MSc(HS)(Biochemistry)

1. The commonly used terms as glucose residues means;
- **A.** Free glucose molecules in fisher form
- **B.** Glucose molecules in a racemic mixture
- **C.** Glucose molecules in chain joined after removal of water
- **D.** Glucose obtained after epimerization of galactose

2. All except one of the following catalyze the anaplerotic reactions;
- **A.** PEP carboxykinase
- **B.** Malic enzyme
- **C.** Pyruvate carboxylase
- **D.** Malate dehydrogenase

3. Find out the correct type of cell that is most effective for destroying intracellular pathogen;
- **A.** Myeloma cells
- **B.** B Cells
- **C.** T helper Cells
- **D.** Cyotoxic T Cells

4. Which of the following combination requires primer for their net synthesis?
- **A.** Cellulose synthesis and DNA synthesis
- **B.** Glycogen synthesis and DNA synthesis
- **C.** Glycogen synthesis and RNA synthesis
- **D.** Cellulose synthesis and RNA synthesis

5. Ouabain, a cardiac glycoside inhibits Na^+K^+ ATPase through which of the following ways;
- **A.** By decreasing the fluidity of membrane near pump
- **B.** By increasing the fluidity of membrane near pump
- **C.** Intracellular binding to pump
- **D.** Extracellular binding to pump

6. Which of the following does not represent protein posttranslational modification's;
- **A.** Incorporation of proline in a protein
- **B.** Acetylation of a protein
- **C.** Phosphorylation of a protein
- **D.** Glycosylation of a protein

7. Which of the following best explains the nick translation;
- **A.** Synthesis of new protein
- **B.** Extension of single phosphoester break
- **C.** Extension of already existing protein.
- **D.** Synthesis of glycoproteins

8. The first stage in the assimilation of CO_2 into biomolecules is;
- **A.** Condensation of $CO_2$with a two carbon acceptor

B. Condensation of $CO_2$with a three carbon acceptor
C. Condensation of $CO_2$with a four carbon acceptor
D. Condensation of $CO_2$with a five carbon acceptor

9. Hydrogen carrier used in dehydrogenation of succinic acid to fumaric acid is;
A. FAD
B. NADP
C. Oxidized glutathione
D. NAD+

10. The peptidoglycan in bacterial envelopes is an alternating copolymer of;
A. N-acetylglucosamine and N-acetylmuramic acid linked by β 1->4 Glycosidic bonds
B. N-acetylglucosamine and N-acetylmuramic acid linked by α 1->4 Glycosidic bonds
C. N-acetylglucosamine and N-acetylmuramic acid linked by β 1->2 Glycosidic bonds
D. N-acetylglucosamine and N-acetylmuramic acid linked by α 1->2 Glycosidic bonds

11. Which of the following is an example of substrate level phosporylation;
A. Conversion of Glucose to glucose 6 phosphate
B. Phosphatase action on protein phosphorylated at serine/ theronine
C. Conversion of 1,3-bisphosphoglycerate to 3-phosphoglycerate
D. Phosphatase action on protein phosphorylated at tyrosine

12. Which of the following best describes the antibodies;
A. Globular proteins
B. Fibrous proteins
C. Prion proteins
D. Synaptic proteins

13. DNA replication between prokaryotes and eukaryotes differs in which of the following aspect;
A. RNA primes DNA synthesis in prokaryotes and not in eukaryotes
B. A single origin of replication in prokaryotes and multiple in eukaryotes
C. Bidirectional replication in prokaryotes and unidirectional in eukaryotes
D. DNA directed DNA polymerase enzyme in prokaryotes and RNA directed DNA polymerase in eukaryotes

14. The wobble rule in the genetic code explains which of the following;
A. The degeneracy in the 3'site of codon
B. The degeneracy in the 5'endof the codon
C. The degeneracy in the 3' end of the anticodon
D. The degeneracy in middle nucleotide of codon and anticodon

15. NADPH generated from pentose phosphate pathway yields reducing power for;
A. Biosynthesis of carbohydrates
B. Biosynthesis of nucleic acids
C. Biosynthesis of amino acids
D. Biosynthesis of fatty acids

16. Which of the following best describe chimera;

A. An animal composed of cells originating from two or more embryo
B. An animal composed of additional appendages due to embryo asymmetric cleavage
C. An animal composed of cells originating from skin cells of same individual
D. An animal composed of cells originating from stromal stem cells

