**TU/CDOE**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (SPRING) 2021**

**DRE 103: BIOMASS ENERGY**

Time: **3 Hours** Total Marks: **70**

*The figures in the right-hand margin indicate marks for the individual question.*

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1. Choose the correct answer: 1x10=10

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| 1. Charcoal yield from biomass is a pyrolysis/anaerobic/aerobic process |
| 1. Pure cellulose can be produced from lignocellulosic biomass by acid/base/enzyme hydrolysis |
| 1. Ethanol/methanol/producer gas production is a microorganism involved biomass conversion process |
| 1. Treating hemicelluloses with concentrated inorganic acid produces furfural/dimethyl ether/starch instead of pentose sugar required for ethanol production |
| 1. The best solar energy-converting machine available in nature is plant/microorganism/human |
| 1. Currently, more than 80% of the methanol is being produced from plant/natural gas/ petrol |
| 1. Internal combustion engine may be derated to run by biogas, since biogas has lower/higher/equal volumetric energy content than petrol |
| 1. The flame velocity of biogas decreases as the concentration of CH4 in biogas increases/decreases/ remains same. |
| 1. The cheapest raw materials for producing ethanol from biomass is saccharine/starchy/cellulosic materials. |
| 1. Energy loss in C4/ C3/CAM plant occurs for photorespiration   2. What do you mean by biomass & biomass energy? Why is biomass renewable? Why is biomass considered as environmental friendly energy source*?* Briefly discuss the various types of biomass conversion processes with examples. 4+4+4+8 =20  **P.T.O.** |

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| 3. Answer the following: 7+8+7+8=30   1. What are the major reasons of going for alternative fuels like bio-diesel and bio-ethanol? 2. Discuss the common feedstock used for production of   (i) biodiesel and (ii) bio-ethanol.   1. Do you see any regional variations of suitability of feedstock for production of these alternative fuels? 2. With the help of neat sketch discuss the transesterification process of biodiesel production.   4. Answer the following:   1. What is biogas? What is the mechanism to form biogas from organic wastes? Mention the different options for biogas utilization. 7 2. Write a short note on densification of biomass. 3   **\*\*\*** |

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