

March 2009

[KU 151]

Sub. Code: 2046

M.D. DEGREE EXAMINATION

Branch XIII – BIOCHEMISTRY
(Common to all Candidates)

**Paper IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT
ADVANCES IN BIOCHEMISTRY**

Q.P. Code : 202046

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : (2 x 20 = 40)

1. List out the proteins present in the body fluids and describe the clinical significance of laboratory diagnosis of saliva.
2. Describe the mechanism of hormone action.

II. Write short notes on : (10 x 6 = 60)

1. Medical genetics.
2. Biochemical changes in pregnancy.
3. Cystatin C.
4. Glycated proteins.
5. Insulin resistance.
6. Hypo and Hyper natremia.
7. Inborn errors of fructose metabolism.
8. Gout.
9. Neonatal screening.
10. Investigation of Jaundice.

September 2009

[KV 151]

Sub. Code: 2046

M.D. DEGREE EXAMINATION

Branch XIII – BIOCHEMISTRY
(Common to all Candidates)

Paper IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT
ADVANCES IN BIOCHEMISTRY

Q.P. Code : 202046

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : **(2 x 20 = 40)**

1. Describe the complications of diabetes mellitus. Clinical importance of HbA1c test in monitoring the treatment.
2. Describe the types and classification of Tumour markers. Give the methods of detection and their clinical uses.

II. Write short notes on : **(10 x 6 = 60)**

1. Peritoneal dialysis.
2. Laboratory diagnosis of Osteoporosis.
3. Triple test.
4. Pancreatic enzymes.
5. Hepcidin.
6. Inborn errors of galactose metabolism.
7. Male infertility.
8. Water balance.
9. Polyclonal antibodies.
10. Gastro intestinal hormones.

March 2010

[KW 151]

Sub. Code: 2046

M.D. DEGREE EXAMINATION

**Branch XIII – BIOCHEMISTRY
(Common to all Candidates)**

**Paper IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT
ADVANCES IN BIOCHEMISTRY**

Q.P. Code : 202046

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary

Answer ALL questions

I. Essay questions : (2 x 20 = 40)

1. Discuss the biosynthesis of thyroid hormones and its regulation. Add a note on laboratory diagnosis of hypothyroidism.
2. Describe the various renal function tests and explain their significance. Add a note on principles of dialysis.

II. Write short notes on : (10 x 6 = 60)

1. Hyper sensitivity reactions.
2. Metabolic syndrome.
3. Wilson's disease.
4. Carbohydrate – related tumour markers.
5. Biochemical changes seen in Alzheimer's disease.
6. Biochemistry of oral contraception.
7. Nitric oxide in the body.
8. Reversal of albumin: globulin ratio.
9. Biochemical basis of diabetic complications.
10. Adipocyte as an endocrine gland.

September 2010

[KX 151]

Sub. Code: 2046

M.D. DEGREE EXAMINATION

Branch XIII – BIOCHEMISTRY

**Paper IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

(Common to all Candidates)

Q.P. Code : 202046

Time : Three hours

Maximum : 100 marks

Draw suitable diagram wherever necessary.

Answer ALL questions.

I. Essay questions :

(2 X 20 = 40)

1. Give an account of different neurotransmitters, their synthesis and current concept of their mechanism of actions.
2. Describe the various liver function tests and explain their significance.

II. Write short notes on :

(10 X 6 = 60)

1. Total parenteral nutrition.
2. Biochemical basis of aging.
3. Circulating tumour markers.
4. Interleukins.
5. Gene therapy.
6. Anti tumour drugs and the biochemical basis of their action.
7. Computer applications in clinical chemistry.
8. Principles of Dialysis.
9. Tumour suppressor gene.
10. Biosynthesis and regulation of Estrogen.

MAY 2011

[KY 151]

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY
CLINICAL BIOCHEMISTRY, HUMAN NUTRITION ENDOCRINOLOGY,
IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY**

Q.P. Code : 202046

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

	Pages (Max.)	Time (Max.)	Marks (Max.)
I. Essay:			
1. Describe in detail the causes, clinical and biochemical features of Panhypopituitarism. Add a note on how you will investigate a case of Panhypopituitarism.	6	15	10
2. Classify and describe in detail the causes of Hyponatremia. Add a note on Pseudohyponatremia.	6	15	10
II. Short Questions:			
1. Biochemical features of diabetic ketoacidosis.	3	8	5
2. Microalbuminuria.	3	8	5
3. Glycogen storage disorders.	3	8	5
4. Hyperlipoproteinemias.	3	8	5
5. hsCRP.	3	8	5
6. Adipose tissue as an endocrine organ.	3	8	5
7. Biochemical analysis of CSF.	3	8	5
8. Henderson Hasselbalch equation.	3	8	5
III. Reasoning Out:			
1. Edema is not a feature of Conn's syndrome. Why?	4	10	5
2. Urinary anion gap is negative in ureterosigmoidostomy. Explain.	4	10	5
3. Intact PTH is not a reliable indicator of bone turn over in dialysis patients. Why?	4	10	5
4. Thiamine is to be supplemented before dextrose infusion in a chronic alcoholic. Why?	4	10	5
IV. Very Short Answers :			
1. Glucose challenge test.	1	4	2
2. Lactose intolerance.	1	4	2
3. Fructosamine.	1	4	2
4. Carbohydrate deficient transferrin.	1	4	2
5. Fibronectin.	1	4	2
6. Maple Syrup Urine Disease.	1	4	2
7. Asymmetric Dimethyl Arginine.	1	4	2
8. Biochemical basis of hypokalemic periodic paralysis.	1	4	2
9. Alpha feto protein as a prenatal marker.	1	4	2
10. Basis of SIADH.	1	4	2

