

BIOCHEMISTRY
SECOND YEAR BSc. MLT
CARBOHYDRATE METABOLISM

ESSAY-10 MARKS

1. Describe the HMP shunt pathway and state its significance
 - Define
 - 2 phases
 - Steps
 - Regulation
 - Significance

2. Describe glycolytic pathway in the body, Add a note on energetics and regulation.
 - Define
 - Site
 - Significance
 - Steps
 - Regulations
 - Energetics

3. Why is the kreb's cycle as final common pathway of metabolism. Explain
 - Define krebs cycle
 - Functions
 - Steps
 - Significance

4. Describe the formation and fate of pyruvic acid in the body
 - Detail about formation pyruvic acid
 - Fate of pyruvic acid

5. Describe the various mechanism which regulate the blood sugar level
 - Enzymatic regulation
 - Hormonal regulations

6. Describe how blood glucose level is maintained. Mention its harmful controls
 - Blood Sugar Regulation
 - Control
7. Define glycosuria and explain in briefly about the different types of the glycosuria
 - Define
 - Types
 - Clinical
 - Manifestations,
 - Lab diagnosis
8. What is the GTT, Describe the GTT with its features, precautions and significance.
 - Define
 - Types
 - Indications
 - Features
 - Significance
9. Describe the formation, fate and role of lactic acid in the body.
 - Define Detail About Formation
 - Fate
 - Role
10. How is the blood glucose level is regulated.
 - Hormonal Regulations
 - Enzymatic Regulations
11. Define glycogenesis, glycogenolysis and gluconeogenesis, define the role of epinephrine in glycogenolysis
 - Define each one and its step
 - Role of epinephrine in glycogenolysis
12. Describe the fate of pyruvic acid in the body
 - Oxidation reactions of pyruvate
13. Describe how glucose tolerance curve is obtained, explain its significance.

- GTT-define
 - Contraindications
 - Procedure
 - Graph
 - Significance
14. What is gluconeogenesis? Describe briefly the metabolic pathway involved in the gluconeogenesis
- Define
 - Steps
 - Enzymes
 - Regulation
 - Energetic
15. What is the normal blood glucose level? how is it maintained in the body
- Blood glucose level and it's regulation
16. "krebs' clinical cycle is the common pathway of metabolism. Justify the statement.
- Krebs cycle- define
 - Steps
 - Enzymes
 - Regulation
 - Energetic
17. Describe the process of glycogen formation and breakdown in the liver. Highlight the point of difference and their significance
- Steps of Glycogenesis and glycogenolysis
 - Difference between those two
 - Significance
18. What is gluconeogenesis? give an outline of reactions. How the reactions controlled?
What is biological importance of these reactions
- Define Gluconeogenesis
 - Steps
 - Enzymes
 - Regulation

- Energetic
19. TCA cycle is called amphibolic in nature justify
- TCA cycle- define
 - Steps and its significance
20. What is the normal blood glucose level. How it is regulated. Add note on enzymatic methods of estimation of blood glucose level.
- FBS, PPBS NORMAL
 - Regulation, hormonal regulation
 - Estimation methods
21. Give the normal blood glucose levels in fasting and postprandial state. Discuss various methods of glucose estimation
- Normal values- FBS,PP
 - Estimation methods-Enzymatic and Non-enzymatic (Principle, procedure, interpretation)

SHORT ESSAY – 5 MARK

1. Cori's cycle
 - Define
 - Steps
 - Significance
2. Gluconeogenesis
 - Define
 - Steps
 - Regulation
 - Significance
3. Glycogenolysis
 - Define
 - Steps
 - Regulation

- Significance
- 4. Glucuronic acid
 - Glucuronic acid pathway and its importance
- 5. Glycogen synthesis
 - Define
 - Steps
 - Regulation
 - Significance
- 6. HMP shunt pathway
 - Define
 - Steps
 - Regulation
 - Significance
- 7. GTT
 - Define
 - Types
 - Significance
- 8. Galactosemia
 - Define
 - Galactose metabolism
 - Clinical significance
- 9. Endocrine regulation of blood sugar
 - Regulation-role of insulin and glycogen
- 10. Glycogenesis
 - Define
 - Steps
 - Regulation
 - Significance
- 11. Biosynthesis of lactose

