MSc(2Yr)(Bioinformatics/System Bio. & Bio.Informatics)

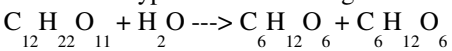
1. How structurally Histidine is differing from Phenylalanine?
    A. NH
    B. OH
    C. NH2
    D. SH
2. Which of these amino acids is "structurally" classified as being neutral polar?
    A. Phe
    B. Arg
    C. Ala
    D. Asn
3. What makes FASTA faster than NEEDLEMAN WUNSCH algorithm?
    A. The processor speed of the computer
    B. Hash table lookup
    C. Dynamic programming
    D. The scoring matrix used

4. How many edges meet at every branch node in a phylogenetic tree?
    A. 1
    B. 2
    C. 3
    D. 4
5. What is the difference between RefSeq and GenBank?
    A. RefSeq includes publicly available DNA sequences
    B. GenBank includes non redundant curated data
    C. GenBank sequences are derived from RefSeq
    D. RefSeq sequences are derived from GenBank
6. The sugar pucker observed generally in A-DNA structures is
    A. C3'-Exo
    B. C3'-Endo
    C. O4'-Exo
    D. C4'-Endo
7. The Pitch/turn of helix observed generally in B-DNA structures is
    A. 24.6
    B. 33.2
    C. 24.8
    D. 33.4
8. The major groove of in A-DNA structures is
    A. narrow
    B. Shallow
    C. deep, narrow
    D. wide, shallow
9. The approach that can be used to predict the 3D structure of a protein which has no detectable sequence similarity with the available templates is
    A. homology modeling
    B. comparative modeling
    C. fold recognition
    D. *ab initio* modeling
10. The Ramachandran plot is a
    A. Phi-Psi scatter diagram.
    B. Phi-Psi correlation diagram.
    C. Phi-Psi steric contour diagram.
    D. Phi-Psi energy diagram.

11. Which of the following can be determined using molecular mechanics?
    A. Molecular orbital energies
    B. Minimum energy conformation
    C. Electrostatic potentials
    D. Transition-state geometries
12. Which factor distinguish between specificity in BLAST
    A. H

B. K
C. H and K
D. H or K

13. How Sequence filtering in BLAST help in fast database searching
    A. Searches for LCR
    B. Searches for Repeats
    C. Both A & B
    D. None of the above
14. What does this E value mean mostly dependent on
    A. Database size
    B. Database type
    C. Database diversity
    D. Do not depend on database
15. SEG and PSEG are used for Low complexity region in BLAST
    A. Amino acid sequence
    B. Nucleic acid sequence
    C. Both
    D. None of the above
16. Many genes involved in pathogenicity are located in defined continuous regions ("islands") of the genome and have different GC content from other portions of the genome, suggesting that they have arisen through
    A. horizontal gene transfer
    B. gene duplication and subsequent mutation
    C. protection from methylation
    D. increase in the rate of mutation of successive GC pairs
17. Polycistronic mRNA refers to
    A. mRNA which is transcribed by multiple RNA polymerases
    B. mRNAs that are simultaneously translated
    C. mRNA that is translated by many ribosomes simultaneously
    D. mRNA with multiple open reading frames
18. Mention the type of the following reaction



    A. Synthesis
    B. Hydrolysis
    C. Dehydration
    D. Hydrogenation
19. Value of coefficient of kurtosis for a Normal distribution is
    A. positive
    B. negative
    C. equal to one
    D. equal to three
20. How SRAM and DRAM differentiated?
    A. SRAM require less power than DRAM
    B. SRAM less expensive than DRAM
    C. SRAM is volatile than DRAM
    D. Both A & B
21. In an airline reservation system, the entities are date, flight number, place of departure, destination, type of plane and seats available. The primary key is
    A. flight number
    B. flight number + place of departure
    C. flight number + date
    D. flight number + destination

22. Which of the following is NOT a characteristic of all Object Oriented Programming Languages?
    A. Inheritance
    B. Garbage collection
    C. Abstraction
    D. Data hiding
23. Which protocol is used by browsers to communicate between two machines?
    A. ftp
    B. ssl
    C. tcp
    D. http