October 2011

[KZ 151]

Sub. Code: 2046

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**CLINICAL BIOCHEMISTRY, HUMAN NUTRITION ENDOCRINOLOGY,
IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY**

Q.P. Code : 202046

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Essay :

**Pages Time Marks
(Max.) (Max.) (Max.)**

- | | | | |
|--|---|----|----|
| 1. How do you diagnose and monitor diabetes mellitus. Add a Note on diabetic ketoacidosis. | 6 | 15 | 10 |
| 2. How do you assess the renal function? | 6 | 15 | 10 |

II. Short Questions:

- | | | | |
|---|---|---|---|
| 1. Interleukins. | 3 | 8 | 5 |
| 2. Glycated proteins. | 3 | 8 | 5 |
| 3. Hyperchloremic acidosis. | 3 | 8 | 5 |
| 4. Biochemical changes of acute hepatitis. | 3 | 8 | 5 |
| 5. Laboratory diagnosis of myocardial infarction. | 3 | 8 | 5 |
| 6. Markers of osteoblasts. | 3 | 8 | 5 |
| 7. Specific dynamic action. | 3 | 8 | 5 |
| 8. Plasma proteins. | 3 | 8 | 5 |

III. Reasoning Out:

- | | | | |
|--|---|----|---|
| 1. At low levels of plasma glucose, liver does not take up glucose. | 4 | 10 | 5 |
| 2. By modulating transcription, can hormone influence biological Effect. | 4 | 10 | 5 |
| 3. What is the body nitrogen balance in high intake of proteins-Why? | 4 | 10 | 5 |
| 4. What is the relationship of creatine kinase with thyroid hormones? | 4 | 10 | 5 |

IV. Very Short Answers :

- | | | | |
|------------------------------|---|---|---|
| 1. Renal amino aciduria. | 1 | 4 | 2 |
| 2. Hemopexin. | 1 | 4 | 2 |
| 3. IgM. | 1 | 4 | 2 |
| 4. Paradoxic aciduria. | 1 | 4 | 2 |
| 5. Calmodulin. | 1 | 4 | 2 |
| 6. Food additives. | 1 | 4 | 2 |
| 7. Pseudogout. | 1 | 4 | 2 |
| 8. Free radicals. | 1 | 4 | 2 |
| 9. Cobalt. | 1 | 4 | 2 |
| 10. What is flipped pattern? | 1 | 4 | 2 |

[LA 151]

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY
CLINICAL BIOCHEMISTRY, HUMAN NUTRITION ENDOCRINOLOGY,
IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY
Q.P. Code : 202046**

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

	Pages (Max.)	Time (Max.)	Marks (Max.)
I. Essay:			
1. What is LIS? Discuss the advantages of LIS in a tertiary care hospital.	9	5	10
2. Strategies to reduce pre analytical variation in a large hospital laboratory.	9	5	10
II. Short notes:			
1. Explain briefly about Hepcidin.	3	8	5
2. Endocrine function of Adipose tissue.	3	8	5
3. Glycated Hemoglobin and its significance.	3	8	5
4. Total parenteral nutrition.	3	8	5
5. Biochemical and metabolic effects of Cytokines.	3	8	5
6. Write briefly on Incretin Effect.	3	8	5
7. Types and function of Blood buffers.	3	8	5
8. Hypercalcemia of malignancy.	3	8	5
III. Reasoning Out:			
1. Large for date babies are commonly encountered in Gestational Diabetes.	5	10	5
2. Susceptibility to bacterial infection is a common complication of Multiple Myeloma.	5	10	5
3. Respiratory distress syndrome in premature infants.	5	10	5
4. Mental retardation in galactosemia.	5	10	5
IV. Very Short Answers :			
1. What is white thrombus?	1	4	2
2. Write two functions of Tissue Plasminogen activator.	1	4	2
3. What are stem cells?	1	4	2
4. Define pro- oxidants. Give an example.	1	4	2
5. Define acute phase proteins and give two examples.	1	4	2
6. Role of Osteoblasts in Bone metabolism.	1	4	2
7. Synthesis of Creatinine.	1	4	2
8. What is reverse Cholesterol transport?	1	4	2
9. Name two disorders of connective tissue and mention the enzyme affected.	1	4	2
10. Differentiate between phosphodiesterases and phosphoprotein phosphatases.	1	4	2

