Test 3

Bio 160 Genetics and Human Affairs

March 24, 2010

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| 1. | Who was the first to discover that inborn errors of metabolism are due to enzymes?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Franklin | | |  |  | | --- | --- | | D. | Griffith | | | |  |  | | --- | --- | | B. | Watson and Crick | | |  |  | | --- | --- | | E. | Avery | | | |  |  | | --- | --- | | C. | Garrod | |  | |

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| 2. | The current model of DNA structure was proposed by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Chargaff, Wilkins and Franklin | | |  |  | | --- | --- | | D. | Charles Darwin | | | |  |  | | --- | --- | | B. | Avery, MacLeod and McCarty | | |  |  | | --- | --- | | E. | Linus Pauling | | | |  |  | | --- | --- | | C. | Watson and Crick | |  | |

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| 3. | The structure of DNA is\_\_\_\_\_\_\_, while RNA is generally\_\_\_\_\_\_\_\_\_\_.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | double-stranded; single-stranded | | |  |  | | --- | --- | | C. | compact; loose | | | |  |  | | --- | --- | | B. | single-stranded; double-stranded | | |  |  | | --- | --- | | D. | loose; compact | | |

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| 4. | The two strands in a DNA molecule are:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | identical | | |  |  | | --- | --- | | C. | antiparallel | | | |  |  | | --- | --- | | B. | complementary | | |  |  | | --- | --- | | D. | b and c | | |

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| 5. | DNA replication is:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Semi-conservative | | |  |  | | --- | --- | | C. | Conservative | | | |  |  | | --- | --- | | B. | Dispersive | | |  |  | | --- | --- | | D. | Discontinuous on both strands | | |

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| 6. | Which of the following  is found in a nucleotide?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | five carbon sugar | | |  |  | | --- | --- | | C. | phosphate group | | | |  |  | | --- | --- | | B. | nitrogenous base | | |  |  | | --- | --- | | D. | all of the above | | |

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| 7. | Which mode of information transfer usually does not occur?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA to DNA | | |  |  | | --- | --- | | C. | DNA to protein | | | |  |  | | --- | --- | | B. | DNA to RNA | | |  |  | | --- | --- | | D. | All occur in a working cell | | |

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| 8. | DNA nucleotides pair via hydrogen bonds.  The base thymine forms a complementary base pair with:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | adenine | | |  |  | | --- | --- | | C. | quanine | | | |  |  | | --- | --- | | B. | thymine | | |  |  | | --- | --- | | D. | cytosine | | |

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| 9. | The process of copying a gene's DNA sequence into a sequence of RNA is called   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | replication | | |  |  | | --- | --- | | C. | translation | | | |  |  | | --- | --- | | B. | transcription | | |  |  | | --- | --- | | D. | PCR | | |

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| 10. | Which molecule contains codons?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA | | |  |  | | --- | --- | | C. | tRNA | | | |  |  | | --- | --- | | B. | mRNA | | |  |  | | --- | --- | | D. | rRNA | | |

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| 11. | RNA is transcribed using the \_\_\_\_\_\_\_\_\_\_strand of DNA   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | coding | | |  |  | | --- | --- | | C. | template | | | |  |  | | --- | --- | | B. | alternate | | |  |  | | --- | --- | | D. | non-template | | |

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| 12. | Loops, coils and sheets are introduced at the \_\_\_\_\_\_\_ structure of the protein.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | primary | | |  |  | | --- | --- | | C. | tertiary | | | |  |  | | --- | --- | | B. | secondary | | |  |  | | --- | --- | | D. | quaternary | | |

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| 13. | Energy is required to break the hydrogen bonds holding the bases together.  Which pair will be the most difficult to separate?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | A -T | | |  |  | | --- | --- | | C. | A - C | | | |  |  | | --- | --- | | B. | C - G | | |  |  | | --- | --- | | D. | G -T | | |

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| 14. | Translation terminates when\_\_\_\_\_\_\_\_\_.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | the A site is empty | | |  |  | | --- | --- | | C. | a release factor is present in the P site | | | |  |  | | --- | --- | | B. | a stop codon is present in the A site | | |  |  | | --- | --- | | D. | Translation reached the end of the mRNA | | |

