INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

M.TECH (CAD/CAM)
TUTORIAL QUESTION BANK

Course Name	**SPECIAL MANUFACTURING PROCESS**
Course Code	BCCB17
Class	M. Tech, II Semester
Branch	CAD/CAM
Year	2018 – 2019
Course Coordinator	Dr. G. Naveen Kumar
Course Faculty	Dr. G. Naveen Kumar, Associate Professor, ME

COURSE OBJECTIVES:

The course should enable the students:

I	Understanding the basic surface treatment coating in manufacturing.
II	Applying the advanced aspects in processing of ceramics.
III	Understanding of modern trends in manufacturing fields

COURSE LEARNING OUTCOMES:

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

BCCB17.01	Ability to apply comprehensive knowledge in mathematics, science and engineering science to manufacturing engineering.
BCCB17.02	Ability to perform engineering analysis by designing and conducting appropriate experiments and analyzing interpreting results.
BCCB17.03	Ability to design products, equipment, tooling and environment for manufacturing systems.
BCCB17.04	Ability to function effectively in team or group settings.
BCCB17.05	Ability to identify, formulate and solve engineering problems.
BCCB17.06	Ability to practice the engineering profession at the highest ethical standards.
BCCB17.07	Ability to communicate effectively.
BCCB17.08	Ability to implement technology with an awareness of important social issues and understand the impact of engineering solutions in a global and societal context.
BCCB17.09	recognition of the need to engage in lifelong learning.
BCCB17.10	knowledge of contemporary issues such as understanding the creation of competitive advantage through manufacturing planning, strategy and control.
BCCB17.11	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

BCCB17.12	understanding of the behavior and properties of materials as they are altered and influenced by manufacturing processes.
BCCB17.13	Ability to use statistical- and calculus-based methods to analyze and control manufacturing operations.
BCCB17.14	Ability to measure manufacturing process variables in a manufacturing laboratory and make technical inference about the process.

UNIT – I			
SURFACE TREATMENT			
Part - A (Short Answer Questions)			
SNo	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	How do I select the most appropriate treatment for my application?	Understand	BCCB17.02
2	What are the operating temperatures for treated surfaces?	Understand	BCCB17.04
3	What is Siltek Deactivation?	Remember	BCCB17.02
4	What are the unique benefits of Siltek deactivation?	Remember	BCCB17.04
5	Does anyone else offer an equivalent to Siltek deactivation?	Remember	BCCB17.04
6	What is the maximum temperature limit for Siltek deactivated glass?	Understand	BCCB17.03
7	Does Restek offer custom surface treatments?	Understand	BCCB17.04
8	Will you re-deactivate my Siltek treated glass liners or treated Siltek metal liners after I clean them?	Understand	BCCB17.04
9	How tightly can the tubing be bent?	Remember	BCCB17.04
10	What materials can be surface treated?	Remember	BCCB17.04
11	How will surface treatments work in my acidic environment?	Remember	BCCB17.04
12	How thick is the Siltek layer?	Understand	BCCB17.04
13	Are secondary deactivations available for Sulfinert treated materials?	Understand	BCCB17.04
14	Can ferrules be treated?	Remember	BCCB17.06
15	Why is Siltek on glass gold in color?	Remember	BCCB17.06
16	Why do Silcosteel treated pieces have different colors?	Remember	BCCB17.06
17	What types of urethane coating are there?	Remember	BCCB17.06
Part - B (Long Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	What is the scope of the surface treatment process? What in accuracies does the finishing processes eliminate.	Understand	BCCB17.01
2	Finishing operations ensure good dimensional accuracy and good surface finish?	Remember	BCCB17.02
3	Why all the components produced are not subjected to the finishing operations?	Understand	BCCB17.02
4	What methods may be used to prepare a surface for an organic finish?	Understand	BCCB17.03
5	What is thermal spraying? Define its process in detail?	Remember	BCCB17.02

