

BIOCHEMISTRY

24th April, 1999

(A) Define the following terms:(32%)

- 1) Clonal selection theory
- 2) Metabolic control analysis
- 3) Substrate-level phosphorylation
- 4) Ramachandran plot
- 5) PEST sequences
- 6) Satellite DNA
- 7) Isoelectric focusing (IEF)
- 8) Monoclonal antibodies

(B) Answer the following questions:

- 1) Describe the different applications of southern blot, northern blot and western blot. (9%)
- 2) Give a brief description of the proposed mechanism of mRNA splicing. (10%)
- 3) Describe the structure and regulation of *trp* operon. (8%)
- 4) What is allosteric inhibition? Describe the allosteric effects of ATP and CTP in the regulation of aspartate carbamoyltransferase. (12%)
- 5) The final product of glycolysis pyruvate must convert to acetyl-CoA in order to enter the Krebs' for further respiration. The enzyme system, pyruvate dehydrogenase complex involves in this conversion. Draw a diagram to show the mechanism of this enzyme complex. (10%)
- 6) Describe the general protocol for the biosynthesis of fatty acid, e.g. a palmitic acid. (10%)
- 7) Describe the function and biosynthesis pathway of NO (nitric oxide). (9%)