

First MBBS Degree Examination

BIOCHEMISTRY – PAPER – VI

April – 2001

1. Describe the biochemical actions of insulin in carbohydrate, lipid and protein metabolism. Name the disorder associated with insulin deficiency. How do you confirm the diagnosis?
2. Write short notes on: a) Name the inherited disorders associated with Tyrosinemia noting the enzyme deficiency. b) Explain the metabolic inter-relationship between sodium concentration and water volume. c) Structure of DNA, d) Partition chromatography. (Principle and Clinical Application), e) Detoxification of Xenobiotics, f) Southern blot technique (Procedure), g) Name the disorders associated with purine nucleotide metabolism, h) Electrophoresis (Principle), i) Normal blood level of calcium and mention the factors regulating it, j) use of plasmids in genetic engineering.

April – 2001

1. Discuss the metabolism of tyrosine. Name the biologically important compounds derived from tyrosine. What are the inborn errors of metabolism of this amino acid?
2. Write short notes on: a) Metabolic role of methionine, b) Polymerase chain reaction, c) Metabolic acidosis, d) tests for glomerular function
3. Write an account of DNA replication.
4. Write short notes on: a) Detoxification by conjugation, b) Oncogenes, c) Role of kidneys in acid-base balance, d) Gout.

November – 2001

1. Name Aromatic Amino acids. Write about metabolism of phenylalanine.
2. Short notes: a) Chromatography, b) Genetic code, c) Blood buffers, d) Iodine,
3. How urea is synthesized? What are metabolic disorders of urea cycle? Mention normal blood urea concentration and its importance?
4. Short notes on: a) T.RNA, b) Test for thyroid function, c) Ontogenesis, d) Colorimeter.

March – 2002

1. Define the terms “ replication transcription and translation” Describe the steps involved in protein biosynthesis.
2. Write short notes on: a) Maple syrup urine disease , b) PRPP biosynthesis and its importance, c) Chromatography, d) Genetic code.
3. Write in detail diagrammatically the reaction mechanisms by which HCO_3^- is reclaimed and regenerated in kidneys. What is meant by metabolic acidosis and how it is compensated?
4. Write notes on: a) Wilson’s disease, b) Structure and functions of Insulin c) Carcinogen, d) Describe the “ Southern Blot” technique.

September – 2002

1. Name aromatic amino acids. Describe the metabolism of tryptophan. Name the important compound synthesized from it and metabolic disorders.
2. Write short notes on: a) Structure and functions of t – RNA, b) AIDS, c) Occupational hazards, d) PCR and its applications.
3. Compare the metabolic changes in well fed state and starvation.
4. Write short notes on: a) Post translations modifications, b) Salvage pathway, c) Define and explain Point mutation with examples, d) Structure of proteins.

October – 2003

I. Write Essay:

1. Write in detail about structural organization of proteins and briefly mention about various methods used in elucidation of primary structure.
2. Write how Acid – Base balance is maintained in the body. Mention causes and biochemical alterations of metabolic acidosis.

II. Write Short notes on:

- a) List various DNA repair mechanisms and give their biomedical importance, b) Enzyme defects and biochemical consequences of two inborn errors of phenylalanine metabolism, c) Name heavy metal poisons, Write biochemical consequences and diagnosis of any two, d) Biochemical roles and nutritional importance of trace elements, e) List the different mechanisms involved in Hormone action and write about the mechanism of action hormones using CAMP as second messenger, f) List various thyroid function tests and give the importance of free thyroid hormones in assessing thyroid function, g) Alterations in biochemical investigations in cirrhosis of liver, h) Metabolically

important products formed from methionine, i) Clinical applications of recombinant DNA technology, j) Biochemical applications of tumormarkers.

August-2004

I. Write Essay

1. Discuss the metabolism of GLYCINE. Add a note on metabolic disorders associated glycine metabolism.
2. Discuss the distribution of calcium in the body. Describe the sources, daily requirement, absorption, and excretion of calcium. How is the blood calcium level regulated?

