

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS)**

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**QUESTION BANK (DESCRIPTIVE)****Subject with Code: Waste to Energy (20EE2128)****Course & Branch: M.Tech – SE,TE,VLSI,ES,PE & CSE****Year & Sem: II-M.Tech & I-Sem****Regulation: R20****UNIT –I**

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|-----------|---|-----------|-------|
| <b>1</b>  | Explain classification of waste – in detail                               | [L3][CO1] | [12M] |
| <b>2</b>  | Discuss Agro based waste briefly  | [L3][CO1] | [12M] |
| <b>3</b>  | Discuss Forest residue briefly  | [L3][CO1] | [12M] |
| <b>4</b>  | Explain the importance of Industrial waste utilization with neat sketches | [L2][CO1] | [12M] |
| <b>5</b>  | What is MSW? Explain different types of MSW                               | [L3][CO1] | [12M] |
| <b>6</b>  | Write short notes on conversion devices wrt waste management              | [L1][CO1] | [12M] |
| <b>7</b>  | (a) Define incinerator?   | [L1][CO1] | [03M] |
|           | (b) Explain the following incinerators briefly                            | [L2][CO1] | [09M] |
|           | (i) Moving Grate (ii) Fixed Grate (iii) Rotary Kiln                       |           |       |
| <b>8</b>  | Explain the following gasifiers with neat sketches                        | [L3][CO1] | [12M] |
|           | (i) Updraft (ii) Down draft gasifier                                      |           |       |
| <b>9</b>  | List out advantages of gasification over incineration                     | [L1][CO1] | [12M] |
| <b>10</b> | Explain various types of digestors for waste management briefly           | [L2][CO1] | [12M] |

**UNIT –II**

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|-----------|---|-----------|-------|
| <b>1</b>  | Explain the process of pyrolysis – in detail  | [L3][CO2] | [12M] |
| <b>2</b>  | What are the various types of pyrolysis? Comparison between methods   | [L2][CO2] | [12M] |
| <b>3</b>  | Discuss Slow and Fast Pyrolysis methods   | [L1][CO2] | [12M] |
| <b>4</b>  | Write short notes on charcoal   | [L3][CO2] | [12M] |
| <b>5</b>  | Explain the following types of charcoal production processes<br>(i) Earth kiln (ii) Brick kiln (iii) Metal kiln         | [L2][CO2] | [12M] |
| <b>6</b>  | List out applications of Charcoal in various domains  | [L3][CO2] | [12M] |
| <b>7</b>  | (a) Define pyrolytic oil?<br>(b) Explain the manufacturing process of pyrolytic oils briefly                            | [L1][CO2] | [03M] |
| <b>8</b>  | Discuss various applications and yields of pyrolytic oils – in detail   | [L2][CO2] | [09M] |
| <b>9</b>  | (a) Define Syngas ? How syngas is produced.<br>(b) Mention primary applications of Syngas in various engineering fields | [L1][CO2] | [06M] |
| <b>10</b> | Write short notes on<br>(i) Charcoal<br>(ii) Pyrolytic oils<br>(iii) Pyrolytic gases                                    | [L3][CO2] | [06M] |
|           |   | [L3][CO2] | [12M] |

**UNIT –III**

- 1 Define gasifier. Classify various types of gasifiers. [L3][CO3] [12M]
- 2 Explain the design, construction and operation of Downdraft gasifier. [L3][CO3] [12M]
- 3 Explain the design, construction and operation of updraft gasifier. [L3][CO3] [12M]
- 4 Explain the design, construction and operation of fluidized bed gasifier. [L3][CO3] [12M]
- 5 Explain Gasifier burner arrangement for thermal heating in detail. [L3][CO3] [12M]
- 6 Draw Gasifier engine arrangement for production of Electric power and explain the methodology. [L3][CO3] [12M]
- 7 Discuss the following [L3][CO3] [12M]  
(i) Equilibrium (ii) Kinetic considerations of gasifier in detail
- 8 Write short notes on [L3][CO3] [12M]  
(i) Downdraft (ii) Updraft gasifiers
- 9 Write short notes on [L2][CO3] [12M]  
(i) Fluidized bed (ii) Downdraft gasifier
- 10 How gasifier output is utilized in Electrical Power Plants - Justify [L3][CO3] [12M]

**UNIT –IV**

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|-----------|---|-----------|-------|
| <b>1</b>  | Write Short notes on Biomass stoves   | [L3][CO4] | [12M] |
| <b>2</b>  | Explain Design, Construction and Operation of Fixed bed combustor             | [L2][CO4] | [12M] |
| <b>3</b>  | Explain Design, Construction and Operation of Inclined Grate Combustor        | [L2][CO4] | [12M] |
| <b>4</b>  | Explain Design, Construction and Operation of Fluidized bed Combustor         | [L3][CO4] | [12M] |
| <b>5</b>  | Briefly discuss various types of Combustors                                   | [L3][CO4] | [12M] |
| <b>6</b>  | Explain the operation of Fixed bed combustor with neat sketches               | [L2][CO4] | [12M] |
| <b>7</b>  | Explain the operation of Inclined Grate Combustors                            | [L2][CO4] | [12M] |
| <b>8</b>  | Explain the operation of Fluidized bed combustor with neat sketches.          | [L3][CO4] | [12M] |
| <b>9</b>  | What is meant by exotic design of Biomass Stove? Explain in detail            | [L2][CO4] | [12M] |
| <b>10</b> | Compare the following combustors wrt operational and constructional features. | [L3][CO4] | [12M] |
|           | (i) Fixed bed (ii) Inclined Grate (iii) Fluidized bed                         |           |       |

**UNIT –V**

- 1 Explain Design, Constructional features of Biogas Plant Technology [L2][CO5] [12M]
- 2 What is meant by Biomass resources? Classify based on their application [L3][CO5] [12M]
- 3 Discuss Biomass conversion processes [L3][CO5] [12M]
- 4 Write short notes on [L2][CO5] [12M]  
(i) Thermo Chemical Conversion (ii) Direct combustion of Biomass
- 5 (a) Classify Biogas plants [L3][CO5] [06M]  
(b) List out applications of biogas plants [L3][CO5] [06M]
- 6 Explain the following in detail [L3][CO5] [12M]  
(i) Biomass gasification (ii) Pyrolysis & Liquefaction
- 7 Explain Alcohol production from Biomass [L2][CO5] [12M]
- 8 Write short notes on [L2][CO5] [12M]  
(i) Urban Waste to Energy Conversion  
(ii) Biomass Energy Programme
- 9 Explain the following in detail wrt biomass plants [L2][CO5] [12M]  
(i) Bio-Chemical Conversion (ii) Anaerobic digestion
- 10 Explain Bio-diesel production in detail [L3][CO5] [12M]

**PREPARED BY: Dr. Rahul Bhattacharjee**