[KD 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

(Revised Regulations)

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. What is quaternary structure of protein? Give examples for proteins having quaternary structure. Write the forces that stabilize this structure. Justify that the structure of collagen is suitable for its function. (25)

2. Mention the normal serum level of Na^+ and K^+ in the blood. Explain the principle behind the flame photometric analysis of these electrolytes. Describe how these electrolytes are estimated colorimetrically. (25)

3. Write short notes on :

(a) Donnan's membrane equilibrium.

(b) Mucopolysaccharides — composition and function of any three of them.

(c) Radioisotope and clinical applications of any three of them.

(d) Surface tension and its biological application.

(e) Biologically important buffers and their applications. (5 × 10 = 50)

November-2001

[KE 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. Discuss the structure and function of different classes of immunoglobulins. Elaborate on the mechanism of anti–body synthesis at the cellular level. (25)

2. What is a Buffer? Discuss in detail the role of buffers in maintaining the pH of blood. (25)

3. Write short notes on : (5 × 10 = 50)

(a) Ion Exchange Chromotography.

(b) Polymerase chain reaction.

(c) ELISA.

(d) Ionophores.

(e) H.P.L.C.

[KG 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. Describe the structure of hemoglobin as related to its physiological functions. (25)

2. What are radioisotopes and stable isotopes? Describe the methods employed for the measurement of radioactivity. Discuss the application of isotopes in Biochemistry. Add a note on radioisotopes of medical significance. (25)

3. Write briefly on : (5 × 10 = 50)

(a) Biologically active peptides.

(b) Active transport.

(c) Functions of nucleotides.

(d) Beer–Lambert's law.

(e) Henderson – Hasselbalch equation and its significance in the bicarbonate buffer system.

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[KH 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. What are glycosaminoglycans? Describe the structure and functions of the different glycosaminoglycans. Add a note on proteoglycans. (25)

2. What are the different levels of protein organisation? Describe the methods used to determine the primary structure of proteins. (25)

3. Write short notes on : (5 × 10 = 50)

   (a) Blot transfer techniques.

   (b) RIA.

   (c) Phospholipids

   (d) Methods of separation of lipoproteins.

   (e) Glutathione.

April-2003

[KI 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Answer ALL questions.

1. What are proteins? Describe the structural organization of proteins. Discuss how the protein are precipitated. (25)

2. What is Beer's law? Describe in detail about various colourimeters. (25)

3. Write short notes on : (5 × 10 = 50)

(a) Henderson – Hesselbalch reaction or equation

(b) Water as ideal biological solvent – Discuss

(c) Glyco–Lipids and their biomedical significance

(d) Affinity chromatography

(e) Radial immuno diffusion (Mancini's technique).

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[KJ 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours — Maximum : 100 marks

Theory : Two hours and Forty minutes — Theory : 80 marks

M.C.Q. : Twenty minutes — M.C.Q. : 20 marks

M.C.Q. must be answered **SEPARATELY** on the answer sheet provided as per the instructions given on the first page of M.C.Q. Booklet.

Answer ALL questions.

Draw suitable diagrams wherever necessary.

1. Discuss the factors involved in transport across cell membrane. (15)

2. Discuss the principle of electrophoresis and mention different types of electrophoresis available. (15)

3. Write short notes on : (10 × 5 = 50)

(a) Principles of Radio Immuno Assay

(b) Iso Electric focusing

(c) ELISA technique

(d) Watson Crick model of DNA

(e) Glutathione

(f) Phospholipids

(g) Structure of Glycogen

(h) Calmodulin

(i) Flame photometry

(j) Sickle cell hemoglobin.

[KM 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

I. Essay : (2 × 15 = 30)

(1) Discuss the principles of electrophoresis and its applications in clinical biochemistry.

(2) Write briefly on principle and application of spectrophotometry.

II. Write short notes : (10 × 5 = 50)

(a) ELISA

(b) Isoelectric focussing

(c) Donnan membrane equilibrium

(d) Radioimmunoassay

(e) PCR

(f) Gel filtration chromatography

(g) RELP

(h) Paper chromatography

(i) Ultracentrifugation

(j) HPLC.

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March-2006

[KO 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours — Maximum : 100 marks

Theory : Two hours and forty minutes — Theory : 80 marks

M.C.Q. : Twenty minutes — M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay : (2 × 15 = 30)

(1) Explain the principles involved and the basic components of HPLC. Mention its application in biology and medicine.

