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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2022

BESAG7010- Bio-Energy System: Design and Applications

(AGE)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

Q.1. Answer ALL questions

	[CO#]	[PO#]
a. What type of fuel are coal, petrol and natural gas?	CO1	PO2
(i) Bio fuels		
(ii) Electrical fuels		
(iii) Fossil fuels		
(iv) Liquid fuels		
b. Non-renewable source of energy is	CO2	PO1
(i) Forest wealth		
(ii) Wild life		
(iii) Hydro power		
(iv) Coal reserves		
c. It is possible to extract maximum energy from wood through	CO1	PO2
(i) Biomass		
(ii) Cracking		
(iii) Direct burning		
(iv) Gasification		
d. Which of the following is a non-renewable resource?	CO2	PO1
(i) Nuclear energy		
(ii) Hydroelectric		
(iii) Hydrogen		
(iv) Geothermal energy		
e. Which of the source of energy is non-renewable?	CO3	PO1
(i) Wild life		
(ii) Forest wealth		
(iii) Coal reserves		
(iv) Hydel-power		
f. Citric acid production is by action of	CO4	PO1
(i) Aspergillus Niger		
(ii) Acetobacter		
(iii) Candida		
(iv) None of these		
g. Thermal power generation is	CO1	PO1
(i) Conventional, renewable, polluting		
(ii) Conventional, renewable, non-polluting		
(iii) Conventional, non-renewable, polluting		
(iv) Non-conventional, non-renewable and non-polluting		
h. Producer gas differs from biogas in having	CO1	PO1
(i) Methane		
(ii) Carbon monoxide		
(iii) Carbon dioxide		
(iv) Formed by fermentation		
i. L.P.G. cooking gas is	CO3	PO2
(i) Low pressure gas		
(ii) Biogas		
(iii) Fossil fuel		
(iv) Low price gas		
j. The incorrectly matched pair is	CO4	PO1
(i) Biogas produced from dung		
(ii) Latex source of liquid hydrocarbons		
(iii) Ethanol used as gasoline		
(iv) Animal energy used most efficiently		

PART – B: (Short Answer Questions)**(2 x 10 = 20 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. What is biomass? Give few examples?	CO2	PO1
b. What raw materials are used as a feedstocks for biomass energy production?	CO1	PO2
c. Analyse the Potential application of Biomass as value added products.	CO1	PO2
d. What are the benefits of biomass?	CO1	PO1
e. Mention the possible primary and secondary sources of solid, liquid and Gaseous Fuel.	CO1	PO1
f. What is biogas? Name the major components of biogas?	CO4	PO1
g. What are the advantages and disadvantages of using biogas?	CO4	PO1
h. How Bio fuels differ from Petroleum Feedstock's?	CO3	PO1
i. Which gases are produced during gasification?	CO4	PO1
j. What biochemical's can be made from poplar?	CO4	PO1

PART – C: (Long Answer Questions)**(10 x 4 = 40 Marks)**Answer ALL questions

	Marks	[CO#]	[PO#]
3. a. Enlist the Biomass Feedstock ,the different conversion processes for the end use as Fuels, Chemicals, Materials, Heat and Power	5	CO1	PO2
b. Enumerate the Chemistry of Gasification.	5	CO1	PO1
(OR)			
c. Discuss in detail about the Overall Steps Involved in Biomass Gasification.	4	CO1	PO2
d. Analyse the Mechanisms of the Biomass Gasification Process mentioning the schematic representation.	6	CO1	PO1
4. a. Draw the Conceptual diagram with respect to the mechanism of gasification demonstrated in multiple steps fixed-bed (a) updraft and (b) downdraft gasifiers	6	CO2	PO2
b. What are the responsible factors which effecting the Gasification Process	4	CO2	PO1
(OR)			
c. Review the Thermo chemical Biomass Gasification with Current Status of the Technology.	10	CO2	PO3
5. a. Emphasise the Biomass-to-Bio energy production Routes through Biological conversion, Chemical conversion and Thermal conversion Processes.	10	CO3	PO2
c. What is the difference between 1st 2nd and 3rd generation?	4	CO3	PO1
d. Discuss with possible chemical reaction for the Biodiesel production from triglyceride oils.	6	CO3	PO2
6. a. Discuss in detail about the metabolic process that converts sugar to acids, gases or alcohol	6	CO4	PO1
b. Mentions the chemical equation of alcoholic fermentation and Lactic acid fermentation from glucose.	4	CO4	PO2
(OR)			
c. Appraise the general overview of Industrial fermentation	5	CO4	PO1
d. Articulate the use of fermentation by microorganisms to make useful products to humans' especially viable cellular material, extracellular metabolites, intracellular components and Transformation of substrate.	5	CO4	PO2

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