Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2017

Course Code**: ME 220**

Course Name**: MANUFACTURING TECHNOLOGY (IE, ME, MA)**

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three questions. Each question carries 10 marks.

1. a. Name the purpose and significance of any *three* tests conducted on moulding sand. (6)

   b. Three pieces being cast have the same volume but different shapes. One is a sphere, one a cube, and the other a cylinder with height equal to its diameter. Which piece will solidify in the least time and which one will take the maximum time? Justify. (4)

2. a. What is directional solidification? (3)

   b. With a neat sketch, explain the working of a hot chamber die casting machine. (5)

   c. State the reasons for misrun and hot tear. (2)

3. a. What is cambering of rolls? Why is it required? (4)

   b. What is draftin rolling? Obtain an expression for maximum possible draft in terms of coefficient of friction between contact surface of rolls and work and the radius of the roll. (6)

4. a. Explain the process of ring rolling. (5)

   b. A 300 mm wide strip 25 mm thick is fed through a rolling mill with two powered rollseach of radius = 250 mm. The work thickness is to be reduced to 22 mm in one pass at a roll speed of 50 rev/min. The work material has a mean flow stress of 175.7MPa and the coefficient of friction between the rolls and the work is assumed to be 0.12.Calculate the roll force and power requirement. (5)

PART B

Answer any three questions. Each question carries 10 marks.

5. a. With the help of neat sketches, explain the differences between open die forging and closed die forging? (5)

   b. Describe the steps involvedin impression die forging with a sketch. (3)

   c. What is the difference between fullering and swaging? (2)

6. a. Mention any three defects in forging and reasons for them. What are the design modifications that can be considered to avoid forging defects? (6)
   b. Define the term extrusion ratio. Discuss any three classification of extrusion. (4)
7. a. Define degrees of freedom with a neat sketch. What are the advantages of locating a workpiece? (3)
   b. Explain 3-2-1 principle using a suitable example. (4)
   c. Differentiate between locating from planes and locating from circular surfaces. (3)
8. a. Define the principles of clamping. Explain the various types of clamps used. (5)
   b. What are the differences between vacuum clamping and magnetic clamping? (5)

PART C

Answer any four questions. Each question carries 10 marks.

9. a. Differentiate between blanking and punching (2)
   b. What is springback? What are its reasons and how can it be avoided? (5)
   c. What is rubber forming? (3)
10. a. What is deep drawing? What are its advantages? (3)
   b. What is spinning? Differentiate between conventional spinning and shear spinning. (4)
   c. Explain the process of stretch forming. (3)
11. a. Define weldability. What are the factors affecting weldability? (4)
   b. With the help of neat sketches, explain the metallurgy of a steel weld and the various regions in the weld. (6)
12. a. Compare leftward and rightward techniques used in gas welding. (5)
   b. When is a low pressure torch used in oxy-acetylene welding? How does it differ from an equal pressure torch? (5)
13. a. Define polarity in arc welding. How does it affect welding? How and why heat generated at electrode and workpiece vary according to polarity? (6)
   b. What are the important components in ultrasonic welding? Explain the process. (4)
14. a. Differentiate between friction welding and resistance welding. (3)
   b. What is the role of flux in brazing and soldering? (3)
   c. What are the different types of solders used in soldering? Give its characteristics. (4)

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Total Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: ME220

Course Name: MANUFACTURING TECHNOLOGY (IE, ME, MA)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three questions. Each carries 10 marks.

