



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING TUTORIAL QUESTION BANK

Course Title	DESIGN FOR MANUFACTURING AND ASSEMBLY				
Course Code	BCCB04				
Programme	M.Tech				
Semester	1	CAD / CAM			
Course Type	Foundation				
Regulation	IARE - R18				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	-	3	-	-
Chief Coordinator	Dr. K. China Apparao, Associate Professor, ME				
Course Faculty	Dr. K. China Apparao, Associate Professor, ME				

COURSE OBJECTIVES:

The course should enable the students:

I	Understanding the basics of Computer Graphics needed for CAD/ CAM applications.
II	Applying the geometrical modeling for computer graphics.
III	Applying data structures in computer graphics.

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 various design recommendation of design process.
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:

BCCB04.01	Identify and understand of basic concepts of DFM and DFA
BCCB04.02	Understand and Apply concepts of Generative DFMA
BCCB04.03	Understand the Various types of materials, its classification, suitable materials for product design
BCCB04.04	Understand the selection of manufacturing sequences and optimal selection
BCCB04.05	Identify the reasons for optimal selection of machining parameters.
BCCB04.06	Identify the various casting design, machining design, designing of formed components
BCCB04.07	Identify various design recommendation for permanent joining such as welding, soldering and brazing
BCCB04.08	understand the different design factors for forging, closed dies forging design
BCCB04.09	Apply the different Design guidelines for extruded sections
BCCB04.10	Understand various design principles for punching, blanking, bending, deep drawing.
BCCB04.11	Understand the different conventional approach and Assembly optimization processes
BCCB04.12	Create the knowledge on cost consciousness & an awareness of Designers' accountability in product design lifecycle .
BCCB04.13	Understand the cost factors that play a part in DFA
BCCB04.14	Understand the general design guidelines for manual assembly and development of the systematic DFA methodology
BCCB04.15	Using CAD, apply design for manufacturing and assembly techniques to mechanical designs.
BCCB04.16	Understand the effect of symmetry effect of chamfer design on insertion operations, estimation of insertion time.

TUTORIAL QUESTION BANK

UNIT – I				
INTRODUCTION TO DESIGN				
Part - A (Short Answer Questions)				
S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	What is DFM?	Understand	CO 1	BCCB04.01
2	What is DFA?	Remember	CO 1	BCCB04.01
3	What is DFMA?	Remember	CO 1	BCCB04.01
4	Discuss the principles of DFMA?	Understand	CO 1	BCCB04.01
5	What are the strengthening factors involved in DFM.	Remember	CO 1	BCCB04.01
6	What are the evaluation methods used in DFM.	Understand	CO 1	BCCB04.01
7	What is the basic concept involved in DFMA.	Understand	CO 1	BCCB04.02
8	List out the general principle used in design.	Remember	CO 1	BCCB04.02
9	Why DFMA should be implemented?	Understand	CO 1	BCCB04.03
10	Why Perform Design for Manufacturing / Assembly (DFM/DFA)	Remember	CO 1	BCCB04.03
11	What are differences in DFM and DFA?	Remember	CO 1	BCCB04.01
12	What are similarities in DFM and DFA?	Understand	CO 1	BCCB04.01
13	List out the DFA process.	Remember	CO 1	BCCB04.01
14	What is manufacturing?	Understand	CO 1	BCCB04.01
15	Classify different types of Manufacturing Processes	Remember	CO 1	BCCB04.01
16	Classify different types of materials	Understand	CO 1	BCCB04.01
17	What are the basic steps of material selection?	Remember	CO 1	BCCB04.01
18	How Does DFM Work?	Remember	CO 1	BCCB04.01
19	What are DFM issues?	Understand	CO 1	BCCB04.01
20	What does DFM stand for?	Understand	CO 1	BCCB04.01
Part - B (Long Answer Questions)				
1	What is DFMA? How the development of DFMA is been progressed?	Remember	CO 1	BCCB04.01
2	Differentiate between DFA, DFM and DFMA	Understand	CO 1	BCCB04.01
3	Explain the effect of part symmetry on handling time.	Understand	CO 1	BCCB04.01
4	List out the Mechanical factors in design for manufacturing and Mechanism selection design for manufacturing.	Remember	CO 1	BCCB04.02
5	Develop various evaluation methods used for manufacturability in DFMA.	Understand	CO 1	BCCB04.03
6	Describe with neat sketch about the manufacturing datum, functional datum & change in datum in DFM.	Understand	CO 1	BCCB04.03
7	Explain the factors influencing Design.	Understand	CO 1	BCCB04.03
8	Explain the various factors that determines the choice of material	Remember	CO 1	BCCB04.02

