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Code No: AME520



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-2

B. Tech VIII Semester Regular Examinations, MAY 2020

Regulations: IARE-R16

DESIGN FOR MANUFACTURING AND ASSEMBLY

ME

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) Explain in detail about mechanical factors considering for DFMA. [7M]
b) Explain the various factors that determine the choice of material [7M]
2. a) Discuss the capabilities and qualities needed by sequential designer [7M]
b) Summarize the factors considered in design for manufacturing and assembly [7M]

UNIT – II

3. a) Explain about all the rules to be followed in designing a casting [7M]
b) Design Recommendation For Parts Generated on Milling Machine [7M]
4. a) Discuss the General Design Principles for Manufacturability [7M]
b) Illustrate the design features for machining, especially for drilling and milling operations [7M]

UNIT – III

5. a) Demonstrate with neat sketch about form design of forging defects. [7M]
b) With Suitable Sketch, Discuss the basic Rules for Form Design of Forging [7M]
6. a) Elaborate the Guidelines for designing weldments. [7M]
b) Explain in detail about the impact of various defects in welding and casting Process in form design. [7M]

UNIT – IV

7. a) List the different limits of Assembly. [7M]
b) Explain the tolerance stacking used in the DFMA and list the significance of tolerance Stacking [7M]
8. a) Discuss the DFA Guidelines [7M]
b) List the recommendations to be considered for the design of assembly. [7M]

UNIT – V

9. a) Discuss the capabilities and qualities needed by sequential designer [7M]
b) List out the design rules for form design of welded member with neat sketch. [7M]
10. a) Discuss the economics of recycling [7M]
b) Explain design rules for part separation. [7M]



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COURSE OBJECTIVES:

The course should enable the students to:

I	Understand various general design rules for manufacture ability and criteria for material selection.
II	Apply various machining process and tolerance aspects in machining.
III	Analyze the design considerations for casting and welding process.
IV	Apply the conceptual design factors to be considered in forging, extrusion and sheet metal work, design guidelines for manual assembly and development of DFA methodology

COURSE OUTCOMES (COs):

CO 1	Identifying primary and secondary components through functional analysis
CO 2	Calculate the design efficiency for their product design
CO 3	Identify the fine finishing operations to obtain dimensional accuracy and surface finish
CO 4	Analyze and derive the gripping, insertion and fixing values through fitting analysis of the product
CO 5	Apply the Design guidelines and assembly techniques to mechanical designs.

COURSE LEARNING OUTCOMES:

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

AME520.01	Identify and understand of basic concepts of DFM and DFA
AME520.02	Understand and Apply concepts of Generative DFMA
AME520.03	Understand the Various types of materials, its classification, suitable materials for product design
AME520.04	Understand the selection of manufacturing sequences and optimal selection
AME520.05	Identify the reasons for optimal selection of machining parameters.
AME520.06	Identify the various casting design, machining design, designing of formed components
AME520.07	Identify various design recommendation for permanent joining such as welding, soldering and brazing
AME520.08	understand the different design factors for forging, closed dies forging design
AME520.09	Apply the different Design guidelines for extruded sections
AME520.10	Understand various design principles for punching, blanking, bending, deep drawing.
AME520.11	Understand the different conventional approach and Assembly optimization processes
AME520.12	Create the knowledge on cost consciousness & an awareness of Designers' accountability in product design lifecycle .
AME520.13	Understand the cost factors that play a part in DFA
AME520.14	Understand the general design guidelines for manual assembly and development of the systematic DFA methodology
AME520.15	Using CAD, apply design for manufacturing and assembly techniques to mechanical designs.
AME520.16	Understand the effect of symmetry effect of chamfer design on insertion operations, estimation of insertion time.

Mapping of Semester End Examinations to Course Learning Outcomes:

SEE Question No.		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	AME520.01	Identify and understand of basic concepts of DFM and DFA	CO 1	Understand
	b	AME520.02	Understand and Apply concepts of Generative DFMA	CO 1	Remember
2	a	AME520.03	Understand the Various types of materials, its classification, suitable materials for product design	CO 1	Understand
	b	AME520.04	Understand the selection of manufacturing sequences and optimal selection	CO 1	Remember
3	a	AME520.05	Identify the reasons for optimal selection of machining parameters.	CO 2	Understand
	b	AME520.06	Identify the various casting design, machining design, designing of formed components	CO 2	Remember
4	a	AME520.07	Identify various design recommendation for permanent joining such as welding, soldering and brazing	CO 2	Remember
	b	AME520.08	understand the different design factors for forging, closed dies forging design	CO 2	Understand
5	a	AME520.9	Apply the different Design guidelines for extruded sections	CO 3	Understand
	b	AME520.10	Understand various design principles for punching, blanking, bending, deep drawing.	CO 3	Remember
6	a	AME520.10	Understand various design principles for punching, blanking, bending, deep drawing.	CO 3	Understand
	b	AME520.11	Understandthe different conventional approach and Assembly optimization processes	CO 3	Understand
7	a	AME520.12	Create the knowledge on cost consciousness & an awareness of Designers' accountability in product design lifecycle .	CO 4	Remember
	b	AME520.13	Understand the cost factors that play a part in DFA	CO 4	Understand
8	a	AME520.14	Understand the general design guidelines for manual assembly and development of the systematic DFA methodology	CO 4	Understand
	b	AME520.14	Understand the general design guidelines for manual assembly and development of the systematic DFA methodology	CO 4	Understand
9	a	AME520.15	Using CAD, apply design for manufacturing and assembly techniques to mechanical designs.	CO 5	Remember
	b	AME520.16	Understand the effect of symmetry effect of chamfer design on insertion operations, estimation of insertion time.	CO 5	Understand
10	a	AME520.16	Understand the effect of symmetry effect of chamfer design on insertion operations, estimation of insertion time.	CO 5	Understand
	b	AME520.15	Using CAD, apply design for manufacturing and assembly techniques to mechanical designs.	CO 5	Remember

Course Coordinator **HOD, ME**
Mr. A Venuprasad, Assistant Professor