17. The first ever amino acid decoded by Nirenberg and Matthaei using a RNA composed of poly-Uracil was;

A. Phenylalanine
B. Methionine
C. Tyrosine
D. Glycine

18. The following neurotransmitters are derivatives of tyrosine, except;

A. Dopamine
B. Epinephrine
C. Norepinephrine
D. Histamine

19. Which one of the following amino acids can interrupt α-helices and also disrupts β Sheets;

A. Phe
B. Cys
C. His
D. Pro

20. The lysosomal enzymes share an important and unique property. Identify the correct Answer;

A. Show an optimal activity at a neutral pH
B. Show an optimal activity at an acidic pH
C. Show an optimal activity at an alkaline pH
D. Show an optimal activity at every pH point

21. Which of the following definition is most appropriate for Ribozymes**?**

A. Ribosomes with enzymatic activity
B. Enzymes associated with ribosome biogenesis
C. Enzymes involved in biosynthesis of ribosomal DNA
D. Ribonucleic acid with catalytic activity.

22. Methotrexate is known to inhibit cancer cell growth due to which of the following;

A. Competitively inhibits DNA Ligase enzyme
B. Competitively inhibits DNA Polymerase
C. Competitively inhibits Dihydrofolate reductase enzyme
D. Competitively inhibits peptidyl transferase enzyme

23. Identify the correct steps of Pyruvate degradation in alcoholic fermentation reaction;

A. Pyruvate → Acetaldehyde →Ethanol
B. Pyruvate → Lactate →Ethanol

C. Pyruvate → Malonyl CoA →Ethanol
D. Pyruvate → Glycerate →Ethanol

24. Out of the following mentioned chemical reactivity, which one best describes the action of DNA ligases;
A. DNA ligase is a polymerase
B. DNA ligase catalyzes oxidation –reduction reaction
C. DNA ligase catalyzes formation of a phophoester bond
D. DNA ligase catalyzes the hydrolysis of a peptide bond

25. The cells that have undergone genetic modifications to grow indefinitely will be termed as;
A. Primary cell culture
B. Secondary cell culture
C. Cell Strain
D. Cell line

26. Which of the following forms of electrophoresis can resolve long DNA molecules >100 kb in size;
A. Standard Agarose gel electrophoresis
B. SDS-polyacrylamide gel electrophoresis
C. Native polyacrylamide gel electrophoresis
D. Pulsed field gel electrophoresis

27. Highest amount of triglycerides is present in;
A. Very low density lipoprotein
B. Low density lipoprotein
C. High density lipoprotein
D. Chylomicrons

28. Any genetic change that can be identified to occur in more than one percent of the population is defined as;
A. Gene Polymorphism
B. Gene Duplication
C. Gene Redundancy
D. Genetic Mutation

29. Which of the following mentioned chromatography's can be used to separate the proteins on the basis of their molecular weight ?
A. Ion-Exchange Chromatography
B. Molecular Exclusion Chromatography
C. Affinity Chromatography
D. Adsorption Chromatography

30. To which of the peptidase categories does Pepsin belong to;
A. Endopeptidase
B. Exopeptidase
C. Carboxypeptidase
D. Aminopeptidase

31. Varying salt concentrations lead to precipitation of different proteins due to which of the following characteristic;

A. Due to Differences in ionic and hydrophobic composition of different proteins
B. Due to globular nature of proteins
C. Due to fibrous nature of proteins
D. Due to association of proteins with nucleotides.

32. Purines and pyrimidines can often exist in their tautomeric forms, these tautomers are easily converted isomers that differ in which of the following;

A. Position of sulfur
B. Position of hydrogen
C. Position of oxygen
D. Position of nitrogen

33. During the chain termination method of DNA sequencing, which of the following functions as chain terminators;

A. 2'-deoxy ribonucloside 5'-triphosphate
B. 2', 3' dideoxy nucleoside 5' triphosphate
C. 2' deoxy-adenosine 5' triphosphate
D. 2'deoxy thymidine 5' triphosphate

34. For a particular protein, how many potential open reading frame can exist;

A. One
B. Two
C. Four
D. Six

35. The α-carboxylic acid group of Glycine amino acid has pK value of 2.35 while for its α-amino group pK is 9.78. identify, which species of glycine would predominate at pH below 2.35;

A. $^{+}H_3NCH_2COO^{-}$
B. H_2NCH_2COOH
C. $H_2NCH_2COO^{-}$
D. $^{+}H_3NCH_2COOH$

36. During purification of proteins by ion exchange chromatography, an anoin exchanger resin would possess which of the following group;

A. A hydrophobic group
B. Both Cationic and anionic groups
C. Cationic group
D. Anionic group

37. During SDS-PAGE, the separation of protein is based on their molecular masses rather than charge. Which of the following contributes to such an effect.

