

Five-Year Integrated M.Sc. Examination, 2021-2022

Semester - III

Course: LS-2-3-1

(Fundamental Processes)

Time: Three hours

Full Marks: 60

Questions are of value as indicated in the margin.

Question No. 1 is compulsory and answer ***any two*** questions from ***Question No. 2 to 4*** and any three questions from ***Question No. 5 to 9***.

1. Write short notes on ***any ten*** of the following: 2x10=20
 - a) Replicon
 - b) Proofreading of DNA replication
 - c) SSBP
 - d) Okazaki fragment
 - e) DNA polymerase
 - f) Photoreactivation
 - g) Enhancers
 - h) Sigma factors
 - i) Rho factor
 - j) Histone proteins
 - k) Mediator
 - l) Proximal promoter elements
2. How fidelity of DNA replication is increased by DNA polymerase? 5
3. Explain the origin of replication in prokaryote and eukaryote. 3+2 = 5
4. What are promoters? Discuss the salient features of bacterial promoters. 1+4 = 5
5. Explain conservative, semiconservative and dispersive model of DNA replication. 10
6. Describe the mismatch DNA repair mechanism in E. coli. 10
7. Which enzymes catalyze synthesis of RNAs in prokaryotes and eukaryotes? What are transcription factors? How do the basal transcription factors facilitate initiation of mRNA synthesis in eukaryotes? 2+2+6 = 10
8. What is meant by catabolite repression? Describe in detail the functions of the following two proteins in regulating lac operon: (a) Lac repressor and (b) CAP. 2+ (4+4) = 10
9. Justify the statement: 'trp operon is under dual control.' 5+5 = 10