6	What are the methods of surface cleaning process?	Remember	BCCB17.02
7	What are the surface coating types? Explain in detail?	Understand	BCCB17.03
8	What are the organic methods of coating? Explain in detail?	Understand	BCCB17.04
9	What is electro forming? Explain in detail with an example.	Remember	BCCB17.03
10	Define and explain about ion implantation?	Understand	BCCB17.06
11	Explain about the diamond coating and cladding with a suitable sketch.	Remember	BCCB17.02
Part - C (Problem Solving and Critical Thinking Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	Enumerate the various Surface treatment processes and explain the importance of it.	Understand	BCCB17.04
2	Explain Chemical vapor deposition and thermal Spraying methods in detail.	Understand	BCCB17.03
3	Explain electro forming process with construction and formation details?	Understand	BCCB17.06
4	Define and explain about chemical vapor deposition?	Understand	BCCB17.05
5	Explain about the methods of cleaning processes?	Remember	BCCB17.02
6	Enumerate the various surface coating types with an example?	Remember	BCCB17.05
7	What are the methods of coating? Explain about economics of coating.	Remember	BCCB17.06
UNIT - II			
PROCESSING OF CERAMICS			
Part – A (Short Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	What are the advantages of using negative rake on ceramic cutting tools?	Remember	BCCB17.08
2	What are the advantages of using negative rake on cemented carbide cutting tools?	Understand	BCCB17.08
3	Write about ceramic matrix composites?	Understand	BCCB17.08
4	What are the necessary conditions for the effective use of ceramic tools?	Understand	BCCB17.08
5	What are the three main variables to be considered in application and selection of turning tools?	Understand	BCCB17.08
6	Write about polymer matrix composites?	Remember	BCCB17.08
7	Why a high standard of surface finish is imparted to cemented carbide cutting tools?	Remember	BCCB17.08
8	Write about metal matrix composites?	Remember	BCCB17.08
9	What are the reinforced plastics?	Remember	BCCB17.08
10	What are the Processing of composites?	Remember	BCCB17.08
Part - B (Long Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	What are the processing of particulate ceramics? Explain in detail?	Understand	BCCB17.08
2	Explain the classifications of ceramics in details?	Understand	BCCB17.08
3	What are the Processing of ceramics: what are their Applications, and characteristics of ceramics?	Understand	BCCB17.08
4	What are the powder preparations methods?	Remember	BCCB17.08

5	What is the consolidation of the ceramic preparation? Explain in detail?	Remember	BCCB17.08
6	Explain in detail about the drying, sintering, hot compaction?	Remember	BCCB17.08
7	What are the areas of application of processing of ceramics?	Remember	BCCB17.08
8	What are the composite layers? Explain in detail?	Understand	BCCB17.08
Part – C (Problem Solving and Critical Thinking)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	How do you classify Ceramics? What are the applications of ceramics?	Remember	BCCB17.08
2	Classify Ceramic fabrication techniques? With a neat sketch?	Remember	BCCB17.09
3	Explain processing of Particulate ceramics elaborate it with their applications?	Remember	BCCB17.08
4	Explain in detail about the Processing of composites materials?	Remember	BCCB17.08
5	Explain the formation of particulate and fiber reinforced composites?	Understand	BCCB17.08
6	Explain about the metal matrix composites and their applications in brief?	Understand	BCCB17.08
7	Explain about the ceramic matrix composites and their applications in brief?	Understand	BCCB17.11
8	Explain about the polymer matrix composites and their applications in brief?	Remember	BCCB17.08
UNIT-III			
FABRICATION OF MICROELECTRONIC DEVICES			
Part - A (Short Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	What is the Crystal growth?	Understand	BCCB17.09
2	How the wafer preparation method is performed?	Understand	BCCB17.08
3	What is the film deposition oxidation	Remember	BCCB17.11
4	What is the lithography?	Understand	BCCB17.10
5	What is the Fabrication of microelectronic devices?	Understand	BCCB17.10
6	What is bonding and packaging?	Understand	BCCB17.09
7	What is reliability and yield?	Understand	BCCB17.09
8	Write about the Printed Circuit boards?	Understand	BCCB17.10
9	What is surface mount technology?	Remember	BCCB17.09
10	Write about the computer aided design in micro electronics?	Understand	BCCB17.09
Part – B (Long Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	Explain about the Crystal growth and wafer preparation?	Understand	BCCB17.08
2	Discuss about the film deposition oxidation?	Understand	BCCB17.09
3	Mention the processes of the bonding and packaging in detail?	Understand	BCCB17.09
4	Explain about the reliability and yield in microelectronic devices?	Remember	BCCB17.09

5	Discuss briefly about the integrated circuit economics?	Remember	BCCB17.10
6	Explain about the surface mount technology?	Remember	BCCB17.09
7	What are the fabrication methods of the computer aided design in micro electronics?	Understand	BCCB17.09
8	Explain in detail about the fabrication of microelectronic devices?	Understand	BCCB17.10
Part – C (Problem Solving and Critical Thinking)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	Discuss about the crystal growth and formation of the crystal growth?	Understand	BCCB17.09
2	Explain about the film deposition oxidation?	Understand	BCCB17.09
3	Explain about the Printed Circuit boards, computer aided design in micro electronics	Remember	BCCB17.09
4	Explain about the bonding and packaging of fabrication of microelectronic devices.	Remember	BCCB17.08
5	Briefly write about the computer aided design in micro electronics?	Understand	BCCB17.08
UNIT-IV			
E-MANUFACTURING			
Part – A (Short Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	What is Nano machining?	Remember	BCCB17.10
2	What is micromachining?	Remember	BCCB17.11
3	Write process parameter for True cutting speed	Remember	BCCB17.12
4	Write process parameter for metal removal rate	Understand	BCCB17.10
5	What is hot machining?	Understand	BCCB17.11
6	Write Advantages and disadvantages of hot machining	Understand	BCCB17.12
7	Explain advantages of nanoscale	Remember	BCCB17.10
8	What are the process parameters in HSM	Understand	BCCB17.11
Part – B (Long Answer Questions)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	Describe about Fabrication techniques in brief.	Understand	BCCB17.10
2	Write short notes on Bottom-up manufacturing.	Understand	BCCB17.11
3	Write short notes on Top-down manufacturing.	Remember	BCCB17.12
4	Classify Micro-Fabrication Technologies.	Remember	BCCB17.10
5	Explain in detail about Focused Beam Lithography	Understand	BCCB17.11
6	Comparison between conventional and high speed machining	Remember	BCCB17.12

