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

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**End Semester Examination – Nov/Dec – 2018**

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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. | Elaborate the economical/environmental benefits of bioenergy over the conventional energy usages. | CO1 | 8 |
| b. | Explain the current usages of lignocellulosic biomass in bioenergy sector. What are the challenges associated with the lignocellulosic biomass? | CO1 | 12 |
| (OR) | | | | |
| 2. |  | Detail the different enzymatic, thermo-chemical conversion process of biomass for bioenergy recovery using schematic flowchart or smart art graphics, if required. Critically compare their advantages and disadvantages. | CO1 | 20 |
|  |  |  |  |  |
| 3. | a. | Explain the properties of Torrefied biomass that are very attractive in bioenergy perspective. | CO2 | 10 |
| b. | Evaluate the different pyrolytic conditions that contribute better conversion into biooil production. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Examine the critical properties that prohibits wider use of bio-oil in alternate energy programs? | CO2 | 10 |
| b. | List out the physio-chemical procedures that can be adopted to bio-oil quality improvement. | CO2 | 10 |
|  |  |  |  |  |
| 5. |  | Explain process level changes in anaerobic-digestion that establish steady-state inhibition. Adopt appropriate diagram for clarification. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Illustrate inter-dependency among acidogenic, acetogenic and methanogenic processes in anaerobic digestion. Highlight the key process parameter in each stage. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | What are the different form of Nitrogen that can be taken by growing plants? | CO3 | 4 |
| b. | Explain the role of nitrification, denitrification steps in nitrogen metabolism in soil with appropriate diagram | CO3 | 16 |
| (OR) | | | | |
| 8. |  | Illustrate the dynamics of ocean atmosphere Carbon exchange with appropriate diagram. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Classify the different pollutant management approaches offered in phytoremediation. | CO3 | 8 |
|  | b. | What kind of plant species are suitable for immobilization of heavy metals from soil? | CO3 | 12 |