Ankara University
Computer Engineering Department
Special Topics Midterm

Duration: 80mins.
Notes: 1. Write your answers in the blanks below the questions.
2. Questions will be answered by only using the techniques explained in the classes.

QUESTIONS

1. (10 points) Describe the role of DNA in protein synthesis.

2. (10 points) Find the template DNA sequence and the coding strand for the given t-RNA sequence.

t-RNA	**A**	**U**	**G**	**C**	**U**	**U**	**A**	**G**	**C**	**U**
Template DNA strand										
Coding DNA strand										

3. (10 points) Explain codon structure and describe the relationship between codon and aminoacids.

4. (10 points) Explain the 4 levels proteins are examined.

1	
2	
3	
4	

Assoc. Prof. Dr. Gazi Erkan BOSTANCI

5. (10 points) Describe, compare and contrast homology and similarity concepts.

6. (10 points) Create the dot-plot for the given sequences.

	G	C	T	A	G	T	C	A	G	A
G										
A										
T										
G										
G										
T										
C										
A										
C										
A										

7. (10 points) Describe the method used for removing the background noise in dot-plots by elaborating the parameters used in the method.

8. (10 points) How many alternative alignments can be found for two DNA sequences of length 10 and 8 by allowing insertion of gaps?

9. (20 points) Fill in the matrix below to find the optimal global alignment for the two sequences using the method explained in the lecture notes and write down the optimal alignment.

Use the following scoring scheme: match: 3, mismatch: -1 gap penalty: -2

		G	A	C	T	T	A	C
G								
T								
G								
A								
A								
C								

Optimal Global alignment: