



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING TUTORIAL QUESTION BANK

Course Title	MANUFACTURING PROCESSES				
Course Code	AMEB05				
Programme	B.Tech				
Semester	III	ME			
Course Type	Core				
Regulation	IARE - R18				
Course Structure	Theory			Practical	
	Lectures	Tutorials	Credits	Laboratory	Credits
	3	1	4	2	1
Chief Coordinator	Mr. G. Aravind Reddy, Assistant Professor				
Course Faculty	Mr. G. Aravind Reddy, Assistant Professor Mr. V. Mahidhar Reddy, Assistant Professor				

COURSE OBJECTIVES:

The course should enable the students:	
I	Understand and develop an appreciation of the manufacturing processes in correlation with material properties.
II	Learn the material properties which change the shape, size and form of the raw materials into the desirable product.
III	Understand the processes for creating products by conventional or unconventional manufacturing methods.

COURSE OUTCOMES (COs):

CO 1	Describe the concept of manufacturing and material, design and properties of casting.
CO 2	Understand the functions of casting defects, welding and industrial concepts.
CO 3	Understand the working of design related and causes and NDT techniques systems.
CO 4	Explore the concept of heat inputs and rapid prototyping, sheet metal and forging.
CO 5	Classification of various manufacturing processes for industrial applications and their use in real world competition.

COURSE LEARNING OUTCOMES (CLOs):

AMEB05.01	Understand and various manufacturing processes used in various industries.
AMEB05.02	Explain the steps involved in casting processes
AMEB05.03	Use design principles to incorporate sprue, runner, gates, and risers in foundry practice.
AMEB05.04	Evaluate properties of sand for use in sand casting.
AMEB05.05	Solve problems and find methods to rectify casting defects.
AMEB05.06	Demonstrate the preparation of moulds for various casting processes
AMEB05.07	Describe applications of various casting processes
AMEB05.08	Explain principles of welding, brazing and soldering processes..
AMEB05.09	Demonstrate use of welding equipment for various industrial applications.
AMEB05.10	Demonstrate use of Brazing and soldering equipment for various industrial applications.
AMEB05.11	Explain design of welded joints, residual stresses, distortion and control.
AMEB05.12	Explain causes and remedies of welding defects.
AMEB05.13	Compare destructive and non-destructive testing techniques.
AMEB05.14	Understand the affect of heat input in welds.
AMEB05.15	Understand the concepts to Additive manufacturing
AMEB05.16	Understand the importance of sheet metal forming, bending, and deep drawing.
AMEB05.17	Compare extrusion and forging processes to identify advantages and limitations.
AMEB05.18	Enable students to understand various manufacturing processes for industrial applications.
AMEB05.19	Enable students to understand importance of manufacturing for lifelong learning, Higher Education and competitive exams.

MOUDLE-I**CASTING****Part - A (Short Answer Questions)**

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	List the common pattern materials.	Understand	CO1	AMEB05.01
2	List different types of sand for sand moulds.	Understand	CO1	AMEB05.01
3	What are different types of binder used in sand casting?	Remember	CO1	AMEB05.01
4	Define green strength of molding sand?	Remember	CO1	AMEB05.01
5	Define permeability of molding sand?	Remember	CO1	AMEB05.01
6	Define cope, drag and cheek?	Understand	CO1	AMEB05.01
7	Define refractoriness of the sand material?	Understand	CO1	AMEB05.01
8	Define flow ability or the sand material?	Understand	CO1	AMEB05.01
9	Define dry strength or the sand mould?	Remember	CO1	AMEB05.02
10	Define collapsibility of the sand mould?	Remember	CO1	AMEB05.02
11	Define hot strength of the sand material?	Remember	CO1	AMEB05.02
12	Define Adhesiveness of the sand material?	Understand	CO1	AMEB05.02
13	What is the effect of cohesiveness of the sand material?	Understand	CO1	AMEB05.02
14	What is the use of cone?	Remember	CO1	AMEB05.02
15	What is the use of chaplets?	Remember	CO1	AMEB05.02
16	What is the use of facing sand?	Remember	CO1	AMEB05.03
17	Define parting line in casting.	Remember	CO1	AMEB05.03
18	What is the function of a Riser?	Remember	CO1	AMEB05.03
19	Define fettling process in casting?	Understand	CO1	AMEB05.03
20	What is rapping allowance?	Understand	CO1	AMEB05.03

