

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
**(MID SEMESTER EXAMINATION SP/2024)**

**CLASS: B.TECH**  
**BRANCH: BIOTECHNOLOGY**

**SEMESTER : IV**  
**SESSION : SP/2024**

**SUBJECT: BE318 BIOENERGY AND BIOFUELS**

**TIME: 02 Hours**

**FULL MARKS: 25**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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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 | 5  |
| Q.2(a) | Write about the different energy alternatives available in India?  | [2] 1 | 1  |
| Q.2(b) | How Biofuels can support India's clean energy ambitions?   | [3] 1 | 2  |
| Q.3(a) | Explain the various types of biomass in detail   | [2] 1 | 2  |
| Q.3(b) | Explain the biomass conversion process and list out the different types of conversions of biomass                            | [3] 1 | 4  |
| Q.4(a) | Write different energy harvesting biochemical pathways & their exploitation to biofuels                                      | [2] 2 | 1  |
| Q.4(b) | Discuss about the aerobic & anaerobic processes for biofuel production with suitable examples                                | [3] 2 | 4  |
| Q.5(a) | What are the benefits of using algae fuel over conventional fuel?  | [2] 2 | 2  |
| Q.5(b) | Write in detail about metabolic engineering for biofuel production?  | [3] 2 | 3  |

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