Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **14BT2054** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOENERGY AND BIOMATERIALS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | What are the major feed-stock for biomass to energy conversion? | CO1 | 2 |
| b. | Explain why biomass energy could be favoured over the conventional energy resourses? | CO1 | 4 |
| c. | What are the challenges still to be addressed in biomass energy conversion? | CO1 | 8 |
| d. | Elaborate why lignocellulosic biomass should be inducted in place of energy crops? | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | What are the potential implications of large-scale biomassproduction? | CO2 | 6 |
| b. | Describe the steps involved in biochemical conversion of biomass to bioenergy. | CO2 | 14 |
|  |  |  |  |  |
| 3. | a. | What are the array of products that may be generated in pyrolysis of biomass? How can you manipulate the step to have a higher conversion to a desired product? | CO2 | 6 |
|  | b. | Describes the conditions and utility of Torrefaction process. | CO2 | 14 |
| (OR) | | | | |
| 4. | a. | What is bio oil? Describe the negative attributes associated with bio oil. | CO2 | 6 |
|  | b. | How bio oil can be generated through pyrolysis? How can it be upgraded? | CO2 | 14 |
|  |  |  |  |  |
| 5. |  | Elaborate the steps involved anaerobic digestion of Biomass, preferably with a schematic diagram | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Elaborate the cascade of phenomenon kicks in when AD process comes under inhibited steady state due to accumulation of ammonia. | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Describe the terrestrial and ocenic C exchange process with appropriate diagram. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | What are the key reactions and metabolic steps in a nitrogen cycle? | CO3 | 16 |
|  | b. | Explain how human activities are interfering the N cycle? | CO3 | 4 |
|  | |  |  |  |
|  | | **Compulsory:** |  |  |
| 9. | a. | What is phytoremediation? Explain how phytoremediation can be implemented as green remediation technology. | CO3 | 16 |
|  | b. | What are the desirable qualities of a plant species when selected for phytoextraction? | CO3 | 4 |

ALL THE BEST