- Lactose metabolism
- 12. D-glucuronic acid formation and function
 - Glucuronic acid pathway and its importance
- 13. Glucosuria
 - Define
 - Causes
 - Clinical significance
 - Lab diagnosis
- 14. Bisphosphoglycerate
 - Rapaport Leubering cycle
 - Significance
- 15. Phosphorfructokinase
 - Role in carbohydrate metabolism
- 16. Key enzymes of glycolysis
 - Enzymes, and its role
- 17. Regulation of glycolysis
 - Enzymes and its regulation
- 18. Role of insulin and adrenaline in carbohydrate metabolism.
 - Role
 - Clinical significance
- 19. Diabetes mellitus
- 20. Define
 - Types
 - Courses
 - Complications
 - Lab diagnosis
- 21. HbA1C
 - Define

- Clinical significance
- Normal range
- Method for detection

22. Renal glycosuria

- Define
- Causes
- Complications
- Clinical significance
- Lab diagnosis

23. Galactose metabolism

- Define
- Steps
- Enzymes
- Galactosuria
- Galactosemia

24. Fructosuria

- Define
- Causes
- Complications
- Clinical significance
- Lab diagnosis

25. Fructose metabolism

- Define
- Steps
- Enzymes
- Fructosuria

26. Hyperglycemia

- Define
- Causes
- Complications
- Clinical Significance

- Lab Diagnosis
- 27. Insulin
 - Structure
 - Role In Metabolism
- 28. Fructose alanine cycle
 - Cycle
 - Steps
 - significance
- 29. Reducing sugars in urine
 - Different sugars
 - Significance
 - Conditions
 - Detection methods
- 30. Describe the metabolic fate of pyruvate
 - Importance of Pyruvate
 - Pyruvate transporter
 - PDH complex
- 31. Describe the clinical manifestations and biochemical finding of Diabetic ketoacidosis.
 - Definition
 - Clinical manifestations
 - Biochemical findings
- 32. Hormonal regulation of blood glucose
 - Insulin mechanism of action
 - Glucagon mechanism of action
- 33. Glycogen storage disorders
 - Definition
 - Types
 - Von Gierke's Disease
- 34. Oxidation of Pyruvate

- Acetyl CoA Formation
- PDH complex

35. Key enzymes in Gluconeogenesis

- Enumerate the enzymes with reaction

SHORT NOTES-3 MARK

1. HMP
2. GTT
3. Metabolic significance of HMP shunt pathway
4. Galactosemia
5. Endocrine regulation of blood sugar
6. Glycogenesis
7. Biosynthesis of lactose
8. D- glucuronic acid formation and function
9. Glucosuria
10. Polyol pathway of glucose
11. Aldolase –B
12. Benedict's test
13. GCT
14. 2,3 BPG
15. Coris cycle
16. Von-Geirkes disease
17. Fructosuria
18. Lactose intolerance
19. Glycated Hemoglobin
20. Glucuronic acid pathway

PROTEINE AND AMINO ACID METABOLISM

ESSAY -10 MARKS

1. Digestion and absorption of proteins
 - Define
 - Site
 - Enzymes
 - Diagram
 - Mechanism

2. Describe urea cycle. Add a note on clinical significance of estimation of urea
 - Define
 - Steps
 - Diagram
 - Regulation
 - Energetics
 - Significance
 - Estimation Of Urea

3. Discuss various methods of urea estimation and mention any one of them in detail
 - various methods
 - principle
 - Reagents
 - Procedure
 - Calculations
 - Significance of one method

4. Discuss the formation of creatinine. Mention the principle and method of estimation of creatinine
 - Formation of Creatinine
 - Methods
 - Principle
 - Reagents
 - Procedure

