

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023  
(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)

Question No.	QUESTION	K LEVEL	CO
1	Control of cell volume, neuron and muscle cell excitability drives transport of sugars, amino acids caused due to gradient in a) cAMP concentration                      b) Ca <sup>2+</sup> ions c) H <sup>+</sup> -K <sup>+</sup> ions                                  d) Na <sup>+</sup> -K <sup>+</sup> ions	K1	CO1
2	H <sup>+</sup> gradient across E.coli membrane generated by oxidation of fuel molecules to drive the uptake of molecules against concentration gradient is a) Lactose racemase                              b) sugar permease c) acetylcholine esterase                      d) acetyl choline	K1	CO1
3	Equivalent expression for entropy that applies to constant temperature condition typical of biological system is a) $\Delta H - T\Delta S \leq 0$ b) $\Delta S > q/T$ c) $\Delta = \Delta H - T \Delta S < 0$ d) $\Delta G = \Delta H - T \Delta S$	K1	CO2
4	Coenzyme Q is a quinone derivative with a long isoprenoid tail, where number of units in mammalian CoQ is _____. a) 5                      b) 10                      c) 6                      d) 8	K1	CO2
5	The ligand for rhodopsin plays an essential role in vision is _____. a) Electron    b) Photon                      c) odorants                      d) bastants	K1	CO3
6	PKA stimulates the expression of specific genes by phosphorylating a transcriptional activator called a) CAMP    b) Adenylate cyclase cascade c) CREB    d) 7TM	K1	CO3
7	Which of the following is a role of cytokine in apoptosis? a) Inhibitor    b) Internal stimuli c) External stimuli                                      d) substrate	K1	CO4
8	Cyclin dependent kinases which control progression through cell cycle check points are totally activated by which of the following a) Binding to cyclin plus phosphorylation by Cdk activating protein kinase b) Binding to cyclins c) Phosphorylation by Cdk activating protein kinase d) Phosphorylation by tyrosine kinase	K1	CO4
9	In _____ fusion proteins called Bcr-Abl consists sequences of genes over expressed for c-Abl kinase protein. a) Chronic myeloid leukemia                      b) Acute myeloid leukemia c) Acute myeloma                                      d) Lymphoid myeloma	K1	CO5
10	Name genes which directly inhibit cell growth or promote cell death. a) gate keeper genes                                      b) care taker genes c) check points    d) transcription factors	K1	CO5

Cont...

**SECTION - B (35 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

11 a.	Explicit reason and functioning of Ca <sup>2+</sup> ATP ase.	K1	CO1
	OR		
11 b.	Discuss about significance of group translocation in cellular system.		
12 a.	Elaborate sequences in biological oxidation and reduction Reaction.	K2	CO2
	OR		
12 b.	Signify with diagram, the mechanism of malate- Aspartate shuttle.		
13 a.	Differentiate Tyrosine Kinase- Ras signal pathway and MAPK pathway.	K2	CO3
	OR		
13 b.	Explain the salient features in CREB downstream genes.		
14 a.	Narrate with a neat sketch four phases in cell cycle. Mention its check points.	K2	CO4
	OR		
14 b.	Chart out inhibitors and its mechanism arresting apoptosis.		
15 a.	Explain with reference to chemical carcinogen pathogenesis of cancer.	K2	CO5
	OR		
15 b.	Draw and describe life cycle of retrovirus.		

**SECTION - C (30 Marks)**

Answer ANY THREE questions

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

16	Explain in detail types of membrane transport adhered in E.coli and gram negative bacteria.	K2	CO1
17	Narrate in detail types of electron carriers and mechanism of proton Translocation.	K2	CO2
18	What is the role of receptors? Classify and signify types of receptors.	K2	CO3
19	Define apoptosis. Explain with a neat diagram process of apoptotic pathway.	K2	CO4
20	Illustrate with a chart Tumor suppressor gene products and exclusive functions of each product.	K2	CO5

Z-Z-Z END