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

**1.** Given below are three statements related to antibodies.
i) Binds to Fc receptors on mast cells.
ii) Important mediator for hypersensitivity
iii) Least abundant isotype in serum
Identify to which type of antibody these statements will hold true.
A) IgA B) IgD C) IgE D) IgM

**2.** A semiconductor memory that stores information permanently and does not lose its content when power is switched off will be
A) Random Access Memory B) Read only Memory
C) Records D) Register

**3.** Agarose is a polymer composed of repeating units of
A) A monosaccharide, galactose
B) A monosaccharide, 3,6 -anhydrogalactose
C) A disaccharide consisting of two galactose units
D) A disaccharide consisting of galactose and 3,6 -anhydrogalactose

**4.** Which of the following is a character based phylogenetic algorithm?
A) Neighbor joining B) Kimura
C) Maximum Likelihood D) UPGMA

**5.** Which of the following electrophoresis type cannot be used for immunoelectrophoresis?
A) Zone electrophoresis.
B) Dot blotting
C) Ouchterloney double diffusion
D) Orthogonal field alternating gel electrophoresis

**6.** Which of the following enzymes category catalyzes reaction where bond formation is coupled with ATP hydrolysis
A) Lyases B) Oxidoreductases C) Isomerases D) Ligases

**7.** The microarrays consist of a solid support with immobilized probes. Which of the following macromolecules can constitute these probes.
A) DNA B) mRNA C) Genes D) Transcripts

**8.** What is the major criterion for resolution in hydrophobic interaction chromatography?
A) Biospecific recognition B) Adsorption
C) Normal phase distribution D) Reverse phase distribution

**9.** Which are the most abundant RNA types?
A) rRNA and mRNA B) rRNA and microRNA
C) tRNA and mRNA D) mRNA and microRNA

**10.** Urea is used as denaturing agent for proteins and peptides during purification and isolation, it does so by all of the following properties, except?

A) Decreases hydrophobic interactions B) Disrupts hydrogen bonds
C) Disrupts ionic interactions D) Disrupts disulfide linkages

**11.** Hyperchromic shift on DNA molecules refers to

A) Increase in UV absorbance due to denaturation of DNA double helix
B) Increase in UV absorbance due to renaturation of DNA double helix
C) Increase in visible range absorbance due to denaturation of DNA double helix
D) Increase in visible range absorbance due to renaturation of DNA double helix

**12.** The terminology Scaffold in Genome sequencing project refers to

A) Ordered set of contigs placed on the chromosome
B) A contiguous stretch of sequence
C) A set of overlapping sequences
D) Sequence overlap information

**13.** All of the following statements are true for ribosome, except one

A) The ribosome binds mRNA molecules
B) The ribosome has specific binding sites for tRNA molecules
C) The ribosome cannot catalyze peptide bond formation
D) The ribosome undergoes movement to translate sequential codons

**14.** Match the cell type with correct receptor identified on their surface

| | |
|---|---|
| a. Antigen presenting cell | 1. $CD8^+$ |
| b. B cell | 2. MHC |
| c. Helper T cell | 3. BCR |
| d. Cytotoxic T cell | 4. $CD4^+$ |

A) a ,1; b, 2; c,3; d,4 B) a ,2; b, 3; c,4; d,1
C) a ,3; b, 2; c,1; d,4 D) a ,4; b, 2; c,3; d,1

**15.** Which one of the following statement is not true for Shine-Dalgarno Sequences?

A) These are purine rich tract of 3-10nucleotides.
B) It is centered ~10 nucleotides upstream from start codon.
C) Base pairing between this sequence and 16 S r RNA is crucial for translation initiation.
D) Complementary binding between this sequence and initiation factors is crucial for translation initiation.

**16.** In one litre of pure water HCl was added at $H^+$ conc. of $10^{-4}$ M. What will be the pH of solution?

A) 4 B) 6 C) 8 D) 10

**17.** All of the following enzymes exist as Zymogens, except

A) Trypsin B) Chymotrysin C) Elastase D) Acetylcholinestrase

**18.** All of the following amino acids have large and polar side-chains, except
A) Glutamine B) Histidine C) Lysine D) Leucine

**19.** A low molecular weight substance that can be made immunogenic by conjugation to a suitable carrier is termed as
A) Hapten B) Adjuvant C) Freund's adjuvant D) Inflammagen

**20.** In which of the mitotic phase, Golgi complex are reformed and daughter cells are formed
A) Interphase B) Anaphase C) Telophase D) Metaphase

**21.** An induced and ordered process in which the cell actively participitates in bringing out its own death is termed as
A) Necrosis B) Apoptosis C) Opsonization D) Autolysis

**22.** The bioinformatics program Clustal performs which type of multiple sequence alignments
A) Progressive B) Iterative C) Block-based D) Random

**23.** All of the following statements are true for enzyme kinetics, except
A) The maximal velocity of a reaction $V_{max}$ occurs at high substrate concentration
B) The maximal velocity of a reaction $V_{max}$ occurs at only high enzyme concentrations
C) The maximal velocity of a reaction $V_{max}$ occurs when enzyme is saturated
D) The maximal velocity of a reaction $V_{max}$ occurs when substrate is entirely in ES form

