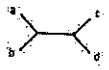
(16) SEAT No._____ No. of Printed Pages: 02

(16) Sardar Patel University
B.Sc. Examination - Semester 6th
US06CBNF05: Bioinformatics Applications II
Subject: Bioinformatics
Wednesday 3rd April, 2019
10:00 pm to 1:00 pm

Note:
1. Figures to the right indicate marks.
2. Draw neat and labelled diagram, wherever necessary.

Total Marks: 70

Q.1. Multiple choice questions [10x1=10]

1. In standard microarrays, the probes are attached via surface engineering to a solid surface by a _____ to a chemical matrix
   a) Metallic bond b) Chemical bond c) Covalent bond d) Aromaticity
2. Microarray is extension of the _____ technique.
   a) Blotting b) Sequencing c) PCR d) 2D gel
3. In microarray, when two different gene do not express at all, the colour on the chip
   a) Yellow b) red c) blue d) black.
4. When sequences are highly dissimilar, which method should be used in phylogenetic?
   a) Max. likelihood method b) UPGMA c)Parsimony d) all
5. Following is NOT the example of rooted tree.
   a)  b)  c)  d) 
6. Which route of drug administration is most likely to lead to the first-pass effect?
   a) Sublingual b) Oral c) Intravenous d) intramuscular
7. When B DNA is slightly dehydrated in the laboratory it takes on
   a) Z conformation b) A conformation c) No change in conformation d) RNA conformation
8. In pre-clinical development, researchers often start by selecting a target associated with a disease then search for a molecule/compound that will affect the target and alter the disease. The target is usually_____
   a) A gene or protein b) The lead compound c) A healthy volunteer d) A rat or small mammal
9. Which of the following Nucleic acid has left handed helix?
   a) Z DNA b) A DNA c) B DNA d) mRNA
10. An ORF with 300 nucleotides can code for maximum _____ number of amino acids.
    a) 100 b) 150 c) 200 d) 300

Q.2. Attempt any Ten [10x2=20]

1. Explain photolithography method in microarray?
2. Briefly discuss microarray fabrication methods.
3. Describe the principle of microarray and its utility.
4. What is bootstrap value? Explain.
5. Diagrammatically explain phylogenetic tree concept.
6. Expand ADMET and its significance.

P.T.O.

7. What are advantages of CADD over conventional drug designing?
8. Briefly explain Lipinski's rules of five.
9. Explain and differentiate high throughput screening and virtual screening method in drug designing.
10. How RNA is different from DNA?
11. Enlist different classes of RNA and briefly state their functions.
12. Diagrammatically explain structure of tRNA.

Q.3. Explain clustering and its types? Elaborate different linkages in clustering method. [10]

OR

Discuss the steps in microarray method and steps used in image analysis. [10]

Q.4. What is phylogeny? Enlist methods used to prepare phylogeny. Construct the tree using UPGMA method with following matrix table. [10]

	Sp1	Sp2	Sp3	Sp4	Sp5
Sp1					
Sp2	17				
Sp3	25	29			
Sp4	6	16	24		
Sp5	31	34	39	29	

OR

Explain the significance of phylogeny. Discuss parsimony method and maximum likelihood method in detail. [10]

Q.5. A. What is drug? Briefly discuss the routes of administration of drug. How choice of route may affect its designing? [05]

B. Explain steps involved in CADD. [05]

OR

A. What is combinatorial chemistry? How application of combinatorial chemistry improves *in silico* drug designing? [05]

B. Discuss docking and its significance. [05]

Q.6. What are secondary and tertiary structures of RNA? Explain M-fold method and its utility in predicting structures of RNA. [10]

OR

Write a short note on following: [6+4]
i) differentiate between A, B, and Z DNA ii) clover leaf model of tRNA

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