B.Sc. (Honours) Examination, 2019
Semester-IV (CBCS)
Botany
Course: CC-8 (Core)
(Molecular Biology)

Time: Three Hours **Full marks: 40**

Questions are of value as indicated in the margin

1. Answer ***any eight*** of the following: 1×8=8
   i) What are the differences between constitutive heterochromatin and facultative heterochromatin?
   ii) What is the difference between snRNA and snRNP?
   iii) State the function of rho factor in prokaryotic transcription termination.
   iv) What is Tm of DNA?
   v) Which wavelength of light is used to analyze hyperchromicity of DNA?
   vi) What are bacterial ribosomes made up of?
   vii) What is frame shift mutation?
   viii) Name two unusual nucleotides present in tRNA.
   ix) What are Shine-Dalgarno sequences?
   x) What is meant by codon degeneracy?
   xi) Distinguish between ribose and deoxyribose.
   xii) What is hyperchromicity of DNA?

Answer *any four* of the following

2. What factors or conditions favor transition from B-DNA to A-DNA? Mention two chemical properties of DNA. Why is mitochondrial DNA highly susceptible to oxidative damage? 3+2+3=8

3. What is transcription bubble? Describe each subunit function of RNA polymerase. Why are sequences within the promoter important? 2+4+2=8

4. What type of genetic transfer was displayed in the Frederick Griffith experiment? What was the experiment? What was the conclusion? 2+4+2=8

5. How do you differentiate between pre-mRNA and mature mRNA? What are the *cis*-acting signal sequences for nuclear pre-mRNA splicing? Describe how these signal sequences are correctly recognized by the splicing machinery.2+2+4=8

6. Describe the steps involved in prokaryotic translation using suitable labelled diagrams. 8

7. Describe the function of different proteins involved in the process of bacterial DNA replication.8

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