Part - B (Long Answer Questions)

1	Explain various manufacturing processes. As an engineer when would you prefer selecting Casting as a manufacturing process?	Understand	CO1	AMEB05.01
2	Define a mould. Make a sketch of a mould and identify its different elements.	Remember	CO1	AMEB05.02
3	Discuss the solidification process for pure metal and an alloy in casting.	Understand	CO1	AMEB05.02
4	Draw a sketch to describe the procedure of placing sprue and risers in sand mould.	Understand	CO1	AMEB05.03
5	What is a pattern? Explain different materials suitable for pattern making.	Remember	CO1	AMEB05.02
6	Name different types of patterns. Explain with neat sketch about split pattern and discuss its use.	Remember	CO1	AMEB05.02
7	What are the requirements of a good gating system? Draw a sketch of a gating system and explain the functions of various elements.	Understand	CO1	AMEB05.03
8	What are the essential properties of molding sand? Briefly explain them.	Understand	CO1	AMEB05.04
9	What is the function of a core? What are core prints?	Remember	CO1	AMEB05.03
10	Compare the hot chamber and cold chamber method of die casting.	Understand	CO1	AMEB05.05
11	What are the advantages and limitations of casting process?	Remember	CO1	AMEB05.02
12	What are the basic requirements of a mould? Name different mould materials.	Understand	CO1	AMEB05.03

13	What factors affect the choice of a particular casting process? Discuss.	Understand	CO1	AMEB05.02
14	Distinguish between a pattern, a mould and a casting.	Remember	CO1	AMEB05.02
15	What are the allowances to be given on a pattern? Explain in detail.	Remember	CO1	AMEB05.03
16	Discuss: (i) sweep pattern (ii) gated pattern	Understand	CO1	AMEB05.03
17	Differentiate between runners and risers.	Understand	CO1	AMEB05.03
18	Explain various sand testing methods.	Remember	CO1	AMEB05.03
19	Explain the characteristics of core. Briefly explain various types of cores.	Remember	CO1	AMEB05.03
20	With neat sketch explain investment casting process and give its applications.	Understand	CO1	AMEB05.05

Part - C (Problem Solving and Critical Thinking Questions)

1	Why coarse sand is better for steel casting than fine grained sand? Why is it that as castings increase in size, it is often better to use increasing coarse sand?	Understand	CO1	AMEB05.04
2	With the help of sketches, discuss the various design considerations for designing the sand mould castings.	Understand	CO1	AMEB05.03
3	Why die casting method is mainly used for non ferrous metals? Explain.	Understand	CO2	AMEB05.06
4	Why venting is necessary in die casting and how it is used?	Understand	CO1	AMEB05.05
5	Why are ejector pins required in die casting? Explain	Remember	CO1	AMEB05.02
6	Why cooling of dies is necessary during their operation?	Remember	CO1	AMEB05.05
7	How the dies for die casting are manufactured? Explain.	Remember	CO1	AMEB05.06
8	State and explain the shell moulding casting process with neat sketch.	Remember	CO1	AMEB05.03
9	Discuss about the size of a cylindrical riser necessary to feed a steel slab casting with a side riser, casting pouring horizontally into the mould.	Understand	CO1	AMEB05.03
10	Compare the solidification times for castings of three different shapes of same volume: Cubic, cylindrical(with height equal to its diameter) and spherical.	Understand	CO2	AMEB05.07

MOUDLE - II

WELDING

Part – A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	What is the use of flux in welding?	Remember	CO2	AMEB05.08
2	Write a short note on butt welding.	Understand	CO2	AMEB05.08
3	List out minimum six types of welding process.	Understand	CO2	AMEB05.08
4	Write a short note on the symbol of weld?	Understand	CO2	AMEB05.09
5	List out the sources of energy used for welding?	Understand	CO2	AMEB05.08
6	What is the use of filler material in welding?	Remember	CO2	AMEB05.08
7	Define carburizing flame and give its ratio?	Remember	CO2	AMEB05.09
8	Define oxidizing flame and give its ratio?	Remember	CO2	AMEB05.08
9	Define neutral flame and give its ratio?	Remember	CO2	AMEB05.08
10	Differentiate between TIG welding and MIG welding.	Understand	CO2	AMEB05.09
11	Write the constituents of electrode coating with their functions.	Understand	CO2	AMEB05.08
12	What is heat shrinkage in spot welding?	Remember	CO3	AMEB05.11
13	What is the effect of clearance in brazing?	Understand	CO3	AMEB05.10

