



ShahJalal University of Science & Technology, Sylhet

Department of Biochemistry and Molecular Biology

B. Sc. (Hons) 1st year 2nd Semester Examination, 2011

Course No: **BMB -125** Course title: **Introductory Molecular Biology**

Credit: **3** Total marks: **70** Time: **3** hours

Instructions:

- Answer any two (2) questions from each Part (A and B).

Part A

- (a) Explain the following with appropriate diagrams where necessary: 4×4=16
 - DNA molecule has polarity.
 - DNA denaturation and renaturation is cooperative.
 - One gene code for one polypeptide.
 - Only a small proportion of the total DNA is actively expressed.
- (b) Define molecular concept of gene. 1.5
- (a) List the distinguishing features of living organism. 6
 - Write down the cellular organization of living organism. 4.5
 - Describe the Mendel's law of inheritance. 7
- (a) List the important features of Watson - Crick DNA model. 5
 - What are the differences and similarities of DNA and RNA? 4
 - Name the different types RNA with their function and distribution. 5
 - Write the functions of nucleic acids. 3.5

Part B

- (a) 'Gene is the fundamental unit of heredity'- justify the statement. 4
 - Summarizes the relationships among chromosomes, genes, DNA, nucleotides and bases. 5
 - "The introns transcribed into RNA are removed by splicing"- proof this statement using appropriate example. 5.5
 - Define deletion and insertion mutations. 3
- (a) How is the beginning of a gene recognized? 5
 - Write short note on central dogma of molecular biology. 3.5
 - Write down the function of the following enzymes 1.5×6=9
 - DNA gyrase, (ii) DNA helicase, iii) DNA polymerase I, iv) DNA polymerase III, v) DNA ligase, vi) RNA polymerase
- (a) What are the applications of molecular biology in medical and pharmaceutical sciences? 6
 - Define gene therapy. How is it done? 4
 - How does forensic identification work? Give some examples of DNA uses for forensic identification. 4
 - "Molecular biology helps to reduce vulnerability of crops to environmental stresses"- explain. 3.5