(LC 151)

APRIL 2013

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII - BIOCHEMISTRY**

**CLINICAL BIOCHEMISTRY, HUMAN NUTRITION, ENDOCRINOLOGY,
IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 marks

I. Essay : (2x10=20)

1. Write a note on Iron metabolism.
2. What are the biochemical functions of liver ?

II. Short Questions: (8x5=40)

1. Significance of TPO Ab
2. What is Microalbuminuria?
3. Significance of the Assessment of fetal lung maturity
4. Metabolic changes in type 2 diabetes
5. Inherited disorders of bilirubin metabolism
6. Biomedical importance of Insulin growth factors
7. Significance of Placental function
8. What is Carcinoembryonic antigen and its significance?

III. Reasoning Out: (4x5=20)

1. Oedema is not a feature of Conn's syndrome
2. Glycoproteins are important in fertilization.
3. Futile cycling of lipids occur.
4. Justify the changes in K_m and V_{max} in the presence of competitive inhibition.

IV. Very Short Answers: (10x2=20)

1. What are Antiphospholipid antibodies?
2. Enumerate the Subunits of lactose synthase.
3. What is Hereditary fructose intolerance?
4. Prognostic value of Prostate specific antigen
5. What are Atrial natriuretic peptides?
6. What is Chloride shift?
7. Biomedical significance of Human placental lactogen
8. What is Relative insulin deficiency?
9. What is anti – GAD?
10. What are the early biomarkers of kidney disorder?

[LD 151]

OCTOBER 2013

Sub. Code: 2046

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

CLINICAL BIOCHEMISTRY, HUMAN NUTRITION, ENDOCRINOLOGY,
IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 marks

I. Essay:

(2 x 10 = 20)

1. Enumerate the World Health Organization's criteria for the diagnosis of diabetes mellitus. Analyze in detail the use of laboratory tests in the diagnosis and monitoring of diabetes mellitus.
2. Enumerate the types and causes of jaundice. Discuss in detail the laboratory assessment of jaundice.

II. Short Questions:

(8 x 5 = 40)

1. Significance of parathyroid function tests.
2. Role of cdk-cyclin complexes.
3. Mechanisms of insulin signaling.
4. Causes and abnormalities in hyperkalemia.
5. Role of cytochrome c in apoptosis.
6. Various maternal screening tests for fetal abnormalities.
7. Significance of major histocompatibility locus.
8. Causes and compensation of respiratory acidosis.

III. Reasoning Out:

(4 x 5 = 20)

1. A drug is known to have a positive interference with the Jaffes test for creatinine. Reason out the impact on calculation of estimated GFR and the corrective actions that may be taken.
2. Discuss the advantages and disadvantages of total parenteral nutrition.
3. Discuss the pros and cons of point of care (POC) testing for cardiac markers.
4. How is RBC zinc protoporphyrin measured? Discuss the pros and cons of zinc protoporphyrin as a marker of iron deficiency anemia.

IV. Very Short Answers:

(10 x 2 = 20)

1. Diagnosis of plasmacytoma.
2. Specific dynamic action for proteins.
3. Role of leptin in obesity.
4. Markers for chronic alcoholism.
5. Proteins in the beta region of serum electrophoretic pattern.
6. Enzyme markers for obstructive jaundice.
7. Simple screening tests for aminoacidurias.
8. Significance of mutual supplementation of foods.
9. Causes of lactic acidosis.
10. Tests to assess fetal lung maturity.

(LE 151)

APRIL 2014

Sub. Code:2046

M.D. DEGREE EXAMINATION
BRANCH XIII - BIOCHEMISTRY
PAPER –IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY
Q.P.Code: 202046

Time: Three Hours

Maximum: 100 marks

I. Essay Questions:

(2X10=20)

1. Discuss in detail about the causes, types and compensatory mechanisms of Metabolic acidosis and alkalosis.
2. Metabolic Functions, regulation, associated disorders and laboratory assessment of adrenal medullary hormones.

II. Short Questions:

(8X5=40)

1. Dietary Fibre.
2. Oncofetal antigens as tumour markers.
3. CSF analysis.
4. Advanced Glycation end products.
5. Epigenetics.
6. Pancreatic Function tests.
7. Neonatal screening for inborn errors in protein metabolism.
8. Markers of bone resorption with their clinical utility.

III. Reasoning Out:

(4X5=20)

1. Why protein is expressed as a ratio with creatinine in spot urine examination?
2. CKD-EPI vs MDRD formula. Which is better for estimating GFR, Why?
3. Explain the reason for infertility in hypothyroid female patients.
4. Tandem Mass spectrometry is used only as a screening tool for aminoacidurias and not as diagnostic tool. Reason out.