- Calculations
 - Significance
5. Discuss various methods of total protein estimation and explain any one of them in detail.
- Various Methods
 - Principle
 - Reagents
 - Procedure
 - Calculations
 - Significance of one method
6. Discuss various methods of albumin estimation and explain any one of them in detail.
- Various methods
 - Principle
 - Reagents
 - Procedure
 - Calculations
 - Significance of one method
7. Classify amino acids. Giving suitable examples
- Classification- with examples
8. Write detail about one carbon metabolism with suitable examples
- One carbon generation and utilization with example
9. Name the Sulphur containing amino acid. Discuss the metabolism of methionine and add a note on homocystinuria.
- List of Sulphur containing aminoacid
 - Methionine metabolism
 - Homocystinuria
10. Discuss the formation of ammonia in the human body. How is ammonia detoxified
- Ammonia metabolism
 - Formation, detoxification, toxicity

11. Enumerate five inborn errors of amino acid metabolism. Add a note on urinary screening for inherited disorders of metabolism
 - List out inborn errors of aminoacid metabolism (Phenyketonuria, Alkaptonuria, MSUD, Hartnups disease, Albinism etc)
 - Urinary Screening tests
12. Explain the reaction by which ammonia is formed in the body and discuss how it is converted to urea and add a note on its regulation
 - Ammonia Formation
 - Urea cycle
 - Energetics and regulation
13. Mention the source of urea. Mention the principle and procedure of the estimation of urea. What is the clinical significance of its estimation
 - Urea cycle
 - Principle and procedure-DAM method
 - Normal value and clinical significance

SHORT ESSAY-5 MARK

1. Transamination
 - Define
 - Biological significance
2. Homocystinuria
 - Define
 - Causes
 - Clinical significance
 - Lab diagnosis
3. Trans deamination
 - Define
 - Pathway
 - Example

4. MSUD
 - Define
 - Causes
 - Clinical significance
 - Lab diagnosis
5. Detoxification of ammonia
 - Define urea cycle with diagram
6. Compounds formed from serine
 - Compounds formed from serine
7. Urea cycle
 - Define urea cycle with diagram
 - Energetic
 - Regulation
8. Metabolic functions of cysteine
 - Formation and its role
9. Transmethylation reaction
 - Define
 - Steps
 - Importance
10. GABA
 - Formation
 - Metabolism
11. Nitric oxide
 - Chemistry
 - Synthesis
 - Metabolic fate
 - Physiological action
12. Compounds formed from tyrosine
 - Melanin

- Catecholamines
- Thyroxine
- 13. Aminoaciduria
 - Define
 - Types
 - Causes
 - Significance
 - Lab diagnosis
- 14. Catecholamines
 - Define
 - Synthesis
 - Metabolism
 - Role
- 15. Glycine metabolism
 - compound formed from glycine and it's role
- 16. creatinine synthesis
 - Creatine formation
 - clinical significance
- 17. compounds formed from serine
 - compound formed from serine and it's role
- 18. biological action of glutathione
 - Formation action
- 19. metabolic functions of cysteine
 - Formation
 - Biological action
- 20. Synthesis of creatinine and describe the methods of estimation
 - Steps
 - Regulation
 - Significance
 - Estimation

SHORT NOTES-3 MARKS

1. Name one carbone units
2. Name the important compound formed from glycine
3. creatinine synthesis
4. Phenylketonuria
5. Hartnups's disease
6. S-adenosyl methionine
7. Parkinsonism
8. Glutathione
9. Huntington's disease
10. Cystathionuria
11. VMA
12. Catecholamines
13. HIAA
14. Carcinoid syndrome
15. Ketogenic aminoacid
16. FIGLU
17. Glycine cleavage system
18. Glucose alanine cycle
19. Transulfuration
20. Jaffer's test
21. Polyamines
22. Alkaptonuria
23. Proteinuria
24. Ninhydrin test
25. NPN
26. A:G ratio
27. Albinism
28. Aminoacid pool
29. Deamination
30. Ammonia toxicity

LIPID METABOLISM

ESSAY-10 MARK

1. Describe the structure and functions of phospholipids.
 - Structure
 - Functions
 - Importance

2. Discuss the saturated and unsaturated fatty acids of biological importance, along with their structure.
 - Define
 - Structure
 - Biological importance of fatty acids

3. Describe the structure of steroids. add note on the function of cholesterol
 - Define
 - Steroid structure
 - Cholesterol formation
 - Functions

4. Write detail about beta oxidation of palmitic acids, giving energetic
 - Beta oxidation
 - Steps
 - Enzymes
 - Regulation
 - Energetics

