| O.P.Code: 20AG0724 | R20 | H.T.No. | | | | | | | | | |
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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**
(AUTONOMOUS)

## B.Tech III Year II Semester Regular Examinations August-2023

### SOLID WASTE & BY-PRODUCT UTILIZATION
(Agricultural Engineering)

**Time: 3 Hours** **Max. Marks: 60**

(Answer all Five Units **5 x 12** = **60** Marks)

| | | | | | |
|---|---|---|---|---|---|
| | | **UNIT-I** | | | |
| **1** | | Explain about recovery of energy from municipal solid waste. | **CO1** | **L2** | **12M** |
| | | **OR** | | | |
| **2** | **a** | Explain about land filling process in waste management. | **CO1** | **L2** | **6M** |
| | **b** | Explain incineration in solid waste management. | **CO1** | **L2** | **6M** |
| | | **UNIT-II** | | | |
| **3** | | Explain in detail about properties and characteristics of bio mass. | **CO2** | **L2** | **12M** |
| | | **OR** | | | |
| **4** | **a** | Explain in detail about thermo chemical conversion. | **CO2** | **L2** | **6M** |
| | **b** | Write about the classification of bio mass. | **CO2** | **L1** | **6M** |
| | | **UNIT-III** | | | |
| **5** | | Explain Up- draft and down-draft Gasifier with neat sketch. | **CO4** | **L2** | **12M** |
| | | **OR** | | | |
| **6** | **a** | Differenciate between fluidized bed and fixed bed gasifier. | **CO4** | **L3** | **4M** |
| | **b** | Discuss about conversion alternatives of gasification. | **CO3** | **L3** | **8M** |
| | | **UNIT-IV** | | | |
| **7** | **a** | Calculate the volume of biogas digester suitable for the output of four cows, and the power available from the digester. Retention time is 20 days, temperature 30°C, dry matter consumed 2 kg/day, biogas yield 0.24 m3/kg, burner efficiency is 60%, and methane proportion is 0.8. Heat of combustion of methane may be assumed to be 28 MJ/m3 at STP. | **CO5** | **L3** | **6M** |
| | **b** | Explain about phases of anaerobic digestion. | **CO5** | **L2** | **6M** |
| | | **OR** | | | |
| **8** | | Explain about fixed dome type biogas plant with neat sketch. | **CO5** | **L2** | **12M** |
| | | **UNIT-V** | | | |
| **9** | **a** | Exaplain the production process of ethanol from corn with the help of a flow cahrt. | **CO3** | **L2** | **6M** |
| | **b** | Explain working principle of piston type briquetting machine with neat diagram. | **CO6** | **L2** | **6M** |
| | | **OR** | | | |
| **10** | | Write a procedure for ethanol production from sugar cane. | **CO3** | **L1** | **12M** |

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