IV. Very Short Answers:

(10X2=20)

1. Tangiers disease.
2. List the biomarkers of chronic alcoholism.
3. Fecal calprotectin.
4. Microalbuminuria and its clinical significance.
5. 2 Early and 2 late markers of myocardial infarction.
6. Co-peptin and its significance.
7. Clinical disorders associated with α_1 - antitrypsin.
8. Mention the hormones which act via JAK-STAT pathway.
9. Enzyme deficiency in McArdles disease and its clinical manifestation.
10. Class switching of immunoglobulins.

(LF 151)

OCTOBER 2014

Sub. Code:2046

**M.D. DEGREE EXAMINATION
BRANCH XIII - BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours

Maximum: 100 marks

I. Essay Questions:

(2 x 10 = 20)

1. Describe the different mechanisms of hormone action
2. What are aminoacidurias? What are the steps to evaluate aminoacidurias?

II. Short Questions:

(8 x 5 = 40)

1. Albuminuria.
2. Biochemical basis of Marasmus and Kwashiorkor.
3. Markers of bone turnover.
4. Evaluation of Growth hormone status in the body.
5. Serum total calcium.
6. Fredrickson's classification of lipoproteinemias – types, biochemical defect and laboratory findings.
7. HbA1c
8. Renal tubular acidosis.

III. Reasoning Out:

(4 x 5 = 20)

1. Why CK MB mass is preferred over CKMB activity in serum in the diagnosis of AMI.
2. What is the rationale behind the administration of Arginine and Benzoic acid in Urea Cycle Disorders.
3. Explain the reasons for biochemical findings in Type I GSD (Glycogen storage disease).
4. Why sometimes urine tests positive for Ketone Bodies although the patient is recovering from DKA and blood glucose levels are not very high.

IV. Very Short Answers:

(10 x 2 = 20)

1. Soret Band
2. Alpha feto protein
3. Immunoglobulins in acute and chronic infections
4. O'Sullivan & Mahan criteria of GDM
5. Medium Chain Acyl CoA dehydrogenase deficiency
6. Incretins and their function
7. Macroamylassemia
8. How will you calculate the expected compensation of pCO₂ in metabolic acidosis and metabolic alkalosis
9. 'Middle' molecules and their importance
10. Which is the best intracellular buffer pair and why?

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND
RECENT ADVANCES IN BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Essay:

(2 x 10 = 20)

1. Define a tumor marker. Classify them and describe their clinical utility.
2. Describe in detail the different biochemical tests to assess thyroid function.

II. Short Questions:

(8 x 5 = 40)

1. Tests to assess tubular function of the kidney.
2. Glycated hemoglobins – chemistry, clinical significance and methods of estimation.
3. What is Diet Induced Thermogenesis & explain its significance in human nutrition?
4. Patient preparation instructions and principle of methods of estimation and NCEP ATP III guidelines on interpretation of serum cholesterol.
5. Metabolism of alcohol and biochemical changes in chronic alcoholic liver disease.
6. Congenital Erythropoietic porphyria.
7. What is 'sick euthyroid syndrome' and what are its lab findings?
8. Cardiac troponins – types, their clinical utility and their pitfalls.

III. Reasoning Out:

(4 x 5 = 20)

1. It is preferable to use boronate affinity chromatography to estimate HbA1c in patients with chronic kidney disease than HPLC or column chromatography. Why?
2. Why is Prothrombin Time expressed as INR while monitoring oral anti coagulant therapy?
3. Why HGPRTase deficiency is associated with hyperuricemia?
4. Why an additional 10% calories is added to the total of BMR and physical activity while calculating the energy requirements of an individual?

IV. Very Short Answers:

(10 x 2 = 20)

1. Biochemical basis for phototherapy for neonatal hyperbilirubinemia.
2. What is meant by the term 'Transport Maximum' of a substance? What is the T_m for Glucose?
3. Quadruple screening test.
4. Glutamic acid decarboxylase 65 (GAD₆₅).
5. Peroxisome Proliferator Activated Receptor - γ and its function.
6. What is Macro CK and what is its significance?
7. What is meant by the term 'titrable acidity' in renal pH regulation?
8. Urea Reduction Ratio and its interpretation.
9. Tay Sach's disease.
10. Lipoprotein X.

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT
ADVANCES IN BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Essay:

(2 x 10 = 20)

1. Discuss the metabolic and biochemical derangements in Diabetic Ketoacidosis and also evaluation of the same.
2. How do you evaluate a patient with features of thyrotoxicosis?

II. Short Questions:

(8 x 5 = 40)

1. Regulation of serum calcium.
2. Brain natriuretic peptide.
3. Compensatory mechanism of metabolic alkalosis.
4. Hepcidin.
5. Polyclonal antibodies.
6. Gastro intestinal hormones.
7. Laboratory diagnosis of Rickets.
8. Markers of Glomerular filtration rate.

