FINAL EXAM
DECEMBER 2011

NATIONAL BOARD OF EXAMINATIONS

BIOCHEMISTRY

PAPER- I

Time : 3 hours **BIOCHEM/D/11/03/I**
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.

Write short notes on:

1. Discuss the metabolism and regulation of fructose 2-6-bisphosphate in the liver and muscles. 10

2. Describe the metabolic fates of acetyl CoA in the body. How is acetyl CoA completely oxidized? 10

3. Name the products obtained from arginine. Discuss the pathways involved. 10

4. a. Discuss the various DNA binding motifs seen in protein DNA interactions. 5+5
   b. What is the role of cyclins and cyclin dependent kinases in the cell cycle?

5. What are trace elements? Name the trace elements. Enumerate the function and disorder of any one. 10

6. a. What is post translational modification of proteins? Explain with the help of an example. Mention the role of vitamins in their modification. 6+4
   b. Classify G-proteins according to their biological function.

7. Describe the structure and functions of plasma membrane. How are amino acids transported through plasma membrane into the cell? 10

8. a. Allosteric regulation of enzymes 5+5
   b. Hill equation

9. a. How is oxidation of extra-mitochondrial NADH mediated? 5+5
   b. Give the mechanism of action of chymotrypsin.

10. What is Bohr's effect? Explain its mechanism at the level of peripheral tissues and the lungs. 10

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PAPER- II

Time : 3 hours **BIOCHEM/D/11/03/II**
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.

Write short notes on:

1. Discuss the lipid profile seen in diabetes mellitus and its biochemical basis. 10

2. What is anion gap? What are the conditions in which it is altered? Give its clinical significance? 1+5+4

3. What are lipotrophic factors? Discuss their mechanism of action. 10

4. Justify the statement "Plasma immunoglobulins play a major role in the body's defense". 10

5. What are the various causes of fat malabsorption? How will you differentiate them with the help of biochemical tests? 5+5

6. Compare and contrast :- 5+5
   a.Real time + Reverse transcriptase PCR
   b.Antibody and antigen coated Elisa.

7. a.Mitochondrial disorders 5+5
   b.Glycosylated proteins and their clinical significance

8. Describe the role of vitamins in TCA cycle. How will patients having pyruvate dehydrogenase deficiency present clinically? 10

9. What are the various laboratory tests used to assess patients with disorders of :- 5+5
   a.Iron metabolism
   b.Copper metabolism

10. What is lactic acidosis? Give its biochemical basis, signs and symptoms. Give the laboratory tests used for its detection. 10

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PAPER- III

Time : 3 hours **BIOCHEM/D/11/03/III**
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.

Write short notes on:

1. Explain the working principle of a flow cytometer. List its applications. 10

2. What are porphyrias? Mention various porphyrias and enzyme defects associated with them? 10

3. Define electrophoresis. What are the different types of electrophoresis used in separation of proteins? Give their principle and applications. 10

4. What is normal blood sugar level? Mention various methods with principle for its estimation. Discuss the most specific method of its estimation. 10

5. a.Tumour suppressor genes.
   b.Telomerases 5+5

6. Compare and contrast :- 5+5
   a.Obesity and overweight
   b.Primary hyperoxaluria and cystinuria

7. Give an account of etiology and pathophysiology of chronic liver disease. What are the biochemical markers used for its diagnosis? 10

8. What are the different types of anemia? Discuss the biochemical basis of vitamins in causing anemia. 10

9. Define balanced diet. Give an account of metabolic adaptation by the body during prolonged fasting with reference to carbohydrates, proteins and lipids. 10

10. a. Xeroderma pigmentosa
    b. Cytochrome P450 5+5

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POSSESSION/USE OF CELL PHONES OR ANY SUCH ELECTRONIC GADGETS IS NOT PERMITTED INSIDE THE EXAMINATION HALL

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BIOCHEMISTRY

PAPER- IV

Time : 3 hours **BIOCHEM/D/11/03/IV**
Max. Marks : 100

Attempt all questions in order.
Each question carries 10 marks.
Write short notes on:

1. Distinguish between:- 5+5
   a. Glycoproteins and Proteoglycans.
   b. SiRNA and MiRNA

2. List the various types of eicosanoids. Explain their importance in the human body. 10

3. What are co-enzyme, isoenzymes and functional plasma enzymes? Discuss the profile of enzyme and isoenzymes in myocardial infarction. 10

4. What are the different structural organizations during packaging of DNA in a eukaryotic cell? What is meant by denaturation of DNA? Define hyperchromicity of denaturation? 10

5. What are extracellular matrix proteins? List their functions. How has fluorescence microscopy contributed to one understanding of the nature of cytoskeleton? 10

6. a. Nanoparticles and their applications 5+5
   b. Molecular chaperones

7. What are heterotrimeric and monomeric G-proteins? Discuss their functions. 10

8. Describe the effect of the following molecules on electron transport chain. 10
   a. Thermogenin
   b. Oligomycin
   c. Atractyloside
   d. BAL

9. a. Briefly discuss Ramchandran plot. 3+7
   b. What is quaternary structure of proteins? Mention the role of various bond in its structure with the help of an example give its biochemical function.

10. a. What are liposomes? Discuss their role in medicine. 5+5
    b. Differentiate between cerebroside and ganglioside and one disorder associated with each.

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