QUESTION BANK

INTRODUCTION TO COMPUTATIONAL BIOLOGY (21BTB102T)

UNIT- 2

PART-A

Choose the correct answer

1. Which of the following is the simplest form of carbohydrates?

(a) Carboxyl groups

(b) Aldehyde and Ketone groups

(c) Alcohol and Carboxyl groups

(d) Hydroxyl groups and Hydrogen groups

2. Which of the following is the most abundant biomolecule on the earth?

(a) Lipids

(b) Proteins

(c) Carbohydrates

(d) Nucleic acids.

3. Which class of carbohydrates cannot be hydrolyzed further?

(a) Monosaccharides

(b) Polysaccharides

(c) Disaccharides

(d) Proteoglycan

4. **Starch consists of**

(a) Branched amylose and branched amylopectin

(b) Unbranched amylose and branched amylopectin

(c) Unbranched amylose and unbranched amylopectin

(d) None of these

5. -------- is not a disaccharides

(a) Maltose

(b) Sucrose

(c) Galactose

(d) Lactose

6. The general formula of Carbohydrates?

(a) $(C_4H_2O)n$

(b) $(C_6H_2O)n$

(c) $(CH_2O)n$

(d) $(C_2H_2O)n$ COOH

7. The major function of carbohydrates are

(a) Storage

(b) Structural framework

(c) Transport Materials

(d) Both Storage and structural framework

8. Which of these is not a lipid?

(a) Fats

(b) Oils

(c) Proteins

(d) Waxes

9. Which of the following is an example of derived lipids?

(a) Terpenes

(b) Steroids

(c) Carotenoids

(d) All of the above

10. Lipids are important constituents of

(a) Nucleus

(b) Ribosomes

(c) Both a and b

(d) Biological membranes

11. The fats and oils are respectively rich in

(a) Unsaturated fatty acids

(b) Saturated fatty acids

(c) Saturated and unsaturated fatty acids

(d) None of these

12. Example of monounsaturated fatty acids are

(a) Oleic acid

(b) Arachidonic acid

(c) Palmitic acid

(d) Linolenic acid

13. Natural lipids are readily soluble in

(a) Oil

(b) Mercury

(c) Water

(d) None of these

14. α-oxidation of fatty acids mostly occurs in

(a) Brain

(b) Adipose tissues

(c) Liver

(d) Muscles

15. Phospholipid contains

(a) Hydrophilic heads and hydrophobic tails

(b) Long water-soluble carbon chains

(c) Positively charged functional groups

(d) Both a and b

16. Coenzyme is

(a) Always a protein

(b) Often a metal

(c) Always an inorganic compound

(d) Often a vitamin

17. Enzyme are made up of

(a) Fat

(b) Protein

(c) Nucleic acids

(d) Vitamins

18. Koshland proposed which model:

(a) Fluid mosaic model

(b) Induced fit model

(c) Lock and key model

(d) Reflective index model

19. Which of the following is responsible for specifying the 3D shape of a protein?

(a) The peptide bond

(b) The amino acid sequence

(c) Interaction with other polypeptides

(d) Interaction with molecular chaperons

20. How many amino acids make up a protein?

(a) 10

(b) 20

(c) 30

(d) 50

21. What is a bond between amino acids called?

(a) Ionic bond

(b) Acidic bond

(c) Peptide bond

(d) Hydrogen bond

22. The cell organelles which is involved in the process of protein synthesis?

(a) Vesicles

(b) Ribosomes

(c) Synchrotrons

(d) Mitochondria

23. The most common secondary structure of protein is

(a) α- helix

(b) β-pleated sheet

(c) β-pleated sheet parallel

(d) β-pleated sheet non parallel

25. Tertiary structure of protein is maintained by

(a) Peptide bond

(b) Hydrogen bond

(c) Di-sulphide bond

(d) all the above

26. Amino acids are joined by

(a) Peptide bond

(b) Hydrogen bond

(c) Ionic bond

(d) Glycosidic bong

26. This hormone is not secreted by Hypothalamus

(a) PRH

(b) FSH

(c) CRH

(d) TRH

27. This is not an endocrine gland

(a) Adrenal

(b) Pituitary

(c) Lacrimal

(d) Thyroid

28. High blood sugar level is controlled by

(a) Glucose

(b) Thyroxin

(c) Insulin

(d) Adrenalin

29. The largest gland in the human body is

(a) Liver

(b) Salivary gland

(c) Endocrine gland

(d) Bile

30. Which of the following pairs of the endocrine gland is located in the brain?

(a) Hypothalamus and thymus

(b) Pituitary and parathyroid

(c) Thyroid and pineal

(d) Hypothalamus and pineal

31. Commonly used vectors for human genome sequencing are

(a) T-DNA

(b) BAC and YAC

(c) Expression vectors

(d) T/A cloning vectors

32. Which of the following was not the goal of human genome project?

(a) Identification of human genes

(b) Human genome sequence determination

(c) Store information in databases

(d) Improve manpower for data analysis

33. How many nucleotides are present in the human genome?

1) 3164.7 million

(2) 2015.9 million

(3) 1982.0 million

(4) 3247.9 million

34. According to human genome project, the maximum numbers of genes are present on

(a) An allosome

(b) An autosome