III. Reasoning Out:

(4 x 5 = 20)

1. Neutral aminoaciduria causes pellagra.
2. Iron is a one way element.
3. Glutathione S transferase acts as a scavenger in detoxification.
4. Vitamin K is necessary for clotting.

IV. Very Short Answers:

(10 x 2 = 20)

1. Fructosamine.
2. Carcino embryonic antigen.
3. Lipoprotein (a).
4. Enumerate the conditions with increased anion gap acidosis.
5. Gilbert's Syndrome.
6. Heat shock proteins (HSP).
7. C reactive protein.
8. Tubular proteinuria.
9. Markers of Bone resorption.
10. Hypokalemia.

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 10 = 20)

1. Discuss briefly the laboratory assessment of chronic renal failure.
2. Describe biochemical basis of senile and differentiate post menopausal Osteoporosis with the specific bio-markers.

II. Short Questions:

(8 x 5 = 40)

1. Metabolic alkalosis.
2. Hyponatremia.
3. Prostate specific antigen.
4. Body Mass Index.
5. Mechanism of action and catabolism of Thyroid hormones.
6. Cyclic AMP.
7. Delta bilirubin and its clinical significance.
8. Cytochrome P 450.

III. Reasoning Out:

(4 x 5 = 20)

1. Carbonic anhydrase inhibitors cause normal anion gap metabolic acidosis.
2. While correcting diabetic ketoacidosis, hypokalemia may occur.
3. Paresthesia in respiratory alkalosis.
4. Alpha-1 anti trypsin deficiency is produced in nephrotic syndrome.

IV. Very Short Answers:

(10 x 2 = 20)

1. Synthesis of cortisol.
2. Endorphins.
3. Fractional excretion of Sodium.
4. Macroamylasemia.
5. Schilling test.
6. Gamma Glutamyl transferase.
7. Xanthomas.
8. C reactive protein.
9. Urine preservatives.
10. Role of Vitamin E in hemolytic anemia.

(LJ 151)

OCTOBER 2016

Sub. Code:2046

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 10 = 20)

1. Describe the Neonatal screening for inborn errors of metabolism.
2. Discuss the role of cardiac markers in assessing myocardial infarction.

II. Short Questions:

(8 x 5 = 40)

1. Glycated haemoglobin.
2. Significance of Anti microsomal antibodies and anti thyroglobulin.
3. How will you diagnose renal tubular Acidosis type I?
4. Multiple myeloma.
5. Balanced diet for lactating Woman.
6. Sickle cell syndrome.
7. Cytochrome p 450.
8. Carboxy haemoglobin.

III. Reasoning Out:

(4 x 5 = 20)

1. Zinc is used for treating Wilson's disease.
2. Lactic acidosis is seen in patients getting biguanides.
3. Diabetic mothers tend to have big babies.
4. Transferrin is used as a better index of protein turnover than albumin.

IV. Very Short Answers:

(10 x 2 = 20)

1. Prostate specific antigen.
2. Anion gap.
3. Histidine load test.
4. Hypokalemia.
5. Role of antioxidants.
6. Activation of vitamin D.
7. Biochemical basis of phototherapy in Physiologic jaundice.
8. Parathyroid function tests.
9. Significance of transketolase activity.
10. Role of chromium.

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours**Maximum: 100 Marks****I. Essay Questions:****(2 x 10 = 20)**

1. What are the causes of Conn's syndrome? Describe in detail the steps involved in the estimation and interpretation of Aldosterone renin ratio. What are the other biochemical changes and clinical features of Conn's syndrome?
2. What are the factors affecting plasma potassium concentration? Mention the renal and nonrenal causes of hypokalemia. Write an algorithm for investigation of hypokalemia.

II. Short Questions:**(8 x 5 = 40)**

1. Estimation of GFR.
2. Quadruple screening.
3. Principles of planning energy requirement for an adult male.
4. Frederickson's classification of dyslipoproteinemias – types, defect and biochemical findings.
5. Homocystinurias.
6. PSA – biochemistry, clinical utility and interpretation of PSA values.
7. Investigations of hypoglycemia.
8. Laboratory assessment of Rickets.

III. Reasoning Out:**(4 x 5 = 20)**

1. Excess intake of Lathyrus odoratus presents with skeletal deformities. Why?
2. Paternal Inheritance of defective PTH receptor allele causes pseudopseudo hypo parathyroidism. Why?
3. 5 α reductase defect presents as 'penis at 12' syndrome. Justify.
4. Fractional excretion of sodium less than in prerenal cause of ARF. Why?

