

2406120201010501
EXAMINATION JANUARY 2025
DOCTOR OF MEDICINE
DOCTOR OF MEDICINE (BIOCHEMISTRY)
PAPER - I - LEVEL 1

[Time: As Per Schedule]

[Max. Marks: 100]

Instructions:

1. Fill up strictly the following details on your answer book
 - a. Name of the Examination : **DOCTOR OF MEDICINE**
 - b. Name of the Subject : **DOCTOR OF MEDICINE (BIOCHEMISTRY) PAPER - I - LEVEL 1**
 - c. Subject Code No : **2406120201010501**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 Write/Draw principle of absorption Spectrophotometry, atomic absorption Spectrophotometry, flame emission Spectrophotometry, fluorometry and chemiluminescence measurement. Describe basic concepts of light sources, spectral isolation and signal detection systems used in absorption Spectrophotometry. Add a note on its applications in medical laboratories. **25**

Q.2 Write short notes **25**

1. What are the requirements of Laboratory Information System (LIS) in ISO 15189:2022 Describe important aspects to look for while procuring an LIS system?
2. Write short note on Risk management of Pre analytical Process in clinical biochemistry laboratory
3. ISO 15189:2022 requirement for report content
4. Planning and technical requirement of internal audit of laboratory.
5. What is NABL Accreditation? Write Difference between accreditation and certification. Explain difference between process and procedure.

Q.3 Write short notes

25

1. Methods and Pre analytical errors in collection of blood for ABG analysis.
2. Order of draw for blood collection.
3. Mechanism of action of corticosteroids and NSAIDS as anti-inflammatory agents.
4. Teaching methods for small group.
5. OSPE& OSCE

Q.4 Write short notes

25

1. Relationship among trueness, accuracy, bias, precision and total error of measurement
2. Write different types of study designs. Write different methods of sampling in research.
3. Tumor markers.
4. Characteristics of a good MCQ item
5. Meta-analysis and Systemic review.

*****END*****

2406120201010502
EXAMINATION JANUARY 2025
DOCTOR OF MEDICINE
DOCTOR OF MEDICINE (BIOCHEMISTRY)
PAPER - II - LEVEL 1

[Time: As Per Schedule]

[Max. Marks: 100]

Instructions:

1. Fill up strictly the following details on your answer book
 - a. Name of the Examination : **DOCTOR OF MEDICINE**
 - b. Name of the Subject : **DOCTOR OF MEDICINE (BIOCHEMISTRY) PAPER - II - LEVEL 1**
 - c. Subject Code No : **2406120201010502**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 Describe characteristics of various hyper- and hyperlipoproteinemias and their clinical significance. Write drugs commonly used to treat cardiovascular risk and their biochemical basis. Add a note on fatty liver and alcohol metabolism. **25**

Q.2 Write short notes **25**

1. Methemoglobinemia - causes, biological response and treatment.
2. Absorption of iron. Write regulation of synthesis of Ferritin and Transferrin-receptor
3. Biochemical basis of etiology, diagnosis and treatment of unconjugated neonatal hyperbilirubinemia.
4. Peroxisomal protein sorting and Zellweger syndrome. Explain ubiquitin mediated protein degradation
5. Chaperones and proteir misfolding disorders.

Q.3 Write short notes **25**

1. Metabolic inter relationship among various tissues in well fed state and starvation.
2. Proto-oncogenes and Oncogenes.
3. Metabolic acidosis.
4. Mitochondrial and metabolic theory of aging
5. Vitamin K cycle and drugs acting on it

Q.4 Write short notes

25

1. Describe ammonia metabolism. Why is ammonia toxic?
2. Collagen synthesis and its disorder
3. Biochemical basis of etiology, clinical features, diagnosis and treatment of various hyperhomocystinemia
4. Biochemical principle of Dithionite test for sickle cell anemia
5. Metabolic derangement in chronic kidney disease

*****END*****

2406120201010503
EXAMINATION JANUARY 2025
DOCTOR OF MEDICINE
DOCTOR OF MEDICINE (BIOCHEMISTRY)
PAPER - III - LEVEL 1

[Time: As Per Schedule]

[Max. Marks: 100]

Instructions:

1. Fill up strictly the following details on your answer book
 - a. Name of the Examination : **DOCTOR OF MEDICINE**
 - b. Name of the Subject : **DOCTOR OF MEDICINE (BIOCHEMISTRY) PAPER - III - LEVEL 1**
 - c. Subject Code No : **2406120201010503**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 What is real-time PCR? Discuss the various dyes and probes used in real-time PCR. How is DNA amplification detected and quantified in real-time PCR? **25**

Q.2 Write short notes **25**

1. Mechanisms of double-stranded DNA break repair and their clinical significance.
2. DNA packing in metaphase chromosomes
3. Structure, function and inhibitors of DNA topoisomerases
4. Iodide metabolism in the thyroid follicle
5. Transposons and pseudo genes

Q.3 Write short notes **25**

1. Protein folding and disorders associated with it
2. Biogenesis and function of siRNA and miRNA
3. Somatic hyper mutation, affinity maturation and Isotype switching in B lymphocytes
4. Genomic and cDNA libraries
5. Biochemical causes, etiology, and treatment of hyperuricemia

Q.4 Write short notes

25

1. Insulin signalling pathway
2. CRISPER
3. Tumor Markers
4. Flow chart for biochemical investigation in suspected case of hyperthyroidism and hypothyroidism.
5. Post translational modification in collagen

*****END*****

2406120201010504
EXAMINATION JANUARY 2025
DOCTOR OF MEDICINE
DOCTOR OF MEDICINE (BIOCHEMISTRY)
PAPER - IV - LEVEL 1

[Time: As Per Schedule]

[Max. Marks: 100]

Instructions:

1. Fill up strictly the following details on your answer book
 - a. Name of the Examination : **DOCTOR OF MEDICINE**
 - b. Name of the Subject : **DOCTOR OF MEDICINE (BIOCHEMISTRY) PAPER - IV - LEVEL 1**
 - c. Subject Code No : **2406120201010504**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 Explain the concept of assay calibration. What is the relationship between trueness, accuracy, bias, precision, and total error in measurement? Also, discuss the key features of the CLSI EP-09-A3 guideline, "Method Comparison and Bias Estimation Using Patient Samples." **25**

Q.2 Write short notes. **25**

1. Reagent-grade water: CLSI specifications, preparation, and instrumentation
2. Methods for determining glycated haemoglobin (HbA1c)
3. Types of chromatography and the separation mechanisms involved
4. Recent advances in sample delivery from wards to laboratories
5. Principles and instrumentation of nephelometry and turbidimetry

Q.3 Write short notes. **25**

1. Non-controllable pre-analytical variables
2. Essential characteristics of a Laboratory Information System (LIS)
3. Conditions for comparing patient results with reference values
4. The principle and applications of mass spectrometry
5. pH electrode - structure, calibration and care

Q.4 Write short notes

25

1. LoB,,LoD,,LoQ, and LoL
2. Desirable characteristics of an External Quality Assessment (EQA) program for clinical chemistry
3. Westgard rules for internal quality control
4. Atomic Absorption Spectrophotometry (AAS)
5. Point-of-Care Testing (POCT)

*****END*****