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| 15. | Identification of DNA as a helical molecule was first shown in 1952 by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Franklin | | |  |  | | --- | --- | | C. | Chargaff | | | |  |  | | --- | --- | | B. | Watson and Crick | | |  |  | | --- | --- | | D. | Griffith | | |

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| 16. | \_\_\_\_\_\_\_\_\_ are the building blocks of DNA   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Histones | | |  |  | | --- | --- | | C. | Nucleotides | | | |  |  | | --- | --- | | B. | Proteins | | |  |  | | --- | --- | | D. | Phosphates | | |

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| 17. | If DNA polymerase could add bases in the 3' to 5' direction, there would be no need for:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA ligase | | |  |  | | --- | --- | | C. | helicase | | | |  |  | | --- | --- | | B. | Okazaki fragments | | |  |  | | --- | --- | | D. | PCR | | |

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| 18. | A DNA strand with the sequence 3' AACGTAACG 5' is transcribed. What is the sequence of the mRNA molecule synthesized?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | 5' AACGTTAACG 3' | | |  |  | | --- | --- | | C. | 5' AACGUAACG 3' | | | |  |  | | --- | --- | | B. | 5' UUGCAUUGC 3' | | |  |  | | --- | --- | | D. | 5' TTGCATTGC 3' | | |

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| 19. | If DNA is compared to a spiral staircase, then steps of the staircase would correspond to:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Sugars | | |  |  | | --- | --- | | D. | Nucleotides | | | |  |  | | --- | --- | | B. | Hydrogen bonds | | |  |  | | --- | --- | | E. | Phosphates | | | |  |  | | --- | --- | | C. | Base pairs | |  | |

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| 20. | In humans, DNA in the nucleus winds around proteins called:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Histones | | |  |  | | --- | --- | | D. | Ribosomes | | | |  |  | | --- | --- | | B. | Histosomes | | |  |  | | --- | --- | | E. | Barr bodies | | | |  |  | | --- | --- | | C. | Karyosomes | |  | |

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| 21. | The nitrogenous bases adenine and thymine are:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Both purines | | |  |  | | --- | --- | | D. | A pyrimidine and a purine, respectively | | | |  |  | | --- | --- | | B. | A purine and a pyrimidine, respectively | | |  |  | | --- | --- | | E. | Amino acids | | | |  |  | | --- | --- | | C. | Both pyrimidines | |  | |

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| 22. | DNA strands are antiparallel, so replication proceeds:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Continuously on both strands | | |  |  | | --- | --- | | D. | Continuously on both strands for a time and then discontinuously | | | |  |  | | --- | --- | | B. | Continuously on one strand and discontinuously on the other | | |  |  | | --- | --- | | E. | Discontinuously using amino acids | | | |  |  | | --- | --- | | C. | Discontinuously on both strands | |  | |

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| 23. | Chargaff showed that if human DNA contained 30% adenine, then the percentage of thymine would be:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | 20% | | |  |  | | --- | --- | | D. | 40% | | | |  |  | | --- | --- | | B. | 30% | | |  |  | | --- | --- | | E. | Cannot be determined | | | |  |  | | --- | --- | | C. | 60% | |  | |

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| 24. | \_\_\_\_\_\_\_ bonds form between amino acids during elongation.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Phosphodiester | | |  |  | | --- | --- | | D. | Hydrogen | | | |  |  | | --- | --- | | B. | Disulfide | | |  |  | | --- | --- | | E. | Glycine | | | |  |  | | --- | --- | | C. | Peptide | |  | |

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| 25. | Some genes code for RNAs that do not specify a protein.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | True | | |  |  | | --- | --- | | B. | False | | |

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| 26. | The structure of DNA:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Is symmetrical | | |  |  | | --- | --- | | D. | Turns to form a helix | | | |  |  | | --- | --- | | B. | Pairs purines with pyrimidines | | |  |  | | --- | --- | | E. | All of these | | | |  |  | | --- | --- | | C. | Is antiparallel | |  | |

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| 27. | Which of the following best illustrates the central dogma of biology?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA → RNA → protein | | |  |  | | --- | --- | | C. | Protein → DNA→ protein | | | |  |  | | --- | --- | | B. | RNA → DNA → protein | | |  |  | | --- | --- | | D. | Protein → RNA → DNA | | |

