

**B.Sc. Biotechnology**

**Semester III**

**Course Title: Cell and Molecular Biology**

**Course Code: UBTTC-301**

**Time Allowed: 3:00 hrs**

**SET I**

**Max. Marks=80**

**Section A (Short Answer questions: All compulsory)**

**(3marks each)**

1. Cells without a membrane-bound nucleus and membrane systems in the cytoplasm are.....cells. Bacterial cell wall constitutes of .....while the plant cell wall comprises of .....
2. Define the terms:  
a) Law of Dominance    b) Conjugation    c) Transposons
3. Compare and contrast between DNA and RNA
4. Transcription process requires the enzyme.....constituting of core components as .....and .....as cofactor.
5. The concept of central dogma was given by.....Transcription and translation occur simultaneously in.....and the structure formed in the cytoplasm is called as.....

**(MM: 5X3=15)**

**Section B (Medium Answer questions: All compulsory)**

**(7 marks each)**

1. Compare and contrast between Prokaryotic and Eukaryotic cell. (7)
2. What are transitions and transversions in mutation? Write a short note on structural alterations of chromosome. (2+5)
3. Diagrammatically explain the technique of agarose gel electrophoresis and discuss its function. (5+2)
4. Describe in detail the experiment suggesting semi-conservative mode of DNA replication? (7)
5. What is genetic code? Explain the characteristic features of the genetic code. (2+5)

**(MM: 7X5=35)**

**Section C (Long Answer questions: Attempt any TWO)**

**(15 marks each)**

1. Explain in detail the cell organelles:  
a) Nucleus                      b) Mitochondria (7.5+7.5)
2. Explain the phenomenon of gene transfer through conjugation and transduction in bacteria. (5+10)
3. Explain the structure of DNA as described by Watson and Crick. Compare and contrast between different forms and shapes of DNA. (7+4+4)
4. What is transcription? Explain the process of transcription in eukaryotes and processing of hnRNA. (2+10+3)
5. What are Inducible and repressible Operons? Explain in detail any one inducible operon in E.coli. (3+12)

**(MM: 15X2=30)**