BIOCHEMISTRY

PAPER-II

BCHEM/D/18/03/II

Time: 3 hours
Max. Marks:100

Important Instructions:

- *Attempt all questions in order.*
- *Each question carries 10 marks.*
- *Read the question carefully and answer to the point neatly and legibly.*
- *Do not leave any blank pages between two answers.*
- *Indicate the question number correctly for the answer in the margin space.*
- *Answer all the parts of a single question together.*
- *Start the answer to a question on a fresh page or leave adequate space between two answers.*
- *Draw table/diagrams/flowcharts wherever appropriate.*

Write short notes on:

1. a) Mechanisms of clinical disorders associated with collagen defects. 5+5
   b) Explain the role played by pyruvate kinase in glycolysis. Elaborate on pyruvate kinase deficiency and hemolytic anemia.

2. a) Explain the factors that lead to metabolic syndrome and the criteria set forth to define it. 6+4
   b) Write about vitamin D resistant rickets and osteoporosis.

3. a) Brown tissue metabolism and thermogenesis. 5+5
   b) Metabolic sources and uses of $NADH^+$ and $NADPH^+$.

4. a) Role of insulin and glucagon on the regulation of blood glucose level during post prandial and prolonged fasting. 6+4
   b) Types of hemoglobins and their physiological relevance.

5. Explain the following terms related to nutrition: 2x5
   a) Dietary reference interval (DRI).
   b) Estimated average requirement (EAR).
   c) Specific dynamic action (SDA).
   d) Biological value of proteins (BV).
   e) Digestibility of proteins.

6. a) Write a note on the salvage of purine bases. Name a disease associated with genetic defect in the purine salvage enzyme. (3+1)+6
   b) Elaborate on the duodenal absorption, storage, and transport of iron. Explain the role of hepcidin in iron hemostasis.

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7. Describe the following with clinical relevance wherever possible: 4+3+3
   a) LDL receptor and Apo B100.
   b) HMG CoA reductase inhibitors.
   c) Bile salt synthesis.

8. a) Glycogen metabolism and its regulation. 6+4
   b) Role of vitamins and hormones in calcium homeostasis.

9. a) Amino acid metabolism during fasting in the liver and the skeletal muscle. 6+4
   b) Nitrogen balance.

10. a) Respiratory burst during phagocytosis. 3+3+4
    b) Nitric oxide.
    c) Antioxidant enzymes.

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