22BCP104N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025
(First Semester)

Branch- **BIOCHEMISTRY**

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	Which of the following is the most abundant lipid in the plasma membrane? a) Cholesterol b) Phospholipids c) Glycolipids d) Steroids	K1	CO1
	2	Which of the following is an example of primary active transport? a) Sodium-potassium (Na^+/K^+) pump b) Glucose transport through GLUT proteins c) Diffusion of gases across membranes d) Water movement through aquaporins	K2	CO1
2	3	The conversion of ADP to ATP in the presence of oxygen occurs in a) Cytoplasm b) Nucleus c) Mitochondria d) Ribosome	K1	CO2
	4	The primary function of the glycerol phosphate shuttle is to: a) Transport glucose into the mitochondria b) Transfer electrons from NADH to the electron transport chain c) Produce ATP directly d) Convert pyruvate into lactate	K2	CO2
3	5	Signaling molecules that bind to receptors and initiate a cellular response are called: a) Enzymes b) Ligands c) Hormones d) Neurotransmitters	K1	CO3
	6	Which of the following is a well-known downstream target gene of CREB involved in neuronal survival and plasticity? a) BDNF b) p53 c) NF-κB d) Caspase-3	K2	CO3
4	7	Which of the following is the primary energy source for oocyte maturation? a) Glucose b) Lactate c) Pyruvate d) Fatty acids	K1	CO4
	8	Which of the following protein families is primarily responsible for inhibiting apoptosis? a) Caspases b) Bcl-2 family c) Tumor suppressor proteins d) Cytochrome c proteins	K2	CO4
5	9	Which type of gene, when mutated, promotes uncontrolled cell division and cancer formation? a) Tumor suppressor gene b) Proto-oncogene c) DNA repair gene d) Apoptotic gene	K1	CO5
	10	Which molecular technique is widely used for analyzing gene expression in cancer cells? a) Northern blot b) RT-PCR c) SDS-PAGE d) Immunohistochemistry	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.	Explain the structure and functions of membrane lipids.	K2	CO1
		(OR)		
	11.b.	Explain the specialized membrane pores.		
2	12.a.	Discuss the laws of thermodynamics.	K3	CO2
		(OR)		
	12.b.	Construct the glycerol phosphate shuttle.		
3	13.a.	Elaborate the G protein coupled receptors.	K3	CO3
		(OR)		
	13.b.	Discuss the CREB downstream genes.		
4	14.a.	Elaborate the check points in cell cycle regulation.	K4	CO4
		(OR)		
	14.b.	Examine the loss of cell cycle control related to cancer.		
5	15.a.	Discuss the pathogenesis of cancer.	K$	CO4
		(OR)		
	15.b.	Elaborate the functions of co-oncoprotein.		

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 various transport mechanism across cell membrane.	K4	CO1
2	17	Elaborate the machinery for ATP formation.	K4	CO2
3	18	Discuss the signaling molecules and their receptors.	K4	CO3
4	19	Discuss the overview of cell cycle and its control.	K4	CO4
5	20	Elaborate the tumor viruses.	K4	CO5

Z-Z-Z END