INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING

TUTORIAL QUESTION BANK

Course Name	:	**PRODUCTION TECHNOLOGY**
Course Code	:	**A40312**
Class	:	II B. Tech II Semester
Branch	:	Mechanical Engineering
Year	:	2016 – 2017
Course Faculty	:	Dr K. G. K. Murti, Professor. B. Sujith Kumar, Assistant Professor.

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S. No	Question	Blooms Taxonomy Level	Course Outcome
Part A-Short (Answers Questions)			
	UNIT - I		
1	List the common pattern materials?	Comprehension	3,4
2	List different types of sand for sand moulds?	Comprehension	1,2,3
3	What are different types of binder used in sand casting?	Comprehension	4,5 1,4
4	Define green strength of a molding sand?	comprehension	1,3,4
5	Define permeability of a molding sand?	Comprehension	1,2,3
6	Define cope, drag and cheek?	Comprehension	2,3,4
7	Define refractoriness of the sand material?	Comprehension	3,4,5 2,3
8	Define flowability or the sand material?	Comprehension	3,4 1,5
9	Define dry strength or the sand mould?	Comprehension	1,2,3
10	Define collapsibility of the sand mould?	Comprehension	4,5
11	Define hot strength of the sand material?	Comprehension	1,3,4
12	Define Adhesiveness of the sand material?	Comprehension	3,4
13	What is the effect of cohesiveness of the sand material?	Comprehension	2,3,4

14	What is the use of cone?	Comprehension	3,4,5
15	What is the use of chaplets?	Comprehension	
16	What is the use of facing sand?	Comprehension	
17	Define parting line in casting ?	Comprehension	
18	What is the use of Riser?	Comprehension	
19	Define fettling process in casting?	Comprehension	
20	What is rapping allowance?	comprehension	
Part B-Long (Answers Questions)			
UNIT - I CASTING			
1	Explain various manufacturing processes. As an engineer when would you prefer selecting Casting as a manufacturing process?	Comprehension knowledge	3,4
2	Define a mould. Make a sketch of a mould and identify its different elements.	knowledge	1,2,3
3	Discuss the solidification process for pure metal and an alloy in casting.	Comprehension knowledge	4,5 1,4
4	Draw a sketch to describe the procedure of placing sprue and risers in sand mould.	Knowledge Comprehension	1,3,4 2,4,5
5	What is a pattern? Explain different materials suitable for pattern making.	Knowledge	3,4 1,2,3
6	Name different types of patterns. Explain with neat sketch about split pattern and discuss its use.	Comprehension	2,3,4
7	What are the requirements of a good gating system? Draw a sketch of a gating system and explain the functions of various elements.	Comprehension Comprehension	3,4,5 2,3
8	What are the essential properties of a molding sand? Briefly explain them.	Knowledge Comprehension	1,2,3 2,3,4,5
9	What is the function of a core? What are core prints?	Knowledge Comprehension	1,2 2,3
10	Compare the hot chamber and cold chamber method of die casting.	Comprehension	3,4 2,3
11	What are the advantages and limitations of casting process?		
12	What are the basic requirements of a mould? Name different mould materials.	Comprehension	1,2,3
13	What factors affect the choice of a particular casting process? Discuss.	Knowledge	2,3
14	Distinguish between a pattern, a mould and a casting.	Comprehension	2,3
15	What are the allowances to be given on a pattern? Explain in detail.	Knowledge	1,2,3
16	Discuss: (i) sweep pattern (ii) gated pattern	Comprehension	2,3
17	Differentiate between runners and risers.	Knowledge	2,3
18	Explain various sand testing methods.	Comprehension	2,3,4,5
19	Explain the characteristics of core. Briefly explain various types of cores.	Knowledge	2,3
20	With neat sketch explain investment casting process and give its applications.	Comprehension	2,3
Part C-(Analytical Questions)			
UNIT - I			
1	Explain the solidification of a metal with neat diagram?	Knowledge	1,2,3
2	Explain the solidification of a alloy with neat diagram?	Comprehension	2,3
3	Explain sweep pattern with neat diagram?	Knowledge	2,3
4	Explain shrinkage pattern with an example?	Comprehension	1,2,3
5	Explain centrifuging casting with neat diagram?	Comprehension	2,3
Part A-Short (Answers Questions)			
UNIT - II			

