



**BB-2106121301010001**  
**M. D. (Biochemistry) Examination**  
**April - 2022**  
**Faculty of Medicine**

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

<p>नीचे दृशविवेक निशानीवाणी विगतो उत्तरवही पर अवश्य लभवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : <b>M. D. (Biochemistry)</b></p> <p>Name of the Subject : <b>Faculty of Medicine</b></p> <p>Subject Code No. : <span style="float: right;">Section No. (1, 2,.....): Nil</span></p> <p style="text-align: center;"><b>2 1 0 6 1 2 1 3 0 1 0 1 0 0 0 1</b></p>	<p>Seat No. : <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></p> <div style="border: 1px solid black; border-radius: 15px; height: 80px; margin-top: 10px; display: flex; align-items: center; justify-content: center;">Student's Signature</div>
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- 1 Explain differences among various types of diabetes mellitus. Explain metabolic changes occurring in diabetes mellitus. Give detailed account of investigations required for diagnosis and prognostic evaluation of diabetic patients. Explain metabolic changes in patient of diabetic ketoacidosis. 25
- 2 Write short notes : 25
- (1) Biochemical events occurring during skeletal muscle contraction
  - (2) Biochemical difference in muscle fibers and fuel used between sprinter and marathon runner.
  - (3) Hormonal changes during menstrual cycle.
  - (4) Biochemical markers of pregnancy.
  - (5) Beer's law, relationship between Transmittance and Absorbance and its application in clinical chemistry.
- 3 Write short notes : 25
- (1) ISO 15189:2012 requirement for report content
  - (2) ISO 15189:2012 requirement for reagents and consumable.
  - (3) Risk management

- (4) Planning and technical requirement of internal audit of laboratory.
- (5) Requirements in ISO 15189:2012 about verification and validation of examination procedure.

**4** Write short notes : **25**

- (1) Problem based learning
- (2) Teaching methods for small group
- (3) Mechanism of action of folate antagonists, neuraminidase inhibitor, M protein inhibitors.
- (4) Mechanism of action of ezetimibe, cholestyramine and statin.
- (5) Mechanism of action of corticosteroids and NSAIDS as anti- inflammatory agents.

**5** 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) Write important points to be keep in mind while writing research paper.
  - (4) What is mean, median and mode? Write significance of each. Explain moving average and its role in clinical laboratory.
  - (5) ABO blood groups
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BB-2106121301020001

M. D. (Biochemistry) Examination

April - 2022

Biochemistry : Paper - II

Time : 3 Hours]

[Total Marks : 100

**Instruction :**

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य लखवी. Fillup strictly the details of signs on your answer book.	Seat No.:
Name of the Examination :	<input type="text"/>
<input checked="" type="checkbox"/> M. D. (Biochemistry)	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input checked="" type="checkbox"/> Biochemistry : Paper - II	<input type="text"/>
Subject Code No. :	Section No. (1, 2,.....) : NIL
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	Student's Signature

- 1 Describe genetic defect resulting in formation of HbS. 25  
Why does HbS precipitate under deoxygenated state? How dehydration can cause sickle cell crisis? What is the mechanism of hemoglobin class switch? Explain biochemical basis of hydroxyurea in treatment of sickle cell anemia.
- 2 Write short notes : 25
  - (1) Overview of carbohydrate metabolism
  - (2) Cytochrome P-450
  - (3) Molecular basis for regulation of HMG Co-A reductase in a cell
  - (4) Thermogenesis in brown adipose tissue
  - (5) Km and Vmax in competitive and noncompetitive enzyme inhibition. Biochemistry basis of change in enzyme activity due to change in pH and temperature.
- 3 Write short notes : 25
  - (1) Metabolic interrelationship among adipose tissue, liver and extrahepatic tissue.
  - (2) Write note on oncogene. Explain biochemical basis of metastasis.

- (3) Respiratory burst in neutrophils and related disorders. Role of NADPH oxidase and myeloperoxidase in neutrophils.
- (4) Write major Glucose transporters. How to do screening and diagnosis of gestational diabetes mellitus.
- (5) Mitochondrial and metabolic theory of aging.

