

COURSE CODE (CREDITS): 18B11BI311 (3)

MAX. MARKS: 35

COURSE NAME: CELL AND MOLECULAR BIOLOGY

COURSE INSTRUCTOR: DR. JATA SHANKAR

MAX. TIME: 2 Hours

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*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

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Q1. What are the key molecular processes involved in DNA replication, and how does the cell ensure the accurate duplication of genetic information during this fundamental biological process? [5 marks] CO II & CO III

Q2. What are the molecular steps involved in the transcription process, and how does it contribute to the synthesis of RNA from a DNA template within a cellular context, explain? [5 marks] CO III

Q3. What are the essential steps in the process of protein synthesis, and how does the information encoded in the DNA sequence ultimately lead to the production of functional proteins within a cellular environment? [5 marks] CO III

Q4. Give an account to the cellular and molecular description of prokaryotic vs eukaryotic cells? Also, give the genomic data of *E. coli* and Human and protein sorting in eukaryotic cells? [5 marks] CO I & II

Q5. Notes on the following (2 marks each) CO I & II

- a. Okazaki fragment
- b. Draw the structure of the Glycine and one more amino acid
- c. Active and passive transport system
- d. Structure of Ribose and Glucose
- e. DNA repair

Q6. In a semi conservative model of DNA replication, in how many daughter cells will have the parent DNA after 10<sup>th</sup> generation cycle? [5 marks] CO I & II