**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (SPRING) 2020**

**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 (options marked in bold letters):

1x10=10

1. Charcoal yield from biomass is **pyrolysis/anaerobic/aerobic** process
2. Pure cellulose can be produced from lignocellulosic biomass by **acid/base/enzyme hydrolysis**
3. **Ethanol/methanol/producer** gas production is a microorganism involved in biomass conversion process
4. Treating hemicelluloses with concentrated inorganic acid produces **furfural/dimethyl/ether/starch** instead of pentose sugar required for ethanol production
5. The best solar energy-converting machine available in nature is **plant/microorganism/human**.
6. Currently, more than 80% of the methanol is producing 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
2. The flame velocity of biogas decreases as the concentration of CH4 in biogas **increases/decreases/ remains** same.
3. The cheapest raw materials for producing ethanol from biomass is **saccharine/starchy/cellulosic** materials.
4. 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.**

3. Answer the following:

a) Discuss alkali catalyzed transesterification of biodiesel production

from vegetable oil. What are the methods for purifying biodiesel

after production? 7+3=10

b) Name some oil seeds available in India that can be used as

non-edible vegetable oil sources for biodiesel production. 5

c) Give the schematic representation with the help of flow chart for

producing ethanol from different types of biomass raw materials

and discuss their salient features on converting them to

fermentable sugars. 2+8=10

4. What do you mean by densification of biomass and what are its

major advantage? 2+3=5

5. Write short notes on **any two** of the following: 5x2=10

a) First and second generation biofuels

b) Importance of biogas as cooking fuel in India

c) New production areas for methanol

production

d) Importance of solid biofuel in domestic

energy sector

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