U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 22BT4PCBAB **Max Marks: 100**
Course: Biochemistry & Bioenergetics

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		What is reduction potential? Explain how it is being measured experimentally with an example.	*CO1*	*PO1*	**06**
	b)		What are high energy compounds? Explain the structure and function of ATP in metabolism.	*CO1*	*PO1*	**08**
	c)		Justify the statement "Standard free energy changes are additive" with a suitable example.	*CO 1*	*PO1*	**06**
			UNIT - II			
2	a)		Describe the sequence of reactions in the oxidation of glucose via Glycolysis.	*CO 2*	*PO2*	**10**
	b)		Describe the Chemiosmotic model of ATP synthesis with a neat diagram.	*CO 2*	*PO2*	**10**
			OR			
3	a)		Explain the mechanism of the reaction catalyzed by PDH complex during the conversion of pyruvate to acetyl-CoA.	*CO 2*	*PO2*	**08**
	b)		Why would it be disadvantageous to the organism to have Glycolysis and Gluconeogenesis operating simultaneously within a cell? Briefly describe one example of reciprocal regulation of Glycolysis and Gluconeogenesis, involving an allosteric regulator. For the example chosen, write out the reaction catalyzed by the enzyme in each pathway, and indicate the nature of the effect of the regulator (e.g., inhibition or activation).	*CO 2*	*PO2*	**08**
	c)		What is substrate level phosphorylation? Explain with an example.	*CO 2*	*PO 2*	**04**

			UNIT - III			
	4	a)	Explain the different stages of CO_2 assimilation in photosynthetic organisms.	*CO 2*	*PO2*	**10**
		b)	Discuss in brief about Hill reaction.	*CO2*	*PO2*	**06**
		c)	Write a note on primary and secondary photopigments.	*CO2*	*PO2*	**04**
			UNIT - IV			
	5	a)	Describe how fatty acids are transported from cytosol to the mitochondrial matrix via carnitine shuttle.	*CO2*	*PO2*	**08**
		b)	Discuss in detail the steps in the β-oxidation of fatty acids. Calculate the energetics of palmitic acid oxidation.	*CO2*	*P 2*	**12**
			UNIT - V			
	6	a)	Define and explain transamination and oxidative deamination reactions. Describe the role of PLP in transamination.	*CO2*	*PO2*	**10**
		b)	Explain the denovo biosynthesis of Purine nucleotides and its regulation.	*CO2*	*PO2*	**10**
			OR			
	7	a)	Describe in detail the sequence of reactions in urea cycle. Add a note on its regulation.	*CO2*	*PO2*	**10**
		b)	Define ammoniotelic, ureotelic and uricotelic organisms with examples.	*CO2*	*PO2*	**04**
		c)	Discuss about the biosynthesis of any one non-essential amino acid.	*CO 2*	*PO2*	**06**

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