14	What is the need of flux in brazing?	Understand	CO3	AMEB05.10
15	What are the process variables in explosive welding?	Understand	CO2	AMEB05.09
16	What are the modes of metal transfer in arc welding?	Understand	CO2	AMEB05.09
17	How is brazing different from welding and soldering?	Understand	CO3	AMEB05.10
18	Define solid state welding?	Remember	CO2	AMEB05.09
19	What are the functions of coating in coated electrode?	Understand	CO2	AMEB05.09
20	List out various defects caused in welding.	Understand	CO3	AMEB05.12
21	What are the various destructive and non-destructive testing techniques used to test the quality of welded joints?	Remember	CO3	AMEB05.13
22	What do you mean by non-destructive testing of welds?	Understand	CO3	AMEB05.13
23	Write a short note on visual inspection methods.	Understand	CO3	AMEB05.13
24	What is the effect of carbon in welding of plain carbon steels?	Remember	CO2	AMEB05.08
25	What are the sources of weld spatter? How can it be controlled?	Remember	CO3	AMEB05.11
26	Why is the quality of SAW very good?	Understand	CO3	AMEB05.11
27	What is the effect of preheating in welding?	Remember	CO3	AMEB05.14
28	State some of the NDT techniques used for testing weldments.	Understand	CO3	AMEB05.13
29	State some of the Destructive testing techniques used for testing weldments.	Understand	CO3	AMEB05.13
Part - B (Long Answer Questions)				
1	Discuss classification of welding processes.	Understand	CO2	AMEB05.08
2	Explain different types of flames with neat sketches in gas welding process. Give applications for each type.	Understand	CO2	AMEB05.08
3	Explain the advantages and limitations of oxy-acetylene welding	Understand	CO2	AMEB05.08
4	Discuss shielded metal arc welding process with a neat sketch.	Remember	CO2	AMEB05.09
5	Explain the function of coating in shielded metal arc welding process.	Remember	CO2	AMEB05.09
6	Discuss electric resistance spot welding process. Explain nugget formation.	Remember	CO2	AMEB05.09
7	Compare resistance spot and seam welding.	Remember	CO2	AMEB05.09
8	Compare resistance upset butt and flash butt welding process	Understand	CO2	AMEB05.09
9	Explain with neat sketch thermit welding process.	Understand	CO3	AMEB05.10
10	Discuss estimation of cost for shielded metal arc welding process.	Remember	CO3	AMEB05.10
11	Compare gas welding and cutting processes.	Remember	CO3	AMEB05.10
12	Discuss the oxy-acetylene welding process setup.	Understand	CO3	AMEB05.10
13	What are the various safety aspects in gas welding? Explain.	Understand	CO3	AMEB05.10
14	Explain the advantages and disadvantages of shielded metal arc welding.	Understand	CO3	AMEB05.10
15	Define polarity as applied to DC arc welding. How is this advantageously used?	Understand	CO2	AMEB05.09
16	Discuss parameters used in resistance spot welding process. Give the industrial applications of spot welding process.	Remember	CO2	AMEB05.08
17	Explain projection welding process and its application.	Remember	CO2	AMEB05.09
18	Discuss the sequence of flash butt welding process. Give applications.	Remember	CO2	AMEB05.09
19	Discuss the advantages and limitations of thermit welding process.	Understand	CO2	AMEB05.08
20	Explain the calculation of productivity in arc welding.	Understand	CO2	AMEB05.08
Part – C (Problem Solving and Critical Thinking)				

