

BIOCHEMISTRY

FIRST YEAR BSc MLT QUESTION BANK

CELL AND CELL ORGANELLS

ESSAY 10 MARKS

1. Draw the structure of an animal cell. Describe the functions of subcellular organelles?
 - Draw neat labelled diagram
 - Describe about each components with their functions
2. Explain the fluid mosaic model of biological membrane with the help of a diagram. Add a note on active transport?
 - Diagram
 - Characteristics
 - Definition
 - Types
 - Mechanism with examples
3. Explain the fluid mosaic model of biological membrane with the help of a diagram. Add a note on passive transport?
 - Diagram
 - Characteristics
 - Definition
 - Types
 - Mechanism with examples
4. Explain the structure of eukaryotic cell with the help of diagram. Mention the main functions of nucleus, golgi apparatus, endoplasmic reticulum and lysosome?
 - Diagram
 - Characteristics
 - Definition
 - Types
 - Mechanism with examples

5. Explain the structure of bio membrane. Add a note on transport mechanisms?
 - Diagram with characteristics
 - Definition, types, mechanisms, examples
6. Describe the different types of ion channels?
 - Definition
 - Types with suitable examples
 - Diagram
7. Describe the different types of ion pumps?
 - Definition
 - Types with suitable examples
 - Diagram
8. Enumerate the eukaryotic cell organelles. Discuss the structure and functions of each organelle with a note on their fractionation and marker enzymes
 - Draw neat labelled diagram
 - Describe about each components with their functions
 - Fractionation methods
 - Marker enzymes in each organelle

SHORT NOTES- 5 MARKS

1. Describe the role of lipids in cell membrane?
 - Explain fluid mosaic model
2. Mitochondria
 - Structure
 - Functions with diagram
3. Peroxisomes
 - Structure
 - Functions with diagram
4. Lysosomes
 - Structure and function

5. Glucose transporters

- Transporters
- Site
- Function

6. Active transport

- Definition
- Mechanism
- Types
- Examples
- Diagram

7. Passive transport

- Definition
- Mechanism
- Types
- Examples
- Diagram

8. Ion pumps

- Definition
- Mechanism
- Types
- Diagram

9. Ion channels

- Definition
- Mechanism
- Types
- Diagram

10. Fluid mosaic model of cell membrane

- Structure
- Components
- Properties

11. Metabolic functions of subcellular organells

- Structure
- Functions with diagram

ANSWER BRIEFLY 3 MARKS

- 1 Difference between eukaryotic cell and prokaryotic cell
- 2 Lysosomes
- 3 Mitochondria
- 4 Peroxisomes
- 5 Golgi apparatus
- 6 Glucose transporters
- 7 Active transport
- 8 Passive transport
- 9 Ion pumps
- 10 Ion channels
- 11 Fluid mosaic model of cell
- 12 Functions of mitochondria, endoplasmic reticulum, Golgi apparatus
- 13 Endoplasmic reticulum
- 14 Functions of ribosomes, functional group of arginine, power generating unit of cell
- 15 Transmembrane proteins

UNITS OF MEASUREMENTS

SHORT NOTES- 5 MARKS

1. SI units
 - Definition
 - Different units-explanation

ANSWER BRIEFLY 3 MARKS

1. SI unit

GLASS WARES

ESSAY 10 MARKS

1. Classify glass wares used in laboratory and mention their use and write notes on cleaning of glass wares?
 - Classify each with diagram and mention their uses
 - Cleaning procedure
 - Preparation of cleaning solutions
2. Write about the cleaning of laboratory glass wares. Preparation of cleaning solutions. Care of laboratory wares and utensils?
 - Types
 - Uses with diagram
 - Preparation of cleaning solutions
 - Care of laboratory wares

SHORT NOTES- 5 MARKS

1. Laboratory cleaning solutions
 - Solutions
 - Preparations
 - Cleaning procedure

2. Care and maintenance of glass ware
 - Methods for care and maintenance
3. Polyolefins
 - Definition
 - Properties
 - Uses
4. Disinfectants used in clinical laboratories
 - Different types of disinfectants
 - Uses
 - Mode of application
5. Types of pipettes
 - Different types of pipettes
 - Specifications
 - Uses

