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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 (2025 - 2026)

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:-

- | | | |
|-------|---|---|
| (1.1) | What is the main challenge in producing single cell protein?(CO1,K2) | 1 |
| | (a) Maintaining optimal growing conditions for the microorganisms | |
| | (b) Extracting the protein from the microorganisms | |
| | (c) Ensuring the protein is safe for animal consumption | |
| | (d) All of the above | |
| (1.2) | Which among the following is not a probiotic?(CO1,K2) | 1 |
| | (a) Escherichia coli | |
| | (b) Saccharomyces cerevisiae | |
| | (c) Fungi | |
| | (d) Lactobacillus | |
| (1.3) | The production of bio ethanol is by fermenting the _____ and starch components.(CO2,K2) | 1 |
| | (a) Acid | |
| | (b) Milk | |
| | (c) Sugar | |
| | (d) Alcohol | |
| (1.4) | What is biostil fermentation?(CO2,K2) | 1 |
| | (a) A process for producing biofuels from biomass | |
| | (b) A process for producing bioplastics from corn | |
| | (c) A process for producing bioethanol from sugarcane | |
| | (d) A process for producing high-purity ethanol from corn or other grains | |

- (1.5) Which of the following is true?(CO3,K2) 1
- (a) biofuels are synthesized from organic matter
 - (b) biofuels are synthesized from inorganic matter
 - (c) biofuels are produced from chemical compounds
 - (d) none of the above
- (1.6) Which all of these can be considered as fuel?(CO3,K2) 1
- (a) Biomass
 - (b) Plastics
 - (c) Impurities
 - (d) None of the above
- (1.7) What types of forest materials are used for biomass?(CO4,K2) 1
- (a) Manure
 - (b) Logging residues
 - (c) Fish oil
 - (d) Tallow
- (1.8) What is biogas?(CO4,K2) 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
- (1.9) Biodiesel is a renewable fuel source because:(CO5,K2) 1
- (a) It is made from vegetable oils or animal fats that can be replenished
 - (b) It can be produced from non-renewable resources like petroleum
 - (c) It does not require any energy input for production
 - (d) It has a longer lifespan than petroleum-based diesel
- (1.10) Which of the following is a potential advantage of using bioreactors for microalgae cultivation?(CO5,K2) 1
- (a) High productivity
 - (b) Control over environmental conditions
 - (c) Lower risk of contamination
 - (d) All of the above

2. Attempt all parts:-

- (2.1) What is the main source of ethanol production?(CO1,K2) 2
- (2.2) What is neutral alcohol?(CO2,K2) 2
- (2.3) What is alcoholometry? Explain the working principle of alcoholometer.(CO3,K2) 2
- (2.4) Which dung is best for biogas?(CO4,K2) 2
- (2.5) Write the name of some value-added products?(CO5,K2) 2

SECTION-B

30

Answer any one of the following:-

(3.1)	Discuss in detail about alcohol technology?(CO1,K2)	6
(3.2)	How raw materials are stored and handled before used in industry?(CO1,K2)	6
Answer any one of the following:-		
(3.3)	How alcohol is produced from grain using wet milling process?(CO2,K2)	6
(3.4)	Discuss batch fermentation in detail?(CO2,K2)	6
Answer any one of the following:-		
(3.5)	How is fermentation process managed to produce alcohol?(CO3,K2)	6
(3.6)	What are the different recycling process for the production of biofuel?(CO3,K2)	6
Answer any one of the following:-		
(3.7)	Draw a well suitable diagram of biogas plant?(CO4,K2)	6
(3.8)	Briefly discuss about biochemical conversion of biomass?(CO4,K2)	6
Answer any one of the following:-		
(3.9)	What are the benefits and advantages of bioenergy?(CO5,K2)	6
(3.10)	How biodiesel is produced from waste oil?(CO5,K2)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Discuss about the different types of yeast strains used in an alcohol industries?(CO1,K2)	10
(4.2)	Explain how grains and sugar crops are stored and handled in alcohol industry?(CO1,K2)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	What do you understand by single stage, recycle and multiple stage fermentation? Discuss each one of them in detail?(CO2,K2)	10
(5.2)	With the help of labelled diagram, discuss the encilium process in detail?(CO2,K2)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	What are the first, second and third generation biofuels? Also discuss about the different recycling process in detail?(CO3,K2)	10
(6.2)	What do you understand by alcoholometry? Draw the suitable diagram of alcohol distillation?(CO3,K2)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	What are the main sources of biofuels? Discuss about different types of biofuels in detail?(CO4,K2)	10
(7.2)	Draw a schematic diagram of syngas fermentation? Also explains the process(CO4,K2)	10
8. Answer any <u>one</u> of the following:-		
(8.1)	What are the environmental impacts associated with the production and use of a product over its entire life cycle, including raw material extraction, processing, manufacturing, transportation, use, and disposal?(CO5,K2)	10
(8.2)	How does the economic viability of a product change over time due to changes in input prices, market demand, and competition?(CO5,K2)	10