

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch - BIOCHEMISTRY

SUB CELLULAR BIOCHEMISTRY

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	A plasmid in a bacterium is best described as: a) The primary genetic material within the nucleoid b) A piece of extra-chromosomal DNA c) A component of the cell membrane d) An organelle for respiration	K1	CO2
	2	Plant cell wall is mainly composed of a) Protein b) Cellulose c) Lipid d) Starch	K2	CO3
2	3	Which of the following is a major role of dysfunctional calcium pumps in a cell? a) Increased ATP production b) Enhanced calcium storage in organelles c) Elevated intracellular calcium levels, leading to apoptosis and toxicity d) Decreased muscle contraction and nerve conduction	K1	CO2
	4	Which of the following is NOT an example of osmosis? a) Swelling of raisins in water b) Water absorption by plant root hairs from the soil c) The movement of oxygen from the lungs into the blood d) The shrinking or swelling of red blood cells in different solutions	K2	CO3
3	5	What is the primary function of glyoxysomes? a) Photosynthesis b) Nitrogen fixation c) Conversion of fatty acids into carbohydrates d) Protein synthesis	K1	CO2
	6	Microfilaments, as part of the cytoskeleton, are involved in: a) Ribonucleoprotein structure b) Mechanical support and motility in eukaryotic cells c) Being found only on the cell surface d) Prokaryotic cell structure	K2	CO3
4	7	Which enzymes are responsible for detoxification of organic compounds carried out by the smooth endoplasmic reticulum? a) Dehydrogenases b) Oxygenases c) Nucleases d) Ribonucleases	K1	CO2
	8	Which of the following ribosomal RNA does not take part in rDNA organization of E.coli? a) 5S RNA b) 23S RNA c) 16S RNA d) 5.8S RNA	K2	CO3

Cont...

5	9	Collagen is formed by _____ a) Three parallel right-handed helices b) Three anti-parallel right-handed helices c) Three parallel left-handed helices d) Three anti-parallel left-handed helices	K1	CO2
	10	Fibronectin is involved in both the insoluble extracellular matrix and as a soluble protein in: a) The nucleus b) The endoplasmic reticulum c) Blood plasma d) Mitochondria	K2	CO3

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.	Tabulate the differences between Plant and animal cell.	K1	CO2
		(OR)		
	11.b.	Identify the structure and functions of Cell membrane .		
2	12.a.	Distinguish Symport and Antiport.	K2	CO3
		(OR)		
	12.b.	Classify the various Types of diffusion.		
3	13.a.	Examine the structural and functional role of Lysosomes.	K3	CO5
		(OR)		
	13.b.	Illustrate the Microfilaments with a neat labeled diagram.		
4	14.a.	Interrupt the role of Endoplasmic reticulum with a neat diagram.	K4	CO1
		(OR)		
	14.b.	Outline the structural features of Ribosomes.		
5	15.a.	Interpret the structure and function of Collagen.	K4	CO1
		(OR)		
	15.b.	Outline the role of Stem cells .		

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	Outline the features of Prokaryotic cells in detail.	K1	CO2
2	17	Elaborate about Active transport.	K2	CO3
3	18	Explore the various features of Microtubules.	K3	CO5
4	19	Explain the structure and functions of Nucleus.	K4	CO1
5	20	Summarize the features of Cell Junctions.	K5	CO1

Z-Z-Z END