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(15) SARDAR PATEL UNIVERSITY

External Examination

Class- S.Y. B. Sc. IV Semester

Date: - 09-04-2016, Day: - Saturday,

Time: - 10:30 pm to 01:30 pm

Course:- US04CBNF01 **Subject: Bioinformatics** **Title: - Bioinformatics Sequence Analysis**

Total Marks: 70

Q1. Multiple choice questions (**All are compulsory**). [10]

(1) An algorithm used to perform local alignment
a) Needleman Wunsch algorithm b) Smithwatermann algorithm c) Dot matrix d) PHYLIP

(2) Continuous set of spaces in the sequence
a) Match b) Gaps c) Mismatch d) None of the above

(3) Which one of the following is a life science search engine?
a) PubMed b) Entrez c) Mozilla d) EBI

(4) The _____ tool compares translated nucleotide query sequence against protein databases.
a) blastp b) tblastn c) blastx d) tblastx

(5) Lalign is a tool for
a) Alignment b) Structure identification c) Drug design d) Sequence identification

(6) HTGS (High-Throughput Genomic Sequences) is a division maintained by _____.
a) NCBI b) PDB C) SCOP d) OWL

(7) Sequence alignment helps scientists
a) to trace out evolutionary relationships b) to infer the functions of newly synthesized genes
c) to predict new members of gene families d) all of these

(8) Which of the following pairs of amino acids is acidic in nature?
a) histidine b) lysine c) leucine d) glutamatic acid

(9) A semi-global alignment penalizes:
a) all gaps b) terminal gaps only
c) internal gaps only d) extending a gap more than initiating one

(10) The order in which ClustalW adds sequences to a multiple alignment is determined by:
a) a phylogenetic tree b) the order they are entered into the program
c) the percent identity d) the organisms they come from

Q2. Answer the following questions in short. **(Any ten)** [20]

(1) Give the significance of Multiple Sequence Alignment.
(2) Differentiate BLAST and FASTA
(3) Define sequence retrieval system (SRS).
(4) Enlist different types of Edit operations used in sequence alignment
(5) Give the abbreviation for: BLAST, NCBI, PAM, and BLOSUM.
(6) Differentiate Between Pairwise and Multiple Alignment.
(7) Give the significance of Dynamic programming algorithm
(8) How PAM is different from BLOSUM
(9) Give the biological significance of gaps.
(10) Diagrammatically show α helix and β sheets.
(11) Briefly explain the forces and bonds in protein structure
(12) Enlist different types of Edit operations used in sequence alignment

P.T.O

Q3. Discuss Dot Plot principles and its working in detail. [10]

OR

Q3. Discuss the concepts of alignment and molecular phylogeny in detail. [10]

Q4. Discuss the procedure and importance of ClustalW tools in the field of bioinformatics. [10]

OR

Q4. Explain BLAST in detail along with its types. [10]

Q5. Explain how initialization is done in DP algorithm and discuss DP algorithm and its type with an example. [10]

OR

Q5. Apply Smith and Waterman Algorithm to determine best alignment for the following sequences:- [10]
SEQ 1: ATGCTATAGA SEQ 2: TACCTATAA
GIVEN: Match score: +2, Mismatch : -1, Gap penalty: -1, Find score and all possible alignments.

Q6. Discuss the structure and properties of proteins. Give the importance of α helix and β pleated sheet in the structure of proteins. [10]

OR

Q6. Discuss the suitable method for secondary structure prediction of protein with its importance. [10]

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[20 / A-14]

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SARDAR PATEL UNIVERSITY

BSc (IV Semester) Examination

2016

Saturday, 9th April

10.30 am to 1.30 pm

US04CELE01 – Electronics Devices and Applications

Total Marks: 70

Q.1 Multiple Choice Questions. [10]

1. At _____ voltage the channel in FET is completely closed.
   (a) Current- ON (b) Switch ON (c) Pinch off
2. In a frequency response curve the output normally remains constant over the _____ range of frequencies.
   (a) High (b) Middle (c) Low
3. In the symbol of enhancement mode MOSFET the line representing the channel is broken to indicate that channel does not exist until the _____ potential is applied.
   (a) Drain (b) Gate (c) Source
4. In N channel enhancement mode MOSFET the substrate is made of _____ type semiconductor.
   (a) PN (b) P (c) N
5. In common source circuit the input and output signals are _____ phase with each other.
   (a) 90 ° out of (b) 180 ° out of (c) 270 ° out of
6. The common source circuit is also called _____ circuit.
   (a) Grounded Drain (b) Source follower (c) Grounded source
7. The dynodes are electrodes which are treated to produce _____ emission.
   (a) Primary (b) Secondary (c) Neutron
8. In common source amplifier output is amplified and _____ phase compared to input.
   (a) Out of (b) In same (c) In same & out of
9. Devices for operation as solar energy converters require _____ surface area.
   (a) Thick (b) Large (c) Small
10. LEDs made from _____ emits infrared radiation.
    (a) GaAsP (b) GaP (c) GaAs

Q.2 Answer **Any Ten** questions in brief. [20]

1. Give the constructional detail of N channel JFET.
2. List different parameters of FET.
3. Define Decibel.

[P.T.O]

4. Why the potential divider biasing circuit is better than self bias circuit?
5. Draw the symbols of depletion enhancement mode MOSFET.
6. Draw the Self-bias circuit using N channel JFET.
7. Draw the ac equivalent circuit of common gate amplifier.
8. Draw the common drain ac equivalent circuit.
9. Why common drain circuit is called Source follower ?
10. What is dynamic scattering ?
11. What does photoconductive cell consist of ?
12. What is an LED ?

Q.3 Why the frequency response of the BJT amplifier falls at lower and higher frequency ends. Explain giving necessary figures. [10]

OR

Q.3 (a) Discuss in detail the drain characteristics of N channel JFET when $V_{GS} = 0$. [05]
(b) Explain in detail the depletion regions of N channel JFET. [05]

Q.4 Explain in detail the enhancement mode MOSFET giving necessary figures. [10]

OR

Q.4 Explain in detail depletion enhancement mode MOSFET giving necessary diagram. [10]

Q.5 (a) Give the circuit of common gate amplifier and explain its working. [05]
(b) Draw the circuit of common drain amplifier and explain its working. [05]

OR

Q.5 Give the circuit of common source amplifier and explain its working. [10]

Q.6 Discuss in detail Liquid crystal display. [10]

OR

Q.6 Discuss in detail the photomultiplier tube. [10]

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