LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **BIOTECHNOLOGY**

FIRST SEMESTER – **NOVEMBER 2024**

PBT1MC02 – BIOMOLECULES AND METABOLISM

Date: 11-11-2024 Dept. No. Max. : 100 Marks

Time: 01:00 pm-04:00 pm

	SECTION A – K1 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
1	**Choose the best option**	
a)	Name the gluconeogenesis pathway i) Kreb's cycle ii) EMP-pathway iii) HMP-pathway iv) Glyoxylate cycle	
b)	The final electron acceptor in the electron transport chain is i) NAD ii) FAD iii) O_2 iv) H_2O	
c)	The direct product of oxidative deamination of glutamate is i) α-Ketoglutarate and Ammonia ii) Pyruvate and Ammonia iii) Acetyl-CoA and Ammonia iv) Oxaloacetate and Ammonia	
d)	Which enzyme is deficient in Type I Glycogen Storage Disease (von Gierke's disease)? i) Glycogen phosphorylase ii) Glucose-6-phosphatase iii) Debranching enzyme iv) Phospho fructokinase	
e)	Ascorbic acid deficiency affects the formation of _____. ii) Collagen ii) Myosin iii) Keratin iv) Histone	
	SECTION A – K2 (CO1)	
	Answer ALL the questions	**(5 x 1 = 5)**
2	**Answer in one or two sentences**	
a)	Define Vant Hoff's rule.	
b)	What is exergonic reaction?	
c)	Illustrate biological polymers.	
d)	Mention the complications of hyperlipoproteinemia.	
e)	Differentiate prebiotic and probiotic.	
	SECTION B – K3 (CO2)	
	Answer any THREE of the following	**(3 x 10 = 30)**
3	Explain how monosaccharides differ from polysaccharides in terms of structure and function.	
4	ATP is considered a high-energy compound. - Discuss	
5	Write a note on gluconeogenesis and energetic reaction.	
6	Discuss the importance of lipoproteins and mention various causes of hyper lipoproteinemia.	

7	Write the importance and significance of water soluble vitamins and fat soluble vitamins.
	SECTION C – K4 (CO3)
	Answer any TWO of the following **(2 x 12.5 = 25)**
8	Illustrate the structures of alpha helix and beta pleated sheets and state its importance in protein function.
9	Write the importance of Malate aspartate shuttle and its importance of enzymatic reaction.
10	Describe the steps of Tricarboxylic acid (TCA) cycle.
11	Explain the importance the following micronutrients of Calcium, Magnesium, Iron, Zinc, Copper.
	SECTION D – K5 (CO4)
	Answer any ONE of the following **(1 x 15 = 15)**
12	Differentiate between the chemiosmotic mechanisms of ATP synthesis in mitochondria and chloroplast.
13	Describe the detoxification of ammonia by urea cycle. Explain its regulation and disorders.
	SECTION E – K6 (CO5)
	Answer any ONE of the following **(1 x 20 = 20)**
14	Design an experiment to investigate the effect of varying ATP concentrations on phospho fructokinase activity in glycolysis.
15	Create a patient monitoring protocol for managing diabetes, incorporating regular HbA1c testing, glucose tolerance tests and insulin assays.

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