9	Discuss the capabilities and qualities needed by sequential designer	Remember	CO 1	BCCB04.02
10	Evaluate the significance of material selection procedure in form design.	Remember	CO 1	BCCB04.02
11	Develop the possible solution for material selection in form design.	Remember	CO 1	BCCB04.01
12	Analyze the impact of selection of materials on form design in DFMA.	Understand	CO 1	BCCB04.01
13	Describe computer application in DFMA with neat sketch.	Understand	CO 1	BCCB04.01
14	Summarize the significance of group technology in DFMA and explain with neat Sketch?	Understand	CO 1	BCCB04.01
15	Briefly explain the design guidelines for extruded sections with neat sketches.	Understand	CO 1	BCCB04.01
16	How the Materials varieties and form design affects the Manufacturing.	Remember	CO 1	BCCB04.02
17	Explain how group technology is helpful in DFMA.	Remember	CO 1	BCCB04.02
18	What is DFMA? Why is it implementing?	Remember	CO 1	BCCB04.02
19	What are the reason claimed for not implementing DFMA?	Remember	CO 1	BCCB04.02
20	Explain how group technology is helpful in DFMA	Understand	CO 1	BCCB04.01

Part - C (Problem Solving and Critical Thinking Questions)

1	Enumerate the steps to be followed when DFMA is used in the design process.	Understand	CO 1	BCCB04.01
2	List the recommendations to be considered for the design of assembly	Understand	CO 1	BCCB04.01
3	Explain the basic concept involved in DFMA	Understand	CO 1	BCCB04.01
4	Illustrate the block diagram for design factors in DFMA	Remember	CO 1	BCCB04.01
5	Describe the design principle for manufacturability in DFMA	Remember	CO 1	BCCB04.01
6	Develop various evaluation methods used for manufacturability in DFMA	Remember	CO 1	BCCB04.01
7	Explain the factors influencing Design	Understand	CO 1	BCCB04.01
8	Explain the various factors that determines the choice of material	Understand	CO 1	BCCB04.02
9	Explain in detail about mechanical factors considering for DFMA	Remember	CO 1	BCCB04.02
10	Explain the tolerance stacking used in the DFMA and list the significance of tolerance Stacking	Remember	CO 1	BCCB04.02

UNIT - II

MACHINING PROCESS

Part – A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy level	Course Outcomes	Course Learning Outcomes
1	Define Machining sequence	Understand	CO 2	BCCB04.04
2	Define Machinability.	Understand	CO 2	BCCB04.04
3	Define accessibility	Understand	CO 2	BCCB04.04
4	Describe how the machined areas can be reduced.	Remember	CO 2	BCCB04.04