ANSWER BRIEFLY – 3 MARKS

- 1 Cleaning of glass wares
- 2 Composition of borosilicate glass wares
- 3 General glass wares
- 4 Ingredients in in borosilicate glass
- 5 Composition of glass used in laboratory glassware
- 6 Cleaning of new glass ware

GRADES, STORAGE AND HANDLING OF CHEMICALS AND REAGENTS

ESSAY 10 MARKS

1. Describe about the grades of chemicals and add a note on storage and handling of chemicals?
 - LR chemicals
 - AR Chemicals
 - GR chemicals
2. Describe the storage and handling of chemicals and reagents?
 - classify the reagents mention their storage safe use

SHORT NOTES- 5 MARKS

1. Grades of chemicals
 - LR chemicals
 - AR Chemicals
 - GR chemicals
2. Storage and handling of reagents
 - Classify the reagents mention their storage safe use

ANSWER BRIEFLY 3 MARKS

1. Grades of chemicals
2. Describe the precautions taken for storage of acids

LABORATORY SAFETY AND HAZARDS

ESSAY 10 MARKS

1. Enumerate the various hazards that can occur in a clinical lab and discuss about the hazards from dangerous chemicals?
 - List out the chemicals causing hazards
 - Describe physical, chemical, biological and radiation hazards
2. Enumerate the various hazards that can occur in a clinical lab and discuss about the hazards from dangerous chemicals? Add a note on the safety precautions?
 - List out and describe physical, chemical, biological and radiation hazards and safety precautions
3. Discuss how a standard clinical laboratory is set up in a P.H.C. Add a note on the laboratory safety measures.
 - Role of laboratory in PHC
 - Organisation of std lab in PHC
 - Define laboratory safety measures Explain in detail

SHORT NOTES 5 MARKS

1. Laboratory hazards and safety measures
 - Hazards
 - Safety measures
2. Radiation hazards
 - Hazards
 - Safety precautions
3. Electrical hazards in laboratory and safety measures to be taken
 - Hazards
 - Safety precautions
4. Universal safety precautions
 - Define laboratory safety measures Explain in detail
5. Medicolegal problems in laboratory
 - Define different types of problems and its solution

6. Waste management in laboratory
 - Different types of wastes
 - Waste management system-steps
 - Methods of disinfection

ANSWER BRIEFLY 3 MARKS

1. Hazards in laboratory
2. Radiation hazards
3. Minimize infections in laboratory workers
4. Precaution against fire in a clinical chemistry lab

ACCIDENTS AND FIRST AIDS IN LABORATORY

ESSAY 10 MARKS

1. Describe about the accidents occurring in the laboratory and their first aid?
 - Accidents
 - First aid

SHORT NOTES 5 MARKS

1. First aid in the laboratory
 - explain accidents and first aid of each
2. Chemical injuries that can occur in a clinical laboratory
 - Explain chemical injuries and first aid of each

ANSWER BRIEFLY 3 MARKS

1. First aid in laboratory
2. Laboratory first aid kit
3. Diagnostic kit

PHYSICAL UNITS AND CHEMICAL UNITS

ANSWER BRIEFLY 3 MARKS

- Factor for conversion of conventional units to SI units of the following analytes- glucose, creatinine, cholesterol

WATER

ESSAY 10 MARKS

1. Water the universal solvent? Add a note on evaluation of water purity?

- Chemistry
- Physical and chemical properties

SHORT NOTES 5 MARKS

1. Water as a universal solvent

- Chemistry
- Properties

ANSWER BRIEFLY 3 MARKS

1. Water as universal solvent
2. Dissociation constant
3. Ionization of water

ACIDS AND BASES

ESSAY 10 MARKS

1. Define pH? Derive Henderson Hassel Bach equation. Add a note on blood buffers?

- Definition
- Derivation
- Buffers and mechanisms

2. Define pH? Derive Henderson Hassel Bach equation. Add a note on measurement of pH?

- Definition
- Derivation
- pH scale ,pH paper, pH meter

SHORT NOTES 5 MARKS

1. Plasma buffers

- Definition
- Types
- Mechanism

2. Henderson Hassel Bach equation

- Derivation
- Applications

3. Define pH? Measurement of pH?

- Definition
- pH scale
- pH paper
- pH meter

4. PH meter

- Definition
- Parts
- Principle
- Procedure
- Care and maintainance

5. Buffer solutions

- Definition
- Types
- Mechanism

ANSWER BRIEFLY 3 MARKS

- 1 pH meter
- 2 Henderson Hasselbach equation
- 3 Zwitter ions
- 4 Isoelectric Ph
- 5 define ph . what is the principle of ph meter
- 6 Triss buffer
- 7 Buffers

