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**INSTITUTE OF AERONAUTICAL ENGINEERING**

(Autonomous)

Dundigal-500043, Hyderabad

**B.TECH IV SEMESTER END EXAMINATIONS (REGULAR/SUPPLEMENTARY) - AUGUST 2023****Regulation: UG20****AIRCRAFT PRODUCTION TECHNOLOGY****Time: 3 Hours****(AERONAUTICAL 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) What is quenching? Explain clearly heat treatment of steel alloy with neat iron-carbon phase diagram. [BL: Understand| CO: 1|Marks: 7]
- (b) Explain heat treatment of an aluminum alloy. How aluminum alloys play an important role in aeronautical firm? [BL: Understand| CO: 1|Marks: 7]

**MODULE – II**

2. (a) Explain the principle of brazing technique. Where brazing is applicable? Write about brazing materials and metals. [BL: Understand| CO: 2|Marks: 7]
- (b) Differentiate between non-destructive test and destructive test. Why NDT is so crucial in the production and manufacturing process? [BL: Understand| CO: 2|Marks: 7]

**MODULE – III**

3. (a) Describe briefly about punching and blanking. Write down the applications and advantages of these. [BL: Understand| CO: 3|Marks: 7]
- (b) List the steps included in riveting operation. Explain the necessity of blank holding in a sheet metal drawing operation. [BL: Understand| CO: 3|Marks: 7]
4. (a) Outline the operation of stretch forming and drawing. Explain the bending and shearing operations with suitable diagrams. [BL: Understand| CO: 4|Marks: 7]
- (b) Differentiate between jig and fixture. With neat sketches explain the rolling and extrusion operations. [BL: Understand| CO: 4|Marks: 7]

**MODULE – IV**

5. (a) What is the mechanism of material removal for ultrasound machining (USM)? Differentiate between milling and surface grinding. [BL: Understand| CO: 5|Marks: 7]
- (b) Elucidate the working principle of electro chemical machining (ECM) with a neat diagram. List the advantages and applications of ECM. [BL: Understand| CO: 5|Marks: 7]
6. (a) How plasma arc machine will work? Explain about abrasive jet machining with neat schematic diagram. [BL: Understand| CO: 5|Marks: 7]

- (b) Demonstrate the working principle of electro discharge machining and mention its applications and advantages. [BL: Understand| CO: 5|Marks: 7]

### MODULE – V

7. (a) How composites can be classified? Explain why composites are supposed to be used in aircrafts? [BL: Understand| CO: 6|Marks: 7]  
(b) List the properties of thermo plastics. Classify them and give typical applications in aerospace industry and mention their critical issues. [BL: Understand| CO:6|Marks: 7]
8. (a) Write about the importance of matrix in composite. Differentiate between composite materials, super alloys, indigenized alloys. [BL: Understand| CO: 6|Marks: 7]  
(b) Classify aircraft materials used for aircraft components and explain them briefly. [BL: Understand| CO: 6|Marks: 7]

