SEAT NO.........................

GANPAT UNIVERSITY
B.TECH SEM. VIth BIOMEDICAL & INSTRUMENTATION ENGINEERING
REGULAR EXAMINATION MAY/ JUNE- 2012
BME– 604: BIOINFORMATICS

TIME: 3 HOURS   **TOTAL MARKS: 70**

INSTRUCTIONS:
1. All the questions are compulsory.
2. Answer to the question of each section must write in separate answer books.
3. Figures to the right indicate marks.
4. Assume data, if needed.
5. Conventional terms/notations are used.

SECTION- I

Q.1 (a) Sometimes information flows from RNA to DNA. Write a program to reverse transcribe RNA to DNA. [6]

(b) Prompt the user to enter two strings of DNA.Concatenate the two strings of DNA by appending the second to the first using the .= assignment opetrator.Print the two strings as concatenated,and then print the second string lined up over its copy at the end of the concatenated strings.For example. if the input strings are AAAA and TTTT,print: [6]

AAAATTTT
    TTTT

Q.2 (a) Explain various methods of changing file permissions in linux. [6]

(b) 1). Explain push, pop, shift and unshift with examples. [6]
2). Explain any five operators used in Perl.
3). How splice function can be used to add or delete an element from the array?

OR

Q.2 (a) Write a program to calculate the reverse complement of a strand of DNA. Do not use the s/// or the tr functions. Use the substring function, and examine each base one at a time in the original while you build up the reverse complement [6]

(b) Write a subroutine to concatenate two strings of DNA. [6]

Q.3 (a) 1.echo $SHELL [11]
2.more sms mms
3.cd DNA
4.ls –l recession
5.cat sms mms
6.vi fashion
7.rm terrorism
8.ls –x
9.mv file tutorial
10.cp pizza pasta
11.chmod 547 blue
12.chmod g-w convergence
13.chmod a+x parties
14.mkdir pastry

15. rmdir dinner
16. grep –i 's' sony
17. grep –c '3' virus
18. grep –v '[aeiou]' cv
19. grep –n '^[a-f]' friends
20. grep 'f[ai][rt]' roadies
21. grep 'hi*' chat
22. grep 'h.t' twitter
23. grep '[a-z]' bindaas
24. grep 'ho*.n' discovery
25. uniq –d love
26. diff –w bollywood Hollywood

OR

Q.3 (a) Write a perl program that inverts the key value pairs. [6]
    (b) Write short note on 'NCBI'. [5]

SECTION- II

Q.4
    (a) What is Molecular Biology & Explain the steps of the Central Dogma of [6]
Molecular Biology with necessary diagrams?
    (b) Explain in detail the types of Protein Structures? [6]

OR

Q.4
    (a) Explain in detail the process of DNA Translation. [6]
    (b) Explain in detail the DNA Mutation. [6]

Q.5
    (a) Explain in detail the process of DNA Transcription. [6]
    (b) What is Genome? Explain in detail the Comparative Genomics. [3]
    (c) What is Steric effect? Define: Turns and Loops. [2]

OR

Q.5
    (a) Explain the process of modification of RNA. [3]
    (b) Enlist the types of Sequence Alignment Methods & Explain the Dot Plot method [4]
with examples.
    (c) Write a short note on: [4]
        1. FASTA.
        2. BLAST.

Q.6
    (a) Find out the optimal global alignment of the sequences: [8]
        1. GAATGATT
        2. GGATAA
By Dynamic Programming with all calculations, where scoring scheme is
$S_{i,j} = 1$ (Match Score)
$S_{i,j} = 0$ (Mismatch Score) & W = -1 (Gap Penalty).
    (b) Explain the types of RNA in detail with necessary diagrams. [4]

'END OF PAPER'

'BEST OF LUCK'