1	Explain the use of flux in welding?	Knowledge Comprehension	3,4 1,5
2	Explain butt welding & Joint?	Knowledge Comprehension	1,2,3
3	Explain lap welding joint?	Comprehension	4,5
4	Describe the symbol of weld?		1,3,4
5	Describe soldering?	Comprehension	3,4
6	Describe brazing?	Knowledge	2,3,4
7	List out the sources of energy used for welding?	comprehension	3,4,5
8	Describe the use of filler material in welding?	Knowledge	1,2,3
9	Define carburizing flame and give its ratio?	Comprehension	3,4
10	Define oxydizing flame and give its ratio?	Knowledge	1,2,3
11	Define neutral flame and give its ratio?	Comprehension	4,5
12	List out the gases used in gas welding?	Knowledge	1,3,4
13	What is the use of heat gas in welding?	Comprehension	3,4
14	List out brazing fluxes used?		1,2,3
15	List out the furnaces used for brazing?		3,4
16	List out the electrode materials used in welding?	Comprehension	1,2,3
17	List out the chemical reactions on thenit welding?	Knowledge	4,5
18	What is the application of them it welding?	Comprehension	1,3,4
19	Describe capillary action in brazing?	Knowledge	3,4
20	Describe the effect of clearance in brazing?	Comprehension	2,3,4,5
Part B-Long (Answers Questions)			
UNIT - II WELDING - I			
1	Discuss classification of welding processes.	Comprehension	3,4
2	Explain different types of flames with neat sketches in gas welding process. Give applications for each type.	Comprehension	1,2,3
3	Explain the advantages and limitations of oxy-acetylene welding	Comprehension	4,5
4	Discuss shielded metal arc welding process with a neat sketch.	Comprehension	1,3,4
5	Explain the function of coating in shielded metal arc welding process.	Comprehension	3,4
6	Discuss electric resistance spot welding process. Explain nugget formation.	Comprehension	2,3,4
7	Compare resistance spot and seam welding.	Analysis	3,4,5
8	Compare resistance upset butt and flash butt welding process	Analysis	1,2,3
9	Explain with neat sketch thermit welding process.	Comprehension	1,2
10	Discuss estimation of cost for shielded metal arc welding process.	Comprehension	3,4
11	Compare gas welding and cutting processes.	analysis	1,5
12	Discuss the oxy-acetylene welding process setup.	knowledge	1,4
13	What are the various safety aspects in gas welding? Explain.	knowledge	1,4
14	Explain the advantages and disadvantages of shielded metal arc welding.	Comprehension	2,4,5
15	Define polarity as applied to DC arc welding. How is this advantageously used?	knowledge	1,2,3
16	Discuss parameters used in resistance spot welding process. Give the industrial applications of spot welding process.	Analysis	2,3,4
17	Explain projection welding process and its application.	Comprehension	2,3
18	Discuss the sequence of flash butt welding process. Give applications.	Comprehension	2,3,4,5

19	Discuss the advantages and limitations of thermit welding process.	Comprehension	2,3
20	Explain the calculation of productivity in arc welding.	Comprehension	2,3
Part C-(Analytical Questions)			
	UNIT - II		
1	Explain different types of flames generated in gas welding with diagram?	Comprehension comprehension	2,3
2	Explain thermit welding with the chemical creations involved in it ?	Comprehension	3,4
3	Explain Arc welding with neat diagram?	comprehension	3,4
4	Explain the types of welding joints with neat diagram?	Comprehension	3,4
5	Explain resistance welding with heat diagram?	Comprehension	3,4
Part A-Short (Answers Questions)			
	UNIT - III		
1	List out the furnaces used for brazing?	Comprehension	3,4
2	List out the brazing filler metals?	Comprehension	1,2,3
3	Describe the need of flux in brazing ?	Comprehension	4,5
4	Describe the effect of more clearance in brazing ?	Comprehension	1,3,4
5	Describe the effect of less clearance in brazing?	Comprehension	3,4
6	Describe HAZ?	Comprehension	2,3,4
7	Describe the nugget formation in welding?	Analysis	3,4,5
8	Describe the indentation formation in welding ?	Analysis	1,2,3
9	Describe the role of pressure in resistance welding?	Comprehension	1,2
10	Describe of time in welding cycle?	Comprehension	3,4
11	Define the squeeze time in welding cycle?	Comprehension	4,5
12	Define welding in welding cycle?	Comprehension Comprehension	2,4,5
13	Define pickling in welding process?	Comprehension knowledge	1,2,3
14	List out the type of spot welding electrodes?	Comprehension	2,3,4
15	Describe the characteristics of a electrode material?	Analysis	2,3
16	Describe seam welding?	Analysis	1,2,3
17	List out the application of TIG welding?	Comprehension	2,3
18	Describe Polarity change in welding?	Comprehension	3,4
19	Define solid state welding?	Analysis	1,2