A. SDS to protein binding ratio of 1.4 g SDS per gram of Protein

B. SDS lend net positive charge on all the proteins
C. SDS causes denaturation of proteins so all proteins become neutral
D. SDS hydrolyzes proteins in stack of low to high molecular weight proteins

38. One of the most common accepted reasons for the β-D-glucose being the most abundant monosaccharide in nature is due to;
A. Presence of all five of its non-H substituent's in equatorial position
B. Presence of all five of its non-H substituent's in axial position
C. Excessive availability in nature
D. Being end product of all complex carbohydrates

39. Which one of the following glycero-phospholipid possess ether linkage instead of ester linkage;
A. Lecithin
B. Plasmalogen
C. Cephalin
D. Lysolecithin

40. Cold blooded animals such as fish maintain the constant level of their membrane fluidity by which of the following process;
A. Through lipid synthesis and degradation
B. Through increasing synthesis of proteins
C. Through developing coating of glycoproteins
D. Through diving deep under sea

41. Shine Dalgarno sequences are present on which of the following biomolecules;
A. 3'end of mRNA
B. 5' end of mRNA
C. 5' end of rRNA
D. 3' End of rRNA

42. The clathrin, which forms a polyhedral framework around vesicles during transport process is an example of ;
A. Nucleotide based scaffold
B. Mixture of lipids and carbohydrate
C. A complex carbohydrate
D. A Protein

43. One of most commonly used marker for targeting proteins to lysosomes is;
A. Erythrose -4 -phosphate
B. Ribulose -5- phosphate
C. Mannose -6- phosphate
D. Sedudoheptulose -7- phosphate

44. Addition of amino acid sequence KDEL to the c-terminal of soluble proteins target such proteins to ;

A. Nucleotide based scaffold
B. Endoplasmic reticulum
C. Cytosol
D. Golgi complex

45. The reaction catalysed by one of the following enzyme uses RNA as the catalytic moiety;
A. Topoisomerase
B. Ribonuclease
C. Amino-acyl tRNA synthetase
D. Peptidyl transferase

46. The granulocytes are classified into which of the following classes;
A. Neutrophils, Eosinophils and basophils
B. Neutrophils, Eosinophils and Acidophils
C. Acidophils, Eosinophils and basophils
D. Acidophils, Eosinophils and Neutrophils

47. All of the following statements are true for T cells except, one. Identify the false statement;
A. T cells arise in the bone marrow.
B. T cells develop in the thymus.
C. T cells have been characterized in three well defined subpopulations.
D. T cells of different subpopulations can have origin either in bone marrow or thymus.

48. All, except one of the following does not represent counter-regulatory hormones working against insulin in raising blood glucose levels in response to hypoglycemia;
A. Glucagon
B. Thyroxine
C. Epinephrine
D. Cortisol

49. A bone macrophage is termed as;
A. Osteoclast
B. Osteoblast
C. Osteomast
D. Osteocyte

50. Which of the following statement is not true for Prostaglandins
A. These are biologically active lipid derivatives of arachidonic acid
B. They mediate inflammatory responses
C. They inhibit platelet aggregation
D. They decrease vascular permeability

51. Homolgous proteins with same function in different species are termed as;
A. Orthologous

B. Paralogous
C. Synlogous
D. Heterologous

52. In the prion disease like mad cow disease , the infective agent is known to be a prion, the nature of which is;
A. Protein
B. Nucleic acid
C. Complex carbohydrate
D. Lipid based signaling molecule

53. A variety of soluble factors contributing to innate immunity are listed below. One of the answers mentioned here is incorrect. Identify the incorrect answer;
A. Lysozyme
B. Interferons
C. Complement proteins
D. Adhesins

54. All the following statements are true for prosthetic groups in a protein, except one. Identify the false statement;
A. The prosthetic group of flavoproteins are derived from vitamin B_2 .
B. The prosthetic group of Ubiquinone a lipid soluble molecule can accept and donate electrons.
C. All the prosthetic groups are always non-amino acid components.
D. Copper atoms can act as prosthetic groups in proteins.