(c) A chromosome present in male only

(d) A chromosome present in female only

35. Which of the following were not used in HGP?

(a) Vectors like BAC and YAC

(b) Hosts like plants and animals

(c) Protein sequencers

(d) DNA sequencers

36. Genome is refers to the

(a) DNA of an organism

(b) Total DNA and RNA of an organism

(c) Entire genes of an organism

(d) Total DNA, RNA and cDNA of an organism

37. DNA sequencing followed by genome annotation are steps of

(a) Comparative genomics

(b) Structural genomics

(c) Functional genomics

(d) Transcriptomics

38. The term genomics was coined by

(a) Thomson Cech

(b) T.H Morgan

(c) Thomson Roder

(d) Craig venter

39. International Human Genome project was initiated by

(a) National Institute of Health (NIH)

(b) Celera genomics

(c) US Department of Energy (DoE)

(d) NOH and US DoE

40. The major approaches used in HGP for identifying genes were

(a) BLAST

(b) Expressed sequence tags

(c) Sequence annotation

(d) b and c

41. Adjacent nucleotides are joined by

(a) Covalent bond

(b) Phosphodiester bond

(c) Ionic bond

(d) Peptide bond

42. The type of coiling in DNA is

(a) Zig-zag

(b) Left-handed

(c) Opposite

(d) Right-handed

43. A nucleoside is composed of

(a) A base+ a sugar

(b) A base+ a sugar+ phosphate

(c) A base+ a phosphate

(d) None of these

44. DNA is present in

(a) Nucleus only

(b) Nucleus, mitochondria and ER

(c) Nucleus, mitochondria and chloroplast

(d) Nucleus, mitochondria and ER

45. The type of sugar in DNA are

(a) Triose

(b) Tetrose

(c) Pentose

(d) Hexose

46. **If the DNA strand has nitrogenous base sequence ATTGCC, the mRNA will have?**

(a) ATTGCA

(b) UGGACC

(c) UAACGG

(d) ATCGCC

47. Anticodon is present in

(a) DNA

(b) tRNA

(c) rRNA

(d) mRNA

48. **RNA contains repeating units of**

(a) Deoxyribonucleotides

(b) Ribonucleotides

(c) Deoxyribonucleosides

(d) Ribonucleosides

49. **Which of the following is found more widely in a cell?**

(a) RNA

(b) DNA

(c) Sphaerosomes

(d) Chloroplasts

50. Which of the following RNAs are the most abundant in an animal cell?

(a) mRNA

(b) tRNA

(c) miRNA

(d) rRNA

51. Margaret Dayhoff developed the first protein sequence database called

(a) SWISS PROT

(b) PDB

(c) Atlas of protein sequence and structure

(d) Protein sequence databank

52. Which of the following is a sequence alignment tool

(a) BLAST

(b) PRINT

(c) PROSITE

(d) PIR

53. The BLAST program was developed in _____

(a) 1992

(b) 1995

(c) 1990

(d) 1991

54. Which of the following is the protein structure database?

(a) SWISS-PORT

(b) GenBank

(c) PDB

(d) DDBJ

55. The scientists who created the first Bioinformatics database?

(a) Dayhoff

(b) Pearson

(c) Richard Durbin

(d) Michael.J.Dunn

56. An example of Homology and similarity tool?

(a) PROSPECT

(b) EMBOSS

(c) RASMOL

(d) BLAST

57. The expansion of BLAST is

(a) Beginners Local Alignment search Tool

(b) Beginners Logical Alignment search Tool

(c) Basic Local Alignment Search Tool

(d) Beginners Local Alignment software Tool

58. Which BLAST type is used to find very distant relationship between nucleotide sequences

(a) tblastx

(b) blastn

(c) blastp

(d) tblastn

59. Which of the following is not a benefit of BLAST?

(a) Handling of gaps

(b) Speed

(c) More sensitive

(d) Statistical rigor

60. Which of the following is not a variant of BLAST?

(a) BLASTN

(b) BLASTX

(c) BLASTP

(d) TBLASTNX

PART-B

Answer the following (4 Marks)

1. Write short notes on Types of Monosaccharides
2. Explain in detail about the functions of proteins
3. What is Lipid? Explain about Classification of Lipids
4. Write short notes on Types of RNA
5. What are the differences between DNA and RNA?
6. Write about nucleic acid compounds
7. Write a short note on enzyme and its classification
8. Write a note on Methodologies of Human genome project
9. Write about application of Human genome project
10. Write a note on functional genomics
11. Write short notes on primary and secondary Sequence database with example
12. List out the uses of BLAST tools

PART-C

Answer the following (12 Marks)

1. Discuss in detail about Disaccharide with example
2. Illustrate polysaccharides with example
3. Discuss in detail about Secondary structure of protein
4. Describe in detail about Structure of DNA
5. Discuss in detail about Mechanism of Enzyme Action and its models

6. Explain in detail about Human genome project and its applications
7. Discuss in detail about genomics
8. Explain about the types of Sequence databases
9. Illustrate about Types and Function of BLAST programming