20	List out the advantages of laser welding?	Analysis	3,4
Part B-Long (Answers Questions)			
UNIT - III			
1	Compare consumable and a non – consumable electrode.	Comprehension	1,2
2	Describe any arc welding process which uses a non consumable electrode.	Analysis	3,4
3	Explain the similarities and differences between consumable and non consumable electrode arc welding processes.	Comprehension	4,5
4	Explain metal inert gas welding process and give industrial applications.	Comprehension	1,3,4
5	What are three main types of metal transfer that can occur during arc welding? Explain with neat sketch.	Comprehension	3,4
6	Discuss some of the attractive features of gas tungsten arc welding process. What are the various gases used in this process.	comprehension	2,3,4
7	Compare gas tungsten arc and gas metal arc welding processes.	Analysis	3,4,5
8	Bring out advantages and disadvantages of gas tungsten arc and gas metal arc welding.	comprehension	1,2,3
9	Explain solid state welding.	comprehension	1,2
10	Discuss friction welding process and give its advantages and limitations.	comprehension	3,4
11	What is induction welding process?	Comprehension	1,2
12	Explain advantages and limitations of induction welding process.	Comprehension	3,4
13	Describe explosive welding process.	knowledge	3,4
14	Give industrial applications of explosive welding.	Comprehension	2,3,4
15	What is LASER welding? Give applications.	Comprehension	3,4,5
16	Explain brazing and soldering process.	Comprehension	1,2,3
17	What do you understand by heat affected zone in welding?	knowledge	1,2
18	Explain welding defects, causes and remedies.	Comprehension	3,4
19	What are the destructive testing methods used in welding?	Comprehension	1,2
20	Explain non-destructive testing methods for welding.	Comprehension	3,4
Part C-(Analytical Questions)			
UNIT - III			
1	Explain any two types of non destructive testing of welds?	Analysis	4,5
2	Explain MIG welding with nest diagram?	Analysis	1,3,4
3	Explain why inert gas is requires for welding?	comprehension	3,4
4	Explain heat affected zone in welding with neat diagram?	Analysis	2,3,4

5	Explain different types of welding defects and remedies?	Analysis comprehension	3,4,5
Part A-Short (Answers Questions)			
UNIT - IV			
1	Define recrystallization temperature?	Analysis comprehension	2,3
2	Describe the process of coining?	Analysis comprehension	4,5
3	Describe the process of piercing?	comprehension	1,3,4
4	Describe the process of blanking?	Analysis comprehension	1,2,3
5	Describe the process of stamping?	Analysis comprehension	2,3,4
6	Describe the process of Embossing?	Analysis comprehension	3,4,5
7	Describe the process of drawing?	Analysis comprehension	2,3,4,5
8	Describe the process of spinning?	comprehension	2,3
9	Describe the process of deep drawing?	Analysis comprehension	3,4
10	Describe the process of bending?	Analysis comprehension	1,2
11	Describe the process of shearing?	comprehension	3,4
12	Describe the process of matching?	Analysis comprehension	1,2,3
13	Describe the process of Perforating?	Analysis comprehension	2,3,4
14	List out the factors effecting shearing operation?	Analysis comprehension	3,4,5
15	Describe the process of cold working?	comprehension	2,3
16	Describe the process of hot working?	Analysis comprehension	4,5
17	List out the types of presses used in sheet metal operations?	Analysis comprehension	1,3,4
18	Describe the process of grain growth?	comprehension	3,4
19	Describe the process of wire drawing?	Analysis comprehension	2,3,4
20		Analysis comprehension	3,4,5
Part B-Long (Answers Questions)			
UNIT - IV			
1	Explain advantages and disadvantages of hot and cold working.	Comprehension knowledge	2,3
2	Compare properties obtained by cold and hot working process.	Comprehension comprehension	3,4
3	Name and sketch different metal forming processes.	Comprehension knowledge	3,4
4	Name some important products manufactured by metal forming processes.	Comprehension comprehension	3,4