5. Describe the beta oxidation of fatty acids. What are the coenzymes required for the beta oxidation and in which steps.
 - Beta oxidation
 - Steps
 - Enzymes and co-enzymes

6. Write detail about the sources and fate of Acetyl CoA.
 - Sources and fate of a acetyl coa

7. Write detail about the denovo synthesis of the fatty acids. what are the coenzymes required, and how it regulated
 - Denovo synthesis
 - Steps
 - Regulation
 - Enzymes
8. Define fatty liver ?explain the causes of fatty liver. Indicate how lipotropic factors can prevent fatty liver.
 - Define,
 - Causes
 - Complications
 - Actions of lipotropic factors
9. What are the ketone bodies / explain the reactions leading to the formation of them. How are they utilized in the body.
 - Ketogenesis
 - Ketosis
10. Name the ketone bodies .give two conditions charecterized by excessive production of ketone bodies. Explain the metabolic derangements and consequences of ketosis.
 - Starvation,
 - DKA
 - Ketonebody formation
 - Complications of ketosis
11. Discuss the formation and fate of cholesterol.
 - Cholesterol metabolism
12. Enumerate the lipoproteins and briefly explain their function. Describe the methods for estimation of cholesterol
 - Lipoprotein classification
 - Function
 - Cholesterol estimation
13. Classify lipoproteins. Describe the metabolism of chylomicrons.

- Lipoprotein classification
 - Function
 - Metabolism of chylomicrons
14. Discuss in detail the sampling, storage and estimation of lipid profile parameters.
- Sampling
 - Storage of sample
 - Estimation criteria
 - Different estimation methods
15. Classify lipoproteins. Describe briefly on lipoprotein metabolism
- Lipoprotein classification and function
 - Chylomicron, VLDL, LDL and HDL metabolism

5 MARK –SHORT ESSAY

1. Glycolipids
 - Define
 - Role
 - Examples
2. Essential fatty acids
 - Define
 - Biological importance
3. Rancidity
 - Define
 - Biological importance
4. Iodine number
 - Define
 - Biological importance
5. Phosphatidyl inositol
 - Define
 - Biological importance

6. Sphingomyelins
 - Define
 - Biological importance
7. Rate limiting enzymes of fatty acid biosynthesis
 - Rate limiting enzymes and it's role
8. Carnitine role in the fatty acid synthesis
 - carnitine and its role
9. Oxidation of odd chain fatty acids
 - Define
 - Steps
 - Importance
10. Metabolism of propionyl CoA
 - fate of propionyl CoA
11. Refsum's disease
 - Define
 - Causes
 - Clinical features
12. Alpha oxidation
 - Define
 - Site
 - Steps
 - Importance
13. Dicarboxylicaciduria
 - Define
 - Causes
 - clinical features
14. Effect of insulin on lipolysis
 - Role of insulin

15. Fatty liver
 - Define
 - Causes
 - Complications
 - clinical features
16. Lipotropic factors
 - Define the role with suitable examples
17. Ketosis
 - Define
 - Site
 - Steps
 - Importance
18. Ketogenesis
 - Define
 - Site
 - Steps
 - Importance
19. Biologically important compounds derived from the cholesterol
 - Define detail with examples
20. HMG CoA reductase
 - Role and it's importance
21. Regulation of cholesterol synthesis
 - Types of regulation and it's action
22. key enzymes of cholesterol biosynthesis
 - Enzymes and it's action
23. Apo -B-100
 - Define
 - role

24. Chylomicrons
 - Define
 - Types
 - Biological role and it's metabolism
25. PUFA
 - PUFA and its biological importance
26. Eicosanoids
 - Role with suitable examples
27. Prostaglandins
 - Role with suitable examples
28. Leukotrienes
 - Role with suitable examples
29. Bile acids
 - Biosynthesis, examples, role
30. Apolipoproteins
 - Role with suitable examples
31. Phospholipids
 - Role with suitable examples
32. Sphingolipids
 - Role with suitable examples
33. Cholesterol estimation
 - Method
 - Principle
 - Procedure
 - Clinical significance
34. Lipid storage disease
 - Types 'enzyme defect and it's role

