JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

M.Sc-III Semester (BT)

COURSE CODE (CREDITS): 20MS1BT311(3) **MAX. MARKS:** 35

COURSE NAME: Bioprocess Engineering and Technology

COURSE INSTRUCTOR: Dr.Garlapati Vijay Kumar **MAX. TIME:** 2 Hours

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1.Lignocellulosics is one of the easily available biomass for industrial commodities production. With a neat sketch depict the lignocellulosic biomass to Bioethanol scheme? Mention the purpose of each step utilized in bioethanol production? **(5 M) (CO V)**

Q2. Enzymes are the sustainable catalysts for the oil and fat industry. Summarize the advantages associated with the enzymes working in organic media and under solvent-free conditions? Give a special note on usage of 1,3-DAG as a specialty over TAG? **(5 M) (CO V)**

Q3.What do you know about scale-up and scale-down approaches utilized in bioprocess Industries? What are the common scale-up rules which need to be maintained during the scale-up operation? Write a note on the characteristic time constants utilized for predicting the reactor limitations for conversion and transport processes? **(5 M) (CO IV)**

Q4. Biodiesel is one of the biofuel as a replacement for fossil fuel. What is the approach utilized for biodiesel products summarized through an equation? Give a note on homogeneous catalysis and heterogeneous catalysis approaches utilized in Biodiesel production? Write a note on the "Whole-crop biorefinery" approach? **(5 M) (CO V)**

Q5. What are the objectives for choosing "Rational protein Design" and "Directed Evolution" approaches in bioprocessing? With a neat sketch compare the RPD with DE? How the mutagenesis techniques differ with the RPD, DE and Focused-DE? **(5 M) (CO IV)**

Q6. Write about the following one's **(10 M) (CO I & CO II & CO III)**

(a) Practical applications of thermophiles. alkaliphiles and halophiles in Bioprocessing(2.5 M)

(b) (b) Salt-in strategy Vs Compatible Solute strategy of Halophiles (2.5 M)

(c) Depiction of steps involved reaching oxygen from air bubble to microbial cell (2.5 M)

(d) Approaches utilized to enhance the oxygen transport in bioprocesses (2.5 M)

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