



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal-500043, Hyderabad

B.Tech VI SEMESTER END EXAMINATIONS (REGULAR) - JULY 2023

Regulation: UG-20

DESIGN FOR MANUFACTURING

Time: 3 Hours

(MECHANICAL ENGINEERING)

Max Marks: 70

Answer ALL questions in Module I and II

Answer ONE out of two questions in Modules III, IV and V

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

1. (a) List various factors that determines the choice of material. Explain the factors influencing design.
[BL: Understand| CO: 1|Marks: 7]
- (b) Elucidate the tolerance stacking used in the DFM and list the significance of tolerance stacking.
[BL: Understand| CO: 1|Marks: 7]

MODULE – II

2. (a) What is meant by parting line? Differentiate between economical and uneconomical design with suitable examples.
[BL: Understand| CO: 2|Marks: 7]
- (b) Design the procedure for how components are manufactured in the industries based on machining area and explain with neat sketch.
[BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) Summarize the following with neat sketch
 - i) Casting pattern
 - ii) Mould
 - iii) Parting line.
[BL: Understand| CO: 3|Marks: 7]
- (b) Discuss the key design elements of sand casting. List the advantages and limitations of metal casting.
[BL: Apply| CO: 3|Marks: 7]
4. (a) Design and develop the possible and portable parting line in casting processes with examples.
[BL: Understand| CO: 4|Marks: 7]
- (b) Explain the steps involved in selection of casting process. Discuss the product design rules for sand casting.
[BL: Understand| CO: 4|Marks: 7]

MODULE – IV

5. (a) Describe an example of product where principle of recyclability has been employed.
[BL: Understand| CO: 5|Marks: 7]
- (b) What are the general problems that we come across while designing for machining operations? Explain how one can overcome those problems?
[BL: Understand| CO: 5|Marks: 7]

6. (a) Name the life cycle assessment methods. Discuss the local and regional issues influencing design for environment. [BL: Understand| CO: 5|Marks: 7]
- (b) List the recommendations to be considered for the design of assembly. Enumerate the steps to be followed when DFMA is used in the design process. [BL: Understand| CO: 4|Marks: 7]

MODULE – V

7. (a) Outline the design considerations for minimum material usage and for remanufacture. [BL: Understand| CO: 6|Marks: 7]
- (b) What are the techniques used to reduce environment impact? Explain the effect of part thickness and weight on handling time. [BL: Understand| CO: 6|Marks: 7]
8. (a) List the three criteria for checking potential part redundancy. Demonstrate the steps involved for minimizing the material usage. [BL: Understand| CO: 6|Marks: 7]
- (b) Summarize how the components are to be manufacture in the industries associated with regulation and standards? [BL: Understand| CO: 6|Marks: 7]

