JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Supplementary Examination- 2026

M.Sc -III[rd] Semester (BT)

COURSE CODE (CREDITS): 20MS1BT311(03) **MAX. MARKS:** 75

COURSE NAME: Bioprocess Engineering and 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 whereever required for solving problems

Q.No	Question	Marks
Q1	Explain in detail about the fermentation techniques utilized for bioprocess product preparation by elaborating the process conditions along with advantages and disadvantages?	12 M
Q2	List the functions of bioreactor and elaborate the classification of fermentation process based on the mode of operation with suitable diagrammatic representations?	12 M
Q3	In BPE, what operations need scale-up and elaborate the concepts of "Scale-up" and "Scale-down" approached utilized in BPE by mentioning the common rules for scale-up and evaluated process changes for scale down?	12 M
Q4	Write about the different types of Immobilized bioreactors utilized in BPE by summarizing the advantages and limitations associated with the immobilized bioreactors?	12 M
Q5	What are the different strategies utilized for protein design? Explain in detail about the each protein design steps in a schematic representation and summarize the how mutation scheme differ with the each strategy?	12 M
Q6	Discuss in detail about the "Pretreatment Technologies" for lignocellulosic bioethanol production by explaining the "purpose", "assessment" and "Different pretreatment technologies"?	7.5 M
Q7	Summarize the differences between enzymatic and chemical modifications utilized in oil and fat industry? Why researchers/industries prefer enzymes working in organic media and under solvent-free conditions elaborate by including the associated advantages?	7.5 M