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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**(An Autonomous Institute Affiliated to AKTU, Lucknow)****B.Tech****SEM: VI - THEORY EXAMINATION (2022-2023)****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. What is the environmental benefit of producing single cell protein?(CO1) 1
- (a) It reduces greenhouse gas emissions
 - (b) It reduces land use for livestock production
 - (c) It reduces water use for livestock production
 - (d) All of the above
- 1-c. For thorough mixing of medium and inoculum the part of fermenter useful is(CO2) 1
- (a) Shaft
 - (b) Headspace

- (c) impeller
(d) sparger
- 1-d. Which of the following is a fermentation process?(CO2) 1
(a) Batch process
(b) Continuous process
(c) both a and b
(d) None of the above
- 1-e. Which of the following is not a biofuel?(CO3) 1
(a) Ethanol
(b) Methanol
(c) Natural gas
(d) Butanol
- 1-f. Algal biomass is used to produce biofuels called ____ (CO3) 1
(a) First generation biofuels
(b) Second generation biofuels
(c) Third generation biofuels
(d) None of the above
- 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 is biogas?(CO4) 1
(a) Gasoline made from biomass
(b) Gas produced by the anaerobic digestion of organic matter
(c) Gasoline made from crude oil
(d) Gas produced by the burning of biomass
- 1-i. Energy resources derived from natural organic materials are called(CO5) 1
(a) geothermal energy
(b) fossil fuels
(c) biomass
(d) Any of the above

- 1-j. Which of the following is a potential disadvantage of using algae as a feedstock for biodiesel production?(CO5) 1
- (a) It is more expensive to produce biodiesel from algae than from vegetable oils
 - (b) It requires large amounts of water to grow algae
 - (c) It is difficult to extract oil from algae
 - (d) None of the above

2. Attempt all parts:-

- 2.a. Name the process which is used for the recovery of ethanol?(CO1) 2
- 2.b. What are the different modes of fermentation?(CO2) 2
- 2.c. Which generation of biofuel is most sustainable?(CO3) 2
- 2.d. What are the sources of biomass feedstock?(CO4) 2
- 2.e. What are the different methods of cell disruption?(CO5) 2

SECTION B

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3. Answer any five of the following:-

- 3-a. Write a short note on pretreatment of alcohol production?(CO1) 6
- 3-b. Write the difference between normal fuel and biofuel?(CO1) 6
- 3-c. Discuss continuous fermentation in detail?(CO2) 6
- 3-d. Write a short note on scaling in distillery industries?(CO2) 6
- 3.e. What do you understand by thermochemical conversion of biomass? Discuss in detail?(CO3) 6
- 3.f. What are the chemical reactions of an anaerobic digestion process? Discuss each of them?(CO4) 6
- 3.g. What are the potential applications and markets for value-added products, and how can their value be maximized?(CO5) 6

SECTION C

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4. Answer any one of the following:-

- 4-a. With the help of suitable example, explain the process of ethanol production in industry?(CO1) 10
- 4-b. What type of yeast is used in alcohol fermentation? What is the importance of alcoholic fermentation in industry?(CO1) 10

5. Answer any one of the following:-

- 5-a. Why cellulosic feedstocks are used for alcohol production in industry? Discuss 10

in detail?(CO2)

5-b. Diagrammatically explain the process of fusel oil separation?(CO2) 10

6. Answer any one of the following:-

6-a. Discuss all techniques used in alcohol production?(CO3) 10

6-b. Explain the biochemistry of alcohol production in detail?(CO3) 10

7. Answer any one of the following:-

7-a. What factors influence the choice of biomass conversion? Discuss each factor in detail?(CO4) 10

7-b. With the help of labelled diagram, discuss thermochemical conversion process in detail?(CO4) 10

8. Answer any one of the following:-

8-a. With the help of flowchart, explain the process of biodiesel production from oil?(CO5) 10

8-b. How does the type of biomass and the method of production affect the environmental sustainability of biomass energy?(CO5) 10

2022-23 Jan - June