

Roll No.

Total Pages :3

CMDE/M-20

2041

Molecular Biology - I

Paper - BCH-204

Time allowed : 3 Hours

Maximum Marks : 80

Note : Question No. 1 is compulsory. Attempt four more questions selecting one question from each section. Each question carries sixteen marks.

1. (i) Write three important differences between DNA and RNA.
- (ii) Write some important features of Chargaff's rule.
- (iii) What are the differences between conservative and semi-conservative modes of DNA replication?
- (iv) What do you mean by discontinuous mode of DNA replication?
- (v) What are split genes?
- (vi) What is the function of reverse transcriptase? What does this enzyme occur?
- (vii) Genetic code is non-overlapping. Elaborate this statement with the help of an example.
- (viii) What are polyribosomes? What is the significance of these structures? (2×8=16)

Section - A

2. (i) How you will prove that RNA acts as genetic material?
- (ii) What is DNA topology? Discuss about topological and geometric properties with the help of suitable examples.
- (iii) Define renaturation. Discuss about Cot half value and its significance. (5+6+5=16)
3. (i) Describe various covalent and non-covalent forces responsible for DNA stability.
- (ii) What are topoisomerases? Discuss the types and mechanism of action of topoisomerases in eukaryotes. (8x2=16)

Section - B

4. (i) With the help of neat and labelled diagrams how you will prove that DNA replication is semi-conservative.
- (ii) Discuss the structure and functions of DNA polymerase I and III involved in prokaryotic DNA replication. (8x2=16)
5. (i) Describe the initiation and elongation of DNA replication in prokaryotes.
- (ii) Write a detailed note on the molecular basis of mutations. (8x2=16)

Section - C

6. (i) What are RNA polymerases? Discuss the structure and functions of various RNA polymerases involved in eukaryotic transcription process.

- (ii) Describe the technique which is used to study the binding of proteins onto the DNA molecule.

(10+6=16)

7. (i) What are post-transcriptional modifications? Discuss the processing of rRNA precursors to form ribosomal subunits in prokaryotes and eukaryotes.

- (ii) Describe termination of transcription process in prokaryotes.

(10+6=16)

Section - D

8. (i) What is Wobble hypothesis? Discuss the various features of Wobble hypothesis.

- (ii) Describe the initiation and elongation stages of translation in prokaryotes.

(6+10=16)

9. (i) Describe the targeting of proteins to lysosomes.

- (ii) Write a note on protein degradation.

- (iii) Discuss the structure of eukaryotic ribosomes.

(8+4+4=16)