

**FIRST M.B.B.S. DEGREE EXAMINATION**  
**Revised (Non-Semester) Regulations**  
**Paper VI – BIOCHEMISTRY – II**  
*Q. P. Code : 524056*

**Time : Three hours**

**Maximum: 100 Marks**

Answer **ALL** questions.  
Draw Suitable diagrams wherever necessary

**I. Essay Questions :** **(2 x 15 = 30)**

1. Describe the pathways 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 :** **(10 x 5 = 50)**

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

**III. Short Answer Questions :** **(10 x 2 = 20)**

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 (1) Lesch-Nyhan Syndrome (2) 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.

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**I. Essay Questions :** **(2 x 15 = 30)**

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 :** **(10 x 5 = 50)**

1. Phenyl ketonuria.
2. Formation of uric acid.
3. Porphyria.
4. Urea cycle.
5. ELISA
6. Active Methionine.
7. Flame photometer.
8. Bilurubin formation & excretion.
9. Plasma proteins.
10. Replication.

**III. Short Answer Questions :** **(10 x 2 = 20)**

1. Detoxification by conjugation.
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.  $\gamma$  Globulins.

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**I. Essay Questions :**

**(2 x 15 = 30)**

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 conditions in which blood urea level is increased and give the biochemical basis.

**II. Write Short notes on :**

**(10 x 5 = 50)**

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

**III. Short Answer Questions :**

**(10 x 2 = 20)**

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.

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**I. Essay Questions :** **(2 x 15 = 30)**

1. Discuss about nucleic acids under following headings:
  - a) Types
  - b) Functions
  - c) Components
  - d) Char gaffs rule of DNA composition
  - e) Different forms of DNA double helix and
  - 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 :** **(10 x 5 = 50)**

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 applications in biochemistry?

**III. Short Answer Questions :** **(10 x 2 = 20)**

1. Phenyl keton uria.
2. Structure of t-RNA.
3. Okazaki pieces.
4. Differences between CPSI and CPS II.
5. Metabolic role of magnesium.
6. Anion Gap.
7. Rotheras test.
8. Gout.
9. Flurosis.
10. Vanden Berg test.

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Answer **ALL** questions.  
Draw Suitable diagrams wherever necessary

**I. Essay Questions :** **(2 x 15 = 30)**

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 :** **(10 x 5 = 50)**

1. Genetic code.
2. Formation of Epinephrine.
3. Cytochrome 450.
4. Purine Salvage pathways.
5. Dehydration.
6. LAC operon.
7. Orotic acidurias.
8. t RNA.
9. Phenyl ketoneuria.
10. Water toxicity.

**III. Short Answer Questions :** **(10 x 2 = 20)**

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

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**Maximum: 100 Marks**

Answer **ALL** questions.  
Draw Suitable diagrams wherever necessary

**I. Essay Questions :** **(2 x 15 = 30)**

1. Write in details 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 :** **(10 x 5 = 50)**

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. Antioxidants.

**III. Short Answer Questions :** **(10 x 2 = 20)**

1. Name the major intracellular and extracellular anion
2. Principle of flamephotometer
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

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**Maximum: 100 Marks**

Answer **ALL** questions.  
Draw Suitable diagrams wherever necessary

**I. Essay Questions :** **(2 x 10 = 20)**

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 :** **(10 x 5 = 50)**

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 :** **(15 x 2 = 30)**

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 aminoacids which take part in one carbon pool
7. Mention the enzymes which require selenium as cofactor.
8. Lesch nyhan syndrome presents with hyperuricemia. Explain.
9. Hypothyroidism presents 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 Two transmethylation reactions.
15. Enzyme deficiency in albinism. Mention two clinical features.

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**Time : 180 Minutes****Maximum: 50 Marks**

Answer **ALL** questions in the same order.  
Draw Suitable diagrams wherever necessary

**I. Elaborate on :**

1. Describe the metabolism of tyrosine.  
Name the inborn errors associated with this pathway (10 x 1 = 10)
2. Enumerate the liver function tests and how Vanden Bergh test distinguishes different types of jaundice. (5 x 1 =

5)

**II. Write notes on:**(10 x 2 = 20)

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 on :**(15 x 1 = 15)

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.



