

Hall Ticket No

Question Paper Code: AAEB16



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER

Four Year B.Tech V Semester End Examinations, May/June – 2020

Regulations: IARE - R18

AIRCRAFT PRODUCTION TECHNOLOGY

(AERONAUTICAL ENGINEERING)

Time: 3 hours

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) What is heat treatment? Explain clearly heat treatment of aluminum alloy with neat iron-carbon phase diagram? [7M]
- b) Explain clearly ferrite, austenite, martensite and cementite. And compare all the states with micro structure of a material? [7M]
2. a) What is allotropy in iron? Draw iron-carbon phase diagram and mention all reactions clearly? [7M]
- b) State difference between surface hardening and case hardening clearly. Clearly give a short note on hardening heat treatment of a material. [7M]

UNIT – II

3. a) Explain the principles and equipment used in arc welding, gas welding, resistance welding. Describe Thermite welding, and recent advances in welding technology, Soldering and brazing techniques. [7M]
- b) Define casting and describe the centrifugal casting process and what work piece configurations. [7M]
4. a) What is the main working principle of MPI and clearly give a note on how to inspect the welded specimen? [7M]
- b) What are main applications of each NDT test? Explain clearly with any one of NDT test which perform on soft and non-ferrous materials. [7M]

UNIT – III

5. a) Why is blank holding necessary in a sheet metal drawing operation? Give the difference between Punching and Blanking. [7M]
- b) Briefly give a note on below operations Punching, Blanking, Drawing, Cupping and explain the applications of these processes. [7M]

6. a) Discuss the type of equipment's and apparatus required to perform riveting operation on aluminum sheet? [7M]
- b) What are the differences between solid riveting and blind riveting? And give a short note on various types of riveting heads? [7M]

UNIT – IV

7. a) Discuss about Computer Numerical Control machine and advantages of CNC over manual machining. What type of coding is required to perform CNC operation? [7M]
- b) Write short on note on lathe machine with neat sketch and also explain the sequence of operations to be perform on lathe machine? [7M]
8. a) Explain the working principle of Electro Chemical Machining with a neat diagram. Write the advantages and applications electro chemical machining. [7M]
- b) How Ultra Sonic Machining will work? List down the type of abrasive particles to be used and applications of Ultra Sonic Machining? [7M]

UNIT – V

9. a) List down the various components of an aircraft where composite materials were replaced metals? [7M]
- b) What is the main purpose of matrix to be used in composite materials? Give the difference between thermo setting and thermo plastic matrix? [7M]
- 10 a) Define isotropic, anisotropic, orthotropic materials? Why composite materials are isotropic in nature? Cite a few examples. [7M]
- b) Define homogeneous, heterogeneous materials? Why composite materials are heterogeneous in nature? [7M]



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COURSE OBJECTIVES

The course should enable the students to:

S. No	Description
I	Study the composition of microstructures of metals and alloys with their applications in aerospace industry.
II	Discuss the various manufacturing processes and selection of process for suitable applications
III	Understand the working principles and applications of conventional and unconventional machining along with their advantages and disadvantages.
IV	Demonstrate the importance of composites with their applications in different areas of aerospace industry

COURSE OUTCOMES (COs):

Students, who complete the course, will have demonstrated the ability to do the following:

CO 1	Demonstrate different type of materials used in aircraft industry and study its properties
CO 2	Understand the process of casting and inspection techniques used for production.
CO 3	Explain sheet metal operations and its tooling operations used for aircraft industry.
CO 4	Gain knowledge about the basic convectional and unconventional Machining
CO 5	Understand the importance of composites and its manufacturing process.

COURSE LEARNING OUTCOMES (CLOs):

Students, who complete the course, will have demonstrated the ability to do the following:

AAEB16.01	Choose a concept or idea of technical real time problems to form solutions for the same.
AAEB16.02	Understand, Identify, Study and comprehend processes that lead to solutions to a particular production.
AAEB16.03	Develop one- self to extend the outputs of research.
AAEB16.04	Outline performance of the output of research, development or design.
AAEB16.05	Identify, solve new problems and gain new knowledge.
AAEB16.06	Understand about the turning, milling, grinding and drilling of a specimen.
AAEB16.07	Getting knowledge about the techniques to produce a safe, effective, economic final product.
AAEB16.08	Understand the theoretical knowledge behind the design and development of aircraft components.
AAEB16.09	Gain knowledge about the basic convectional, unconventional riveting and welding for knowledge based exams.
AAEB16.10	Discuss the principle of advanced materials and what factors drive to develop the composite materials.

AAEB16.11	Extend the outputs of earlier research and discover good ideas for new products or improving current products.
AAEB16.12	Memorize procedure and steps to keep the products working effectively.
AAEB16.13	Gain knowledge about what materials used to manufacture for each component in an aircraft.
AAEB16.14	Ability to summarize the efficiency of the product development in achieving the mission goal.
AAEB16.15	Ability to summarize the efficiency of the safety of flight

MAPPING OF SEMESTER END EXAMINATION TO COURSE OUTCOMES

SEE Question No.		Course Outcomes			Blooms' Taxonomy Level
1	a	AAEB16.01	Choose a concept or idea of technical real time problems to form solutions for the same.	CO 1	Knowledge
	b	AAEB16.03	Develop one- self to extend the outputs of research.	CO 1	Understand
2	a	AAEB16.01	Choose a concept or idea of technical real time problems to form solutions for the same.	CO 1	Understand
	b	AAEB16.02	Understand, Identify, Study and comprehend processes that lead to solutions to a particular production.	CO 1	Understand
3	a	AAEB16.04	Outline performance of the output of research, development or design.	CO 2	Remember
	b	AAEB16.05	Identify, solve new problems and gain new knowledge.	CO 2	Understand
4	a	AAEB16.05	Identify, solve new problems and gain new knowledge.	CO 2	Understand
	b	AAEB16.06	Understand about the turning, milling, grinding and drilling of a specimen.	CO 2	Remember
5	a	AAEB16.07	Getting knowledge about the techniques to produce a safe, effective, economic final product.	CO 3	Understand
	b	AAEB16.08	Understand the theoretical knowledge behind the design and development of aircraft components.	CO 3	Remember
6	a	AAEB16.09	Gain knowledge about the basic convectional, unconventional riveting and welding for knowledge based exams.	CO 3	Remember
	b	AAEB16.08	Understand the theoretical knowledge behind the design and development of aircraft components.	CO 3	Understand
7	a	AAEB16.11	Extend the outputs of earlier research and discover good ideas for new products or improving current products.	CO 4	Understand
	b	AAEB16.12	Memorize procedure and steps to keep the products working effectively.	CO 4	Remember
8	a	AAEB16.12	Memorize procedure and steps to keep the products working effectively.	CO 4	Understand
	b	AAEB16.11	Extend the outputs of earlier research and discover good ideas for new products or improving current products.	CO 4	Remember

9	a	AAEB16.13	Gain knowledge about what materials used to manufacture for each component in an aircraft.	CO 5	Remember
	b	AAEB16.14	Ability to summarize the efficiency of the product development in achieving the mission goal.	CO 5	Understand
10	a	AAEB16.15	Ability to summarize the efficiency of the safety of flight	CO 5	Understand
	b	AAEB16.14	Ability to summarize the efficiency of the product development in achieving the mission goal.	CO 5	Remember

Signature of Course Coordinator

HOD, AE