1	Classify the different regions of oxy-acetylene flame and with the help of neat sketches explain their characteristics.	Remember	CO2	AMEB05.08
2	State the purpose of Thermit welding. Where would you recommend it and why?	Remember	CO2	AMEB05.09
3	Why is cleaning of metal is important for successful resistance welding? Explain.	Remember	CO2	AMEB05.08
4	Calculate the melting efficiency in the case of arc welding of steel with a potential of 20V and current of 200A. The travel speed is 5mm/s and the cross sectional area of the joint is 20mm ² . Heat required to melt steel may be taken as 10J/mm ³ and the heat transfer efficiency as 0.85.	Remember	CO2	AMEB05.08
5	Explain the effect of “Thermal conductivity” and “Thermal expansion” on welding process.	Understand	CO2	AMEB05.08
6	In an arc welding process, the voltage and current are 25V and 300A respectively. The arc heat transfer efficiency is 0.85 and welding speed is 8mm/s. What is the net heat input in J/mm?	Understand	CO2	AMEB05.08
7	Why do we do the edge preparation before welding? What are the different ways of edge preparation techniques?	Understand	CO3	AMEB05.11
8	Write primary and secondary combustion equations in oxy-acetylene gas welding process. Is it an endothermic process or exothermic process?	Remember	CO2	AMEB05.08
9	In a given arc welding operation, the power source is at 20V and current is at 300A. If the electrode travel speed is 6mm/s, calculate the cross sectional area of the joint. The heat transfer efficiency is 0.8 and melting efficiency is 0.30. Heat required to melt the steel is 10J/mm ² .	Remember	CO2	AMEB05.08
10	Assume that two 1.5mm thick steel sheets are being spot welded at a current of 5500A and current flow time t=0.15s. Using electrodes 6mm in diameter, estimate the amount of heat generated and its distribution in the weld zone. Use an effective resistance of 250μΩ.	Remember	CO2	AMEB05.08
11	Can we join dissimilar materials? If so give those process names and describe the basic principle of working.	Understand	CO2	AMEB05.09
12	Which welding technology out of TIG/MIG welding uses non consumable electrode? Explain that process with neat diagram.	Understand	CO2	AMEB05.09
13	Why DC arc welding is more used than AC arc welding in specialized applications?	Remember	CO2	AMEB05.09
14	The voltage length characteristic of a DC arc is given by $V=20+30l$, where “V” is the arc voltage and „l” is the length of arc in cm. Determine the open circuit voltage and short circuit current for arc lengths ranging from 3 to 5mm and current ranging from 200 to 400Amp during welding operation.	Remember	CO2	AMEB05.08
15	The voltage length characteristic of a DC arc is given by $V=20+40l$, where “V” is the arc voltage and „l” is the length of arc in cm. The power source characteristic is approximated by a straight line with an open circuit voltage is 80V and short circuit current is 300Amp.(i) When the arc length is changed from 3 to 5mm, Calculate change in arc power. (ii) Calculate arc length at a maximum current of 200Amp.	Understand	CO2	AMEB05.08
16	Can we join dissimilar materials? If so give those process names and describe the basic principle of working.	Understand	CO2	AMEB05.09
17	Explain how cracking in weldments can be avoided.	Understand	CO3	AMEB05.12
18	Explain the technical meaning of: (a) Hot cracking (b) Cold cracking	Remember	CO3	AMEB05.12

	(c) Grain growth (d) Recrystallization			
19	Which one of the following NDT would be used to examine a completed weld for surface defects: (a) Ultrasonics (b) Dye-penetrant (c) Radiography (d) Acoustics Explain that process.	Understand	CO3	AMEB05.13