1	a)	List at least four types of moulding sand based on their use in moulding operation.	(2)
	b)	Explain four desirable properties of moulding sand.	(8)
2		With a neat and labelled sketch, analyse the steps in Shell moulding process. List advantages and application of the process.	(10)
3	a)	Describe the construction and advantage of Planetary roll mill with simple sketch.	(4)
	b)	Identify and explain a process for production of seamless tubes and pipes.	(6)
4		With simple sketches describe the following: -	
		i) Alligatoring	(3)
		ii) Neutral point	(3)
		iii) Thread rolling process	(4)

PART B

Answer any three questions. Each carries 10 marks

5	a)	Identify four advantages of forging process.	(4)
	b)	Differentiate between Extrusion and Drawing process with simple sketches.	(6)
6		Explain the following: -	
		i) Cold shuts	(3)
		ii) Forging under sticking condition	(3)
		iii) A process for making thin wires	(4)
7	a)	With a neat sketch explain 3-2-1 principle of locating.	(6)
	b)	Describe four principles of clamping.	(4)
8		Describe with sketches the working principle of : -	
		i) Strap clamp	(3)
		ii) Slide clamps	(3)
		iii) Hinge clamps	(4)

PART C

Answer any four questions. Each carries 10 marks.

9		With simple sketches illustrate the following: -	
		i) Tube spinning	(3)
		ii) Stretch forming	(3)
		iii) Deep drawing	(4)
10		Enumerate the following with simple sketches: -	
		i) Spring back	(3)
		ii) Shear spinning	(3)
		iii) Rubber forming	(4)

11	a)	Describe any four welding defects.	(4)
	b)	What is Heat Affected Zone (HAZ)? Explain the parameters affecting HAZ.	(6)
12	a)	Enumerate the principle of resistance welding	(2)
	b)	Analyse different types of welding flames in oxy acetylene gas welding with neat sketches.	(8)
13	a)	List the use and types of filler materials and fluxes used in gas welding?	(4)
	b)	Describe two types of electrical resistance welding processes with neat sketches.	(6)
14	a)	Explain Friction welding process with a neat diagram.	(4)
	b)	With a neat sketch explain the Submerged Arc Welding. What are the applications of this process?	(6)

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Total Pages: 1

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: ME220

Course Name: MANUFACTURING TECHNOLOGY (MC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1		What are the different types of patterns used? Explain with neat diagrams.	(10)
2	a)	Which type of casting would you use if you want to make a toy and why?	(4)
	b)	Explain any two methods for testing sand properties.	(6)
3	a)	What is hot rolling and cold rolling?	(5)
	b)	Explain the process and advantages of thread rolling.	(5)
4		Explain different types of rolling mills with the help of neat sketches.	(10)

PART B

Answer any three full questions, each carries 10 marks.

5	a)	What is forging? Explain advantages and disadvantages of forging.	(5)
	b)	What are the defects in forged parts?	(5)
6		Using open-die forging operation, a solid cylindrical piece of 304 stainless steel having 100mm diameter and 72 mm height is reduced in the height to 60 mm at room temperature. Assuming μ as 0.22, calculate the forging force at the end of stroke. Take k and n for 304 stainless steel as 1275 MPa and 0.45 respectively.	(10)
7	a)	Explain 3-2-1 principle..	(5)
	b)	Define degrees of freedom with a neat sketch.	(5)
8		What are the principles of clamping? Explain different types of clamps.	(10)

PART C

Answer any four full questions, each carries 10 marks.

9	a)	What are the characteristics of sheet metals?	(7)
	b)	Define punching force.	(3)
10		Explain the classification of press working dies on the basis of method of operation.	(10)
11	a)	What are the types of cutting operations? Explain.	(5)
	b)	Define weldability. What are the advantages and disadvantages of welding?	(5)
12	a)	Explain leftward and rightward welding techniques used in gas welding.	(5)
	b)	What is plasma arc welding? Explain the advantages and disadvantages.	(5)
13		Explain different types of weld defects with suitable sketches.	(10)
14	a)	What are the basic types of welding joints?	(5)
	b)	Define welding positions. Explain different types of welding positions.	(3)
	c)	What are the advantages and disadvantages of submerged arc welding?	(2)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH/FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: ME220

Course Name: MANUFACTURING TECHNOLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