IV. Very Short Answers:**(10 x 2 = 20)**

1. What is lithogenic bile?
2. BMR.
3. What is the diagnostic significance of spot urinary chloride?
4. What is sick euthyroid syndrome?
5. What is ALD disease?
6. Biochemical assessment of Adrenoleuko dystrophy mucopolysaccharidoses.
7. What is Delta Anion gap and its significance?
8. What is the significance of delta bilirubin?
9. What is 1, 5 anhydro glucitol? What is its significance?
10. FIGLU test.

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 10 = 20)

1. Explain Preclinical and clinical markers of Diabetes Mellitus.
2. Explain the Mechanism of Action of Hormones with suitable examples.

II. Short Questions:

(8 x 5 = 40)

1. Post prandial hypo glycemia.
2. Amylase/creatinine clearance Ratio.
3. Classical Phenyl Ketonuria.
4. Dinitro Phenyl Hydrazine Test.
5. Overload Proteinuria.
6. Clinical Importance of Serum Alkaline Phosphatase.
7. Unconjugated Hyper Bilirubinuria.
8. Cardiac Troponin I.

III. Reasoning Out:

(4 x 5 = 20)

1. There is Peak incidence of Acute Myocardial Infarction in the early morning.
2. Cardiac TroponinT is not effective in early diagnosis of Myocardiac infarction.
3. Sample for Plasma Renin activity should not be kept in ice.
4. Borderline values of Lecithin Sphingomyelin ratio cannot be interpreted.

IV. Very Short Answers:

(10 x 2 = 20)

1. Non Thyroid illness.
2. Screening tests for Cushing syndrome.
3. Lab. Evaluation of Hirsutism.
4. Evaluation of Ovulation.
5. Amniotic fluid alpha - Fetoprotein.
6. Diagnostic Criteria of Gestational Diabetes Mellitus.
7. Self Monitoring of Blood glucose.
8. Dual Phorphyria.
9. Watson Schwartz test.
10. Ovarian Tumour Markers.

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P.Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Discuss in detail the synthesis, regulation, mechanism of action and functions of Thyroid Hormones. Add a note on laboratory evaluation of Hypothyroidism.
2. Define Tumor markers. Discuss in detail about carbohydrate marker, oncofetal antigen, receptors and their clinical applications.

II. Short notes:

(10 x 5 = 50)

1. Metabolic changes in Type 2 Diabetes Mellitus.
2. Tests to assess the tubular functions of Kidney.
3. Laboratory diagnosis of Myocardial infarction.
4. Secondary Hyperparathyroidism.
5. Neonatal Screening.
6. Hypomagnesemia.
7. Markers of Bone Resorption.
8. SIADH.
9. Paraproteinemias.
10. Addison's disease.

III. Reasoning Out:

(4 x 5 = 20)

1. Point mutation results in Malignant Hyperthermia.
2. Digitalis is a Positive Inotropic agent.
3. Anti – oxidant can be Pro-oxidant.
4. Epigenetic mechanisms involved in cancer.

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Write in detail the Biochemistry, mechanism of actions, function and clinical significance of Anti-Diuretic Hormone. Add a note on laboratory evaluation of Diabetes Insipidus.
2. Write in detail the synthesis, secretion, mechanism of action and biological functions of Parathyroid Hormones. Add a note on its measurement.

II. Short notes:

(10 x 5 = 50)

1. Diabetic Keto Acidosis.
2. Metabolic syndrome.
3. Proteinuria.
4. Exocrine pancreatic functions tests.
5. Hypoglycemia.
6. Bio- markers of Acute Kidney Injury.
7. Thyroid Hormone Resistance.
8. Pheochromocytoma.
9. Laboratory tests for Growth Hormone Deficiency.
10. Protein Energy Malnutrition.

III. Reasoning Out:

(4 x 5 = 20)

1. Prothrombin time is interpreted as INR.
2. Renal tubular acidosis is associated with Normal anion gap Metabolic Acidosis.
3. Prion disease is protein conformation disease.
4. NF-kB pathway is regulated by Glucocorticoids.

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Write an essay on Hormones produced by Pancreas, their mechanism of action, biochemical functions and assay methods.
2. Essay on cardiac Biochemical function tests with respect to Acute Myocardial infarction.

II. Short notes:

(10 x 5 = 50)

1. Directed evolution of enzyme.
2. Obesity.
3. Antisense therapy.
4. Starvation Keto acidosis.
5. Homocystinurias.
6. Acute Phase reactants.
7. Tubular function tests.
8. Growth factors.
9. Serum Electrolytes.
10. Screening tests for Inborn errors of aminoacid metabolism.

III. Reasoning Out:

(4 x 5 = 20)

1. Aldosterone receptor is not sensitive to Cortisol.
2. Muscle weakness and Headache are common in Conn's syndrome.
3. Vmax decreases in non competitive enzyme inhibition.
4. Creatine kinase in Thyroid dysfunction.

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. What are the hormones acting on Calcium homeostasis? How do they act in the regulation of serum Calcium? Add a note on the investigations in hypocalcemia and hypercalcemia.
2. Write an essay on Biochemical investigations for a case of Hepatocellular Carcinoma?