24. What are the advantages in batch processing mode in computers?
    A. Error detection is simple
    B. System design is simple
    C. Error detection is complex
    D. Both A & B
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26. Which one is correct?
    A. 8 bit = 1 byte
    B. 1024 KB = 1MB
    C. 1024GB = 1 Terabyte
    D. All the above
27. Kernel is the heart of Unix/Linux and wrapped by
    A. shell
    B. shell command
    C. shell disk
    D. none of the above
28. What is the major advantage of DOT PLOT analysis?
    A. Identify all possible match
    B. Identify all possible mismatch
    C. Identify all ungapped match
    D. All the above
29. To compare DNA sequence in DOT PLOT we need
    A. Low window and high stringencies
    B. Low stringencies and high window
    C. Low window and low stringencies
    D. High window and high stringencies
30. Repeat and inverted repeats in DNA sequences are significantly identify by DOT PLOT
    A. Agree
    B. May be
    C. Strongly agree
    D. Not possible
31. Log odd matrices of PAM highly dependent on ?
    A. 1572 change amino acid changes in PAM
    B. 71 groups of PAM
    C. Entropy of PAM
    D. None of the above
32. Entropy of the matrix1 & 2 are +0.36 & +0.70. Which matrix is significantly distinguished between real vs. chance alignment.
    A. Matrix 1
    B. Matrix 2
    C. Data is no significant
    D. Both A & B
33. Significant of pair sequence alignment is not possible without scoring matrix.
    A. Statement is correct
    B. Statement is incomplete
    C. Statement is no universal
    D. Statement is justified
34. Which matrices significantly identify distant homologues?
    A. PAM
    B. BLOSUM
    C. Both
    D. None of the above
35. If the clustering in a matrices increased from 40% to 60%. Then information content would increased from
    A. 0.3 to 0.5 per residue
    B. 0.4 to 0.7 per residue
    C. Do not change
    D. None of the above
36. Three dimension protein structure is stabilized with

A. Non covalent bonding
B. Covalent bonding
C. Manly non covalent bonding
D. Both A & B

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38. In semi-empirical methods
    A. Nuclei & electrons are distinguished
    B. Nuclei & electron are no distinguish
    C. Nuclei are only considered
    D. Electron are only considered
39. In hemoglobin structure which amino acid is involved in oxygen binding?
    A. Seventh and eighth residues in helices F and E
    B. Seventh and eighth residues in helices E and F
    C. Leu & Val
    D. None of the above
40. Globin fold consist of
    A. All alpha helices
    B. Eight alpha helices
    C. Four alpha & four beta helices
    D. None of the above
41. Statistical thermodynamics deals with
    A. pressure
    B. entropy
    C. free energy
    D. all of the above
42. Plasmid DNA is
    A. Positively supercoiled
    B. Negatively supercoiled
    C. Early supercoiled
    D. supercoiled
43. Topology of DNA could be described by
    A. Linking number
    B. Twisting number
    C. Writhing number
    D. All of the above
44. PHYLIP program of phylogenetic analysis based on
    A. Parsimony method
    B. Distance method
    C. Partly on distance method
    D. None of the above
45. Which of these amino acids is highly conserved?
    A. Glycine
    B. Alanine
    C. both
    D. none
46. Triad tools in molecular modeling consist of
    A. Force field, Parameter sets, molecular mechanism
    B. Force field, Minimization algorithm, Parameter sets
    C. Force field, molecular dynamics, parameter sets
    D. All of the above
47. CHARMm family
    A. Program for molecular minimization
    B. It is a force feild
    C. Force field parameter
    D. None of the above
48. Supercoiling has a significant role in controlling gene expression
    A. Statement is correct
    B. State is incomplete

C. Statement is not justify
D. None of the above

49. Global minimum energy conformation is always an active conformation of the model
A. Statement is correct
B. State is incomplete
C. Statement is not justify
D. None of the above

50. Molecular descriptor
A. Log p
B. Clog p
C. HUMO
D. All of the above

51. Which of the following is a subset of {b, c, d}?
A. { }
B. {a}
C. {1, 2, 3}
D. {a, b, c}

52. Two sequences are said to be homologous if:
A. They have diverged from a common ancestor.
B. Their alignments share 30% identity or more.
C. They belong to the same fold family.
D. They have converged to share similar functional properties.