			Marks
1	a)	Write two advantages and disadvantages of sand casting.	(2)
	b)	List the types of patterns and pattern materials.	(4)
	c)	What is a core? Write any two functions and requirements of a core.	(4)
2	a)	List the sand testing methods.	(2)
	b)	With the aid of sketches write short note on the following i)Two High Mill ii) Three High Mill iii) Four High Mill	(4)
	c)	What is the function of gates in casting? Write short notes on the types of Gates?	(4)
3	a)	What do you mean by recrystallization temperature?	(2)
	b)	Define the terms i) Draft ii) Neutral point iii) Angle of Bite	(4)
	c)	Write notes on the Hot chamber pressure die-casting process	(4)
4	a)	What are the methods used to reduce the roll force requirement in rolling process?	(3)
	b)	$\mu \geq \text{Tan}(\alpha)$. Where μ= coefficient of friction, α= angle of bite or angle of contact. From the above statement write down the roll bite conditions in rolling.	(4)
	c)	Write short notes on Hot and Cold Rolling process.	(4)

PART B

Answer any three full questions, each carries 10 marks.

5	a)	With the aid of a simple sketch explain about open die forging.	(3)
	b)	Write short notes son the following forging methods. i)Upsetting ii) Fullering iii) Edging	(3)
	c)	With the aid of a sketch list the terminology for a forging die.	(4)
6	a)	List the Extrusion Defects.	(2)
	b)	List the forging defects? Write short note on any two forging defects.	(4)
	c)	Write short note on Degree of Freedom. Draw a sketch showing the 12 degrees of freedom.	(4)
7	a)	What is a clamp?	(2)
	b)	Differentiate between Hot and Cold Extrusion.	(4)
	c)	Write short notes on the following locating methods i) Locating from circular surfaces. ii) Concentric locating	(4)
8	a)	Vacuum Clamping	(3)
	b)	Write notes on Hinge Clamping.	(3)
	c)	Write down the principles of clamping.	(4)

PART C

Answer any four full questions, each carries 10 marks.

9	a)	What is Bending? Write short notes on Bend allowance and Bend Deduction	(3)
	b)	Write short notes on the following terms: i) Bend axis ii) Flat length iii) Bend length	(3)
	c)	Explain about Press-brake forming	(4)
10	a)	What do you mean by the term Bendability?	(2)
	b)	Write notes on Shear spinning process.	(4)
	c)	Write notes on rubber forming process.	(4)
11	a)	Define the term Weldability.	(2)
	b)	Write short notes on the following weld defects i) Cracks ii) Distortion iii) Lack of penetration.	(4)
	c)	What do you mean by HAZ? Write short notes on the regions of HAZ.	(4)
12	a)	Write short notes on Gas welding. Write any three advantages, dis advantages and application of gas welding.	(5)
	b)	Write notes on the following i) Consumable Electrodes ii) Non-consumable Electrodes	(5)
13	a)	Explain how Plasma arc Welding is carried out.	(5)
	b)	Explain how Gas Tungsten Arc welding is carried out. Write any two advantages of Gas Tungsten Arc welding.	(5)
14	a)	Explain the following types of welding process: i) Stud Welding ii) Percussion welding	(5)
	b)	Write notes on the following i) Torch Brazing ii) Vacuum Brazing	(5)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH/FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: ME220

Course Name: MANUFACTURING TECHNOLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1	a)	What is Casting? Give a brief idea about Investment casting.	5
	b)	Elucidate about different types of casting defects.	5
2	a)	What is rolling? Showcase its advantages over casting.	5
	b)	Write a brief note about different types of rolling defects with neat sketch.	5
3	a)	Interpret forging. What are the advantages of forging?	5
	b)	With neat sketch explain about die design features.	5
4	a)	Define clamping. Explain principle of clamping.	5
	b)	Explicate Hinge clamping with neat diagrams.	5

PART B

Answer any three full questions, each carries 10 marks.