5	Distinguish between machinability and clamp ability.	Understand	CO 2	BCCB04.04
6	Define Pattern.	Understand	CO 2	BCCB04.04
7	What is meant by parting line?	Applying	CO 2	BCCB04.04
8	Define mould.	Analyzing	CO 2	BCCB04.04
9	What is meant by cast hole?	Evaluating	CO 2	BCCB04.04
10	What is meant by Machined ho	Creating	CO 2	BCCB04.05
11	Demonstrate the portable parti	Remembering	CO 2	BCCB04.05
12	Discuss how the uneconomical	Understanding	CO 2	BCCB04.05
13	Summarize the various factors in machining	Applying	CO 2	BCCB04.05
14	When design is modified in DFM	Analyzing	CO 2	BCCB04.04
15	Differentiate core and cavity.	Evaluating	CO 2	BCCB04.04
16	List out the casting defects.	Creating	CO 2	BCCB04.04
17	Explain the basic steps involved in G.T.	Remembering	CO 2	BCCB04.04
18	Explain any two computer application for DFMA.	Understand	CO 2	BCCB04.04
19	What are the merits of implementing computer application in DFMA process?	Remember	CO 2	BCCB04.06
20	Explain the various computer applications in DFMA process.	Understand	CO 2	BCCB04.06
Part - B (Long Answer Questions)				
1	Illustrate the following with neat sketch i) Casting pattern ii) mould iii) parting line.	Understand	CO 2	BCCB04.04
2	Summarize about minimizing the core requirements in casting process with example	Remember	CO 2	BCCB04.04
3	Describe about machined holes in casting process with suitable example	Understand	CO 2	BCCB04.04
4	Design and develop possible and portable parting line in casting processes with example.	Understand	CO 2	BCCB04.04
5	Discuss with neat sketch about detail about casting requiring special sand cores.	Remember	CO 2	BCCB04.04
6	Describe and develop the Obviate sand cores in casting process.	Understand	CO 2	BCCB04.04
7	Explain in detail about inspection method in GT.	Remember	CO 2	BCCB04.05
8	Explain in detail with suitable sketch of optiz method.	Understand	CO 2	BCCB04.05
9	Describe in detail about design features to facilitate machining, drills and milling cutters.	Understand	CO 2	BCCB04.06
10	Discuss in detail General design rules for riser necks used in iron castings	Understand	CO 2	BCCB04.05
11	Write notes on Design Consideration in Castings	Remember	CO 2	BCCB04.04
12	Explain briefly Computer modeling of casting processes	Understand	CO 2	BCCB04.04
13	Discuss the use of GT for Design of Manufacturing Systems	Understand	CO 2	BCCB04.06
14	Illustrate the following with neat sketch i) Casting pattern ii) mould iii) parting line.	Remember	CO 2	BCCB04.04
15	Explain with suitable sketch about casting defects.	Understand	CO 2	BCCB04.04
16	Develop the design factors to be considered for redesign of casting based on parting line consideration with suitable sketch.	Understand	CO 2	BCCB04.04

17	Explain the design factors to be considered when selecting casting as a manufacturing process	Remember	CO 2	BCCB04.04
18	Illustrate redesigning of castings in the context of parting line considerations and to obviate the cores	Understand	CO 2	BCCB04.05
19	List out and explain the effect of casting discontinuities on the properties of a casted product	Remember	CO 2	BCCB04.05
20	Briefly discuss the product design considerations in machining with neat sketches.	Understand	CO 2	BCCB04.04

Part – C (Problem Solving and Critical Thinking)

1	Illustrate the design rules for design for machinability with suitable sketch	Understand	CO 2	BCCB04.06
2	Explain briefly the mechanical properties that affect Machinability	Creating	CO 2	BCCB04.06
3	Discuss in detail Economic And Product Design Considerations In Machining	Analysing	CO 2	BCCB04.06
4	Design the procedure for how components are manufactured in the industries based on machining area and explain with neat sketch?	Understand	CO 2	BCCB04.05
5	Differentiate between economical and uneconomical design with suitable example.	Understand	CO 2	BCCB04.06
6	Explain the significance of machinability in the DFMA associated with Machining process with neat sketch.	Creating	CO 2	BCCB04.05
7	Design the various steps for material selection in the form design.	Remember	CO 2	BCCB04.06
8	List out the design rules for form design of casting member with neat sketch	Understand	CO 2	BCCB04.04
9	Explain in detail about the influence of material in form design.	Understand	CO 2	BCCB04.04
10	Why there is a minimum section thickness criterion for different alloys to be casted?	Understand	CO 2	BCCB04.04

UNIT-III

METAL JOINING

Part - A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	Define welding.	Understand	CO 3	BCCB04.07
2	Classify the welding.	Understand	CO 3	BCCB04.07
3	Describe about the design rules for welding.	Understand	CO 3	BCCB04.07
4	Summarize the various defects in welding.	Remember	CO 3	BCCB04.07
5	what are the design rules for welding member.	Understand	CO 3	BCCB04.07
6	Define slag in weld?	Understand	CO 3	BCCB04.07
7	Define oxy acetylene weld?	Remember	CO 3	BCCB04.07
8	Define neutral flame?	Understand	CO 3	BCCB04.07
9	Define carbon arc welding?	Remember	CO 3	BCCB04.07
10	Define fluxcored arc welding?	Understand	CO 3	BCCB04.07