METHODS OF MEASURING LIQUIDS AND SOLIDS

SHORT NOTES 5 MARKS

1. Analytical balances
 - Uses
 - Parts
 - Procedure
 - Maintenance
 - Applications
2. Methods of measuring liquids
 - Different equipments for measurement
 - Procedure
 - Maintenance
3. Electronic balance
 - Uses
 - Parts
 - Procedure
 - Maintenance
 - Applications

4. Describe the different types of weighing balances

- Types of balances
- Uses
- Parts
- Procedure
- Maintenance
- Applications

ANSWER BRIEFLY 3 MARKS

1. Care of single pan balance
2. Single pan balance
3. Care of analytical balance
4. Standard weight in the weight box supplied with an analytical balance

CALIBRATION OF PIPETTES

ESSAY 10 MARKS

1. Describe about the calibration of pipettes and other volumetric apparatus?
 - Definition
 - Calibration methods
 - Calibration procedures

SHORT NOTES 5 MARKS

1. Calibration of pipette and other volumetric apparatus
 - Define
 - Methods

ANSWER BRIEFLY 3 MARKS

- 1 Standardization of a 10ml volumetric pipette
- 2 Calibration of pipettes

VOLUMETRIC ANALYSIS

SHORT NOTES 5 MARKS

1. Preparation of 500ml of 0.1M silver nitrate
 - Using formula $N_1V_1=N_2V_2$
2. Primary standard and secondary standard chemicals
 - Define
 - Classify with examples
3. Preparation of 500ml of 0.1M silver nitrate
 - Using formula $N_1V_1=N_2V_2$
4. Preparation of exactly 0.1N HCl solution
 - Using formula $N_1V_1=N_2V_2$
5. Convert 8.2mg/dl calcium to millimoles per liter
6. Preparation of normal saline
 - Using formula $N_1V_1=N_2V_2$
7. Normal solution , molar solution and percentage solution
 - Normality with equation
 - Molarity with equation
 - Percentage solutions-preparation procedure
8. Explain different types of dilutions used in clinical chemistry laboratory
 - Different types of dilutions
 - Uses
 - Preparation
9. Ways of expression of solution strength
 - Molarity
 - Normality
 - Molality
 - Percentage solutions

10. Differentiate between normal solutions and molar solutions
 - Normality with equation
 - Molarity with equation
11. Mention the procedure for preparation of 500ml of 1M NaOH
 - Using formula $N_1V_1 = N_2V_2$
12. Preparation of 500ml of 0.1N potassium permanganate
 - Using formula $N_1V_1 = N_2V_2$
13. Percentage solutions
 - Percentage solutions-preparation procedure
 - Uses

ANSWER BRIEFLY 3 MARKS

- 1 Primary standard and secondary standard chemicals
- 2 Define normality . mention the procedure for preparation of 1N HCl
- 3 How will you prepare a 100ml 0.1NaOH solution
- 4 Preparation of 500ml of 2N H₂SO₄
- 5 Secondary standards
- 6 Preparation of normal saline
- 7 Molarity of a solution
- 8 Preparation of 1N NaOH solution using anhydrous NaOH pellets
- 9 How will you convert 8.2mg/dl of serum calcium into mmol/L
- 10 How will you prepare normal saline and mention its physiological basis
- 11 Define molality. Mention the procedure for preparation of 500ml of 1Molal NaOH
- 12 Write the procedure for preparing 100ml of 0.1N NaOH

- 13 Define normality. Mention the procedure for preparation of 500ml 3N HCl
- 14 Define molarity. Mention the procedure for preparation of 500ml of 1M sodium bicarbonate
- 15 How will you prepare 100ml of 0.01M KCl solution
- 16 How much sodium hydroxide is required to prepare 1 litre of 1.5 N NaOH solution
- 17 How much milliliters of conc HCl(sp gr 1.8, 90%pure) are need to prepare 1L of 0.5N HCl solution