**24.** The acronym for the T-coffee program is
A) Tree-based consistency on function for alignment evaluation
B) Tree-based consistency objective function for e -value evaluation
C) Tree-based consistency objective function for alignment evaluation
D) Tree-based consistency on function for alignment and e-value evaluation

**25.** The translocon embedded in ER membrane is a channel for
A) Inward Transport of Ca ions
B) Outward Transport of Ca ions
C) Inward Transport of Nascent polypeptides
D) Outward Transport of Nascent polypeptides

**26.** The terminal signal in a flowchart represents
A) Processing B) Decision C) Start and End D) Debugging

**27.** Identify which one out of the following does not represent a subtype of printers
A) Ink-Jet B) Daisy Wheel C) Laser D) Dot pitch

**28.** A terabyte comprises of which of the following
A) 1024 gigabyte B) 1024 megabyte C) 1024 kilobyte D) 1024 byte

**29.** The correct definition for a PAM unit would be
A) One mutation per 100 amino acid residues
B) One mutation per 100nucleotides only

C) One amino acid only
D) One nucleotide only

**30.** The disorganization of a protein termed denaturation can be brought by all of the following agents , except

A) Radiations B) Heat C) Urea D) Proteases

**31.** The operating system that is self-contained in the device and resident in ROM is

A) Batch processing operating system B) Real -time operating system
C) Embedded operating system D) Multiprocess operating system

**32.** In the glycolytic cycle which of the following set of enzymes are ATP utilizing enzymes

A) Hexokinase and Pyruvate Kinase
B) Hexokinase and Phosphofructo kinase
C) Phosphoglycerate kinase and Pyruvate Kinase
D) Phosphoglycerate kinase and phospho fructokinase

**33.** The term cDNA is used for describing which of the following?

A) A modified conformation form of DNA
B) A complimentary DNA made against mRNA template
C) A complimentary DNA made against DNA template
D) A complimentary DNA made against Protein template

**34.** Which of the following mentioned program is for protein secondary structure prediction by *ab-initio* approach.

A) Chou-Fasman method B) Needleman-Wunsch method
C) Bayesian method D) Markov model method

**35.** In a BLAST search the list of words extracted from the query sequence is called as

A) Tupple B) Guide C) Score D) Seeding

**36.** For a database the term data integrity refers to

A) No duplication of data B) Accuracy of data
C) Security of data D) Centralization of data

**37.** All of the following statement are true for Low complexity regions, except

A) Sequence regions with highly repetitive residues
B) Short repeat segments of sequence
C) Sequence regions over-represented by a small number of residues
D) Sequence regions under-represented by a small number of residues

**38.** All of the following names are abbreviated names of sequence formats, except

A) GenBank B) GenPept C) FASTA D) BLAST

**39.** Which of the following is the correct name of the first bioinformatics database developed by Margaret Dayhoff

A) Atlas of Protein Sequence and Structure
B) Atlas of Protein Structure

C) Atlas of Nucleotide Sequence and Structure
D) Atlas of Nucleotide Sequence

**40.** The protein structures from secondary to quaternary are maintained by various types of stabilizing forces. All of the following mentioned are examples of these forces, except one.

A) Electrostatic interactions B) Van-der Waals forces
C) Hydrogen bonding D) Peptide bonds

**41.** Majority of the protein glycosylation takes place in which of the cellular organelle.

A) Ribosomal assembly B) Peroxisomes
C) Golgi complex D) Endoplasmic reticulum

**42.** A Monochromator is used in a spectrophotometer for which of the following mentioned functions

A) To create a straight beam of light
B) To create a source of light
C) To select a source of light from different sources
D) To select a light beam of desired wavelength

**43.** How many base pairs are present in a helix in A-DNA?

A) 9 B) 10 C) 11 D) 12

**44.** Which of the following best describe the antibodies

A) Fibrous proteins B) Prion proteins C) Globular proteins D) Synaptic proteins

**45.** Allergic reaction in an organism is due to production of which of the following types of Antibodies against an antigen

A) IgG B) IgA C) IgD D) IgE

**46.** Identify which of the following amino acid has a hydrophobic side chain?

A) Asparagine B) Lysine C) Leucine D) Glycine

**47.** The cells which have potency to divide and develop to form an entire organism are known as

A) Totipotent cells B) Multipotent cells C) Unipotent cells D) Pleuripotent cells

**48.** A computer network, which spans over a large geographical area, is termed as

A) LAN B) WAN C) Hub D) Router

**49.** A genetic disorder Phenylketonuria is due to the deficiency of which one of the following enzymes

A) Phenylalanine hydroxylase B) Phenylalanine keto reductase
C) Phenylalanine oxidase D) Phenylalanine synthase

