

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: BIOTECHNOLOGY**

**SEMESTER : IV
SESSION : SP/2025**

SUBJECT: BE318 BIOENERGY AND BIOFUELS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Write in detail about (i) First generation (ii) Second generation (iii) Third generation of Biofuels with suitable examples?	[5] 1	Applying
Q.1(b)	Write in detail about the energy crisis and different energy alternatives available in India?	[5] 1	Understanding
Q.2(a)	Write a short note about the metabolic pathways for the various products from fermentation?	[5] 1	Analyze
Q.2(b)	Write in detail about metabolic engineering for biofuel production?	[5] 2	Evaluate
Q.3(a)	With the help of a schematic diagram, describe the key steps involved in the production of biobutanol and highlight the additional co-products that give value to the biorefinery.	[5] 2	Applying
Q.3(b)	Explain the various steps involved in biogas production and the factors affecting the same. Also discuss the factors affecting the operation of biogas production.	[5] 2	Evaluate
Q.4(a)	Write about the impact on biomass conversion and bio refining of biofuel residues?	[5] 3	Evaluate
Q.4(b)	Write in detail about the various biofuel properties specifications and guidelines?	[5] 3	Analyze
Q.5(a)	Comment on Hydrogen as fuel of the future.	[5] 4	Understanding
Q.5(b)	Describe the carbon cycle of the bioenergy system and explain the difference between fossil fuels and biofuels with regard to carbon dioxide emission	[5] 4	Analyze

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