(2) What are the different mechanisms by which enzyme activity is modulated in biological systems? Explain with suitable examples.

II. Write short notes on : (10 × 5 = 50)

(a) Anapleurotic reactions of TCA cycle

(b) Phospholipids

(c) Flame photometry

(d) Mucopolysaccharides

(e) Membrane proteins

(f) Renal mechanism of acid base balance

(g) Factors affecting electrophoresis

(h) Mutarotation

(i) Prostaglandins

(j) Glycosides.

[KO 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay : (2 × 15 = 30)

(1) Explain the principles involved and the basic components of HPLC. Mention its application in biology and medicine.

(2) What are the different mechanisms by which enzyme activity is modulated in biological systems? Explain with suitable examples.

II. Write short notes on : (10 × 5 = 50)

(a) Anapleurotic reactions of TCA cycle

(b) Phospholipids

(c) Flame photometry

(d) Mucopolysaccharides

(e) Membrane proteins

(f) Renal mechanism of acid base balance

(g) Factors affecting electrophoresis

(h) Mutarotation

(i) Prostaglandins

(j) Glycosides.

[KP 172] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

(Revised Regulations)

Branch XIII — Biochemistry

Paper I — PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Time : Three hours — Maximum : 100 marks

Theory : Two hours and forty minutes — Theory : 80 marks

M.C.Q. : Twenty minutes — M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay :

1. Discuss the structure of protein in detail. How is the structure of protein established? (20)

2. Discuss in detail radio isotopes and their uses. (15)

3. What are various Buffers system in our body? Discuss their role in regulation of pH. (15)

II. Write Short notes on : (6 × 5 = 30)

(a) Density gradient ultra centrifugation

(b) Plasma buffers.

(c) Tandem mass spectrometry

(d) Membrane transport systems

(e) HPLC

(f) Fluid mosaic model.

[KQ 149] **Sub. Code : 2071**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Common to :

Paper I (Old/New/Revised Regulations) (Candidates admitted from 1988–89 onwards)

and

Paper I (For candidates admitted from 2004–2005 onwards)

Time : Three hours — Maximum : 100 marks

Theory : Two hours and forty minutes — Theory : 80 marks

M.C.Q. : Twenty minutes — M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay :

1. Discuss in detail about the principle, types and applications of Electrophoresis. (20)

2. Describe the fluorimetric techniques and their applications. (15)

3. Enumerate the structure and various functions of heteropolysaccharides. (15)

II. Write short notes on : (6 × 5 = 30)

(a) Transport proteins.

(b) Biochemical findings in acidosis.

(c) Atomic absorption spectroscopy (AAS).

(d) Sphingolipids.

(e) Ion-exchange chromatography.

(f) Small nuclear RNAs (Sn RNAs).

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[KR 160] **Sub. Code : 2056**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Common to :

Paper I (Old/New/Revised Regulations)
(Candidates admitted from 1988–89 onwards)
and
Paper I (For candidates admitted from 2004–05 onwards)

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

I. Essay :

1. Give in detail the structure, classes and properties of immunoglobulins. (20)

2. Principle and applications of spectrophotometry in the study of enzyme kinetics. (15)

3. Describe the structures, functions of polyunsaturated fatty acids and their derivatives. (15)

II. Write short notes on : (6 × 5 = 30)

(a) Poly Acrylamide Gel Electrophoresis (PAGE)

(b) Collagen

(c) Glucose challenge test

(d) Chemical composition of cell membranes

(e) Buffers of renal system

(f) Types of auto pippettes.

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MARCH 2008

[KS 148] **Sub. Code : 2043**

M.D. DEGREE EXAMINATION.

Branch XIII — Biochemistry

PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION AND BIOCHEMICAL TECHNIQUES

Common to all regulations

Q.P. Code : 202043

Time : Three hours Maximum : 100 marks

Answer ALL questions.

Draw diagram wherever necessary.

