

QUIZ II
L519: Bioinformatics: Theory and Applications
School of Informatics
Indiana University – Bloomington
Jan. 27, 2003

NAME: _____ NETWORK-ID: _____

Guidelines

1. Answer briefly with one or a few statements.
2. This is a open-everything quiz, but you need to write what you understand in your *own writing*. If you copy a text from a book or note, there will not be any credit.
3. When a list words are given, all the words should be used to answer the question.

Problem 1: Central dogma(20 pts) Explain briefly what the central dogma of biology is.

Problem 2: (20 pt) A DNA molecule consists of two antiparallel strands.

- Explain how two strands are held together.
- Each strand is read in a particular order from the 5' end to 3' end. Give an example of a 5bp DNA molecule and show how to read each strand.

Problem 3: transcription (10 pt) Explain how a DNA is transcribed to a mRNA molecule with the following words. *the transcription factors, the promoter sites, the RNA polymerase*

Problem 4: RNA (10pt) Explain briefly the roles of mRNA, tRNA, and rRNA.

Problem 5: translation (10pt) Explain how a protein is synthesized from the mRNA sequence with the following words. *amino acids, codon, anticodon, mRNA, tRNA, ribosome, start and stop codons*

Problem 6: (10pt) Explain cDNA map.

Problem 7: cloning (10pt) Cloning is a *in vivo* DNA amplication technique. Explain it with the following words. *vector DNA, Chromosomal DNA, host.*

Problem 8: PCR (10pt) PCR (Polymerase Chain Reaction) is a *in vitro* DNA amplication technique. Explain it with the following words. *Taq polymerase, two primers, heating and cooling.*