INDICATORS

SHORT NOTES 5 MARKS

1. Chemical indicators and theory of indicators
 - Indicators and theory

ANSWER BRIEFLY 3 MARKS

1. Indicators

COLLECTION , PRESERVATION AND PROCESSING OF SPECIMENS

ESSAY 10 MARKS

1. Collection, preservation and processing of biological specimens for biochemical examinations?
 - Explain collection methods
 - Preservatives
 - Transport of blood, urine, CSF and other body fluids

SHORT NOTES 5 MARKS

1. Collection, preservation and processing of biological specimens for biochemical examinations?

- Explain collection methods
 - Preservatives
 - Transport of blood, urine, CSF and other body fluids
2. Urine preservatives
- Preservatives
 - Properties
 - Uses
3. Anticoagulants
- Define
 - Classify
 - Mechanism
 - Uses
 - Advantages
4. Collection of urine samples
- Explain collection methods
 - Preservatives
 - Transport of urine
5. Blood collection with evacuated blood collection tubes and mention the order of draw
- Explain collection methods
 - Different types of samples
6. Reducing substances in urine
- Explain different reducing substances
 - Method of detection
 - Clinical significance
7. Reference material
- Preparation
 - Uses
 - Significance

ANSWER BRIEFLY 3 MARKS

1. Urine preservatives
2. Anticoagulants
3. Types of urine samples
4. Evacuated blood collection tubes
5. Precautions to avoid hemolysis during sample collection

PREPARATION AND STORAGE OF DISTILLED AND DEIONIZED WATER

SHORT NOTES 5 MARKS

1. Evaluation of water purity
 - Methods
2. Deionisation
 - Define
 - Principle
 - Parts
 - Procedure
 - Uses
 - Maintenance
3. Distillation
 - Define
 - Principle
 - Parts
 - Procedure
 - Uses
 - Maintenance
4. Preparation and storage of deionized water
 - Define

- Principle
- Parts
- Procedure
- Uses
- Maintenance
- Storage

5. Preparation and storage of distilled water

- Define
- Principle
- Parts
- Procedure
- Uses
- Maintenance
- Storage

6. Differentiate between deionized and distilled water

Differences in

- Define
- Principle
- Parts
- Procedure
- Uses
- Maintenance
- Storage

7. Purification of water

- Methods
- Significance

8. Preparation of reagent grade water

- Define
- Principle
- Parts
- Procedure

- Uses
- Maintenance
- Storage

9. Preparation and storage of double distilled water

- Define
- Principle
- Parts
- Procedure
- Uses
- Maintenance
- Storage

ANSWER BRIEFLY 3 MARKS

1. Double distilled water
2. Deionized water
3. Distilled water

COLORIMETRIC ANALYSIS

ESSAY 10 MARKS

1. Discuss the components, principle and working of atomic absorption spectrophotometer?
 - Principle
 - Components with features
 - Light path
 - Applications
2. Discuss the components, principle and working of Flame photometry?
 - Principle
 - Parts

- Light path
 - Applications with diagram
3. Discuss the components, principle and working of photometer?
- Principle
 - Parts
 - Light path
 - Applications with diagram
4. Discuss the components, principle and working of spectrophotometer?
- Principle
 - Parts
 - Light path,
 - Applications with diagram
5. Discuss the components, principle and working of colorimeter?
- Principle
 - Parts
 - Light path,
 - Applications with diagram

SHORT NOTES 5 MARKS

1. Describe the principle, parts, applications of Colorimeter

- Principle
- Parts
- Light path
- Types
- Applications

2. Describe the principle, parts, applications of spectrophotometer

- Principle
- Parts
- Light path
- Types
- Applications

3. Describe the principle, parts, applications of atomic absorption spectrophotometer

- Principle
- Parts
- Light path
- Types
- Applications

4. Describe the principle, parts, applications of nephelometer

- Principle
- Parts
- Light path
- Types
- Applications

5. Flame photometer and its applications

- Define
- Principle
- Components
- Procedure
- Applications

6. Fluorimetry

- Principle
- Light path
- Components
- Types
- Procedure
- Applications

7. Absorption filters

- Different type filters
- Significance

8. Laws of light absorption

- Beer's law
- Lambert's law

- Application

9. Nephelometry

- Define
- Principle
- Components
- Procedure
- Applications

10. Turbidimetry

- Define
- Principle
- Components
- Procedure
- Applications

11. Reflectance photometry

- Define
- Principle
- Components
- Procedure
- Applications

12. Wavelength selection spectrophotometry

- Define
- Principle
- Wavelength selection
- Components
- Procedure
- Applications