35. Catecholamines.
 - Define
 - Classify
 - Functions

36. HDL metabolism.
 - Definition
 - Steps
 - Regulation
 - Significance

37. Beta oxidation of palmitic acid
 - Definition
 - Steps
 - Regulation
 - Significance

38. LDL Metabolism
 - Synthesis, Apoproteins
 - Metabolism
 - Function and Significance

39. Atherosclerosis
 - Definition
 - Risk factors
 - Clinical significance
 - Laboratory investigations

40. Classify eicosanoids, Enumerate the functions of prostaglandins
 - Classification
 - Functions of prostaglandins

41. Reverse cholesterol transport
 - HDL metabolism

42. Hyperlipidemia

- Definition
- Types in detail

43. Any five screening tests for inborn errors of metabolism

- Inborn errors
- Screening tests

SHORT NOTES- 3MARKS

1. Structure of cholesterol
2. Regulation of cholesterol
3. Classification of lipoproteins
4. Apo-lipoproteins
5. BAD cholesterol
6. GOOD- cholesterol
7. Free fatty acids
8. Bile acids
9. PUFA
10. EFA
11. Prostaglandins
12. Leukotrienes
13. Tay-sachs disease
14. Gaucher's disease
15. Niemann-pick disease
16. Obesity
17. Lipotropic factors
18. Trans fatty acids
19. Sphingolipids
20. Fatty acid synthase complex
21. Name 6 risk factors of coronary artery diseases

INTER RELATION BETWEEN THE METABOLISM OF CARBOHYDRATE, LIPIDS, PROTEINE

ESSAY-10 MARK

1. Discuss the formation of Acetyl coA from pyruvate. How is acetyl coA is further metabolized in the citric acid cycle.
 - Formation of pyruvate
 - Citric acid cycle, and it's significance
2. Give an account of the citric acid and explain why it is called the common terminal metabolic pathway
 - Citric acid cycle and it's significance
3. Write the steps of citric acid cycle, what is the biological significance of this cycle
 - Citric acid cycle and it's significance
4. Describe the reactions of the citric acid cycle , how many ATP molecules are generated per molecule of acetyl coA entering the cycle
 - Citric acid cycle, it's significance
 - Energetics
5. Explain the amphibolic nature of citric acid cycle.
 - Citric acid cycle and it's significance
6. Define oxidative phosphorylation, Explain the chemiosmotic theory
 - Define, oxidative phosphorylation,
 - Substrate level phosphorylation
 - Chemiosmotic theory with suitable diagram
7. Write the membrane of the electron transport chain in the order of redox potentials, and show the steps where ATP is synthesized.
 - ETC-outline
 - Explain different components with suitable diagram
 - Steps in ATP synthesis

8. Define the oxidative phosphorylation, and add short note about substrate level phosphorylations.
 - Define, oxidative phosphorylation,
 - Substrate level phosphorylation with examples

SHORT ESSAY-5 MARK

1. Substrate level phosphorylation
 - Define and explain with examples
2. Regulations of ATP synthesis
 - Define ATP synthesis, steps and its regulation
3. Site specific Inhibitors of Electron transport chain
 - Define and explain with diagram
4. Chemiosmotic theory
 - Define with diagram
5. Co-enzymes Q
 - Define
 - functions and significance
6. ATP synthase complex
 - Explain with definition and suitable diagram
7. Electron transport chain
 - Define, stages ,significance
8. ATP synthase complex
 - Explain with definition and suitable diagram
9. Organization of electron transport chain (Diagram only)
 - Draw the diagram of ETC

SHORT NOTES-3 MARKS

1. Cytochrome oxidase
 - Role and importance
2. Cytochrome
 - Define with suitable examples
3. Uncouplers of electron transport chain
 - Define with suitable examples
4. Inhibitors of ETC
 - Define with suitable examples
5. Energy rich compounds
 - Define with suitable examples
6. Oxidative phosphorylations
 - Define with suitable example
7. Substrate level phosphorylation
 - Define and explain with examples

NUCLIC ACID METABOLISM

ESSAY-10 MARK

1. Write detail about biosynthesis of purine metabolism
 - Define
 - Requirements
 - Types and steps of synthesis
2. Write detail about denovo synthesis of purine
 - Define
 - Site
 - Requirements
 - Types, and steps of synthesis