**4** Write short notes : **25**

- (1) G protein coupled receptors.
- (2) Transferrin cycle. Role of hepcidin in iron metabolism.
- (3) Write note on oncogene. Ames test for detection of carcinogens.
- (4) Ubiquitin mediated protein degradation.
- (5) Vitamin K cycle and drugs acting on it.

**5** Write short notes : **25**

- (1) Maple syrup urine diseases.
  - (2) Collagen synthesis and its disorder.
  - (3) HDL metabolism.
  - (4) Biochemical basis of etiology, clinical features, diagnosis and treatment of various hyperhomocystinemia.
  - (5) Biochemical explanation of galactosemia.
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**BB-2106121301030001**  
**M. D. Examination**  
**April - 2022**  
**Biochemistry : Paper-3**

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

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नीचे दशावेल ✎ निशानीवाणी विगतो उत्तरवही पर अवश्य लखवी. Fillup strictly the details of ✎ signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
✎ M. D	<input type="text"/>
Name of the Subject :	<input type="text"/>
✎ Biochemistry : Paper-3	<input type="text"/>
✎ Subject Code No. :	Section No. (1, 2,.....): Nil
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	Student's Signature

- 1 Write types of RNA. Describe Transcription cycle. Write note on Transcription control regions for eukaryotic gene. Write Post-transcriptional modification of primary transcript. Write name of drugs which inhibit eukaryotic and prokaryotic transcription process. 25
- 2 Write short notes : 25
  - (1) Explain allelic exclusion during B lymphocyte development.
  - (2) Structure, function and inhibitors of DNA topoisomerases.
  - (3) Double stranded break repair mechanisms.
  - (4) Degeneracy of genetic code, concept and mechanism of wobbling phenomenon.
  - (5) Propagation of epigenetic signal after DNA replication.
- 3 Write short notes : 25
  - (1) Explain junctional diversity events during immunoglobulin gene rearrangement. Explain somatic hypermutation and its significance.
  - (2) MHC class 1 and 2 receptors



- (3) Major features of human mitochondrial DNA
- (4) Biogenesis and function of miRNA and siRNA.
- (5) What are the molecular events leading to lymphocyte switch from IgM to IgG to IgA?

4 Write short notes : 25

- (1) DNA motifs
- (2) CRISPR gene editing
- (3) Viral integration and transposon in human genome
- (4) Write various ways of gene regulation
- (5) PCR - principle, types and clinical application.

5 Write short notes : 25

- (1) DNA sequencing by Sanger's - Transgenic animals and knockout animals.
  - (2) Iodide metabolism in thyroid follicles.
  - (3) Biochemical reason of etiology and treatment of hyperuricemia.
  - (4) Circularization of mRNA during translation.
  - (5) Angelman and prader willi syndrome- compare and contrast.
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- (3) Noncontrollable preanalytical variables.
- (4) Explain principle of measurement of pO<sub>2</sub>, pCO<sub>2</sub>, pH and HCO<sub>3</sub> in ABG equipment. How does IQC and EQA of ABG analysis poses unique challenges?
- (5) Principle of HPLC. Draw diagram of HPLC equipment. Explain what is isocratic and polycratic separations in HPLC.

4 Write short notes :

25

- (1) Principle, instrumentation and uses of capillary electrophoresis.
- (2) Structure, physiological Role, Different types of estimation methods, Reference range and clinical importance of D-Dimer.
- (3) Potentiometry using Ion selective electrodes for Na<sup>+</sup>, K<sup>+</sup> and Cl<sup>-</sup>
- (4) Explain concept and application of Molar Absorptivity giving suitable examples.
- (5) Desirable characteristics of EQA program for clinical chemistry.

5 Write short notes :

25

- (1) LJ Chart for quality control. Explain concept of six sigma and measurement of sigma in a clinical chemistry laboratory.
  - (2) Newer advances in vacuum tubes technology for patient and phlebotomist safety.
  - (3) Collection of urine specimen.
  - (4) Process of introducing new laboratory method in routine use.
  - (5) Evaluation of the Linearity of Quantitative Measurement using CLSI EP 06-A.
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