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| 28. | Which of these is not found in RNA?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Nitrogen | | |  |  | | --- | --- | | D. | Purines | | | |  |  | | --- | --- | | B. | Phosphate | | |  |  | | --- | --- | | E. | Ribose | | | |  |  | | --- | --- | | C. | Deoxyribose | |  | |

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| 29. | How do transcription factors function in the expression of genes?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | They initiate translation | | |  |  | | --- | --- | | D. | They halt RNA polymerase at the end of transcription | | | |  |  | | --- | --- | | B. | They associate to initiate translation | | |  |  | | --- | --- | | E. | They bring amino acids into the ribosome | | | |  |  | | --- | --- | | C. | They turn transcription of specific genes on or off | |  | |

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| 30. | Transcription and replication are alike in that both:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Are guided by complementary base pairing | | |  |  | | --- | --- | | D. | Require a promoter and RNA polymerase | | | |  |  | | --- | --- | | B. | Are regulated by homeobox genes | | |  |  | | --- | --- | | E. | Are created from an ordered sequence of amino acids | | | |  |  | | --- | --- | | C. | Require DNA polymerase | |  | |

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| 31. | The DNA template ATGCGTTA is transcribed into an RNA strand with the sequence:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | TACGCAAT | | |  |  | | --- | --- | | D. | AUGCGAAU | | | |  |  | | --- | --- | | B. | UAACGCAU | | |  |  | | --- | --- | | E. | AUGCGUUA | | | |  |  | | --- | --- | | C. | UACGCAAU | |  | |

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| 32. | In transcription, one DNA strand is transcribed into a(n) \_\_\_\_\_ RNA strand, which is translated into protein.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Ribosomal | | |  |  | | --- | --- | | D. | Anticodon | | | |  |  | | --- | --- | | B. | TRNA | | |  |  | | --- | --- | | E. | Thymine rich | | | |  |  | | --- | --- | | C. | Messenger | |  | |

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| 33. | A(n) \_\_\_\_\_\_\_ molecule carries amino acids to the ribosomes where they are joined to form a polypeptide.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | MtDNA | | |  |  | | --- | --- | | D. | TRNA | | | |  |  | | --- | --- | | B. | RRNA | | |  |  | | --- | --- | | E. | SiRNA | | | |  |  | | --- | --- | | C. | MRNA | |  | |

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| 34. | A codon consists of 3 consecutive:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA bases | | |  |  | | --- | --- | | D. | MRNA bases | | | |  |  | | --- | --- | | B. | Amino acids | | |  |  | | --- | --- | | E. | Proteins | | | |  |  | | --- | --- | | C. | TRNA bases | |  | |

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| 35. | After transcription and before translation, eukaryotic mRNA is modified by adding:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | TRNAs and amino acids | | |  |  | | --- | --- | | D. | Ribosomes and tRNAs | | | |  |  | | --- | --- | | B. | Amino acids and a poly-A tail | | |  |  | | --- | --- | | E. | Mutations | | | |  |  | | --- | --- | | C. | A cap of modified nucleotides and a poly-A tail | |  | |

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| 36. | B is an intron between two exons A and C. Which representation best describes how this region of mRNA will appear after it is transcribed and processed by a spliceosome?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | A-C | | |  |  | | --- | --- | | D. | A-B-C | | | |  |  | | --- | --- | | B. | A-B | | |  |  | | --- | --- | | E. | B only | | | |  |  | | --- | --- | | C. | B-C | |  | |

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| 37. | The linear order of amino acids in a polypeptide is the \_\_\_\_\_\_\_ structure of a protein.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Primary | | |  |  | | --- | --- | | D. | Quaternary | | | |  |  | | --- | --- | | B. | Secondary | | |  |  | | --- | --- | | E. | Chaperone | | | |  |  | | --- | --- | | C. | Tertiary | |  | |

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| 38. | Spongiform encephalopathies, such as mad cow disease, are caused by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | A degenerate genetic code | | |  |  | | --- | --- | | D. | Misfolded proteins | | | |  |  | | --- | --- | | B. | Triplet repeats in genes | | |  |  | | --- | --- | | E. | Lack of amino acids in the diet | | | |  |  | | --- | --- | | C. | Lack of intron splicing | |  | |

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| 39. | Which of the following observations about the genetic code most supports the hypothesis that life evolved from a common ancestor?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | It is a triplet code | | |  |  | | --- | --- | | C. | It is degenerate | | | |  |  | | --- | --- | | B. | It is universal | | |  |  | | --- | --- | | D. | Some cells translate the stop codon as a 21st amino acid | | |