3. Write detail about biosynthesis of pyrimidine metabolism
 - Define
 - Site
 - Requirements
 - Types, and steps of synthesis
4. Write detail about catabolism of purine, add a short note about uric acid.
 - Define
 - Site
 - Steps
 - Gout
 - Uric acid detection
5. Catabolism of purine and write a note about gout
 - Define
 - Site
 - Steps
 - Gout
 - Uric acid detection

SHORT ESSAY-5MARK

1. Gout
 - Define
 - Types
 - Catabolism of purine
 - Uric acid detection
2. Uric acid
 - Catabolism of purine
 - Uric acid detection
 - Gout
 - Normal range

3. Denovo synthesis of pyrimidine
 - Define
 - Site
 - Steps
4. Denovo synthesis of purine
 - Define
 - Site
 - Steps
5. Salvage pathway of purine
 - Define
 - Site
 - Steps
6. Disorders of purine metabolism
 - Define
 - Clinical features
7. Disorders of pyrimidine metabolism
 - Define, clinical features
8. Lesch-nyhan syndrome
 - Define
 - Clinical features,
 - Classification
 - Lab diagnosis
9. Orotic aciduria
 - Define
 - Clinical features
 - Classification, lab diagnosis

SHORT NOTES -3 MARK

1. Gout
2. Denovo synthesis of pyrimidine
3. Uric acid
4. Disorders of pyrimidine metabolism
5. Disorders of purine metabolism
6. Oroticaciduria
7. Leschnyhan syndrome
8. Salvage pathway of purine
9. Denovo synthesis of purine

VITAMINES AND CO-ENZYMES

FAT SOLUBLE VITAMINE

ESSAY-10 MARK

1. Describe sources, biochemical functions, RDA and deficiency manifestations of Vitamin A
 - Sources
 - Biochemical functions
 - RDA
 - Deficiency manifestations
2. Describe sources ,biochemical functions , RDA, and deficiency manifestations of Vit .D
 - Sources
 - Biochemical Functions
 - RDA
 - Deficiency Manifestations
3. Describe sources, biochemical functions , RDA,and deficiency manifestations of Vit .E
 - Sources
 - Biochemical Functions

- RDA
 - Deficiency Manifestations
4. Describe sources ,biochemical functions , RDA,and deficiency manifestations of Vit .K
- Sources
 - Biochemical Functions
 - RDA
 - Deficiency Manifestations
5. Describe about the dietary sources, RDA,biochemical functions and deficiency manifestations of vit.B₁₂
- Sources,
 - RDA
 - Biochemical Functions
 - Deficiency Manifestations
6. Escribe about the dietary sources, RDA,biochemical functions and deficiency manifestations of vit.B₉ (folic acid)
- Sources
 - RDA
 - Biochemical functions
 - Deficiency manifestations
7. Write the dietary source, daily requirement, biological functions and deficiency manifestations of vitamin C
- Sources
 - RDA
 - Biochemical functions
 - Deficiency manifestations

SHORT ESSAY-5 MARKS

1. Sources and daily requirements of vitamin A
- Sources
 - Daily Requirements

- Role
- 2. Functions of vitamin A
 - Sources
 - Daily Requirements
 - Role Of Vit A
- 3. Visual cycle
 - Role Of Vitamin A
 - Diagrammatic Representation Of Visual Cycle
 - Sources
- 4. Hypervitaminosis A
 - Sources
 - RDA,
 - Characters Of Hypervitaminosis
- 5. Antioxidant vitamin
 - Vit E & Vit A Sources
 - Biochemical Functions
 - RDA
 - Deficiency Manifestations
- 6. Functions of vitamin D
 - Sources
 - Biochemical functions
- 7. Activations of vitamin D
 - Role
 - Activation
 - RDA
- 8. Renal rickets
 - Define
 - Types
 - Clinical Significance

9. Tocopherol
 - Define
 - Forms
 - Vitamin A
 - Important, Role In Vision

10. Biological role of vitamin k
 - Vitamin K Sources
 - Role In Coagulation
 - Vit K Cycle

11. Gama carboxylic reactions
 - Vitamin K Sources
 - Role In Coagulation
 - Vit K Cycle

12. What is the normal daily requirement of Vitamin A & vitamin D and it's role
 - Daily Requirement Of Vitamin A & Vitamin D
 - Biochemical Role