13. Assess linearity of a method

- Describe different methods and its procedure

ANSWER BRIEFLY 3 MARKS

- 1 Nephelometry and its application
- 2 Difference colorimeter and spectrophotometer
- 3 Flame photometry
- 4 Beer lamberts law
- 5 Interference in flame photometry
- 6 Principle of atomic absorption spectroscopy
- 7 Uses of atomic absorption spectrophotometry
- 8 Fluorimetry
- 9 Filters used in colorimeter
- 10 Components of a single cell photometer

RADIOACTIVITY

ESSAY 10 MARKS

1. Define Radio-Isotopes? Describe basic principles of radioactivity, detection and measurements of radioactivity and applications?

- Definition
- Principle
- Detection methods
- Applications

SHORT NOTES 5 MARKS

1. Define radio activity? Mention Radioisotopes and their applications
 - Definition
 - Radio isotopes and applications

2. Detection of radio activity
 - Define radio activity
 - Different methods with principle
 - Procedure
 - Advantages
 - Diagram
3. Applications of radioisotopes in medicine
 - Radio isotopes and applications
4. Characteristics of alpha, beta and gamma radiations
 - Alpha radiation
 - Beta radiation
 - Gamma radiation
5. Radioimmunoassay
 - Definition
 - Principle
 - Procedure
 - Application
6. Principles of radioactivity
 - Definition
 - Principle
7. Disposal of radioactive waste
 - Type of waste
 - Disposal methods

ANSWER BRIEFLY 3 MARKS

1. Radioisotopes and their applications
2. Detection of radio activity
3. Units of radioactivity
4. Gamma radiation

LABORATORY EQUIPMENTS

SHORT NOTES 5 MARKS

1. Describe the principle, parts, applications of centrifuge
 - Define
 - Principle
 - Parts
 - Procedure
 - Uses
 - Maintenance
2. Working principles of magnetic stirrer and its use
 - Define
 - Principle
 - Parts
 - Procedure
 - Uses
 - Maintenance
3. Techniques of using vacuum desiccator
 - Define
 - Principle
 - Parts
 - Procedure
 - Uses
 - Maintenance
4. Technical specification of a centrifuge required for a clinical lab with a sample load of 300-400 per day
5. Vortex mixer
 - Define
 - Principle
 - Parts
 - Procedure

- Uses
- Maintenance

6. Cold centrifuge

- Define
- Principle
- Parts
- Procedure
- Uses
- Maintenance

ANSWER BRIEFLY 3 MARKS

1. Vortex mixer
2. Electrical balance
3. Desicator
4. Homogenizer
5. Magnetic stirrer
6. Cold centrifuge
7. Centrifuge
8. Maintenance of centrifuge

GENERAL PROPERTIES

SHORT NOTES 5 MARKS

1. Viscosity
 - Definition
 - Factors
 - Detection methods
 - Applications

2. Osmosis
 - Definition
 - Factors
 - Detection methods
 - Applications
3. Reverse osmosis
 - Definition
 - Factors
 - Detection methods
 - Applications
4. Surface tension
 - Definition
 - Factors
 - Detection methods
 - Applications
5. Dialysis
 - Definition
 - Properties
 - Applications
6. Colloids
 - Definition
 - Types
 - Properties
 - Applications
7. Emulsions
 - Definition
 - Types
 - Applications
8. Adsorption
 - Definition

- Types
 - Applications
9. Donnan membrane equilibrium
- Principle
 - Calculations
 - Properties
 - Applications
10. Partition coefficient
- Definition
 - Applications
11. Diffusion
- Definition
 - Types
 - Properties
 - Application
12. Describe the principle and uses of reverse osmosis
- Definition
 - Applications
13. Definition
- Types
 - Properties
 - Application

ANSWER BRIEFLY 3 MARKS

1. Viscosity
2. Osmosis
3. Surface tension
4. Dialysis

5. Colloids
6. Emulsions
7. Adsorption
8. Donnan membrane equilibrium
9. Partition coefficient
10. Diffusion
11. Facilitated diffusion

CARBOHYDRATES

ESSAY 10 MARKS

1. Classify carbohydrates giving suitable examples. Add a note on mucopolysaccharides?
 - Classification with examples
 - Types
 - Properties
 - Examples
2. Classify carbohydrates giving suitable examples. Add a note on digestion and absorption of carbohydrates?
 - Classification with examples
 - Digestion mechanisms
 - Absorption mechanisms