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| 40. | \_\_\_\_\_\_\_ tag misfolded proteins for refolding or degredation into amino acids.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Chaperones | | |  |  | | --- | --- | | D. | Proteosomes | | | |  |  | | --- | --- | | B. | Folding catalysts | | |  |  | | --- | --- | | E. | Ubiquitin molecules | | | |  |  | | --- | --- | | C. | Folding sensors | |  | |

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| 41. | \_\_\_\_\_\_\_ are tunnel-like structures that degrade misfolded proteins into amino acids.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Chaperones | | |  |  | | --- | --- | | D. | Proteosomes | | | |  |  | | --- | --- | | B. | Folding catalysts | | |  |  | | --- | --- | | E. | Ubiquitin molecules | | | |  |  | | --- | --- | | C. | Folding sensors | |  | |

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| 42. | Proteomics refers to the study of all proteins made by a cell or organism.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | True | | |  |  | | --- | --- | | B. | False | | |

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| 43. | A coding portion of a gene is called a(n):   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Intron | | |  |  | | --- | --- | | D. | Promoter | | | |  |  | | --- | --- | | B. | Domain | | |  |  | | --- | --- | | E. | Acetyl group | | | |  |  | | --- | --- | | C. | Exon | |  | |

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| 44. | Multiple proteins can be produced from a single gene by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Intron shuffling | | |  |  | | --- | --- | | D. | Production of pseudogenes | | | |  |  | | --- | --- | | B. | Alternate splicing of exons | | |  |  | | --- | --- | | E. | Chromatin remodeling | | | |  |  | | --- | --- | | C. | Chain switching | |  | |

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| 45. | A chemical or physical agent that causes mutations is called a:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Mutator | | |  |  | | --- | --- | | D. | Mutagen | | | |  |  | | --- | --- | | B. | Tautomer | | |  |  | | --- | --- | | E. | Triplet codon | | | |  |  | | --- | --- | | C. | Teratomer | |  | |

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| 46. | Estimates of spontaneous or *de novo*, mutation rates are made using dominant disorders because:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | They will never be detected | | |  |  | | --- | --- | | D. | They can be identified by DNA sequencing | | | |  |  | | --- | --- | | B. | They will not affect offspring | | |  |  | | --- | --- | | E. | All of these | | | |  |  | | --- | --- | | C. | They are often obvious in the phenotype | |  | |

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| 47. | Mutational hot spots occur most often where the DNA is:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Unwound and stretched | | |  |  | | --- | --- | | D. | Bound by RNA polymerase | | | |  |  | | --- | --- | | B. | Repetitive or symmetrical | | |  |  | | --- | --- | | E. | Replaced with RNA in the genome | | | |  |  | | --- | --- | | C. | Highly coiled | |  | |

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| 48. | Palindrome sequences are often found at mutation hotspots. Which of the following is a palindrome?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | AAAATTTT | | |  |  | | --- | --- | | D. | GATCGATC | | | |  |  | | --- | --- | | B. | ATATGCGC | | |  |  | | --- | --- | | E. | UCGUGGCCUU | | | |  |  | | --- | --- | | C. | GATCCTAG | |  | |

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| 49. | A germline mutation:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Occurs only in microbes | | |  |  | | --- | --- | | D. | Are expressed only in embryos | | | |  |  | | --- | --- | | B. | Affects a particular subset of cells | | |  |  | | --- | --- | | E. | Occurs in bacteria or viruses | | | |  |  | | --- | --- | | C. | Affects all cells of an individual | |  | |

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| 50. | A somatic mutation:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Occurs only in microbes | | |  |  | | --- | --- | | D. | Are expressed only in embryos | | | |  |  | | --- | --- | | B. | Affects a particular subset of cells | | |  |  | | --- | --- | | E. | Affects sleep cycles | | | |  |  | | --- | --- | | C. | Affects all cells of an individual | |  | |

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| 51. | A point mutation alters:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | A single base | | |  |  | | --- | --- | | D. | A chromosome arm | | | |  |  | | --- | --- | | B. | 3 bases | | |  |  | | --- | --- | | E. | Sticky ends | | | |  |  | | --- | --- | | C. | An amino acid | |  | |