13. Rickets
 - Types ,Clinical Significance

14. Vit. K cycle
 - Explain, Vitamin K Cycle with Diagram and It's Role

15. Co enzyme role of niacin
 - Co enzymes
 - Functions
 - Significance

16. Biochemical functions of vitamin A
 - Vitamin A
 - Functions
 - Significance

SHORT NOTE -3MARK

1. Sources and daily requirements of vitamin A
2. Functions of vitamin A
3. Visual cycle
4. Hypervitaminosis A
5. Antioxidant vitamin
6. Functions of vitamin D
7. Activations of vitamin D
8. Vitamin deficiency
9. Renal rickets
10. Tocopherol
11. Biological role of vitamin k
12. Gama carboxylic reactions
13. What is the normal daily requirement of Vitamin A & vit .D
14. Rickets
15. Vit. K cycle
16. Biological role of vitamin A
17. Wald's visual cycle
18. Dark adaptation mechanism
19. Colour blindness
20. RDA of vitamin A
21. Sunshine vitamin
22. Vitamin D is a prohormone
23. Calcitriol
24. Effect of vit.D
25. Biochemical role of vit E
26. Renal rickets
27. Active forms of vit. A
28. Biochemical role of vit K

WATER SOLUBLE VITAMINES

ESSAY-10 MARK

1. Describe about the dietary sources, RDA, biochemical functions and deficiency manifestations of vitamin C
 - Sources
 - RDA
 - Biochemical functions
 - Deficiency manifestations

SHORT ESSAY-5 MARK

1. Co-enzyme actions of thiamine
 - Sources,
 - Physiological Role
 - Deficiency Manifestations
2. Metabolic role of riboflavin
 - Co-enzymes forms of riboflavin
 - Riboflavin deficiency
 - Significance
3. Deficiency of folic acid
 - Deficiency manifestations
 - Lab diagnosis,
 - Sources
4. PLP
 - Co-enzyme forms
 - Role
 - Deficiency manifestations
 - Sources

5. Co-enzyme action of biotin
 - Sources,
 - Physiological Role
 - Deficiency Manifestations
6. Deficiency of Vitamin B₁₂
 - Folate Trap
 - Megaloblastic Anaemia
 - Demyelination
 - Achlorhyria
 - Lab Diagnosis
 - Treatment
7. Biochemical functions of Vitamin B₁₂
 - Bio chemical role,
 - Sources,
 - Deficiency manifestations
8. Absorption of Vitamin B₁₂
 - Detail About Forms,
 - Absorption
 - Transport
 - Storage
9. Niacin deficiency
 - Detail about pellagra
 - Causes,
 - Sources of niacin
10. Biochemical functions of folic acid
 - Co-enzymes role of folic acids
 - Deficiency manifestations
 - Transmethylation reaction
11. Biochemical functions of vitamin c
 - Biochemical Role
 - Deficiency Manifestations

12. Pathothenic acid
 - Structure
 - Co-Enzyme Activity
 - Sources
 - Deficiency Manifestations

13. Niacin
 - Structure,
 - Co-enzyme activity
 - Sources
 - Deficiency manifestations

14. Thiamine
 - Structure
 - Co-Enzyme Activity
 - Sources
 - Deficiency Manifestations

15. Biotin
 - Structure
 - Co-enzyme activity
 - Sources,
 - Deficiency manifestations

16. Biotin antagonist
 - Detail about biotin
 - Avidine
 - Deficiency of biotin
 - Sources

17. Vitamin c
 - Structure
 - Co-enzyme activity
 - Sources,
 - Deficiency manifestations

18. Pellagra
 - Deficiency Manifestations,
 - Causes
 - Sources
 - RDA
19. Estimation of Vitamin C
20. Different methods
21. Principle, Procedure
22. Interpretation
23. Assessment of Vitamin B12
 - Method of estimation
 - Principle, Procedure
 - Interpretation
24. Biochemical functions of Niacin
 - Co-Enzymes Forms Of Niacin
 - Niacin Deficiency
 - Significance
25. Beriberi
 - Deficiency Manifestations
 - Types, And It' Significance

