Printed Page:- 04 **Subject Code**:- **ABT0613**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2023 - 2024)

Subject: Biofuels & Alcohol Technology

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. Which of the following is not a phase of the brewing process?(CO1) 1

(a) Fermentation

(b) Pre-fermentation

(c) Wort manufacture

(d) Post-fermentation

1-b. Which of the following process encourages grain germination? (CO1) 1

(a) Malting

(b) Milling

(c) Mashing

(d) Boiling

1-c. _____ is a metabolic process that produces chemical changes in organic substrates through the action of enzymes. (CO2) 1

(a) Buffers

(b) Fermentation

(c) Bioreactor

(d) All of the above

1-d. In ethanol fermentation, one glucose molecule is converted into? (CO2) 1

(a) two ethanol molecules

(b) two carbon dioxide molecules

(c) Both A and B

(d) one ethanol molecules and one carbon dioxide molecules

1-e. Which of the following is an example of a second-generation biofuel? (CO3) 1

(a) Ethanol produced from corn

(b) Biodiesel produced from soybeans

(c) Ethanol produced from cellulose

(d) Biogas produced from animal waste

1-f. After the fermentation is over, ethanol is recovered by (CO3) 1

(a) centrifugation

(b) distillation

(c) filtration

(d) cell disintegration

1-g. Which of the following technologies are used to convert biomass into useful energy forms?(CO4) 1

(a) Bio-chemical process

(b) Galvanization

(c) Doping

(d) Photoelectric effect

1-h. What are the four main types of thermo-chemical processes? (CO4) 1

(a) Galvanization, photovoltaic effect, chemo-mechanical effect, pyrolysis

(b) Pyrolysis, gasification, combustion, hydrothermal processing

(c) Pyrolysis, gasification, combustion, doping

(d) Photovoltaic effect, gasification, combustion, hydrothermal processing

1-i. Which of the following are the types of bioenergy? (CO5) 1

(a) Animal energy and chemical energy

(b) Solar energy and nuclear energy

(c) Fossil fuels and solar energy

(d) Animal energy and biofuels

1-j. Raising crops for the production of ethanol is known as _____ (CO5) 1

(a) energy plantation

(b) energy cropping

(c) agro-technology

(d) biomass production

2. Attempt all parts:-

2.a. Write the name of five biobased products? (CO1) 2

2.b. Define fermentation? (CO2) 2

2.c. What is first generation biofuel? (CO3) 2

2.d. What are the sources of biomass feedstock?(CO4) 2

2.e. What do you understand by bioenergy? (CO5) 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. How raw materials are stored and handled before used in industry? (CO1) 6

3-b. Discuss in detail about alcohol technology? (CO1) 6

3-c. Discuss the process of wine production in detail? (CO2) 6

3-d. Discuss about the homofermentative pathway of lactic acid production? (CO2) 6

3.e. How is fermentation process managed to produce alcohol? (CO3) 6

3.f. How thermal gasification of biomass takes place? (CO4) 6

3.g. How biodiesel is produced from algae? (CO5) 6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a. What is alcohol technology? How micro-organisms are used in the production of alcohol? (CO1) 10

4-b. With the help of labelled diagram, explain the process of ethanol production using solid state fermentation? (CO1) 10

5. Answer any <u>one</u> of the following:-

5-a. Discuss in detail about the homofermentative and heterofermentative pathway of alcohol production? (CO2) 10

5-b. Explain in detail about the different fermentative pathway of alcohol production? (CO2) 10

6. Answer any <u>one</u> of the following:-

6-a.	How quality control takes place in distillery units? Explain with the help of flowchart? (CO3)	10
6-b.	What kinds of biomass can be used to generate fuel and products? (CO3)	10

7. Answer any <u>one</u> of the following:-

7-a.	Discuss in detail about syngas fermentation? (CO4)	10
7-b.	Explain about the four stages of anaerobic digestion? (CO4)	10

8. Answer any <u>one</u> of the following:-

8-a.	How cultivation of microalgae is done? Explain with the help of suitable diagram? (CO5)	10
8-b.	How processing and extraction of value added products are done? Discuss in detail? (CO5)	10