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**INSTITUTE OF AERONAUTICAL ENGINEERING****(Autonomous)**

B.Tech IV Semester End Examinations (Regular) - May, 2018

**Regulation: IARE – R16****AIRCRAFT MATERIALS AND PRODUCTION****Time: 3 Hours****(AE)****Max Marks: 70****Answer ONE Question from each Unit****All Questions Carry Equal Marks****All parts of the question must be answered in one place only****UNIT – I**

1. (a) Define the terms: Quenching and Normalizing. Write some of their applications. [7M]  
(b) Explain hardening and tempering. What are the changes that happen in the properties of materials during hardening and tempering. [7M]
2. (a) Classify stainless steels. Write their applications in Aircraft Industry. [7M]  
(b) Explain heat treatment of an aluminum alloy? How aluminum alloys play an important role in aeronautical firm? [7M]

**UNIT – II**

3. (a) What is the importance of casting in Aviation industry? [7M]  
(b) Write the classifications of centrifugal casting. Elaborate its applications. [7M]
4. (a) Distinguish between Non-Destructive Test(NDT) and Destructive Test. Why is NDT so crucial in the production and manufacturing process. [7M]  
(b) Discuss working principle of arc welding and write down its advantages and disadvantages. [7M]

**UNIT – III**

5. (a) Explain Punching and Blanking operations. Write down their applications and advantages. [7M]  
(b) Explain super plastic forming. Discuss its applications. [7M]
6. (a) Explain different tools used in shearing operation. With neat sketches, explain the bending and shearing operations? [7M]  
(b) Explain any two types of riveted joints. Discuss the advantages of riveting process over welding. [7M]

**UNIT – IV**

7. (a) Explain working principle of thermally material removal? [7M]  
(b) What is difference between position of cutting tool in both unconventional and conventional machining operation? [7M]

8. (a) Explain clearly about CNC machine and advantages of CNC over manual machining? [7M]  
(b) Discuss the working principle of ECM with a neat diagram. Write the advantages and applications of electro chemical machining. [7M]

**UNIT – V**

9. (a) Define composite material. Explain why metals are to be replaced by composites? [7M]  
(b) Explain the role of fiber in composites? Discuss about some of the important fibers. [7M]
10. (a) Explain about thermo plastics? Explain their properties. Classify them and give typical applications in aerospace industry and mention their critical issues. [7M]  
(b) Elaborate applications of composite materials? Give their properties and load of impacts on them. Elaborate the temperature settings on thermo setting plastics. [7M]

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