

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech.- VI Semester (Biotechnology)

COURSE CODE (CREDITS): 18B1WBT634 (03)

MAX. MARKS: 25

COURSE NAME: Bioenergy and Biofuels (elective)

COURSE INSTRUCTOR: Prof. Sudhir Kumar

MAX. TIME: 2 Hour

Note: (a) All questions are compulsory.

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

Q.No	Question	CO	Marks																				
Q1	Differentiate between the following by giving suitable examples or case studies:- i) SHF and SSF ii) LPG and Biogas iii) Second generation and First generation biofuels	III	2+2																				
Q2	a) Identify the coproducts and byproducts of corn ethanol process? Elaborate the coverage of ethanol applications in areas other than biofuel. b) In a biogas plant established in a JUIT; how do we calculate the production of biogas produced in a particular day? Calculate the amount by assuming the diameter of gas holder as 150 cm and increment in height of gas holder from 28 cm to 46 cm.	IV	2+1																				
Q3	a) Comment upon composition of lignocellulosic biomass, and elaborate the process of cellulose degradation, conversion and utilization to ethanol. b) Judge the significance of Biomass Databases? Give one example of such database and its utility.	V	3+1																				
Q4	a) Why do we prefer E 85 fuel compared to E 100 fuel? b) Interpret the Octane rating on its value and how does it impact the fuel quality? c) Elaborate the utility and characteristics of Dual Fuel Internal Combustion Engine.	I	2+2+2																				
Q5	a) Prepare a plan to make Himachal Pradesh as energy independent state with sustainable practices. b) Assess the technoeconomic constraints of Bioethanol program in India?	II	3+2																				
Q6	<table><tr><th>Feedstock</th><th>Dry matter (DM %)</th><th>Organic dry matter (ODM% of DM)</th><th>Biogas yield (m³/ton ODM)</th><th>Biogas yield (m³/wet ton)</th></tr><tr><td>Cow dung</td><td>7-15</td><td>65-85</td><td>200-400</td><td>25</td></tr><tr><td>Vegetable waste</td><td>10-20</td><td>65-85</td><td>400-700</td><td>75</td></tr><tr><td>Fat slurry</td><td>8-50</td><td>70-90</td><td>600-1300</td><td>310</td></tr></table> <p>Cmpare the concepts of DM, ODM, wet waste considering the above data.</p>	Feedstock	Dry matter (DM %)	Organic dry matter (ODM% of DM)	Biogas yield (m ³ /ton ODM)	Biogas yield (m ³ /wet ton)	Cow dung	7-15	65-85	200-400	25	Vegetable waste	10-20	65-85	400-700	75	Fat slurry	8-50	70-90	600-1300	310	IV	3
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