MOUDLE -III

METAL FORMING

Part – A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	Define recrystallization temperature?	Remember	CO4	AMEB05.15
2	What are different types of rolling techniques?	Remember	CO4	AMEB05.15
3	What is the process involved in making internal gears?	Remember	CO4	AMEB05.15
4	What are the various forces involved in rolling process?	Understand	CO4	AMEB05.15
5	Write any four disadvantages of Hot working process?	Understand	CO4	AMEB05.15
6	What are the operations used for making a compound die?	Understand	CO4	AMEB05.15
7	What is the process used for making the parts of circular cross-section which are symmetrical about the axis of rotation	Remember	CO4	AMEB05.14
8	What are various types of rolling mills?	Understand	CO4	AMEB05.15
9	Describe the process of deep drawing?	Remember	CO4	AMEB05.15
10	How are tensile strength, yield strength and hardness affected with cold working process?	Understand	CO4	AMEB05.15
11	Write a short note on specialized types of piercing techniques.	Remember	CO4	AMEB05.15
12	Define forming in terms of bending?	Understand	CO4	AMEB05.15
13	What is meant by swaging?	Remember	CO4	AMEB05.15
14	List out the factors effecting shearing operation?	Remember	CO4	AMEB05.15
15	What type of metals is preferred for wire drawing?	Understand	CO4	AMEB05.15
16	What is meant by grain growth?	Remember	CO4	AMEB05.15
17	List out the types of presses used in sheet metal operations?	Remember	CO4	AMEB05.15
18	What are the power requirements for rolling process?	Remember	CO4	AMEB05.15
19	Write a short note on the process of wire drawing.	Remember	CO4	AMEB05.15
20	What happens when the grain structure of metal is refined?	Remember	CO4	AMEB05.15

Part – B (Long Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	Explain advantages and disadvantages of hot and cold working.	Understand	CO4	AMEB05.15
2	Compare properties obtained by cold and hot working process.	Understand	CO4	AMEB05.14
3	Name and sketch different metal forming processes.	Remember	CO4	AMEB05.15
4	Name some important products manufactured by metal forming processes.	Remember	CO4	AMEB05.15
5	What are the types of rolling processes? What products are made by rolling processes?	Understand	CO4	AMEB05.15
6	Explain how do you find force and power requirement for rolling processes?	Remember	CO4	AMEB05.15
7	Compare blanking and piercing.	Understand	CO4	AMEB05.15

8	Explain bending. How do you find the forces required for bending of sheet metal?	Remember	CO4	AMEB05.15
9	Explain wire and tube drawing.	Understand	CO4	AMEB05.15
10	Differentiate hot and cold spinning process.	Understand	CO4	AMEB05.15
11	Discuss various types of presses and press tools.	Understand	CO4	AMEB05.15
12	Explain how do you find the force requirement in drawing?	Remember	CO4	AMEB05.14
13	Explain deep drawing process.	Remember	CO4	AMEB05.15
14	What do you mean by forming limit diagram?	Understand	CO4	AMEB05.15
15	How do you find the forces required in deep drawing?	Remember	CO4	AMEB05.15
16	Explain compound die with a neat sketch.	Understand	CO4	AMEB05.15
17	Discuss defects and remedies in deep drawing.	Understand	CO4	AMEB05.15
18	Explain spring back in bending operation.	Remember	CO4	AMEB05.15
19	Write a short note on coining process.	Remember	CO4	AMEB05.15
20	What are various types of stamping techniques? Explain in detail.	Understand	CO4	AMEB05.15
Part – C (Problem Solving and Critical Thinking)				
1	Explain working principle of hydraulic and pneumatic press hot working and cold working process?	Understand	CO4	AMEB05.15
2	Differentiate hot working and cold working process.	Understand	CO4	AMEB05.16
3	How are Blanking and piercing operations performed simultaneously in making compound die?	Remember	CO4	AMEB05.15
4	Explain different types of sheet metal operations?	Remember	CO4	AMEB05.15
5	Explain the parameters to be considered in bending a sheet metal with neat diagram?	Remember	CO4	AMEB05.15
6	How are the forces calculated for performing rolling operation?	Understand	CO4	AMEB05.15
7	Differentiate flat rolling and ring rolling.	Understand	CO4	AMEB05.15
8	Explain strain hardening techniques involved in automobile industry	Understand	CO4	AMEB05.15
9	Write a note on micro stamping.	Understand	CO4	AMEB05.15
10	How is tool life estimated in Blanking and piercing techniques?	Understand	CO4	AMEB05.15
MODULE -IV				
EXTRUSION AND RAPID PROTOTYPING				
Part - A (Short Answer Questions)				
S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	What are the metals suitable for hot extrusion?	Understand	CO4	AMEB05.14
2	List out the limitations of direct extrusion?	Remember	CO4	AMEB05.14
3	Explain the effect of friction in extrusion process?	Understand	CO4	AMEB05.14
4	Name the applications of tube extrusion?	Understand	CO4	AMEB05.14
5	What is the technique used for making cold chisels?	Understand	CO4	AMEB05.14
6	Name some fluids used in hydrostatic extrusion.	Understand	CO4	AMEB05.15
7	How is length of the tool and pressure related in backward extrusion process?	Understand	CO4	AMEB05.15
8	What is the operation used for making bolt heads?	Remember	CO4	AMEB05.15
9	What is the reciprocating speed of hydraulic punch in impact extrusion?	Remember	CO4	AMEB05.15
10	What are the properties that can be improved by hydrostatic extrusion?	Understand	CO4	AMEB05.16
11	What are the properties that can be improved by smith extrusion?	Understand	CO4	AMEB05.16

