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 | **Time: 2 hours**
Major: Biochemistry & Biotechnology | **Max. marks: 60**

23BBC05 Genetics and Molecular Biology

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 (XcXc) 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)