II. Short notes:

(10 x 5 = 50)

1. Phage display.
2. Antenatal screening.
3. Synthetic nucleotide analogues.
4. Immunoglobulins.
5. Fortification of food.
6. Cytokines.
7. Biochemical functions of Placenta.
8. Clinical manifestations of Peroxisomal dysfunction.
9. Serum Lipid profile.
10. Gastro intestinal hormones.

III. Reasoning Out:

(4 x 5 = 20)

1. In MODY HbA1c is normal.
2. In Glucose metabolism Substrate cycles are not futile cycles.
3. Pompe's disease infantile form is associated with failure to thrive.
4. Benzoate is used in treatment of Urea cycle defects.

[LQ 151]

**AUGUST 2020
(MAY 2020 SESSION)**

Sub. Code: 2046

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. What is LIS? Discuss the advantages of LIS in a tertiary care hospital.
2. Strategies to reduce pre analytical variation in a large hospital laboratory.

II. Short notes:

(10 x 5 = 50)

1. Explain briefly about hepcidin.
2. Endocrine function of adipose tissue.
3. Glycated hemoglobin and its significance.
4. Total parenteral nutrition.
5. Investigations for female infertility.
6. Write briefly on incretin effect.
7. Types and functions of blood buffers.
8. Hypercalcemia of malignancy
9. Biochemical and metabolic effects of interleukins.
10. Functions of placenta.

III. Reasoning Out:

(4 x 5 = 20)

1. Large for date babies are commonly encountered in Gestational diabetes
2. Susceptibility to bacterial infection is a common complication of Multiple myeloma.
3. Ferritin as a biomarker of inflammation.
4. Prebiotics and probiotics

[LS 151]

NOVEMBER 2020
(OCTOBER 2020 SESSION)
M.D. DEGREE EXAMINATION

Sub. Code: 2046

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. What is automation of Clinical Laboratory? Discuss the sections in a clinical laboratory that can be automated.
2. Write briefly on quality control in laboratory. What are the variables that affect quality of the test reports?

II. Short notes:

(10 x 5 = 50)

1. Write briefly on GLP –I.
2. Biochemistry and functions of Neurotransmitters.
3. Metabolic aspects of Osteoporosis.
4. Explain Dietary supplements.
5. Functions of Growth factors.
6. Prenatal Diagnosis and its applications.
7. Principles of Dialysis.
8. Interpretation of Thyroid function tests in pregnancy
9. Glycosurias and their clinical importance.
10. Biochemical and metabolic effects of Interleukins.

III. Reasoning Out:

(4 x 5 = 20)

1. Early cataract formation in Diabetes mellitus.
2. Biochemical basis of renal osteodystrophy.
3. Bone is a dynamic tissue
4. Mechanism of hepatic encephalopathy.

[MD 0721]

JULY 2021
(MAY 2021 SESSION)
M.D. DEGREE EXAMINATION

Sub. Code: 2046

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Write in detail about laboratory diagnosis and monitoring of diabetes mellitus.
2. Explain biochemical derangements in metabolic syndrome.

II. Short notes:

(10 x 5 = 50)

1. Vitamin D resistant osteomalacia.
2. Indirect tests of pancreatic function.
3. Sex hormone binding globulin.
4. Biosynthesis of catecholamines.
5. cAMP as intracellular signal.
6. Balanced Diet.
7. Laboratory investigation of amenorrhea.
8. Congenital adrenal hyperplasia.
9. Biochemical screening for Down syndrome.
10. Congenital erythropoietic porphyria.

III. Reasoning Out:

(4 x 5 = 20)

1. Urine Ketones lack clinical specificity for diabetic keto acidosis.
2. Friedwald equation should not be used for samples with Triglycerides over 400mg%.
3. Free T₄ assay is more preferable than Total T₄ assay.
4. In Dubin Johnson syndrome, Urine Urobilinogen will be elevated.

[MD 1121]

NOVEMBER 2021
(OCTOBER 2021 SESSION)
M.D. DEGREE EXAMINATION

Sub. Code: 2046

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. How will you investigate a case of Jaundice?
2. Explain the laboratory assessment of Osteoporosis.

II. Short notes:

(10 x 5 = 50)

1. Vitamin D dependent Osteo malacia.
2. Screening tests for Mal absorption syndromes.
3. Classify hormones according to mechanism of action with suitable examples.
4. Corticosteroid binding globulin.
5. c GMP as intra cellular Signal.
6. Dietary fibre.
7. Laboratory investigation of Male hypogonadism.
8. Addison's disease.
9. Acute intermittent Porphyria.
10. Self Monitoring of Blood Glucose.