12	What are the key aspects of RPT?	Understand	CO4	AMEB05.15
13	Explain the need for Rapid Prototyping	Understand	CO4	AMEB05.15
14	Explain in detail the process chain of Rapid Prototyping	Understand	CO4	AMEB05.15
15	What is Rapid Tool?	Understand	CO4	AMEB05.15
16	Explain subtractive process in rapid prototyping.	Understand	CO4	AMEB05.15
17	How to carry out manual arc welding process? Explain the procedure.	Understand	CO2	AMEB05.08
18	Explain the spot welding cycle with neat sketch.	Understand	CO2	AMEB05.09
19	Explain the various types of resistance welding processes. What are the advantages, disadvantages and their limitations?	Understand	CO2	AMEB05.09
20	Explain explosive welding with a neat sketch.	Remember	CO2	AMEB05.09
Part - B (Long Answer Questions)				
1	Explain forward and back ward extrusion.	Understand	CO4	AMEB05.14
2	Discuss the process of impact extrusion	Understand	CO4	AMEB05.14
3	What are the advantages of hydrostatic extrusion?	Understand	CO4	AMEB05.14
4	Explain manufacture of seamless tubes by extrusion process.	Understand	CO4	AMEB05.14
5	Compare hot and cold extrusion.	Remember	CO4	AMEB05.14
6	How do you find the forces in extrusion operation?	Remember	CO4	AMEB05.15
7	Explain tube and pipe extrusion process.	Remember	CO4	AMEB05.15
8	Discuss defects in extrusion.	Understand	CO4	AMEB05.15
9	Discuss factors for die design in extrusion.	Understand	CO4	AMEB05.15
10	What are the lubricants used in extrusion processes?	Understand	CO4	AMEB05.15
11	What are various types of hammers and presses?	Remember	CO4	AMEB05.16
12	Explain advantages and limitations of swaging.	Remember	CO4	AMEB05.18
13	Discuss the evolution of RP systems indicating the history and their growth rate in the industrial sector.	Understand	CO4	AMEB05.15
14	Summarize the key aspect of rapid prototyping. Explain With an example the historical development of rapid prototype technologies	Understand	CO4	AMEB05.15
15	Explain rapid prototyping, Explain the difference between traditional prototyping and rapid prototyping	Understand	CO4	AMEB05.15
16	Categorize of applications in rapid prototype technology in manufacturing industries and also compare rapid prototype technology with computer numerical control technology	Remember	CO4	AMEB05.16
17	How to carry out manual arc welding process? Explain the procedure.	Understand	CO2	AMEB05.08
18	What is laser welding? Explain with application, advantages and disadvantages.	Remember	CO2	AMEB05.09
19	Write the weld properties, advantages and limitations of friction welding.	Understand	CO2	AMEB05.09
20	Explain about brazing process with applications.	Understand	CO3	AMEB05.10
Part – C (Problem Solving and Critical Thinking)				
1	Determine forms when a material is subjected to extension process.	Understand	CO4	AMEB05.15
2	Compare the difference between forward backward and impact extension?	Understand	CO4	AMEB05.15
3	What are the defects identified in forging and give remedies for each defects?	Understand	CO4	AMEB05.15
4	What are the considerations to be taken for making a die using extrusion?	Remember	CO4	AMEB05.16
5	How are internal cavities minimised during extrusion of a metal? Explain.	Understand	CO4	AMEB05.15
6	Write a note on metals that are included in friction extrusion process.	Understand	CO4	AMEB05.15

