Roll No. ..... **Total No. of Pages : 2**

PC 12993-N

K-13/2111

PRINCIPLES OF BIOCHEMISTRY—1101T

Semester—I

Time Allowed : Three Hours] [Maximum Marks : 75

Note :– The candidates are required to attempt *two* questions each from Sections A and B. Section C will be compulsory.

SECTION—A

I. What are proteins ? Describe their three-dimensional structure along with the forces stabilizing it. Add short notes on pH and Isoprenoids.

II. Explain the structure and function of biological effectors. Add a note on phosphatidylinositol as intracellular messenger.

III. Write the functions of fat soluble vitamins and the hormones secreted by anterior pituitary gland. Add short notes on micelles and liposomes.

IV. Describe the salient features of competitive, non-competitive and uncompetitive enzyme inhibitions giving one example of each. Define K_m, V_{max} and Isozymes. 2×15=30

SECTION—B

V. Give the reactions, function and regulation of Citric Acid Cycle.

VI. Illustrate the Calvin Cycle for fixation of CO_2 in C_3 plants. Draw a diagram of photosynthetic non-cyclic electron flow in plant chloroplasts.

VII. Write the pathway for the biosynthesis of triacylglycerol. Add a note on the regulation of fatty acid metabolism.

VIII. Explain the degradation of purines in human beings. Add a note on the regulation of amino acid biosynthesis. 2×15=30

SECTION—C

IX. (i) What is the difference between amylose and amylopectin ?

(ii) Define gluconeogenesis and glycogenesis.

(iii) Define coenzymes giving an example along with its function.

(iv) Give the functions of the hormones oxytocin and vasopressin.

(v) Write the structure and function of phosphatidylserine.

(vi) What is pKa of a weak acid ? Draw the Zwitterion structure of alanine at pH 7.0.

(vii) Give reactions for the assimilation of ammonium ion into glutamine and glutamate.

(viii) Draw the diagram of purine ring showing molecular origins of its atoms.

(ix) Highlight the roles of acyl carrier protein and s-adenylmethionine (SAM) in metabolism.

(x) What is lactic acid fermentation ? 10×1.5=15