**FIRST M.B.B.S. DEGREE EXAMINATION****Paper VI – BIOCHEMISTRY – II***Q. P. Code : 524056***Time : 180 Minutes****Maximum: 100 Marks**Answer **ALL** questions.

Draw Suitable diagrams wherever necessary

**I. Elaborate on:****Pages Time Marks  
(Max.) (Max.) (Max.)**

- |   |    |    |    |
|---|----|----|----|
| 1. With the help of a figure, describe the process by which DNA replication takes place in a cell.  | 16 | 25 | 15 |
| 2. What are the functions of sodium in the body?<br>What is the reference range for levels of serum sodium?<br>Describe the working of the renin-angiotensin-aldosterone system to maintain optimal amounts of sodium in the body.<br>Briefly discuss disorders associated with derangements in sodium homeostasis. | 16 | 25 | 15 |

**II. Write notes on:**

- |   |   |   |   |
|---|---|---|---|
| 1. Secondary structure of proteins.                             | 3 | 8 | 5 |
| 2. Structure of an immunoglobulin, with the help of a figure.   | 3 | 8 | 5 |
| 3. Causes and manifestations of gout.                           | 3 | 8 | 5 |
| 4. Transamination reactions.                                    | 3 | 8 | 5 |
| 5. Role of lungs in maintenance of pH of blood.                 | 3 | 8 | 5 |
| 6. Conjugation reactions involved in metabolism of xenobiotics. | 3 | 8 | 5 |
| 7. Principle and applications of electrophoresis.               | 3 | 8 | 5 |
| 8. Functions of tyrosine in the body.                           | 3 | 8 | 5 |
| 9. Tumour markers.  | 3 | 8 | 5 |
| 10. Salvage pathway for purines and its importance in the body. | 3 | 8 | 5 |

**III. Short Answers on:**

- |  |   |   |   |
|--|---|---|---|
| 1. Outline the distribution of water in the various compartments of the body.  | 1 | 5 | 2 |
| 2. What is the mechanism of action of steroid hormones?  | 1 | 5 | 2 |
| 3. List four features of the genetic code.   | 1 | 5 | 2 |
| 4. Explain the clinical relevance of serum creatinine levels.  | 1 | 5 | 2 |
| 5. What is meant by the polymerase chain reaction?<br>List Two of its applications.  | 1 | 5 | 2 |
| 6. What are the reference levels of glucose and protein in cerebrospinal fluid?<br>How are they affected in bacterial meningitis?    | 1 | 5 | 2 |
| 7. What is meant by quaternary structure of a protein?<br>Name a protein, abundantly found in blood that has a quaternary structure. | 1 | 5 | 2 |
| 8. Name the bases found in nucleic acids.  | 1 | 5 | 2 |
| 9. List four causes of respiratory acidosis.   | 1 | 5 | 2 |
| 10. What are the functions of glutathione?   | 1 | 5 | 2 |

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**Maximum: 50 Marks**

Answer **ALL** questions.

Draw Suitable diagrams wherever necessary

**I. Elaborate on:**

**(2 x 7.5 = 15)**

1. Name the Aromatic Amino acids. Add a note on physiologically important derivatives of tyrosine.
2. Explain Protein synthesis in detail. Add a note on drugs that inhibit protein synthesis.

**II. Write notes on :**

**(10 x 2.5 = 25)**

1. Thyroid function Tests
2. Recombinant DNA Technology
3. Structure of DNA
4. Post transcriptional modifications
5. Functions of albumin
6. Electrophoresis and its applications
7. Causes for respiratory acidosis
8. Renal mechanism of maintaining Acid Base Balance
9. Purine Salvage pathway
10. Lac Operon concept.