SHORT NOTES 5 MARKS

1. Define and Classify carbohydrates
 - Definition
 - Classification with suitable examples
2. Digestion and absorption of carbohydrates
 - Digestion in detail

- Absorption mechanisms
- 3. Reactions of monosaccharides
 - Reactions
 - Principle
 - Procedure
 - Observation
- 4. Polysaccharides
 - Define
 - Classify
 - Properties
 - Examples
 - Biomedical importance
- 5. Osazone reaction
 - Principle
 - Reagents
 - Observations
- 6. Mucopolysaccharides
 - Structure
 - Properties
 - Function
- 7. Disaccharides
 - Define
 - Classify
 - Properties
 - Examples
 - Biomedical importance
- 8. Heteropolysaccharides
 - Structure
 - Properties
 - Function

9. Stereoisomerism
 - Definition
 - Properties
 - Examples
10. Meister's cycle
 - Definition
 - Cycle
11. Glycosaminoglycans
 - Structure
 - Properties
 - Function
 - Examples
12. Differences between starch and glycogen
 - Define starch and glycogen
 - Properties
 - Differences
13. Stereo isomers of glucose
 - Definition
 - Properties
 - Examples
14. Oxidation of glucose
 - Define and detail oxidation of glucose
15. Isomerism in mono saccharides
 - Explain isomerism in monosaccharides
16. Mention any five mucopolysaccharides and any one function of each
 - Mucopolysaccharides
 - Examples with functions

ANSWER BRIEFLY 3 MARKS

1. Polysaccharides
2. Osazone reaction
3. Mucopolysaccharides
4. Disaccharides
5. Reactions of monosaccharides
6. Mutarotation
7. Anomerism
8. Epimerism
9. Mutarotation and its practical importance
10. Anomerism in sugars
11. Oxidation of glucose
12. Diastereo isomers of glucose
13. Homopolysaccharides
14. Linkage in lactose, composition of selivanoffs reagent, ring present in histidine
15. Give the structural representation for epimers of glucose
16. Epimers
17. Stereoisomers
18. Linkage in sucrose , why benedicts test is called semi quantitative, ring present in tryptophan
19. Benedicts test
20. Composition of Barfoeds reagent, linkage in maltose , name two basic amino acids
21. Glycogen

PROTEINS

ESSAY 10 MARKS

1. Classify proteins giving suitable examples. Add a note on the functions of proteins?
 - Classification in detail with examples
 - Functions
2. Classify proteins giving suitable examples. Add a note on the digestion and absorption of proteins?
 - Classification in detail with examples
 - Digestion and absorption mechanism
3. What are the different levels of organization of proteins?
 - Describe primary, secondary, tertiary and quaternary structure with diagrams
4. What are the different levels of organization of proteins? Discuss the primary structure of proteins with suitable example?
 - Definitions of primary, secondary, tertiary and quaternary structure
 - Primary structure of insulin with diagram
5. Classify amino acids, giving suitable examples? Mention their properties
 - Classification in detail with examples and properties

SHORT NOTES 5 MARKS

1. Classification of amino acids
 - classify in detail with examples
2. General reactions of amino acids
 - Reaction due to amino group
 - Reactions due to carboxyl group
 - Reactions due to side chain
3. Levels of organization of proteins
 - Explain primary, secondary, tertiary and quaternary structure of proteins with diagram

4. Denaturation of proteins
 - Define
 - denaturing agents
 - examples
5. Colour reactions of amino acids
 - Reactions
 - Principle
 - Procedure
 - Observations
6. Precipitation reactions of proteins
 - Define
 - Classify
 - Principle of each
7. Glycoproteins
 - structure and function
8. Digestion and absorption of proteins
 - digestion in detail with absorption mechanisms with diagram
9. Secondary structure of proteins
 - describe alpha helix and beta pleated sheet with diagram
10. Describe the different methods of studying the protein structure
 - end group analysis, sequencing, ingram's technique
11. Structural proteins
 - Define
 - Classify
 - Functions
12. Functions of albumin
 - Explain functions of albumin
13. Primary structure of proteins