II. Write short notes on:

1. Alkaptonuria. 2. Transfer RNA. 3. Metabolism of zinc. 4. Detoxication by conjugation. 5. Salvage pathway of purine synthesis. 6. Metabolic Acidosis. 7. Tumor markers. 8. Clearance tests. 9. Lac operon. 10. Cytochrome P 450.

February-2005

I. Essay:

1. Describe the metabolism of phenyl alanine in the body and discuss the inborn error associated with the metabolism.
2. What is the normal pH of the blood? Explain the various mechanisms by which the normal pH of the blood is maintained.

II. Short notes on:

- (a) Role of vitamin D in calcium metabolism. (b) Iron. (c) Prostaglandins. (d) Ketone bodies. (e) Degeneracy code. (f) Detoxification. (g) Gout. (h) Anti oxidants. (i) Genetic code. (j) Protooncogenes and Oncogenes.

August-2005

I. Essay:

1. Why Ammonia is toxic to the body? What are the ways by which Ammonia is disposed in the body? Add a note on Hyperammonemia conditions.
2. What is the normal serum calcium level? Explain how serum calcium level is maintained. Name the hypocalcemia conditions.

II. Short notes on:

- (a) Synthetic nucleotides and their importance. (b) Liver function tests. (c) Anion gap and its diagnostic importance. (d) Tumor Markers. (e) Salvage Pathways. (f) Mechanism of action of Thyroid hormones. (g) Detoxification by Hydroxylation. (h) Blotting techniques. (i) Glutathione role in Amino acid transport. (j) Essential Amino acids.

February-2006

I. Essay:

1. Describe the metabolism Tryptophan and add a note inborn errors associated with it.
2. Describe the Denovo synthesis of purine nucleotides.

II. Short notes on:

- (a) Isoelectric PH. (b) Thin layer chromatography. (c) Functions of plasma proteins. (d) Zinc. (e) Metabolic acidosis. (f) Gamma amino butyric acid. (g) Methyl melonic aciduria. (h) Structure of t RNA. (i) LAC operon. (j) Insulin.

August-2006

I. Essay:

1. Describe the sources, requirement, absorption, transport, storage forms, functions, deficiency and toxic manifestations of iron.
2. Discuss urea cycle under the following headings:
(a) Site. (b) Sources of amino group. (c) Steps and. (d) Regulation.
3. Discuss about nucleic acids under the following headings:
1.Types. 2. Functions. 3. Components.4. Char gaff's rule of DNA composition. 5. Different forms of DNA double helix and (f) Differences between DNA and RNA.

II. Write short notes on:

- (a) Post translational modification with two examples. (b) Alpha helical structure of a peptide. (C) Buffer system in the body. (d) Principles of electrophoresis and its clinical applications. (e) Applications of genetic engineering. (f) G- proteins.

February-2007

I. Essay:

1. What is the active form of methionine how it is formed? What are its functions? Enumerate the steps of methionine metabolism and write the disorders associated with its metabolism.
2. What is the normal p H of blood Discuss the mechanism involved in its regulation?
3. Mention the sources, daily requirement, functions and deficiency symptoms of calcium. Explain how serum level of calcium is regulated.

II. Short notes on:

- (a) Oncogenes. (b) Electrophoresis. (c) Genetic code. (d) Insulin. (e) Gout. (f) Detoxification.

August-2007

Essay Questions.

1. Describe the mechanism of DNA Replication. Add a note on DNA Repair mechanism.
2. Name the branched chain Amino acids. Describe the pathway for the metabolism of branched chain amino acids. Add a note on maple syrup urine disease.

3. Short answers:

- (a) Recombinant DNA Technology. (b) Wilson's Disease. (c) Secondary Structure of Proteins. (d) Polyamines. (e) Metabolic Acidosis. (f) Restriction Endonucleases. (g) Functions of Phosphorus. (h) Purine salvage pathway. (i) Post- Translational modification. (j) Role of lungs in Acid – Base balance.

February-2008

I. Essay Questions:

1. What is Normal Blood Glucose Level? Describe the regulation of Blood Glucose.
2. Write in detail about how ammonia is formed from amino acids, transported and connected to urea.

