

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3EXAMINATION- 2024

M.Sc-III Semester (BT)

COURSE CODE (CREDITS):20MS1BT311 (3-0-0)

MAX. MARKS:35

COURSE NAME: Bioprocess Engineering & Technology

COURSE INSTRUCTORS: Dr.Garlapati Vijay Kumar

MAX. TIME: 2 Hours

Note:(a)All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1	Explain in detail how the “lipase specificity” helps for complete and specific hydrolysis of oils/fat? Write about the features of “Interesterification” and degumming of oils by immobilized lipases? What are the pros of utilizing “1,3-Diacylglycerols” as specialty cooking oils rather than “Monoacylglycerols”?	6
Q2	Summarize the Oxygen transfer rate (OTR) relationship with the Volumetric mass-transfer coefficient (K_La)? Discuss in detail the different methods used for K_La determination?	6
Q3	Demonstrate the “Lignocellulosic Bioethanol Technology” with a neat diagram explaining the steps and purpose? Explain in detail the Immobilized lipase-mediated synthesis of Biodiesel?	6
Q4	If you asked to enhance the thermostability and specificity of an enzyme, how do the “Directed Evolution” and “Rational Protein Design “approaches help you attain your goal? Explain both processes in detail with a neat sketch and explain how the mutagenesis approaches and basic information needed differ in each case?	6
Q5	Justify the complexities that need to be taken care of while scaling bioreactors? Write about the typical time constants used to predict the reactor limitations? What standard scale-up rules need to be followed for the scale-up process?	6
Q6	Illustrate the following one’s (a) “Crab tree effect” associated with the Continuous reactor system? (2.5 M) (b) Mass transfer steps involved in transferring oxygen from gas bubble to microbial cell? (2.5 M)	5

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