- Explain the primary basic structure of proteins with examples

14. Function and classification of proteins

- Define
- Classify
- Functions

15. Absorption of amino acids

- digestion in detail with absorption mechanisms with diagram

ANSWER BRIEFLY 3 MARKS

1. Levels of organization of proteins
2. Denaturation of proteins
3. Glycoproteins
4. Digestion and absorption of proteins
5. Classification of amino acids
6. Colour reactions of amino acids
7. Secondary structure of proteins
8. Isoelectric precipitation
9. collagen helix
10. Apoproteins
11. Describe two colour reactions specific for aromatic aminoacids
12. Aldehyde test
13. Sakaguchis test
14. Primary structure of proteins
15. Biuret test

16. Transport proteins
17. Classification of proteins
18. Biological functions of proteins
19. Tertiary structure of Proteins
20. Quaternary structure of proteins
21. Essential amino acids
22. Conjugated proteins
23. Aromatic amino acids
24. Name essential sulphur containing aminoacids, diastereic isomer of galactose, functional group of histidine

LIPIDS

ESSAY 10 MARKS

1. Classify lipids giving suitable examples. Add a note on digestion and absorption of lipids?
 - Classification in detail with examples
 - Digestion and absorption in detail with diagram
2. Classify lipids based on structure with suitable examples?
 - Classification in detail with examples
3. Classify lipids and add a note on fatty acids?
 - Classification in detail with examples
 - Definition of fatty acids, classification
 - Properties

SHORT NOTES 5 MARKS

1. Classify lipids? Digestion and absorption of lipids

- Classification
 - Digestion mechanisms and absorption mechanisms
2. Lipoproteins
 - Define
 - Classify
 - Function
 - Diagram
 3. Chylomicrons
 - define, structure, function
 4. PUFA and its clinical significance
 - Define
 - Classify
 - Clinical significance
 5. Phospholipids
 - Structure
 - Classification
 - Properties
 - Functions
 6. Saturated and unsaturated fatty acid
 - Define
 - Classify
 - Clinical significance
 7. Functions of phospholipids
 - Define
 - Classify
 - Functions
 8. Sphingolipids
 - Structure
 - Classification

- Properties
 - Functions
 - Clinical significance
9. Describe the role of lipids in cell membrane
- Diagram
 - Characteristics
10. Functions of lipids
- Define
 - Classify
 - Functions

ANSWER BRIEFLY 3 MARKS

1. PUFA and its clinical significance
2. Saponification number and iodine number
3. Rancidity
4. Lipoproteins
5. Chylomicrons
6. Phospholipids
7. Micelles
8. cardiolipins
9. Lecithin
10. Functions of bile salts
11. Essential fatty acids
12. Biochemical role of cholesterol
13. Unsaturated fatty acids

14. Triglycerides
15. Omega -3 fatty acids
16. Racemic mixture
17. Classify phospholipids

NUCLEIC ACIDS

ESSAY 10 MARKS

1. Describe the Watson and Crick model of DNA. Add a note on the structural difference between DNA and RNA?
 - Diagram
 - Features of model
 - Difference
2. Describe structure of DNA? Add a note on nucleosomes and histones?
 - Diagram
 - Features of model
 - Definition and diagram

SHORT NOTES 5 MARKS

1. Diagrammatically represent t-RNA, indicating the functions of each arm
 - Diagram
 - Properties of each arm and functions
2. Watson - Crick model of DNA
 - features with diagram
3. Purines and pyrimidine
 - purines, pyrimidine with structure
4. Reactions of NPN substances
 - Reaction principle
 - Procedure

- Observation of urea, creatinine, uric acid

5. Nucleosomes and histones

- Structure and functions

6. Structure of adenine and guanine and mark the various atoms

- purines, pyrimidine with structure-mark the atoms

7. Functions of nucleotides

- Define Functions

ANSWER BRIEFLY 3 MARKS

1. Purines and pyrimidines
2. Diagrammatically represent t-RNA indicating the functions of each arm
3. Reactions of NPN substances
4. B - DNA
5. Name the pyrimidine bases and narrate the structure of any two
6. tRNA
7. Nucleosomes
8. RNA
9. Purines
10. Enumerate the three functions of nucleotides
11. Nucleotides
12. Sources of atoms of pyrimidine ring
13. Structure of DNA
14. Diagrammatically represent the sources of atoms in purine ring

15. Structure and functions of RNA
16. Structure of pyrimidines
17. Histones
18. Watson and crick model of DNA

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