11	Define submerged arc welding?	Remember	CO 3	BCCB04.07
12	What is filled weld?	Understand	CO 3	BCCB04.07
13	Define wetting?	Understand	CO 3	BCCB04.07
14	What is bending?	Remember	CO 3	BCCB04.08
15	What is notching?	Understand	CO 3	BCCB04.08
16	What is nibbling?	Remember	CO 3	BCCB04.08
17	What is Bending Force?	Remember	CO 3	BCCB04.08
18	Define piercing?	Remember	CO 3	BCCB04.09
19	Define forging force?	Remember	CO 3	BCCB04.09
20	define extrusion	Understand	CO 3	BCCB04.10
Part – B (Long Answer Questions)				
1	Explain with examples the design considerations for welded members	Understand	CO 3	BCCB04.07
2	Elaborate the Guidelines for designing weldments.	Understand	CO 3	BCCB04.07
3	List out the design rules for form design of forging member with neat sketch	Understand	CO 3	BCCB04.07
4	List out the design rules for form design of forging member with neat sketch	Understand	CO 3	BCCB04.09
5	List out the design rules for form design of welded member with neat sketch.	Understand	CO 3	BCCB04.07
6	Explain in detail about the impact of various defects in welding and casting Process in form design.	Understand	CO 3	BCCB04.10
7	Discuss the applications of design for machining rules.	Understand	CO 3	BCCB04.08
8	Discuss the general design recommendations for forging operation.	Understand	CO 3	BCCB04.10
9	Explain the effect of thermal stress in weld joints.	Understand	CO 3	BCCB04.07
10	Discuss the importance of pre and post treatment of welds.	Understand	CO 3	BCCB04.07
11	Sketch and explain how to choose parting line in forging design.	Understand	CO 3	BCCB04.09
12	Briefly explain the factors that affect drawability.	Understand	CO 3	BCCB04.09
13	Explain component design for blanking operation.	Remember	CO 3	BCCB04.10
14	Explain the Form Design of Forging with suitable example.	Understand	CO 3	BCCB04.09
15	Explain the basic design rules of form design of forging	Understand	CO 3	BCCB04.09
16	Illustrate the design for manufacturability recommendations for closed die forged parts	Remember	CO 3	BCCB04.09
17	With Suitable Sketch, Discuss the basic Rules for Form Design of Forging	Remember	CO 3	BCCB04.09
18	Factors to be considered for the Sound welding joint	Understand	CO 3	BCCB04.07
19	Explain the basic design rules of form design of forging	Understand	CO 3	BCCB04.10
20	Factors to be considered for the Sound welding joint	Understand	CO 3	BCCB04.07
Part – C (Problem Solving and Critical Thinking)				
1	List out and explain the factors which affect the design of weldments.	Remember	CO 3	BCCB04.07

2	What do you know about Keeler Goodman forging line diagram? Explain	Understand	CO 3	BCCB04.09
3	Discuss the design considerations for punching and blanking operations.	Remember	CO 3	BCCB04.10
4	Explain the effect of thermal stress in weld joints.	Understand	CO 3	BCCB04.07
5	Explain briefly the design rules for welding	Remember	CO 3	BCCB04.07
6	Why pre and post treatment of welds are done? Explain	Understand	CO 3	BCCB04.07
7	Briefly discuss about design for blanking.	Understand	CO 3	BCCB04.10
8	Discuss the design guide lines for deep drawing.	Understand	CO 3	BCCB04.10
9	Explain design considerations affecting drawability.	Remember	CO 3	BCCB04.10
10	Briefly explain the design guidelines for brazed joints.	Understand	CO 3	BCCB04.10

UNIT-IV

ASSEMBLY ADVANTAGES

Part – A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	Define disassembly	Understand	CO 4	BCCB04.11
2	Define assembly	Understand	CO 4	BCCB04.12
3	Define Remanufacturing.	Understand	CO 4	BCCB04.11
4	Define energy efficiency	Remember	CO 4	BCCB04.11
5	List the three functions that make up Assembly.	Understand	CO 4	BCCB04.13
6	What are the three activities associated with Handling?	Remember	CO 4	BCCB04.11
7	Name four reasons for separate parts in a product.	Understand	CO 4	BCCB04.11
8	List and describe four assembly objects.	Understand	CO 4	BCCB04.11
9	Name Three Methods of Assembly.	Understand	CO 4	BCCB04.12
10	What are the major components that make up an assembly line?	Understand	CO 4	BCCB04.12
11	List three basic assembly line categories.	Remember	CO 4	BCCB04.12
12	What are the two DFA subdivisions?	Remember	CO 4	BCCB04.13
13	List five general principles of Product Design.	Understand	CO 4	BCCB04.12
14	Give three guidelines for simplifying and reducing fasteners.	Understand	CO 4	BCCB04.13
15	List the three criteria for potential part redundancy.	Remember	CO 4	BCCB04.12
16	Principles of part design?	Understand	CO 4	BCCB04.13
17	Guidelines for eliminating overlapping and tangling.	Understand	CO 4	BCCB04.11
18	Guidelines for using asymmetry.	Understand	CO 4	BCCB04.13
19	What are the four steps of the Product Redesign Process	Understand	CO 4	BCCB04.12
20	What is one good measure of improvement of a product redesign using principles of DFA	Remember	CO 4	BCCB04.13

