

Enrollment No: \_\_\_\_\_

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B. Tech Mid Semester Exam**

Semester: 6<sup>th</sup>  
 Subject Code: (203120385)  
 Subject Name: (Biomass Conversion and Utilization)

Date: (02/02/2024)  
 Time: (1hr: 30min)  
 Total Marks: 40

Sr. No.		Marks
Q.1	(A) Five One line Questions (1) Define water gas shift reaction and methane formation reaction? (2) Write down the energy services provided with producer gas and ethanol? (3) Define the biochar and biofuels with examples? (4) How we can convert biomass into energy? Explain in short. (5) Write down the biomass carbon cycle?	05
	(B) Five Fill in the blanks (1) In entrained flow gasifier finely refined fuel particles and gasifying media come in the form of a _____ from the _____ end of the reactor? (2) In the drying, the amount of heat required is proportional to the _____ content? (3) _____ is the ratio of the biogas production rate at normal conditions and the narrowest cross-sectional area of gasifier? (4) The oxidation is carried out in conditions of lack of _____ with respect to the stoichiometric requirement? (5) The principal reactions of gasification are _____ character?	05
Q.2	Attempt any four (Short Questions)	12
	(1) Explain the following with examples? (a) Moisture content (b) Superficial velocity (c) Gasifying agent	
	(2) What is size reduction technology? Explain in short with its significance in biomass industry?	
	(3) Define the different types of composition of biomass in detail.	
	(4) What is concept of bio-refinery? Explain with diagram and define all the necessary terms.	
	(5) What is the concept of Biomass Incineration? Explain how solid waste incineration works with diagram.	
Q.3	Attempt any two questions	08
	(1) What do you mean by biomass? Explain the examples of the following. (a) Field and plantation biomass (b) Urban waste biomass (c) Industrial biomass (d) Aquatic biomass	

Q.2	Attempt any four (Short Questions)	12
	(1) Explain Fluidized Bed Combustors (FBC) and write its advantages.	
	(2) Explain distillation process with diagram.	
	(3) Draw the Benchmark Roadmap.	
	(4) Explain the Asset and Workplace Management by flow chart?	
	(5) Explain the coal properties.	
Q.3	Attempt any two questions	08
	(1) Explain underground coal gasification and its benefits.	
	(2) Write down the Primary, Secondary and Tertiary Objectives of the Energy Management (3 objectives for each)?	
	(3) Explain the Energy Audit Instruments in details?	
Q.4	(A) Explain the 10 steps for the detailed Audit including Pre-audit phase, Audit phase and post-audit phase?	05
	(B) Explain the Energy monitoring and targeting in details?	05
	OR	
	(B) What is the difference between updraft gasifier and downdraft gasifier explain with diagram.	05