II. Write short notes on:

- (a) Give the structure of Immunoglobulin and their functions. (b) Functions of Zinc and Selenium. (c) Storage and Transport of Iron in the body. (d) Transamination reactions. (e) Renal Regulation of p H of Blood. (f) Vanden berg's reaction. (g) Fluorometry. (h) Hyperurecimia. (i) Secondary structure of Protein. (j) Transmethylation.

August-2008

I. Essay Questions:

1. Describe the pathway of Methionine metabolism. Add a note on metabolic functions of methionine and cysteine.
2. Describe the biosynthesis of purine nucleotide. Add a note on regulation.

II. Write Short notes on:

1. Transamination reactions. 2. Renal regulation of p H. 3. Gout. 4. Mutation. 5. Differences between DNA and RNA. 6. Oncogenes. 7. Post transcriptional modifications. 8. Formation of creatine. 9. Alkaptonuria. 10. Southern blotting.

III. Short Answers Questions:

1. Name the buffer systems of blood. 2. Sources of carbon and nitrogen in purine ring. 3. Wobble hypothesis. 4. Write the enzyme defect in (a) Lesch-Nyhan syndrome (b) Orotic aciduria. 5. Okasaki fragments. 6. What are Xenobiotics? 7.

Causes of Metabolic acidosis. 8. Name the important compounds formed from Glycine. 9. Inhibitors of protein biosynthesis. 10. Apoptosis.

February-2009

I. Essay Questions:

1. Name the compounds derived from glycine. Explain any two in detail.
2. Describe in detail the mechanism of regulation of blood PH.

II. Write Short notes on:

1. Phenyl ketonuria. (2)Glutathione. (3) Metabolic acidosis. 4. Codons. 5. Renal function test. 6. Orotic acid urea. 7. Wobble hypothesis. 8. Vanden Bergh's test. 9. Rickets. 10. r Globulins.

August-2009

I. Essay Questions:

1. Name liver function tests with diagnostic significance of each. Write in detail the biochemical tests of any three done in your laboratory.
2. Describe the pathway for synthesis of urea from ammonia. What is normal blood urea level? Name the condition in which blood urea level is increased and give the biochemical basis.

II. Write Short notes on:

1. Denaturation. 2. Reverse transcription. 3. Sphingolipidosis. 4. GOUT. 5. Metabolic acidosis. 6. Tumor markers. 7. Colorimeter. 8. Functions of adrenal cortical hormones. 9. Plasmid. 10. Functions of albumin.

III. Shore Answer Question:

1. Maple syrup urine disease. 2. Alkali reserve. 3. Biological value of proteins. 4. Carcinogenic virus. 5. Electrophoretic technique and its importance. 6. Methemoglobin. 7. Importance of glucose six phosphate dehydrogenase deficiency. 8. G- Proteins. 9. Renal threshold substances. 10. Carbon monoxide.

February-2010

I. Essay Question:

1. Describe about nucleic acids under the following headings:
(a) Types (b) Functions (c) Components (d) Chargaff's rule of DNA composition. (e) Different forms of DNA double helix and. (f) Differences between DNA and RNA. (f) Differences between DNA and RNA.
2. Describe the steps of S-adenosyl methionine cycle. Explain the term transmethylation with five suitable examples.

II. Write Short notes on:

1. Give an account of the formation of specialized products from glycine.
2. Explain the term transamination and its salient features.
3. Polymerase chain reaction and its applications.
4. Blotting techniques.
5. Gene therapy.
6. Write an account of salvage pathway in purine nucleotide synthesis. Add a note on Lesch-Nyhan syndrome.
7. Post translational modification.
8. What are porphyrias? Describe any three porphyrias in detail.
9. Give an account of water distribution and its balance in the body.
10. What are isotopes? What are its application in Biochemistry?

III. Short Answer Questions:

1. Phenylketonuria.
2. Structure of t-RNA.
3. Okazaki pieces.
4. Differences between CPSI and II.
6. Anion Gap.
7. Rotheras test.
8. Gout.
9. Fluorosis.
10. Vanden Berg test.

August-2010

I. Essay Questions:

1. Describe the separation of Serum Proteins by paper electrophoresis. Draw the pattern of electrophoresis in i) Multiple Myeloma ii) Nephrotic syndrome.
2. How is blood pH regulated?