53. Hydropathy plots are usually used to predict:
A. beta secondary structures
B. transmembrane domains
C. alpha secondary structures
D. tertiary structure

54. zinc finger is a small
A. conserved structural
B. super secondary structures
C. transcription factor shape
D. variations in structure

55. Should one use several gene prediction packages, and why?
A. no, each is 100% accurate
B. yes, it's useful to see what is/isn't predicted by each package and, consensus is useful
C. yes as none of them work reliably
D. no, as the use of several packages complicates the analysis

56. Which of the following is NOT a prime number?
A. 11
B. 21
C. 31
D. 41

57. SRS is:
A. a Website for sequence similarity searches
B. a Website specializing in mapping mutations related to human disease
C. a Website that indexes many biological databases and is searchable by keywords
D. a Website for protein family database searches

58. In heme synthesis in mammalian cells:

A. Succinyl CoA and alanine are the immediate substrates for formation of delta-aminolevulinic acid.
B. Ferric iron is inserted into protoporphyrin IX.
C. Coproporphyrin IV is an intermediate.
D. Porphobilinogen is formed by the condensation of two molecules of delta-aminolevulinic acid.

59. Why are color schemes important in creating and analyzing sequence alignments?
A. They look pretty
B. To make clearer printouts and presentations
C. To allow you to distinguish conserved residues and residue groups more easily
D. To allow you to detect active sites of proteins

60. The Myeloid cells include
    A. monocytes,
    B. macrophages,
    C. neutrophils,
    D. ALL
61. Systems biology include
    A. modeling of complex biological systems
    B. Application of static systems theory to molecular biology.
    C. Identify different sub structures.
    D. functional genomics

62. Rotation is permitted about
    A. N-Cα and Cα-C bonds.
    B. N-Cα or Cα-C bonds.
    C. N-Cα not Cα-C bonds.
    D. N-Cα, Cα-C bonds.

63. Twilight zone of protein sequence alignments
    A. The signal gets blurred near about 20-35% sequence identity
    B. IT is described by an explosion of false negatives
    C. 95% of all pairs detected had different structures.
    D. all of the above
64. molecular orbital theory is
    A. bonds between atoms, are moving under the influence of the nuclei in the whole molecule
    B. bonds between atoms, are not moving under the influence of the nuclei in the whole molecule
    C. atoms between bonds, are moving under the influence of the nuclei in the whole molecule
    D. toms between bonds, are not moving under the influence of the nuclei in the whole molecule
65. What is a theoretical biologist?
    A. Mathematical biology
    B. Evolutionary biology
    C. BOTH
    D. None of the above

66. Identify which of the following terms refers to the arrangement of different protein subunits in a multiprotein complex.
    A. primary structure
    B. secondary structure
    C. tertiary structure
    D. quaternary structure
67. which BLOSUM matrices used for distantly related proteins
    A. BLOSUM 62
    B. BLOSUM 80
    C. BLOSUM 45
    D. BLOSUM 50

68. Microcanonical ensemble is
    A. equal probability each possible state with constant energy and composition
    B. un equal probability each possible state with constant energy and composition
    C. equal probability each possible energy state
    D. un equal probability each possible energy state

69. DNA supercoiling can be described numerically by changes
    A. linking number
    B. twist number
    C. writhe number
    D. all
70. Identify the strongest form of intermolecular bonding that could be formed involving the residue of the amino acid serine.
    A. ionic bond
    B. hydrogen bond
    C. van der Waals interactions
    D. none of the above

71. Well-conserved regions in multiple sequence alignments:
    A. Reflect areas of structural importance.
    B. Reflect areas of functional importance.
    C. Reflect areas of both functional and structural importance.
    D. Reflect areas likely to be of functional and/or structural importance.
72. Triad tools in molecular modeling do not consist of
    A. Force field, Parameter sets, molecular mechanism
    B. Force field, Minimization algorithm, Parameter sets
    C. Force field, molecular dynamics, parameter sets
    D. All of the above
73. AMBER family
    A. Program for molecular minimization
    B. It is a force feild
    C. Force field parameter
    D. None of the above
74. Which matrices pairs has comparable results
    A. PAM50 BLOSUM90
    B. PAM20 BLOSUM60
    C. PAM160 BLOSUM60
    D. PAM200 BLOSUM30
75. What is Phonemics?
    A. variation in phenotype & genotype as it changes during its life span
    B. variation in genotype as it changes during its life span
    C. Variation in phenotype as it changes during its life span.
    D. none