I. Essay questions : ($2 \times 20 = 40$)

1. Give an account of the structural organisation of proteins and a note on denaturation. (20)

2. Write in detail on the technique of high performance liquid chromatography. (20)

II. Write short notes on : ($10 \times 6 = 60$)

1. Mucopolysaccharides.

2. Membrane structure.

3. Phospholipids.

4. DNA structure.

5. Ion selective electrodes.

6. ELISA.

7. Radio isotopes in metabolic studies.

8. Ultracentrifugation.

9. Donnan membrane equilibrium.

10. Henderson-Hasselbalch equation.

October 2011

[KZ 148] **Sub. Code: 2043**

M.D. DEGREE EXAMINATION

BRANCH XIII – BIOCHEMISTRY

PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION BIOCHEMICAL TECHNIQUES, BIOSTATISTICS

Q.P. Code : 202043

Time : 3 hours (180 Min) **Maximum : 100 marks**

Answer ALL questions in the same order.

I. Essay :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. Discuss the atomic absorption spectrophotometry and mention its uses.	6	15	10
2. Describe the structure and properties of immunoglobins	6	15	10
II. Short Questions:			
1. Buffers.	3	8	5
2. Starch.	3	8	5
3. Amino acids not found in proteins.	3	8	5
4. Osmometry.	3	8	5
5. Lipoproteins.	3	8	5
6. Management of radioactive wastes.	3	8	5
7. ELISA.	3	8	5
8. Isoelectric focusing.	3	8	5
III. Reasoning Out:			
1. What is the reason for increased mobility of albumin in protein electrophoresis?	4	10	5
2. What is the significance of ionic strength of buffer electrophoresis?	4	10	5
3. What is the reason for using polymeric packings as an alternative to silica in High performance liquid chromatography?	4	10	5
4. Hydrophobic interaction as a result of association of nonpolar groups is Favoured in polar solutions of protein - why?	4	10	5
IV. Very Short Answers :			
1. Define Outlier.	1	4	2
2. Heparin.	1	4	2
3. Principle of flurometry.	1	4	2
4. Uronic acids.	1	4	2
5. Mean.	1	4	2
6. Restriction fragment length polymorphism.	1	4	2
7. Peptide bond.	1	4	2
8. Accuracy.	1	4	2
9. Electroendosmosis.	1	4	2
10. Surface tension.	1	4	2

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April 2012

[LA 148] **Sub. Code: 2043**

M.D. DEGREE EXAMINATION
BRANCH XIII – BIOCHEMISTRY
PAPER I – PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION BIOCHEMICAL TECHNIQUES, BIOSTATISTICS
Q.P. Code : 202043

Time : 3 hours **Maximum : 100 marks**
(180 Min)

Answer ALL questions in the same order.

	Pages (Max.)	Time (Max.)	Marks (Max.)
I. Essay:			
1. Explain in detail the principle of Mass Spectrometry and its application in Clinical Biochemistry.	9	15	10
2. What is Turn-Around –Time? Explain the ways of improving Turn-around –Time in the laboratory of a large hospital.	9	15	10
II. Short Questions:			
1. Amyloidosis and its clinical importance.	3	8	5
2. Types and functions of Collagen.	3	8	5
3. Clinical aspects of nutritional anaemias.	3	8	5
4. Biochemical basis of including fibre in the diet.	3	8	5
5. Function of Protein Kinases.	3	8	5
6. Fatty acyl CoA dehydrogensases.	3	8	5
7. Liquid Chromatography and its applications.	3	8	5
8. Synthesis of Triacylglycerols.	3	8	5
III. Reasoning Out:			
1. Fetal blood has a higher affinity for oxygen than does adult blood.	5	10	5
2. Individuals with malabsorption disorders are advised to include short and medium chain fatty acids in the diet – explain.	5	10	5
3. Explain the mechanism of action of PABA analogs.	5	10	5
4. Deficiency of the urea cycle enzyme Ornithine Transcarbamoylase can cause excretion of pyrimidine precursors- explain	5	10	5
IV. Very Short Answers :			
1. 1. Express the following laboratory values (given in conventional units) in S.I units. Blood Glucose 120 mg/dl Blood Urea 40 mg /dl Serum Creatinine 2.0 mg/dl Serum Total Protein 6.8g/dl	1	4	2
2. Define Bioluminescence	1	4	2
3. Write the principle of Flurometry.	1	4	2
4. What is Type I reagent grade water?	1	4	2
5. What is meant by Standard Reference Material? Give an example.	1	4	2
6. What are salvage reactions of Pyrimidine bioystnthesis?	1	4	2
7. What is Xanthine lithiasis ?	1	4	2
8. Give examples of modifications of amino acid that are already present in peptides.	1	4	2
9. Define Edman Reaction.	1	4	2
10. Write the principle of Iso-electric focusing.	1	4	2

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