22BOP206N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025
(Second Semester)

Branch - **BOTANY**

CELL AND 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	Which of the following is known as the powerhouse of a cell? a) Mitochondria b) Cytoplasm c) Lysosome d) Nuclei	K1	CO1
	2	The outermost covering of the plant cell is constituted by: a) Lignin b) Chitin c)Glycocalyx d) Cellulose	K2	CO1
2	3	Who is the father of cell biology? a) George N. Papanicolaou b) George Emil Palade c) Robert Hooke d) Linnaeus	K1	CO2
	4	Lysosomes are produced by which of the following cell organelles? a) Mitochondria b) Endoplasmic Reticulum c) Golgi Complex d) DNA	K2	CO2
3	5	The method of DNA replication is _____ a) conservative b) semi-conservative c) non-conservative d) disruptive	K1	CO3
	6	Which of the following is not a part of the nucleotide of DNA? a) Nitrogenous base b) Deoxyribose sugar c) Phosphoric acid d) Amino acid	K2	CO3
4	7	The lac operon consists of ____ structural genes. a) 1 b) 2 c) 3 d) 4	K1	CO4
	8	Which of the following enzymes are used in the process of transcription? a) DNA Polymerase b) RNA Polymerase c) DNA helicase d) DNA topoisomerase	K2	CO4
5	9	Which of the following technologies is commonly used for genome sequencing? a) Sanger sequencing b) CRISPR-Cas9 c) Polymerase chain reaction (PCR) d) Western blotting	K1	CO5
	10	Which of these is a proteomics database for protein-protein interactions? a) PDB (Protein Data Bank) b) STRING c) KEGG d) NCBI	K2	CO5

Cont...

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.	Examine the structure and components of the plasma membrane.	K4	CO1
		(OR)		
	11.b.	Analyze the detailed structure and function of mitochondria.		
2	12.a.	Explain the stages and processes of cell division.	K5	CO2
		(OR)		
	12.b.	Compare and contrast the rough and smooth endoplasmic reticulum.		
3	13.a.	Discover and explore the various types of RNA.	K4	CO3
		(OR)		
	13.b.	Classify the major structural and functional differences between DNA and RNA.		
4	14.a.	Explain the detailed process of transcription.	K5	CO4
		(OR)		
	14.b.	Evaluate the steps of protein synthesis in eukaryotic organisms.		
5	15.a.	Categorize the key insights from comparative genomics.	K4	CO5
		(OR)		
	15.b.	Examine the applications of protein microarray.		

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	Discuss the Genomic Organization and its significance.	K6	CO1
2	17	Construct and explain the Structure and Types of Chromosomes.	K4	CO3
3	18	Justify the mechanisms involved in the Replication of DNA.	K5	CO3
4	19	Criticize the processes regulating gene expression and their impact.	K5	CO5
5	20	Assess the various aspects of proteomics.	K5	CO5

Z-Z-Z END