7	Explain in detail about Nanoimprint Lithography with a neat sketch	Understand	BCCB17.10
8	Write short notes on Physical vapor deposition and chemical vapor deposition	Remember	BCCB17.11
Part – C (Problem Solving and Critical Thinking)			
S No	**QUESTION**	**Blooms taxonomy level**	**Course Learning Outcomes**
1	Explain about the Nano manufacturing techniques and their applications in brief?	Understand	BCCB17.10
2	Explain in detail about the high Speed machining process and their applications in brief?	Understand	BCCB17.11
3	Comparison between high speed machining (HSM) and Electrical Discharge machining (EDM)	Remember	BCCB17.12
4	Explain about high speed machining and write Advantages and disadvantages of HSM	Remember	BCCB17.10
5	Explain about characteristic features and applications of micro drilling	Remember	BCCB17.10
6	Explain in detail about Scanning Probe Lithography with a neat sketch	Understand	BCCB17.11
7	Write characteristics and applications of HSM with suitable examples	Understand	BCCB17.12
UNIT-V			
RAPID PROTOTYPING			
Part - A (Short Answer Questions)			
1	Why rapid prototyping is important in industries	Understand	BCCB17.13
2	Briefly classify the rapid prototyping process	Remember	BCCB17.14
3	Define the fundamental principle of stereo lithography process	Remember	BCCB17.15
4	List out the application of fused deposition modeling	Remember	BCCB17.16
5	Explain the selective laser sintering process	Understand	BCCB17.17
6	What are the applications of FDM models? Give an example	Understand	BCCB17.18
7	Explain applications of analysis and planning in rapid prototyping	Understand	BCCB17.13
8	Explain rapid prototyping. Classification of rapid prototyping system	Understand	BCCB17.14
9	Write the limitations of rapid prototyping	Understand	BCCB17.15
10	What is rapid tool and list out its advantages?	Understand	BCCB17.16
11	Explain the three dimensional printing.	Remember	BCCB17.16
12	How does aerospace technology make use of rapid tooling applications	Understand	BCCB17.17
Part - B (Long Answer Questions)			
1	Explain the need of rapid prototyping	Understand	BCCB17.13
2	List out the classification of rapid prototype systems	Understand	BCCB17.14

3	Define the fundamental principle of stereo lithography process	Understand	BCCB17.15
4	Define Fused deposition modeling	Understand	BCCB17.16
5	Discuss the merits and demerits of selective laser sintering process	Remember	BCCB17.17
6	Differentiate soft tooling and hard tooling and compare direct tooling and indirect tooling	Remember	BCCB17.18
7	What is rapid tooling and explain the applications of rapid prototype tool in manufacturing and tooling	Remember	BCCB17.13
8	Discuss the advantages and disadvantages of laser Sintering, fused deposition method	Understand	BCCB17.14
9	Explain in detail the process chain rapid prototyping.	Understand	BCCB17.13
10	Discuss limitations of rapid prototyping explain in detail.	Understand	BCCB17.14
Part – C (Problem Solving and Critical Thinking)			
1	Explain the various demands on CAD system used in rapid prototyping	Understand	BCCB17.13
2	Explain with a neat sketch, principle of operation of selective laser sintering process	Understand	BCCB17.14
3	Discuss the evolution of rapid prototype systems indicting the history and growth rate in industrial sector	Understand	BCCB17.15
4	What are the advantages and limitations of stereo lithography	Understand	BCCB17.16
5	Explain with a neat sketch the following concept of modeling techniques of 3D printer	Understand	BCCB17.17
6	Explain the application of rapid prototyping component from concept modeling and describe any three geometric modeling techniques	Remember	BCCB17.18
7	Explain in contrast “Rapid prototyping tooling is required or not” to conventional machining	Remember	BCCB17.13
8	Summarize the statement “rapid prototyping uses the effective use of material, production ease of manufacturing and tooling”.	Understand	BCCB17.14
9	Explain in details the working principle of solid ground curing models with its advantages and disadvantages. Differentiate SLA and SLS in rapid prototyping.	Understand	BCCB17.15
10	What are features of LOM process? Describe the process flow of LOM process List practical out applications	Understand	BCCB17.16

Prepared By:

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MECHANICAL ENGINEERING