Part – B (Long Answer Questions)

1	Describe in detail about the design for accessibility	Understand	CO 4	BCCB04.11
2	Explain in detail about the design for assembly.	Remember	CO 4	BCCB04.11

3	Describe in detail about the design for economy	Understand	CO 4	BCCB04.12
4	Explain in detail about the reduction of machined area.	Remember	CO 4	BCCB04.13
5	What are the general problems we come across while designing for machining operations? Explain how one can overcome those problems.	Understand	CO 4	BCCB04.11
6	Summarize the principles and process used for Design for Assembly	Understand	CO 4	BCCB04.12
7	Summarize the principles and process used for Design for Assembly	Understand	CO 4	BCCB04.12
8	Write a brief note on the following: a)Multi station assembly system b)Automated assembly system	Remember	CO 4	BCCB04.13
9	What are the factors considering while selecting a mechanism for particular product?	Understand	CO 4	BCCB04.11
10	How “simplification by separation” principle affects the design of product? Explain.	Remember	CO 4	BCCB04.12
11	List the recommendations to be considered for the design of assembly.	Understand	CO 4	BCCB04.11
12	Mention any four rules for design for assembly	Understand	CO 4	BCCB04.11
13	Explain in detail about the assembly limits, Datum features & tolerance stack	Understand	CO 4	BCCB04.12
14	How the evaluation method used in DFMA.	Remember	CO 4	BCCB04.13
15	what are main factors consider in assembly.	Understand	CO 4	BCCB04.12
16	Explain in detail about the design for accessibility.	Remember	CO 4	BCCB04.13
17	what are steps involved in life cycle assessment.	Understand	CO 4	BCCB04.12
18	Demonstrate the steps involved for minimizing the material usage.	Understand	CO 4	BCCB04.13
19	Discuss the relationship between “Design For Economy” and “Design For Machining”	Understand	CO 4	BCCB04.12
20	Discuss the local and regional issues influencing design for environment.	Remember	CO 4	BCCB04.13
Part – C (Problem Solving and Critical Thinking)				
1	Enumerate the steps to be followed when DFMA is used in the design process	Understand	CO 4	BCCB04.11
2	List the recommendations to be considered for the design of assembly	Remember	CO 4	BCCB04.11
3	Explain how group technology is helpful in DFMA	Understand	CO 4	BCCB04.12
4	Illustrate an example of product where principle of recyclability has been employed.	Remember	CO 4	BCCB04.12
5	Discuss the local and regional issues influencing design for environment.	Understand	CO 4	BCCB04.13
6	Name the lifecycle assessment methods used in design for environment	Understand	CO 4	BCCB04.12
7	Discuss the global issues influencing design for environment.	Understand	CO 4	BCCB04.12
8	Discuss Design for Accessibility and Design for Recyclability	Remember	CO 4	BCCB04.13
9	What is Group Technology? State its Advantages and limitations	Understand	CO 4	BCCB04.12