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| 52. | Which of the following is a transition mutation?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | ACC → CCA | | |  |  | | --- | --- | | C. | GG → CC | | | |  |  | | --- | --- | | B. | A → G | | |  |  | | --- | --- | | D. | A → T | | |

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| 53. | Which type of mutation substitutes one amino acid for another?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Nonsense | | |  |  | | --- | --- | | D. | Presence | | | |  |  | | --- | --- | | B. | Missense | | |  |  | | --- | --- | | E. | All of these | | | |  |  | | --- | --- | | C. | Sense | |  | |

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| 54. | A mutation that changes the codon GAA to UAA (stop) is a \_\_\_\_\_\_\_ mutation.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Missense | | |  |  | | --- | --- | | D. | Truncation | | | |  |  | | --- | --- | | B. | Nonsense | | |  |  | | --- | --- | | E. | Viral | | | |  |  | | --- | --- | | C. | Frameshift | |  | |

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| 55. | Which addition to a DNA sequence would not cause a frameshift mutation?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | T | | |  |  | | --- | --- | | D. | GGCT | | | |  |  | | --- | --- | | B. | GC | | |  |  | | --- | --- | | E. | AAAAA | | | |  |  | | --- | --- | | C. | GCT | |  | |

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| 56. | Transposable elements:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Are found only in viruses | | |  |  | | --- | --- | | D. | Are rare | | | |  |  | | --- | --- | | B. | Cannot mutate | | |  |  | | --- | --- | | E. | Are deleted in meiosis | | | |  |  | | --- | --- | | C. | Move | |  | |

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| 57. | A mutation expressed only under certain conditions is:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Germinal | | |  |  | | --- | --- | | D. | Conditional | | | |  |  | | --- | --- | | B. | Somatic | | |  |  | | --- | --- | | E. | The worst kind | | | |  |  | | --- | --- | | C. | *De novo* | |  | |

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| 58. | Ultraviolet light damages DNA by causing:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Purine rings | | |  |  | | --- | --- | | D. | Radioactivity | | | |  |  | | --- | --- | | B. | Strand breaks | | |  |  | | --- | --- | | E. | Night blindness | | | |  |  | | --- | --- | | C. | Pyrimidine dimers | |  | |

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| 59. | DNA damage in bacteria caused by ultraviolet light can usually be repaired by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | DNA ligase | | |  |  | | --- | --- | | D. | DNA replication | | | |  |  | | --- | --- | | B. | Photoreactivation | | |  |  | | --- | --- | | E. | Chromatin remodeling | | | |  |  | | --- | --- | | C. | Ionizing radiation | |  | |

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| 60. | Individuals with \_\_\_\_\_\_\_ develop numerous skin cancers when exposed to sunlight.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Ataxia tetangiectasis | | |  |  | | --- | --- | | D. | Xeroderma pigmentosum | | | |  |  | | --- | --- | | B. | Cockayne syndrome | | |  |  | | --- | --- | | E. | Hereditary nonpolyposis colon cancer | | | |  |  | | --- | --- | | C. | Werner syndrome | |  | |

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| 61. | A mutation can:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Prevent the production of a protein | | |  |  | | --- | --- | | D. | Slow the production of a protein | | | |  |  | | --- | --- | | B. | Cause a protein to be overexpressed | | |  |  | | --- | --- | | E. | All of these | | | |  |  | | --- | --- | | C. | Impair a protein's function | |  | |

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| 62. | The best test of the mutagenic potential of a substance would be:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | A family pedigree | | |  |  | | --- | --- | | C. | Beryllium screening | | | |  |  | | --- | --- | | B. | The Ames test | | |  |  | | --- | --- | | D. | Karyotype analysis | | |

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| 63. | Gene expression profiles may be useful in predicting disease progression and responsiveness to therapy.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | True | | |  |  | | --- | --- | | B. | False | | |

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| 64. | Which of the following neurologic conditions can be both inherited and acquired?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Alzheimer's disease | | |  |  | | --- | --- | | C. | Fatal familial insomnia | | | |  |  | | --- | --- | | B. | Creutzfeldt-Jakob disease | | |  |  | | --- | --- | | D. | Huntington's disease | | |

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| 65. | Some mutations may not affect the phenotype.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | True | | |  |  | | --- | --- | | B. | False | | |

