Hall Ticket No | | | | | | | | | | | Question Paper Code: AMEC42

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech VII SEMESTER END EXAMINATIONS (REGULAR) - DECEMBER 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 out the general principle used in design. Enumerate the steps to be followed when DFM is used in the design process. [BL: Understand| CO: 1|Marks: 7]

   (b) Differentiate between DFM and DFA. Evaluate the significance of material selection procedure in form design. [BL: Understand| CO: 1|Marks: 7]

MODULE – II

2. (a) What are the general problems we come across while designing for machining operations? Explain how one can overcome those problems. [BL: Understand| CO: 2|Marks: 7]

   (b) Justify the statement "Design rules for machining are intended to improve machined part quality and reduce machining costs". [BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) List out the design rules for forging member. Summarize various casting defects. [BL: Understand| CO: 3|Marks: 7]

   (b) Describe in detail about design features to facilitate machining, drills and milling cutters. [BL: Understand| CO: 3|Marks: 7]

4. (a) Illustrate the following with neat sketch
   i) Casting pattern ii) mould iii) parting line. [BL: Understand| CO: 4|Marks: 7]

   (b) Describe the design factors to be considered for redesign of casting based on parting line consideration with suitable sketch. [BL: Understand| CO: 4|Marks: 7]

MODULE – IV

5. (a) Why pre and post treatment of welds are done? Explain the design principles for bending operation. [BL: Understand| CO: 5|Marks: 7]

   (b) Discuss the design considerations for punching and blanking operations.Differentiate between punching and blanking. [BL: Understand| CO: 5|Marks: 7]

6. (a) Illustrate the design for manufacturability recommendations for closed die forged part. [BL: Understand| CO: 5|Marks: 7]

   (b) Write a brief note on the following:
   i) Multi station assembly system
   ii) Automated assembly system [BL: Understand| CO: 5|Marks: 7]

MODULE – V

7. (a) Discuss four different methods of powder production. List the advantages and limitations of each one of them. [BL: Understand| CO: 6|Marks: 7]

   (b) Classify the presses for sheet metal working on the basis of source of power. What needs to be considered when bending a metal using a press brake? [BL: Understand| CO: 6|Marks: 7]

8. (a) What is the task of statistical quality control (SQC) and what are the statistical quality tools available? [BL: Understand| CO: 6|Marks: 7]

   (b) Write short notes on:
   i) Process capability
   ii) Geometric tolerance
   iii) Remanufacturing. [BL: Understand| CO: 6|Marks: 7]