III. Reasoning Out:

(4 x 5 = 20)

1. Hyperthyroidism can occur in patients with Trophoblastic tumours.
2. Plasma Anti Diuretic Hormone levels should always be correlated with plasma osmolality.
3. In Gilbert syndrome, Urine Urobilinogen will be absent.
4. Serum TSH levels are best for monitoring T₄ replacement therapy in Hypothyroidism.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0522]

MAY 2022

Sub. Code: 2046

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Detail the investigation and probable diagnosis for a 55 year old male with a history of abdominal distension, vomiting and passing clay coloured stools.
2. Explain the mechanism the body adapts to maintain blood PH. Add a note on its disorders.

II. Short notes:

(10 x 5 = 50)

1. Bone markers.
2. Adipose tissues as an endocrine organ.
3. Female infertility hormones.
4. Polyclonal antibodies.
5. Cerebrospinal fluid analysis.
6. Hormones of the adrenal glands.
7. Inborn errors of fructose metabolism.
8. Hyperparathyroidism.
9. Acute kidney injury.
10. Von-Geirke disease.

III. Reasoning Out:

(4 x 5 = 20)

1. Monosodium glutamate a food additive causes sudden acute headache and sweating with tingling sensation. Explain.
2. Diabetic ketoacidosis affects the potassium balance. How?
3. Respiratory alkalosis is caused by hyperventilation. Explain
4. Newborn had jaundice immediately after birth. Explain the biochemical basis.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 1022]

OCTOBER 2022

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

I. Essay Questions:

(2 x 15 = 30)

1. Describe the Neonatal screening for inborn Errors of Metabolism (IEM).
2. Discuss briefly the various Renal Function tests and explain their significance.

II. Short notes:

(10 x 5 = 50)

1. C.S.F. analysis.
2. Biomarkers of Sepsis and their significance.
3. Sick Euthyroid syndrome and its lab findings.
4. Hypokalemia – Algorithm to Biochemical Evaluation.
5. Lab diagnosis of Pheochromocytoma.
6. Delta Bilirubin and its significance.
7. Biochemical Markers in Covid 19.
8. Prediabetes.
9. Multiple Myeloma.
10. Newer cardiac markers.

III. Reasoning Out:

(4 x 5 = 20)

1. Large for date babies are commonly seen in Gestational Diabetes Mellitus.
2. Renal Tubular Acidosis is associated with Normal Anion Gap Metabolic Acidosis.
3. There is a peak incidence of Acute Myocardial Infarction in early morning.
4. Lactic Acidosis is seen in patients on treatment with Biguanides.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 0723]

**JULY 2023
(MAY 2023 EXAM SESSION)**

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

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

1. Define Polyuria. Discuss in detail about causes and investigations of Polyuria.
2. What is Laboratory Information System (LIS)? Discuss the advantages of Laboratory Information System in a Tertiary Care Hospital.

II. Short notes: (10 x 5 = 50)

1. Types of Renal Tubular Acidosis.
2. Biochemical basis of Diabetic complications.
3. Wolman's disease.
4. Circulating Tumour Markers.
5. Gene Therapy.
6. Algorithm for the differential diagnosis of Hyperkalemia.
7. Explain briefly about Hepcidin.
8. Role of CDK-cyclin complexes.
9. Biochemical markers in Amniotic fluid.
10. Hypogonadotropic Hypogonadism.

III. Reasoning Out: (4 x 5 = 20)

1. Cholera and Whooping Cough are due to altered G-Protein Activity.
2. Urinary Anion Gap is negative in Ureterosigmoidostomy. Explain.
3. Intact PTH is not a reliable indicator of bone turnover in dialysis patients. Why?
4. A drug is known to have a positive interference with the Jaffe's test for creatinine. Reason out the impact on calculation of estimated GFR and the corrective actions that may be taken.

THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY

[MD 1223]

**DECEMBER 2023
(OCTOBER 2023 EXAM SESSION)**

Sub. Code: 2046

**M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY**

**PAPER IV – CLINICAL BIOCHEMISTRY, HUMAN NUTRITION,
ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN
BIOCHEMISTRY**

Q.P. Code: 202046

Time: Three Hours

Maximum: 100 Marks

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

1. An essay on Biochemical investigations for a 30 year old female with a Thyroid Swelling.
2. What is Base deficit? Explain the Biochemical aspects related to condition of Low pH.

II. Short notes: (10 x 5 = 50)

1. Gonadotropins.
2. Biomarkers for Hepatocellular carcinoma.
3. Calcium as second messenger.
4. Pleural Fluid analysis.
5. Monoclonal antibodies.
6. Diabetes insipidus.
7. Lactate dehydrogenase.
8. Procalcitonin.
9. Nutritional aspects of Protein.
10. Serum Electrolytes.

III. Reasoning Out: (4 x 5 = 20)

1. Fructosamine in Diabetes Mellitus.
2. Point of care testing in Myocardial infarction.
3. Role of Human Placental Lactogen.
4. Zinc is used in treating Wilson's disease.