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| 66. | A missense mutation causes sickle cell anemia by:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | Altering the protein's code that changes its shape and affecting its function | | |  |  | | --- | --- | | D. | Inverting a segment of a chromosome | | | |  |  | | --- | --- | | B. | Changing a triplet codon that does not affect the reading frame | | |  |  | | --- | --- | | E. | Creating a ring chromosome | | | |  |  | | --- | --- | | C. | Altering an intron splicing site so that an entire exon is deleted | |  | |

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| 67. | About what percent of the human genome actually encodes proteins?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | 0.5 | | |  |  | | --- | --- | | D. | 10 | | | |  |  | | --- | --- | | B. | 1.5 | | |  |  | | --- | --- | | E. | 100 | | | |  |  | | --- | --- | | C. | 5.0 | |  | |

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| 68. | DNA is able to replicate as quickly as it does because it has many   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | replication forks. | | |  |  | | --- | --- | | C. | chromosomes. | | | |  |  | | --- | --- | | B. | replication spoons. | | |  |  | | --- | --- | | D. | genes. | | |

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| 69. | The nitrogenous base that is in RNA but not in DNA is     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | thymine. | | |  |  | | --- | --- | | D. | urea. | | | |  |  | | --- | --- | | B. | thiamine. | | |  |  | | --- | --- | | E. | adenine. | | | |  |  | | --- | --- | | C. | uracil. | |  | |

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| 70. | There are \_\_ different sequences of codons possible in the genetic code.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | 3 | | |  |  | | --- | --- | | D. | 64 | | | |  |  | | --- | --- | | B. | 4 | | |  |  | | --- | --- | | E. | 46 | | | |  |  | | --- | --- | | C. | 16 | |  | |

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| 71. | A mutation that adds one or two bases to a gene disrupts the   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | replicating frame. | | |  |  | | --- | --- | | C. | genetic code. | | | |  |  | | --- | --- | | B. | intron index. | | |  |  | | --- | --- | | D. | reading frame. | | |

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| 72. | Chromatin remodeling can block \_\_\_\_\_\_\_\_ and microRNA binding can block \_\_\_\_\_\_\_.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | transcription; translation | | |  |  | | --- | --- | | D. | DNA replication; DNA repair | | | |  |  | | --- | --- | | B. | translation; transcription | | |  |  | | --- | --- | | E. | acetylation; phosphorylation | | | |  |  | | --- | --- | | C. | synthesis of tRNAs; synthesis of rRNAs | |  | |

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| 73. | A germline mutation passes from generation to generation because it occurs during the DNA replication before   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | mitosis. | | |  |  | | --- | --- | | D. | puberty. | | | |  |  | | --- | --- | | B. | meiosis. | | |  |  | | --- | --- | | E. | RNA replication. | | | |  |  | | --- | --- | | C. | fertilization. | |  | |

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| 74. | In Ehlers-Danlos syndrome type 1, collagen molecules are   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | too short. | | |  |  | | --- | --- | | D. | too scarce. | | | |  |  | | --- | --- | | B. | missing. | | |  |  | | --- | --- | | E. | too abundant. | | | |  |  | | --- | --- | | C. | too long. | |  | |

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| 75. | The type of DNA repair that corrects errors due to oxidative damage by replacing one to five nucleotides is   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | A. | mismatch repair. | | |  |  | | --- | --- | | C. | roto-rooter repair. | | | |  |  | | --- | --- | | B. | base excision repair. | | |  |  | | --- | --- | | D. | photoreactivation. | | |

Test 3 10 Key

1. C

2. C

3. A

4. D

5. A

6. D

7. C

8. A

9. B

10. B

11. C

12. B

13. B

14. B

15. A

16. C

17. B

18. B

19. C

20. A

21. B

22. B

23. B

24. C

25. A

26. E

27. A

28. C

29. C

30. A

31. C

32. C

33. D

34. D

35. C

36. A

37. A

38. D

39. B

40. E

41. D

42. A

43. C

44. B

45. D

46. C

47. B

48. C

49. C

50. B

51. A

52. B

53. B

54. B

55. C

56. C

57. D

58. C

59. B

60. D

61. E

62. B

63. A

64. B

65. A

66. A

67. B

68. A

69. C

70. D

71. D

72. A

73. B

74. C

75. B