Hall Ticket No | | | | | | | | | | |

Question Paper Code:AAEC10

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech IV SEMESTER END EXAMINATIONS (REGULAR) - JULY 2022
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
(NOTE: Provision is given to answer TWO questions from among one of the Modules III / IV / V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Draw a neat labeled iron-iron carbide diagram and explain eutectic and eutectoid reaction in it. [BL: Understand| CO: 1|Marks: 7]

   (b) To refine the grain structure and to improve the machinability of a steel alloy with 1.2% carbon in steel, suggest a suitable heat treatment process and explain the same with the help of phase diagram. [BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Explain electron beam welding with neat schematic. List the advantages of electron beam welding and laser beam welding processes, in comparison with arc welding process. [BL: Understand| CO: 2|Marks: 7]

   (b) Is nondestructive testing being advantageous than destructive testing? Justify your answer with suitable example. Also, explain working principle of ultrasonic testing with neat schematic. [BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) State the principle involved in punching operation. With neat schematic explain any four types of sheet metal operations. [BL: Understand| CO: 3|Marks: 7]

   (b) Identify the causes of errors in the design and operation of jigs and fixtures? Explain the 3-2-1 principle of jigs fixtures design [BL: Apply| CO: 3|Marks: 7]

4. (a) Show how assembly jigs are usually grouted to the ground using foundation bolts for a typical wing assembly jigs. [BL: Understand| CO: 4|Marks: 7]

   (b) Identify the various types of rivets that are applicable for an aircraft industry. Justify your answer with respect to the loads and atmospheric affects over aircraft. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) Elaborate types of bonds used in manufacturing of grinding wheels. Also, elaborate any two grinding operations with neat schematic. [BL: Understand| CO: 5|Marks: 7]

(b) In a mild steel block, a flat surface of length 100 mm and width 60 mm has to be finished in a shaping machine in a single pass. How much machining time will be required if the number of strokes per minute = 80, feed of the job = 0.2 m/stroke, Approach = Overrun = 5 mm, Quick Return Ratio = 0.5. [BL: Apply| CO: 5|Marks: 7]

6. (a) Discuss briefly about the chucks used in lathe machine. Differentiate between shaping, planning and slotting, as regards relative tool and work motions. [BL: Understand| CO: 5|Marks: 7]

(b) Determine the cutting time for plain milling a rectangular surface of length 100 mm and width 50 mm by a helical fluted plain HSS milling cutter of diameter 60 mm, length 75 mm and 6 teeth. Assume the approach (A) and Overrun (O) each equal to 5 mm, the cutting speed = 40 m/min and feed per tooth = 0.1 mm. [BL: Apply| CO: 5|Marks: 7]

MODULE – V

7. (a) Classify different types of resins used in manufacturing of composite materials. Highlight its properties. [BL: Understand| CO: 6|Marks: 7]

(b) Identify various new materials that are being used in aerospace industries as an alternative for conventional materials. [BL: Apply| CO: 6|Marks: 7]

8. (a) Interpret about alleviation procedures used in aircraft industry. Mention the functions of a matrix and reinforcement in a composite material. [BL: Understand| CO: 6|Marks: 7]

(b) How are composites classified? Briefly explain each type of composites with their merits and demerits [BL: Understand| CO: 6|Marks: 7]