Instructions:

1. Attempt any EIGHT from following: \(2 \times 8 = 16\)

   a. Write the functions of mitochondria & nucleus.

   b. Draw the structures of alanine & phenylalanine.

   c. Explain mutarotation with example.

   d. Write Liebermann burchard & salkowski tests.

   e. Give diagrammatic representation of weld’s visual cycle.

   f. Discuss functions of electrolytes in life processes.

   g. Explain the term ‘Enzyme specificity’ with examples.

   h. Write in short about Alkaptonuria.

   i. Give different types of leucocytes.

   j. Explain isoelectric pH of amino acid.

   k. Justify why sucrose is non-reducing sugar.

   l. Differentiate between fats & oils.
2. Attempt any FOUR from following:  

(a) Draw neat, well labelled diagram of animal cell.

(b) Discuss biological role of proteins.

(c) Classify carbohydrates with examples.

(d) Define the terms:
   (i) Acid value
   (ii) Saponification value
   (iii) Iodine value

(e) Explain denaturation of proteins in detail.

(f) Describe diabetes mellitus in detail.

3. Attempt any FOUR from following:  

(a) Explain nutritional deficiency diseases of proteins.

(b) Describe polysaccharides in detail.

(c) Classify lipids with examples.

(d) Give coenzyme forms of following vitamins:
   (i) Thiamine
   (ii) Riboflavin
   (iii) Niacin

(e) Describe phospholipids with examples.

(f) Give biochemical role of pyridoxine & folic acid.
4. Attempt any FOUR from following:  \[ 3 \times 4 = 12 \]
   (a) Explain water balance of our body.
   (b) Classify enzymes on the basis of reaction catalysed by them.
   (c) Explain the terms: Gluconeogenesis, Glycogenolysis & Glycogenesis.
   (d) Enlist different abnormal constituents of urine; give significance of each constituent.
   (e) Give biochemical role of following:
       (i) Sodium
       (ii) Phosphorus
       (iii) Iron
   (f) Define the terms:
       (i) Induced enzymes
       (ii) Constitutive enzymes
       (iii) Isoenzyme

5. Attempt any FOUR from following:  \[ 3 \times 4 = 12 \]
   (a) Define dehydration; explain types of dehydration.
   (b) Discuss various diagnostic applications of enzymes.
   (c) Define the terms:
       (i) Catabolism
       (ii) Ketosis
       (iii) Arteriosclerosis

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(d) Explain megaloblastic anaemia & sickle cell anaemia.

(e) Enlist different factors affecting rate of enzyme catalysed reaction; explain effect of hydrogen ion concentration in detail.

(f) Describe biosynthetic pathway of urea in body.

6. **Attempt any FOUR from following :**  

(a) Write deficiency symptoms of Vit-A, Vit-D, Vit-E, Vit-K.

(b) Describe the importance of calcium in human body.

(c) Explain pathway of glycolysis in detail.

(d) Explain β oxidation of fatty acids in detail.

(e) Explain kreb cycle in detail.

(f) Enlist different leucocyte disorders; explain any two disorders in detail.