

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026  
(Third Semester)

Branch – MICROBIOLOGY

MOLECULAR BIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

| Module No. | Question No. | Question                                                                                                | K Level | CO  |
|------------|--------------|---------------------------------------------------------------------------------------------------------|---------|-----|
| 1          | 1            | Chromosomal material is<br>a. DNA      b. RNA      c. both      d. none                                 | K1      | CO1 |
|            | 2            | Another name for DNA gyrase is<br>a. Helicase      b. SSB      c. topoisomerase      d. ligase          | K2      | CO1 |
| 2          | 3            | mRNA Cap is<br>a. ATP      b. GTP      c. CTP      d. TTP                                               | K1      | CO2 |
|            | 4            | _____ has Clover model<br>a. mRNA      b. rRNA<br>c. tRNA      d. all of the above                      | K2      | CO2 |
| 3          | 5            | Stop codon is<br>a. UAG      b. UGA<br>c. UAA      d. all of the above                                  | K1      | CO3 |
|            | 6            | Protein synthesis happens at<br>a. Nucleus      b. Ribosome<br>c. SER      d. Golgi body                | K2      | CO3 |
| 4          | 7            | An operon has<br>a. Promoter      b. Repressor<br>c. Inducer      d. all of the above                   | K1      | CO4 |
|            | 8            | Allolactose is a/an _____ of Lac operon<br>a. Promoter      b. Repressor<br>c. Inducer      d. operator | K2      | CO4 |
| 5          | 9            | Coding sequence is<br>a. Exon      b. Intron<br>c. operon      d. none of the above                     | K1      | CO5 |
|            | 10           | Lariat model represents<br>a. Transcription      b. translation<br>c. Splicing      d. replication      | K2      | CO5 |

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

| Module No. | Question No. | Question                                               | K Level | CO  |
|------------|--------------|--------------------------------------------------------|---------|-----|
| 1          | 11.a.        | Explain the Meselson and Stahl's experiment.           | K3      | CO1 |
|            |              | (OR)                                                   |         |     |
|            | 11.b.        | Demonstrate autoradiography techniques in detail.      |         |     |
| 2          | 12.a.        | Appraise the structure and function of RNA polymerase. | K5      | CO2 |
|            |              | (OR)                                                   |         |     |
|            | 12.b.        | Explain the structure of tRNA.                         |         |     |

Cont...

|   |       |                                                        |    |     |
|---|-------|--------------------------------------------------------|----|-----|
| 3 | 13.a. | Prescribe the properties of Genetic code.              | K6 | CO3 |
|   | (OR)  |                                                        |    |     |
|   | 13.b. | Compile the post transcriptional modification process. |    |     |
| 4 | 14.a. | Assess the lac operon and its regulation.              | K5 | CO4 |
|   | (OR)  |                                                        |    |     |
|   | 14.b. | Discuss the structure of trp operon.                   |    |     |
| 5 | 15.a. | Explain the Splicing mechanism.                        | K6 | CO5 |
|   | (OR)  |                                                        |    |     |
|   | 15.b. | Summarize the hormonal control of gene expression.     |    |     |

**SECTION -C (30 Marks)**

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

| Module No. | Question No. | Question                                                                               | K Level | CO  |
|------------|--------------|----------------------------------------------------------------------------------------|---------|-----|
| 1          | 16           | Analyze the structure and types of DNA, illustratively.                                | K3      | CO1 |
| 2          | 17           | Explain the transcription process in detail.                                           | K5      | CO2 |
| 3          | 18           | Summarize Translation process in detail.                                               | K6      | CO3 |
| 4          | 19           | Analyze the Regulation of Trp operon in detail.                                        | K5      | CO4 |
| 5          | 20           | Elucidate the characters of eukaryotic mRNA. Add a note on eukaryotic RNA polymerases. | K6      | CO5 |

Z-Z-Z

END