5	a)	With neat sketch demonstrate Coining process.	5
	b)	Why connecting rod of a diesel engine is manufactured with forging techniques?	5
6	a)	Differentiate between cold and hot extrusion process.	6
	b)	Illustrate about wire drawing process with neat sketch.	4
7	a)	Interpret 3-2-1 principle with neat sketch.	5
	b)	Explain Swing clamping procedure with neat sketch.	5
8	a)	Highlight why clamping is so important and showcase. What are the advantages of clamping?	6
	b)	With neat sketch demonstrate locating from circular surfaces?	4

PART C

Answer any four full questions, each carries 10 marks.

9	a)	Determine bending terminology with neat sketch?	5
	b)	Justify the phenomenon spring back? And how we can overcome springback?	5
10	a)	With neat sketch clarify Rubber forming process with neat sketch?	4

	b)	Elucidate about tube spinning procedure?	6
11	a)	Define welding? Demonstrate weldability.	3
	b)	With neat sketch justify any one type of fusion welding?	7
12	a)	Elucidate about deep drawing process?	4
	b)	With neat sketch explain Flame characteristics of a gas welding process?	6
13	a)	Why welding is important than other joing process?	4
	b)	Write short note on Resistance welding? Clarify why is it so important?	6
14	a)	With neat sketch explicate Ultrasonic welding?	5
	b)	Write short note about Plasma arc welding?	5

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: ME220
Course Name: MANUFACTURING TECHNOLOGY (IE, ME, MA)

Max. Marks: 100 Duration: 3 Hours

PART A
Answer any three questions. Each question carries 10 marks.

1	a)	Why casting is preferred over other methods of manufacturing? Discuss	3
	b)	With the help of neat sketches, explain any two types of commonly used patterns	4
	c)	Distinguish between liquid shrinkage and solid shrinkage as related to casting. How they are taken care of in designing sand casting	3
2	a)	Describe the complete step by step procedure of investment casting.	4
	b)	Explain any one type of centrifugal casting process with a neat sketch	4
	c)	Name any eight common defects encountered in casting process	2
3	a)	Sketch and explain Cluster and Planetary rolling mill arrangements used in rolling processes	6
	b)	Why is the surface finish of a rolled product better in cold rolling than in hot rolling?	2
	c)	A 400 mm thick slab is to be cold rolled. The roll diameter is 800 mm and the co-efficient of friction is 0.08. Determine the maximum possible draft	2
4	a)	With the help of a neat sketch, explain the distribution of roll pressure along the contact length in flat rolling.	4
	b)	Is rolling process useful for making seamless thick-walled tubes? Explain with proper sketches.	4
	c)	How can you reduce the 'roll force' in a rolling process?	2

PART B
Answer any three questions. Each question carries 10 marks

5	a)	What do you understand by the term 'flash' in a forging? Explain with the help of a sketch	3
	b)	With a neat diagram explain the process of direct extrusion.	4
	c)	Explain with a neat sketch 'wire drawing' process	3
6	a)	Make neat sketches and explain coining and heading	4
	b)	With the help of a schematic illustration, explain impact-extrusion process. What is the function of a stripper plate in impact extrusion?	4

	c)	Explain the difference between open and closed die forging techniques.	2
7	a)	Explain the aspect 'Degree of freedom of movement of a free body' with special reference to location of workpieces	3
	b)	What is the principle of 'Six-point location'? Explain with suitable sketches	7
8	a)	Select a locating system to best locate the part shown in *Figure A.*	3

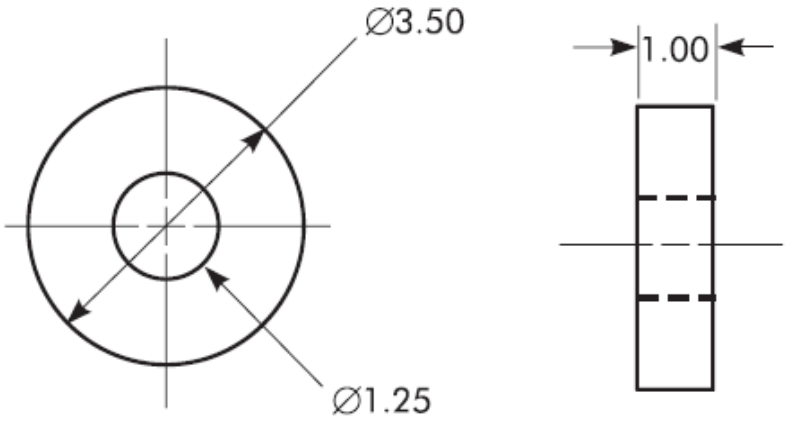

Figure A.