SHORT NOTE-3 MARKS

1. Beriberi
2. Wernicke - korsakoff syndrome
3. Infentile beriberi
4. Pellagra
5. Co-enzyme form of PLP
6. Structure of pathothenic acids
7. Co-enzyme A
8. Gopalans burning foot syndrome

9. Structure of biotin
10. Carboxylation reactions
11. Anti egg white injury factors
12. Transmethylation reaction
13. Folate trap
14. Macrocytic anaemia
15. FIGLU excretion test
16. Folate antagonist
17. Intrinsic factor
18. Megaloblastic anaemia
19. Schilling test
20. Biochemical functions of vitamin C
21. Scurvy

NUTRITION

ESSAY -10 MARK

1. Define BMR, write detailed about factors affecting BMR & determinations of BMR.
 - Define ,factors, detection

SHORT ESSAY-5 MARK

1. BMR
 - Define
 - Detection
 - Factors affecting
2. Nutritional importance & caloric value of carbohydrate
 - Define, and its importance
3. Respiratory quotient
 - Define
 - Factors affecting
 - Clinical aspects

4. Role of carbohydrate in diet
 - Define
 - Role
 - Its importants
5. Role of lipids in diet
 - Define
 - Role
 - Pufa & its importants
6. Glycaemic index
 - Define,
 - Factors affecting
 - Calculation
 - Types with examples
7. Protein energy malnutrition (PEM)
 - Define,
 - Types with clinical features
8. Kwashiorkor
 - Define
 - Clinical features
9. Marasmus
 - Define
 - Clinical features

SHORT NOTE-3 MARK

1. Role of carbohydrate in diet
2. Role of lipids in diet
3. Glycemic index
4. Protein energy malnutrition (PEM)
5. Kwashiorkor

6. SDA
7. Benedict-Roth metabolism apparatus
8. Body mass index
9. Marasmus

URINE, CSF, OTHER BODY FLUIDS

ESSAY-10 MARK

1. Write detail about collection, physical, chemical examination of CSF.
 - Site
 - Collection
 - Physical
 - Chemical examination of CSF and clinical significance
2. Normal and abnormal constituents of urine
 - Define detailed about each one with significance
3. Physical and chemical examinations of urine
 - Physical, chemical examinations of urine
4. Enumerate three organic constituents of urine and describe the formation and estimation of any one
 - List out the constituents
 - Formation in detail
 - Estimation methods

SHORT ESSAY -5 MARK

1. Synovial fluid
 - Site
 - Function
 - Physical and chemical examination,
 - Normal composition
 - Clinical significance

2. Pleural fluid
 - Site
 - Function
 - Physical and chemical examination
 - Normal composition
 - Clinical significance
3. Pericardial fluid
 - Site
 - Function
 - Physical and chemical examination,
 - Normal composition,
 - Clinical significance
4. Peritoneal fluid
 - Site
 - Function
 - Physical and chemical examination
 - Normal composition
 - Clinical significance
5. Amniotic fluid
 - Site, function
 - Physical and chemical examination
 - Normal composition,
 - Clinical significance
6. CSF
 - Site
 - Function
 - Physical and chemical examination
 - Normal composition
 - Clinical significance
7. Exudates and transudate
 - Define
 - Factors affecting

8. Normal organic constituents of Urine
 - List out organic constituents
 - Detection methods
9. Detection of Inorganic and organic constituents of urine
 - List out organic constituents
 - Detection methods
10. Components of CSF in health and disease
 - Composition of CSF in normal and in clinical conditions
11. Blood sampling
 - Different blood sampling methods in detail
12. 24 hour urine sampling
 - Method of collection with precautions
 - Preservatives

SHORT NOTES -3 MARK

1. Benedicts test
2. Heat and acetic acid test
3. Fouchets test
4. Schales and schales method
5. Ehrlichs test
6. Hay's test
7. Specific gravity of urine
8. Urinometer
9. Benzidine test
10. Biuret test
11. Mucine clot test
12. Lumbar puncture
13. Physical examination of urine
14. Chemical examination of urine