A checkpoint in S phase is important for preventing non-disjunction.

   Answer: d.

CATEGORY: MEIOSIS

3. When is meiosis I completed during oogenesis?
   a. At 6 months of embryonic development
   b. At puberty
   c. When an egg is released during ovulation
   d. At fertilization

   Answer: c.

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CATEGORY: CHROMOSOMES AND INHERITANCE

4. Which of the following statements is *incorrect* regarding individuals who are heterozygous for a recessive allele?
   a. They express the dominant allele.
   b. They are carriers of the recessive allele.
   c. They have a 50% chance of passing the recessive allele onto their children.
   d. They express the traits of both alleles.

   Answer: d.

CATEGORY: THE STRUCTURE OF DNA

5. Given the following sequence of one strand of DNA, predict the complementary DNA sequence.

   5′ GCTTAGCAGC 3′

   a. 3′ CGAATCGTCG 5′
   b. 3′ CGAAUCGAGC 5′
   c. 3′ GCTTAGCAGC 5′
   d. 3′ CGACGATTCG 5′

   Answer: a.

CATEGORY: TRANSCRIPTION

6. The DNA of the *CFTR* gene which is mutated in individuals suffering from Cystic fibrosis consists of 216,000 nucleotides, however the mRNA transcribed from this gene is only 6,128 nucleotides long. What accounts for this size difference?
   a. The DNA is double-stranded structure and the RNA is single stranded.
   b. There are more amino acids coded for by the DNA than the mRNA.
   c. mRNA processing has spliced out the introns.
   d. mRNA processing has spliced out the exons.
   e. When the mRNA is produced, it is highly folded and therefore less long.

   Answer: c.

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CATEGORY: THE GENETIC CODE

7. How many nucleotides would be required to code for a protein which is 300 amino acids in length?
   a. 3
   b. 100
   c. 300
   d. 900
   e. 1200

   Answer: d.

CATEGORY: TRANSLATION

8. In the process of translation,
   a. the DNA sequence of a gene is copied into DNA.
   b. the DNA sequence of a gene is copied into mRNA.
   c. ribosomes assemble amino acids using an mRNA template.
   d. RNA polymerase assembles amino acids according to the codons in DNA.
   e. All of the above.

   Answer: c.

CATEGORY: MUTATIONS

9. Which of the following mutations would produce the biggest change in the amino acid sequence of the resulting protein?
   a. Substitution of a single nucleotide at the 3′ end of the coding sequence of a gene
   b. Deletion of a nucleotide near the 3′ end of the coding sequence of a gene
   c. Deletion of three nucleotides in the middle of the coding sequence of a gene
   d. Insertion of a single nucleotide at the 5′ end of the coding sequence of a gene
   e. Insertion of a single nucleotide at the 3′ end of the coding sequence of a gene

   Answer: d.

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CATEGORY: MOLECULAR TECHNIQUES

10. Which of the following statements describing the properties of the Polymerase Chain Reaction (PCR) is *incorrect*?
    a. PCR can replicate large quantities of DNA from a single cell.
    b. Amplification of DNA by PCR depends on primers finding an exact match in the template.
    c. PCR is used to create a karyotype.
    d. PCR uses the same enzyme that is used by the cell for DNA replication.
    e. A PCR reaction is used in paternity testing.

    Answer: c.

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