**III. Short Answers on:**

**(10 x 1 = 10)**

1. Enzyme defect in a)Phenylketonuria b) Alkaptonuria
2. DNA polymerase enzyme
3. Types of mutations
4. Reverse Transcriptase
5. Inhibitors of RNA synthesis
6. Features of Genetic Code
7. Gout
8. Name Two Renal Function Tests
9. Denaturation of proteins
10. Name Two enzymes that are increase in hepatic jaundice.

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[LD 505]

AUGUST 2013

Sub. Code : 4056

**FIRST M.B.B.S. DEGREE EXAMINATION**

**Paper VI – BIOCHEMISTRY – II**

*Q. P. Code : 524056*

**Time : 180 Minutes**

**Maximum: 50 Marks**

**Answer ALL questions.**

**Draw Suitable diagrams wherever necessary**

**I. Elaborate on:**

**(2 x 7.5 = 15)**

1. Describe the catabolism of Heme in the body.  
Explain the different types of jaundice.  
How do you investigate a case of jaundice?
2. What is the normal pH of blood.  
Describe the various mechanisms which maintain it?  
Mention the acid base disorders.

**II. Write notes on:**

**(10 x 2.5 = 25)**

1. Active form of methionine and its function
2. Inhibitors of Protein Biosynthesis
3. Porphyria
4. LAC Operan
5. Transcription & Post Transcriptional modification
6. Cyclic AMP
7. Detoxification by conjugation
8. Renal Function Tests
9. Tumor Markers
10. Different mechanisms involved in hormone action.

**III. Short Answers on:**

**(10 x 1 = 10)**

1. ELISA
2. Hyperkalemia
3. Okazaki fragments
4. Thyroid Function Tests
5. Creatinine clearance
6. GABA
7. Iso electric pH of proteins
8. Maple syrup urine disease
9. Multiple Myeloma
10. Lesch-Nyhan Syndrome and orotic aciduria.

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Draw Suitable diagrams wherever necessary

**I. Elaborate on:****(2 x 7.5 = 15)**

1. What is the reference range for serum uric acid?  
What is the source of uric acid in the body?  
What is its ultimate fate?  
Discuss causes of abnormalities in levels of serum uric acid.
2. Describe recombinant DNA technology.  
Explain the different techniques with its application.

**II. Write notes on:****(10 x 2.5 = 25)**

1. Essential amino acids
2. Structure of tRNA
3. Restriction endonucleases
4. Post-translational modifications of proteins
5. What is creatine clearance? Write the normal value of it.
6. Sources of ammonia in the body and its metabolism
7. Functions of glycine in the body
8. Heavy metal poisonings
9. Disorders associated with potassium homeostasis
10. Functions of nucleotides

**III. Short Answers on:****(10 x 1 = 10)**

1. List two applications of electrophoresis in medicine.
2. List the different types of immunoglobulins.
3. Outline the reaction by which deoxynucleotides are formed in a cell from ribonucleotides.
4. Explain the anti-neoplastic effect of methotrexate.
5. List the biochemical abnormalities seen in phenylketonuria.
6. What are the compensatory changes that occur in response to respiratory acidosis?
7. Outline the mechanism of action of glucagon
8. What is reference range of sodium. Write 2 causes of hyponatremia.
9. What is the function of cytochrome P<sub>450</sub> in the body?
10. Name two tumour suppressor genes and the malignancy that is specifically associated with abnormalities in each of these genes.

[LF 505]

AUGUST 2014

Sub. Code: 4056

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**Time: Three Hours**

**Maximum: 50 Marks**

**Answer ALL questions in the same order.**

**I. Essay:**

**(1 x 10 = 10)**

1. Discuss in detail the replication of DNA.  
Mention the inhibitors of replication.

**II. Write Notes on:**

**(2 x 5 = 10)**

1. Transamination reaction and its significance.
2. Homocystinuria.

**III. Short Answers on:**

**(10 x 3 = 30)**

1. Bicarbonate buffer system
2. Hyperkalemia
3. Define electrophoresis and mention its applications
4. Renal tubular function tests
5. Urinary findings in jaundice
6. Methemoglobin
7. Structure of immunoglobulin
8. Regulation of heme synthesis
9. Operon concept
10. Define PCR and mention its four applications.

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