7	Explain the classification of rapid manufacturing process, explain merits and demerits	Understand	CO4	AMEB05.15
8	Discuss the evolution of RP systems indicating the history and their growth rate in the industrial sector	Understand	CO4	AMEB05.15
9	Explain in detail the process chain of Rapid Prototyping	Remember	CO4	AMEB05.15
10	Explain, with suitable example, how rapid prototyping and tooling are the good examples as part of computer integrated Manufacturing.	Understand	CO4	AMEB05.15

MOUDLE -V

FORGING

Part - A (Short Answer Questions)

S No	QUESTION	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes
1	What are the advantages of open die forging?	Remember	CO4	AMEB05.17
2	What are the tools required for forging?	Remember	CO4	AMEB05.17
3	Explain the effect of friction in extrusion process?	Understand	CO4	AMEB05.17
4	What is the principle of forging process?	Understand	CO4	AMEB05.17
5	What is the technique used for making cold chisels?	Understand	CO4	AMEB05.17
6	How is length of the tool and pressure related in backward extrusion process?	Understand	CO4	AMEB05.17
7	What is the principle of forging technique?	Remember	CO4	AMEB05.17
8	What is the operation used for making bolt heads?	Remember	CO4	AMEB05.17
9	Write any three defects of forging.	Understand	CO4	AMEB05.17
10	How is cross sectional area of metal affected with application of force in the direction perpendicular to length axis in smith forging?	Understand	CO4	AMEB05.17
11	How is ductility of a metal affected in cold forging process?	Understand	CO4	AMEB05.17
12	What are the materials used for making forging hammers?	Remember	CO4	AMEB05.17
13	What is the suitable temperature for performing hot forging in aluminum alloys?	Understand	CO4	AMEB05.17
14	Write a note on drop forging.	Understand	CO4	AMEB05.17
15	Explain the characteristics of forging process.	Remember	CO4	AMEB05.17
16	Write a short note on cold forging.	Remember	CO4	AMEB05.17
17	Which characteristic of material is used in forging process?	Understand	CO4	AMEB05.17
18	Explain the mechanical working processes in forging.	Understand	CO4	AMEB05.17
19	Write a note on roll forging	Understand	CO5	AMEB05.18
20	What is the suitable temperature for performing hot forging in alloys?	Remember	CO5	AMEB05.18

Part - B (Long Answer Questions)

1	Explain various forging processes.	Remember	CO4	AMEB05.15
2	What are various types of hammers and presses?	Remember	CO5	AMEB05.18
3	Discuss any five forging defects.	Remember	CO4	AMEB05.17
4	What do you understand by isothermal forging and incremental forging?	Remember	CO5	AMEB05.18
5	Differentiate between drop forging and press forging.	Understand	CO4	AMEB05.17
6	Compare open die and closed die forging.	Understand	CO4	AMEB05.17
7	Explain advantages and limitations of roll forging.	Understand	CO4	AMEB05.17
8	Explain advantages and limitations of swaging.	Remember	CO5	AMEB05.18
9	Explain how you find the forces in forging operation.	Remember	CO5	AMEB05.18

10	Explain advantages and limitations of mechanical forging presses.	Remember	CO5	AMEB05.18
Part – C (Problem Solving and Critical Thinking)				
1	Determine the Principle of forging and different methods of forging?	Understand	CO4	AMEB05.17
2	Compare the difference between smith forging and roller forging?	Understand	CO4	AMEB05.17
3	What are the defects identified in forging and give remedies for each defects?	Understand	CO4	AMEB05.17
4	What are various forces involved in forging process? Explain briefly.	Remember	CO5	AMEB05.18
5	How are internal cavities minimized during extrusion of a metal? Explain.	Understand	CO5	AMEB05.18
6	Write a note on metals that are included in friction extrusion process.	Understand	CO5	AMEB05.18
7	Write a note on tools used for forging process.	Understand	CO5	AMEB05.18
8	Explain the forces in forging operations.	Remember	CO5	AMEB05.18
9	Discuss the design principles of drop forging?	Understand	CO5	AMEB05.18
10	What are the General Considerations Adopted For Designing A Forging Job.	Understand	CO5	AMEB05.18

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