

2020

**BIOCHEMISTRY — GENERAL**

**Fourth Paper**

**Full Marks : 75**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

Answer **question no. 1** and **one each** from **Unit-I** and **Unit-II**.

1. Answer the following questions : 3½×10
- (a) Name two glucogenic and two ketogenic amino acids.
  - (b) Name three inhibitors of electron transport chain.
  - (c) Differentiate between serum and plasma.
  - (d) What do you mean by respiratory quotient?
  - (e) What is the clinical significance of LDH?
  - (f) What is substrate level phosphorylation?
  - (g) Discuss briefly about inborn error of amino acid metabolism.
  - (h) Write down the normal serum level of fasting and PP sugar level.
  - (i) What is the biological function of selenium?
  - (j) What is gluconeogenesis?

**Unit - I**

2. (a) Write down the reaction steps for the formation of acetyl-CoA from pyruvate.  
(b) Explain briefly dark reaction of photosynthesis.  
(c) Schematically represent malate-aspartate shuttle. 3+4+3
3. (a) How fatty acids are transported from cytosol to mitochondria? Represent schematically.  
(b) Give two examples of uncouplers of oxidative phosphorylation.  
(c) What is transamination reaction? Give one example.  
(d) How NADH regulate TCA cycle?  
(e) Write down the steps of TCA cycle where CO<sub>2</sub> is generated. 3+1+(1+1)+2+2

**Please Turn Over**

**Unit - II**

4. (a) Write down the biological function of iron and calcium.  
(b) Define : (i) BMR (ii) PER (iii) BV.  
(c) What is visual cycle? What is the role of vitamin-A in visual cycle? 3+4+(1+2)
5. (a) Discuss the important functions of vitamin like compounds (i) ubiquinone (ii) lipoic acid.  
(b) What are the significances of LDH and CPK?  
(c) Why lead and mercury are toxic for us? What symptoms are found in human because of their toxicity? (1+1)+(2+2)+(2+2)

Answer **any two** questions, taking **one each** from **Unit-III** and **Unit-IV**.

**Unit - III**

6. (a) What is meant by isotypic determinants? How do they differ from idiotypic determinants?  
(b) What is passive agglutination?  
(c) What is antibody avidity?  
(d) Draw a labelled diagram of an immunoglobulin molecule.  
(e) Explain the principle of Radial immunodiffusion assay. (1+1)+1+1+3+3
7. (a) What is the difference between antigenicity and immunogenicity?  
(b) What are the major functions of the antibodies IgG and IgE?  
(c) Describe the characteristic features of Mast cell and Dendritic cell.  
(d) Describe briefly functions of MHC I and MHC II. 2+3+3+2

**Unit - IV**

8. (a) 'DNA replication is semiconservative in nature.' — Explain with experimental evidence.  
(b) What is point mutation? Explain with a suitable example.  
(c) Name two inhibitors of transcription. How do they work?  
(d) Draw the structure of t-RNA and label properly. 3+1+(2+2)+2
9. (a) What is Wobble hypothesis?  
(b) What is meant by positive control of lac operon?  
(c) (i) What is a restriction endonuclease?  
(ii) How many types of restriction endonuclease are there?  
(iii) Give two examples of restriction endonuclease.  
(d) What is the function of DNA polymerase I? 2+2+(1+2+1)+2
-