II. Write Short notes on:

1. Genetic code.
2. Formation of Epinephrine.
3. Cytochrome 450.
4. Purine Salvage pathways.
5. Dehydration.
6. LAC Operon.
7. Orotic acidurias.
8. tRNA.
9. Phenylketonuria.

III. Short Answer notes on:

1. Xeroderma pigmentosum.
2. Hemoglobin S.
3. Functions of Parathyroid hormone.
4. Mention two second messengers.
6. Oxytocin.
7. Addison's disease.
8. Functions of Glucagon.
9. Gamma Amino Butyric Acid.
10. Hartnup's disease.

February-2011

I. Essay Questions:

1. Write in detail about the initiation, elongation and termination of transcription. Give an account of post transcriptional processing.
2. Write in detail about the absorption transport, daily requirement and deficiency Manifestation of Iron.

II. Write Short notes on:

1. Synthesis and mechanism of action of Nitric Oxide
2. Homocystinurias

3. Hyperuricemias 4. Metabolic acidosis 5. Phase two detoxification 6. Cyclic AMP 7. Assessment of hypothyroidism 8. Mutations 9. Electrophoresis 10. Antioxidant

III. Short Answer Questions:

1. Name the major intracellular and extracellular anion.
2. Principle of flame photometer.
3. Metabolic roles of Zinc and selenium.
4. Orotic aciduria.
5. Chimeric DNA.
6. Osmolality.
7. Anti HIV drugs.
8. Compounds formed from Glycine.
9. Write the normal serum sodium and potassium level.
10. What are monoclonal and polyclonal antibodies.

August 2011

I. Essay questions:

1. What is cloning? Mention the various types of cloning. Describe in detail the steps involved in recombinant DNA technology.
2. Describe the role of plasma and renal buffers in maintaining acid base homeostasis.

II. Write short notes on:

1. Purine salvage pathway
2. Explain the types and functions of immunoglobulins.
3. Phenylketonuria
4. Fluorosis
5. Serum protein electrophoresis.
6. Cell cycle.
7. Role of Parathormone in calcium, phosphate homeostasis.
8. Define Xenobiotics and add a note on the various detoxification reactions
9. Mutation
10. Secondary structure of protein.

III. Short Answer Questions:

1. Urea cycle disorders cause orotic aciduria explain
2. Acidosis causes hyperkalemia why?
3. Define frameshift mutation with an example.
4. We need two primers for polymerase chain reaction Justify.
5. Mechanism of action of Chloramphenicol.
6. Mention the enzymes which require selenium as cofactor.
8. Lesch Nyhan syndrome presents with hyperuricemia. Explain.
9. Hypothyroidism present with hypercholesterolemia. Why?
10. Histidine load test.
11. Mention two tumour markers and specify the diagnostic application.
12. M band.
13. Beer Lambert's Law.
14. Mention 2 transmethylation reaction.
15. Enzyme deficiency in albinism. Mention two clinical features.

February-2012

I. Elaborate on:

1. Describe the metabolism of tyrosine. Name the inborn errors associated with this pathway.
2. Enumerate the liver function tests and how Vanden Bergh test distinguishes different types of jaundice.

II. Write notes on:

1. Post translational modifications.
2. Electrophoresis.
3. Repair mechanism of DNA.
4. Salvage pathway of purine synthesis.
5. Functions of Glucocorticoids.
6. Functions of albumin.
7. Precipitation reactions of Proteins.
8. Tubular function tests.
9. Role of kidney in regulating the pH of blood.
10. Immunoglobulins.

III. Short Answers

1. Restriction Endonucleases.
2. Mutagens.
3. Lesch Nyhan Syndrome.
4. Denaturation of proteins.
5. Differences between DNA and RNA.
6. What are the enzymes required for DNA replication.
7. What is the principle of affinity Chromatography?
8. What are the causes of respiratory acidosis?
9. Maple syrup urine disease.
10. Urea clearance.
11. Bence Jones Protein.
12. What are Oncogenes?
13. Beer- Lambert's Laws.
14. What are the forces that stabilize secondary structure of proteins?
15. Name the basic Amino Acids.