



Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD (now MoE)

Re-accredited with an 'A++' Grade by NAAC CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test II – October 2025

Semester V

Class : III UG

Major: Biochemistry & Biotechnology

23BBC05 Genetics and Molecular Biology

Time: 2 hours

Max. marks: 60

Course Outcomes:

CO1: Understand the key concepts of Classical Mendelian genetics, its deviations and relationship between genotype and phenotype

CO2: Comprehend the knowledge on mutations, variations in chromosomes, concepts of genetic recombination and population genetics

CO3: Appreciate the intricate molecular mechanisms of the various steps in replication, transcription and translation

CO4: Gain insight into the molecular mechanism of DNA damage, repair and recombination

CO5: Acquire knowledge on the regulation of gene expression

Part A

6 x 1 = 6

Choose the correct answer

1. A colorblind woman (X_cX_c) marries a man with normal vision (XY).
What percentage of their sons will be color blind? CO4:K5
a. 0% b. 25% c. 50% d. 100%
2. In conjugation, the donor cell is usually CO4:K2
a. F⁻ cell b. F⁺ cell c. R⁻ cell d. Hfr cell only
3. All of the following are bacterial transposons except CO2:K3
a. IS1 b. Tn9 c. P element d. IS10
4. In E. coli the chain initiating amino acid in protein synthesis is CO4:K1
(A) N-formyl methionine (B) Methionine (C) Serine (D) Cysteine
5. Mammalian RNA polymerase I synthesises CO5:K2
(A) mRNA (B) rRNA (C) tRNA (D) hnRNA
6. Which of the following is a non-sense codon? CO3:K2
a. AAA b. UUU c. AUG d. UAA

Part B

3 x 6 = 18

Answer the following.

Answers should not exceed 200 words or one page

7. (a) Briefly explain the sex-linked inheritance with an example CO4:K5
(Or)
7. (b) Write a brief note on types of sex determination CO3:K3
8. (a) What is a lac operon? Explain CO5:K5
(Or)
8. (b) Illustrate the tertiary and Secondary structure of tRNA. CO3:K3
9. (a) Discuss in detail on general features of genetic codon CO3:K3
(Or)
9. (b) Explain the post translational modification of proteins CO3:K4

Part C

3 x 12 = 36

Answer the following not exceeding 700 words or four pages

10. (a) Give a detailed account on transposons CO4:K5
(Or)
10. (b) Describe the different types of genetic recombination in bacteria CO5:K5
11. (a) Write an essay on types of mutation and mutagenic agents CO1:K3
(Or)
11. (b) Compare and contrast the initiation, elongation and termination of prokaryotic and eukaryotic transcription CO3:K3
12. (a) Explain the post-transcriptional modification in eukaryotes CO3:K2
(Or)
12. (b) Discuss in detail on protein synthesis with a neat diagram CO4:K3