**50.** The Sodium dodecyl sulphate Polyacrylamide Gel Electrophoresis resolves proteins and polypeptides based on

A) Electric Charge B) pH

C) Molecular Weight D) Molecular Shape

**51.** According to Enzyme classification nomenclature the Enzyme Glucokinase belongs to which category

A) Isomerase B) Transferase C) Hydrolase D) Oxidoreductase

**52.** All the molecules mentioned hereby are nucleoside, except one of these. Identify that molecule.

A) Adenosine B) Cytosine C) Guanosine D) Uridine

**53.** A tRNA containing UAC anticodon will be base pair with which of the following codon

A) GUA B) AUG C) UAC D) CAU

**54.** The genetic variations present in at least one per cent of the population will be termed as

A) Copy number variation B) Single nucleotide polymorphism
C) Gene variant D) Mutation

**55.** In order to identify the protein in main protein database corresponding to the DNA sequence provided, which program should you use .

A) Blastn B) Blastp C) Blast D) Tblastn

**56.** In a typical PCR each cycle has multiple steps. Identify the correct number and order of steps

A) Two steps, denaturation then renaturation
B) Two steps, renaturation then denaturation
C) Three steps, denaturation, renaturation and synthesis
D) Three steps, renaturation, denaturation and synthesis

**57.** Which of the following organisms was completely sequenced and when?

A) *Haemophilus influenzae* in 1995 B) *Haemophilus influenzae* in 2001
C) *Escherichia coli* in 1995 D) *Escherichia coli* in 2001

**58.** Following are the examples of score matrices to calculate alignment of protein sequences, except

A) PAM B) BLOSUM C) Gonnet D) Pfam

**59.** The FASTA sequence format uses the following symbols

A) '>' for beginning of sequence, '|'for extra information
B) '<' for beginning of sequence, '|'for extra information
C) 'l'for beginning of sequence, '>' for extra information
D) 'l' for beginning of sequence, '<' for extra information

**60.** The technique abbreviated as RT-PCR stands for

A) Reverse transcription -polymerase chain reaction
B) Reverse transcriptase- polymerase chain reaction
C) Reciprocal transcription- polymerase chain reaction
D) Reciprocal transcriptase-polymerase chain reaction

**61.** The fastest memory in a computer system is

A) RAM B) ROM C) RM D) Cache

**62.** The eukaryotic cytoskeleton is constituted by all of the following components, except.

A) Intermediate filaments B) Spiral filaments

C) Actin filaments D) Myosin filament

**63.** Which of the following is the cofactor for enzyme of DNA replication?

A) $Mg^{2+}$ B) $Ca^{2+}$ C) $Co^{2+}$ D) ATP

**64.** The process of erasing data on a CD-RW disk is called

A) Peeling B) Annealing C) Scrapping D) Smoothening

**65.** How many bases are known to constitute the Human genome?

A) 3 million base pairs B) 3 billion base pairs

C) 4 million base pairs D) 4 billion base pairs

**66.** Which of the following databases can be used for submission of the sequence of a newly identified gene.

A) A Primary database B) A Secondary database

C) BLAST D) Any genome browser

**67.** All of the following biochemical processes are responsible for post –translational Modifications in proteins, except?

A) Amino acid residues modifications B) Formation of disulfide bonds

C) Proteolytic cleavage D) Formation of peptide bonds

**68.** Which of the following set of databases represent literature databases

A) MEDLINE and PubMed B) MEDLINE and PDB

C) PDB and PubMed D) SCOPUS and PDB

**69.** All of the statements are true for plasmids except one. Identify the false statement

A) They are circular DNA molecule

B) They have antibiotic resistance gene

C) They have the ability of self-replication

D) The size of plasmid is as big as that of chromosomal DNA

**70.** The DNA molecule differs from RNA in all of the following ways except, one?

A) Presence of thymine

B) A sugar molecule

C) Functions performed by each of these molecules

D) The 5' and 3' orientation of the polynucleotide strand

**71.** Sucrose is a disaccharide of glucose and fructose linked by

A) α, β (1 → 2)glycosidic bond B) α, β (1 → 3)glycosidic bond

C) α, β (1 → 4)glycosidic bond D) α, β (1 → 6)glycosidic bond

**72.** The sample of purified DNA can be checked quantitatively for yield by which of the following methods.

A) Spectrophotometrically taking absorption at 260nm
B) Spectrophotometrically taking absorption at 280nm
C) Performing agarose gel electrophoresis
D) Performing acryl amide gel electrophoresis

**73.** The alpha helical stability of a protein molecule can be disrupted by all of the following , except.

A) Presence of proline in the sequence
B) Bulky side chains of aromatic amino acids
C) Branched chain amino acids
D) Presence of alanine in the sequence

**74.** The program ORF Finder identifies all ORFs using.

A) Only one standard genetic code for each amino acid
B) Any genetic code for an amino acid
C) Either standard or alternative genetic codes for each amino acid
D) Special codes assigned to each amino acid

**75.** The essential feature of a cloning vector is.

A) It should have a strong promoter
B) It should have a terminator region
C) It should have a marker gene
D) It should have b-galactose gene

*x-x-x*