5	What are the types of rolling processes? What products are made by rolling processes?	Comprehension knowledge	2,3
6	How do you find force and power requirement for rolling processes?	Comprehension comprehension	4,5
7	Compare blanking and piercing.	Comprehension	1,3,4
8	Explain bending. How do you find the forces required for bending of sheet metal?	comprehension	3,4
9	Explain wire and tube drawing.	Analysis comprehension	2,3,4
10	Discuss hot and cold spinning.	Analysis comprehension	3,4,5
11	Discuss types of presses and press tools.	comprehension	1,2,3
12	How do you find the force requirement in drawing?	Analysis comprehension	1,2
13	Explain deep drawing process.	Analysis comprehension	2,3
14	Discuss forming limit diagram.	Analysis comprehension	1,2
15	How do you find the forces required in deep drawing?	comprehension	1,2,3
16	Explain with a neat sketch about compound die.	Analysis comprehension	1,2
17	Discuss defects and remedies in deep drawing.	Analysis comprehension	3,4
18	Explain spring back in bending operation.	comprehension	2,3
19	Describe coining process.	Analysis comprehension	2,3
20	Discuss process of stamping.	Analysis comprehension	1,2
Part C-(Analytical Questions)			
	UNIT - IV		
1	Explain working principle of hydraulic and pneumatic press hat working and cold working process?	Comprehension comprehension	3,4
2	Explain the difference between hat working and cold working process?	Comprehension	1,2
3	Explain strain hardening?	comprehension	3,4
4	Explain different types of sheet metal operations?	Comprehension	1,2
5	Explain the parameters to be considered in bending a sheet metal with neat diagram?	comprehension	3,4
Part A-Short (Answers Questions)			
	UNIT - V		
1	Describe the process of open die forging?	Analysis comprehension	3,4
2	Describe the process of closed die forging?	Analysis comprehension	1,2
3	Describe the process of Drop forging?	comprehension	3,4
4	Describe the process of upset forging?	Analysis comprehension	1,2

5	Describe the process of rolling?	Analysis comprehension	2,3
6	Describe the process of Direct extrusion?	Analysis comprehension	4,5
7	Describe the process of indirect extrusion?	comprehension	1,3,4
8	Describe the process of Hydrostatic extension?	Analysis comprehension	3,4
9	Describe the process of impact extrusion?	Analysis comprehension	2,3,4
10	Describe the process of cold extrusion?	comprehension	3,4,5
11	Define billet in extrusion process?	Analysis comprehension	1,2,3
12	Describe the process of swaging?	Analysis comprehension	1,2
13	Describe the process of rotary forging?	Comprehension	2,3
14	Describe the process of smith forging?	comprehension	1,2
15	List out the defects in forgiving?	Comprehension	1,2,3
16	List out the tools required in forging?	comprehension	1,2
17	Explain the effect of friction in extrusion process?	Comprehension	3,4
18	What is the principle of forging process?	comprehension	2,3
19	Describe the process of tube extrusion?	Comprehension	2,3
20	List out the limitation of direct extrusion?	comprehension	1,2
Part B-Long (Answers Questions)			
	UNIT - V		
1	Explain forward and back ward extrusion.	Analysis comprehension	2,3
2	Discuss the process of impact extrusion	Analysis comprehension	4,5
3	What are the advantages of hydrostatic extrusion?	comprehension	1,3,4
4	Explain manufacture of seamless tubes by extrusion process.	Analysis comprehension	3,4
5	Compare hot and cold extrusion.	Analysis comprehension	2,3,4
6	How do you find the forces in extrusion operation?	Analysis comprehension	3,4,5
7	Explain tube and pipe extrusion process.	comprehension	1,2,3
8	Discuss defects in extrusion.	Analysis comprehension	1,2
9	Discuss factors for die design in extrusion.	Analysis comprehension	2,3
10	What are the lubricants used in extrusion processes?	comprehension	1,2
11	Explain various forging processes.	Analysis comprehension	1,2,3

12	What are various types of hammers and presses?	Analysis comprehension	1,2
13	Discuss any five forging defects.	Comprehension	3,4
14	What do you understand by isothermal forging and incremental forging?	comprehension	2,3
15	Differentiate between drop forging and press forging.	Comprehension	2,3
16	Compare open die and closed die forging.	comprehension	1,2
17	Describe roll forging.	Comprehension	3,4
18	Explain swaging.	Comprehension	2,3
19	How do you find the forces in forging operation?	comprehension	2,3
20	Explain advantages and limitations of mechanical forging presses.	Comprehension	1,2
Part C-(Analytical Questions)			
UNIT - V			
1	Determine forms when a material is subjected to extension process.	Analysis comprehension	3,4
2	Compare the difference between forward backward and impact extension?	Analysis comprehension	2,3
3	Determine the Principle of forging and different methods of forging?	comprehension	2,3
4	Compare the difference between smith forging and roller forging?	Analysis comprehension	1,2
5	What are the defects identified in forging and give remedies for each defects?	Analysis comprehension	2,3