



# INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

## End-Autumn Semester Examination 2023-24

Date of Examination: \_\_\_\_\_ Session: (FN/AN) \_\_\_\_\_ Duration: 3 Hrs Full Marks: \_\_\_\_\_  
 Subject No. : EP 60044 \_\_\_\_\_ Subject : Frugal Engineering \_\_\_\_\_  
 Department/Center/School: Rajendra Mishra School of Engineering Entrepreneurship \_\_\_\_\_  
 Specific charts, graph paper, log book etc., required \_\_\_\_\_  
 Special Instructions (if any) : \_\_\_\_\_

- ✓ 1. a) How to gain 'Empathic' understanding and (b) culminate into 'Defining' in the Design Thinking Process [5+3]
- ✓ 2. a) In the context of frugal disruptive innovation, how the Design Driven Innovation (DDI) approach can be embraced  
 b) Explicate tenets of DDI using the example of iPod of Apple Inc. [3+5]
3. a) How does 'Mass Customisation' support the frugal innovation paradigm?  
 b) Elucidate the precepts of mass customization using an example [3+5]
- ✓ 4. Illustrate 'Design for Manufacturing (DfM/A)' describing its steps and its tenets. [7]
5. ✓ a) Expound the steps of Engineering Design Model prepared by NASA.  
 b) What is the denotation of 'Double Diamond' in this context [5+3]
- ✓ 6. State the implication of Fuzzy Front End in Product Development [5]
- ✓ 7. Describe the steps involved in Value Engineering, useful for Frugal Design [6]