10	Discuss the DFA Guidelines.	Remember	CO 4	BCCB04.12
UNIT-V				
DESIGN OF MANUAL ASSEMBLY				
Part – A (Short Answer Questions)				
S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	Define Life cycle assessment.	Remember	CO 5	BCCB04.14
2	What are the main objectives of environmental design?	Understand	CO 5	BCCB04.14
3	List the significance of DFE.	Applying	CO 5	BCCB04.15
4	Describe the global issues.	Analyzing	CO 5	BCCB04.15
5	Describe the local issues.	Evaluating	CO 5	BCCB04.16
6	List the guideline for material selection	Creating	CO 5	BCCB04.14
7	When is it most important to apply design for assembly principles in the development of a product..	Remember	CO 5	BCCB04.14
8	What is the formula for calculating the Product assembly Merit (PAM)?	Understand	CO 5	BCCB04.14
9	List the three criteria for checking potential part redundancy.	Applying	CO 5	BCCB04.15
10	Define disassembly	Analyzing	CO 5	BCCB04.14
11	Define Recyclability	Evaluating	CO 5	BCCB04.15
12	Define Remanufacturing.	Creating	CO 5	BCCB04.15
13	Define energy efficiency.	Remember	CO 5	BCCB04.15
14	Describe the standards followed in design for environmental.	Understand	CO 5	BCCB04.16
15	Demonstrate the steps involved for minimizing the material usage.	Applying	CO 5	BCCB04.14
16	What is the formula for the Combined Average Merit (CAM)?	Analyzing	CO 5	BCCB04.14
17	What is the formula for calculation the part merit rating?	Remember	CO 5	BCCB04.15
18	Differentiate Regulation and standards.	Understand	CO 5	BCCB04.14
19	What are the steps involved in Recyclability.	Remember	CO 5	BCCB04.15
20	What are the basic DFE methods?	Remember	CO 5	BCCB04.15
Part – B (Long Answer Questions)				
1	Explain the effect of part thickness and weight on handling time.	Remember	CO 5	BCCB04.14
2	What are the techniques used to reduce environment impact.	Understand	CO 5	BCCB04.15
3	Describe the standards followed in design for environmental.	Remember	CO 5	BCCB04.15
4	Explain following. 1. Design for Economy. 2. Tolerance Stack	Understand	CO 5	BCCB04.15
5	What is Design for Environment? Discuss guidelines for DFE.	Remember	CO 5	BCCB04.16

6	Discuss the Design considerations for minimum material usage for Remanufacture	Understand	CO 5	BCCB04.14
7	Discuss Design for Accessibility and Design for Recyclability.	Understand	CO 5	BCCB04.14
8	Explain the factors which affect the design of a component.	Understand	CO 5	BCCB04.15
9	What is the task of statistical quality control (SQC) and what are the statistical quality tools available?	Remember	CO 5	BCCB04.15
10	Describe various geometric technique used in reverse engineering	Understand	CO 5	BCCB04.14
11	What are guidelines for Design for Robustness? Discuss.	Remember	CO 5	BCCB04.14
12	Distinguish between the following with suitable sketch i) Recycling ii) Remanufacturing	Remember	CO 5	BCCB04.15
13	Summarize how the components are to be manufacture in the industries associated with regulation and standards.	Understand	CO 5	BCCB04.16
14	Briefly explain the role of CAD in product design and design for assembly.	Remember	CO 5	BCCB04.16
15	Explain briefly about assembly features characterization of assembly feature with examples.	Understand	CO 5	BCCB04.15
16	Mention any four rules for design for assembly?	Remember	CO 5	BCCB04.15
17	Give the importance of regulations and standards in design	Understand	CO 5	BCCB04.16
18	Discuss in detail about the mechanism selection and the evaluation method adapted in design.	Understand	CO 5	BCCB04.16
19	Write short notes on: (1) Process Capability (2) Geometric Tolarence	Understand	CO 5	BCCB04.15
20	With suitable examples, explain in detail how the design alternatives are exposed.	Remember	CO 5	BCCB04.14
Part – C (Problem Solving and Critical Thinking)				
1	How the uneconomical design is identified and modified? illustate with an example	Understand	CO 5	BCCB04.15
2	Discuss the design considerations for minimum material usage and for remanufacture	Remember	CO 5	BCCB04.16
3	Explain design for clampability and accessibility	Understand	CO 5	BCCB04.15
4	Explain design rules for part separation	Understand	CO 5	BCCB04.15
5	Enlist any six design rules for parts consolidation	Understand	CO 5	BCCB04.16
6	How to identify uneconomical design? Explian briefly.	Remember	CO 5	BCCB04.16
7	Name few design method for reducing environmental impact	Understand	CO 5	BCCB04.15
8	Discuss the economics of recycling.	Remember	CO 5	BCCB04.14
9	Name few hazardous material used in product and their impact in environment.	Understand	CO 5	BCCB04.15
10	Explain product life cycle management.	Understand	CO 5	BCCB04.16

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