55. All the following mentioned molecules are neurotransmitters, except one;
A. Norepinephirne
B. Acetyl-choline.
C. Gamma amino butyric acid.
D. Gamma glutamyl cysteinyl glycine

56. All the following mentioned energy data required to cleave a bonding status is true. One of the data is false, identify that data;
A. Covalent bond~ 80 -100 kilocalories /mol
B. Hydrogen bond~ 2 -5 kilocalories /mol
C. Ionic bond about ~3 kilocalories /mol
D. Van der Waals force~ 1-3 kilocalories /mol

57. Chitin the primary component of the outer cytoskeleton in insects is a polymer of;
A. Unbranched polymer of N-acetyl glucosamine
B. Branched polymer of N-acetyl glucosamine
C. UnBranched polymer of N-acetyl glucosamine and glucosamine
D. Branched polymer of N-acetyl glucosamine and glucosamine

58. Identify the correct set of pyrimidines;

A. Adenine, Cytosine
B. Thymine, Cytosine
C. Thiamine, Uracil
D. Thiamine, Guanine

59. Identify the correct set of enzymes in glycolytic pathway catalyzing directly ATP providing reactions;
A. Hexokinase and Pyruvate kinase
B. Phosphpfructokinase and Pyruvate kinase
C. Phosphoglycerate kinase and Pyruvate kinase
D. Enolase and Pyruvate kinase

60. During enzyme inhibition both apparent Km and Vmax decrease during which type of enzyme inhibition;
A. Suicide inhibition
B. Competitive inhibition
C. Mixed (non-competitive)
D. Uncompetitive

61. The terminal electron acceptor during electron transport or respiratory chain is ;
A. Oxygen
B. Water
C. NAD^+
D. FAD

62. Which one of the following represents the gratuitous inducer for *lac* operon;
A. Lactose
B. Galactose
C. Isopropyl thio galactoside
D. Glucose

63. With respect to glycolysis, which of the following represents Pasture effect;
A. Accumulation of lactic acid in presence of oxygen in anaerobic cell
B. No net change in formation of glycolytic intermediates in presence of oxygen in anaerobic cell
C. Increased synthesis of glycolytic intermediates in presence of oxygen in anaerobic cell
D. Inhibition of glycolytic intermediates in presence of oxygen in anaerobic cell

64. Which one of the following enzyme utilizes six different coenzymes to catalyze the product formation;
A. Peptidyl transferase
B. Pyruvate dehydrgenase
C. Lipoxygenase
D. F_0F_1ATPase A complex

65. One of the anabolic variant of citric acid cycle that leads to net synthesis of carbohydrate from fats in some species is represented by which one of the following;

A. Glucuronic acid cycle
B. Kreb's cycle
C. Cori cycle
D. Glyoxalate Cycle

66. The Net ATP synthesis from one molecule of Palmitate comes out to be;
A. 30 ATP molecules
B. 129 ATP molecules
C. 229 ATP molecules
D. 16 ATP molecules

67. Which among the following represents the major fate of glucose formed by gluconeogensis is;
A. In the synthesis of glycogen in nervous tissue.
B. Catabolism of glucose by Nervous tissue
C. Synthesis of glycogen in skeletal muscle
D. Regulation of blood glucose

68. During the light reaction the sunlight is used to carry out photochemical oxidation of H_2O. Which of the following two specific things are accomplished during this reaction;
A. Formation of NADPH and ATP
B. Formation of Carbohydrate and ATP production
C. Formation of $FADH_2$ and NADPH
D. Formation of $FADH_2$ and ATP

69. Cancer cell are genetically unstable and have highly aberrant chromosome compliments. This type of condition is termed as;
A. Aneuploidy
B. Diploidy
C. Monoploidy
D. Heteroploidy

70. Which of the following definitions is best suited to describe phenomenon of florescence;
A. Absorb light as UV radiations and release a portion in visible wavelengths
B. Absorb light as IR radiations and release a portion in visible wavelengths
C. Absorb light as Visible radiations and release a portion in UV wavelengths
D. Absorb light as Visible radiations and release a portion in IR wavelengths

71. In two dimensional gel electrophoresis technique;
A. First the proteins are resolved on anonic character then Mass
B. First the proteins are resolved on cationic character then Mass
C. First the proteins are resolved on Isoelectric point then Mass
D. First the proteins are resolved on Mass then Isoelectric point

72. During C4 cycle which of the following event occur;

A. Incorporation of CO_2 to C_4 intermediate
B. Release of CO_2 from to C_4 intermediate
C. Cyclic exchange of C_8 to C_4 compounds
D. Hydrolysis of C_8 compounds to C_4 compounds

73. During starvation brain uses which of the following biomolecules for fuel generation;
A. Sorbitol
B. Glycated heamoglobin
C. Glucose
D. Ketone Bodies

74. Most of the nitrogen that finds its way from ammonia to amino acids and other nitrogenous compounds is brought about by which of the following amino acid;
A. Aspartate and argenine
B. Glutamate and glutamine
C. Argenine and lysine
D. Serine and glycine

75. Which of the following compound function as carrier upon which carbon and nitrogen atom are assembled that eventually forms urea;
A. Citrulline
B. Ornithine
C. Argenine
D. Arginosuccinate

x-x-x