

(3 Hours)

[Total Marks : 100

- N.B. :**
- (1) All questions are **compulsory**.
 - (2) All questions carry **equal** marks.
 - (3) Attempt any **one** question out of **a** and **b**.
 - (4) Attempt any **one** question out of **c** and **d**.
 - (5) Draw **flowcharts** and **diagrams** wherever **necessary**.
 - (6) Answerbooks of **Section I** and **Section II** to be **tied together**.

Section I

1. (a) Describe gluconeogenesis using lactate as precursor. 5
 OR
 (b) Explain glycogenolysis and its regulation. 5
 (c) Give an account of regulation of blood glucose level by Insulin and Epinephrine. 5
 OR
 (d) Explain photosynthesis in C4 plants. 5

2. (a) Explain β -oxidation of even carbon fatty acids and its regulation. 5
 OR
 (b) Discuss white Adipose tissue metabolism. 5
 (c) Give an account of catabolism of Tyrosine. 5
 OR
 (d) Explain transamination with suitable examples and give its significance. 5

3. (a) Describe synthesis of pyrimidine nucleotides by salvage pathway. 5
 OR
 (b) Discuss catabolism of purine nucleotides. 5
 (c) Explain protein caloric malnutrition syndrome. 5
 OR
 (d) Describe various anthropometric measurements used in field of nutrition. 5

4. (a) Describe catabolism of Hemoglobin. 5
 OR
 (b) What is metabolic and respiratory alkalosis ? Discuss its compensation. 5
 (c) Name all the enzymes used in liver function tests. Explain their significance. 5
 OR
 (d) Enlist any four neurotransmitters and their role. 5

5. (a) Classify immunoglobulins and write their functions. 5
 OR
 (b) Describe method of producing antibodies against proteins in laboratory animals. 5
 (c) State the principle of ELISA. Discuss various types of ELISA and their applications. 5
 OR
 (d) Discuss cellular and humoral immunity in T and B cells. 5

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Section II

6. (a) What is principle, technique and applications of density gradient centrifugation ? 5
OR
 (b) Describe the principle and methodology of IR spectroscopy. Write its significance. 5
 (c) Explain hazards in handling of radioisotopes and their safety measures. 5
OR
 (d) Write principle and methodology of scanning electron microscopy and give its applications. 5
7. (a) Explain principles involved in designing good research. 5
OR
 (b) Describe various types of research and give its significance. 5
 (c) Discuss different methods involved in data collection. 5
OR
 (d) Explain mechanics and precautions of writing reports for scientific journals and symposia. 5
8. (a) What is standard deviation and standard error ? Give their significance. 5
OR
 (b) What is Gaussian distribution ? Discuss it with its applications. 5
 (c) What is paired 't' test and state its application with suitable example ? 5
OR
 (d) Give an account of ANOVA. 5
9. (a) Discuss in detail linear regression. 5
OR
 (b) What are analysis choices for multiple regression ? 5
 (c) Explain in detail the applications of Chi-square test. 5
OR
 (d) Give the details of Yates correction as applied to Chi-square test. 5
10. (a) Explain the role of computers in information retrieval from databases. 5
OR
 (b) Write a note on Genomic data bank. How information is retrieved and applied ? 5
 (c) How sequence alignment is carried out ? 5
OR
 (d) Discuss the term "Proteomics". How it is important in modern biology research ? 5