	b)	What do you understand by foolproofing? Explain with an example	3
	c)	What are the different types of strap clamp? Give sketches	4

PART C

Answer any four questions. Each question carries 10 marks.

9	a)	Describe with neat sketch the deep-drawing process. What defects can occur in an improperly deep drawn product?	5
	b)	Discuss with neat sketch the working of metal spinning process	5
10	a)	Why is it necessary to provide clearance between the punch and die in a shearing operation? Give reasons	2
	b)	Write a note on ''bending'' of sheet metal. What is spring back and how is its effect eliminated?	5
	c)	Bring out the differences between punching and blanking.	3
11	a)	What is the Guerin process? How does the Guerin process reduce the cost of tooling in a drawing operation?	3
	b)	Define heat affected zone? What is its importance in producing a crack free weld?	3
	c)	What are the factors that affect weldability	4
12	a)	Sketch the three types of gas welding flames and give differences between them.	3
	b)	With a neat sketch explain the construction and working of Carbon Arc Welding	4

	c)	Explain the term ‘flux’ or ‘soldering fluid’. Enumerate the fluxes commonly used in soldering process.	3
13	a)	What is the difference between a consumable electrode and nonconsumable electrode? For which processes does a filler metal have to be added by a separate mechanism?	3
	b)	Explain the working of Resistance Spot Welding. State their advantages and limitations	7
14	a)	Explain operation, equipment and applications of ultrasonic welding.	6
	b)	Explain construction and working principle of submerged arc welding	4

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: ME220
Course Name: MANUFACTURING TECHNOLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three questions. Each question carries 10 marks.

1	a)	How are patterns classified? Describe the various types of allowances provided in patterns.	(5)
	b)	Define gating ratio and illustrate the components of a gating system with a neat diagram	(5)
2	a)	Explain the process of hot chamber die casting with neat sketch and justify the drawback of hot chamber die casting with respect to casting of different metals.	(6)
	b)	Describe the procedure of making castings by the investment castings with appropriate sketches.	(4)
3	a)	Why rolling is an important industrial metal forming operation? Justify, how roll separating force can reduce in rolling process.	(5)
	b)	With suitable sketches explain the stages involved in shape rolling of structural sections	(5)
4	a)	Explain rolling geometry and different types of rolling mills?	(6)
	b)	Why the surface finish of a rolled product is better in cold rolling than hot rolling?	(4)

PART B

Answer any three questions. Each question carries 10 marks

5	a)	(i) What is isothermal forging? (ii) Explain the features of an impression die and closed die forging process	(6)
	b)	Sketch and explain the sequence of steps involved in the manufacturing of connecting rod using forging process.	(4)
6	a)	Explain briefly with neat sketches different processes of extrusion and also discuss their relative merits and demerits.	(5)
	b)	What is wire drawing process? What are the factors control the wire drawing process?	(5)
7	a)	Explain six point location principle and its importance in manufacturing.	(6)
	b)	Write a short notes on the following locating methods i) Locating from circular surfaces. ii) Concentric locating	(4)
8	a)	What is a clamp? Describe general principle of clamping.	(6)
	b)	Differentiate between vacuum clamping and magnetic clamping.	(4)

PART C

Answer any four questions. Each question carries 10 marks.

9	a)	With a neat sketch, explain the rubber forming process. How does it differ from rubber hydro forming process?	(5)
	b)	What are the factors affecting shearing operation?	(5)
10	a)	Enumerate the following with simple sketches (1) Stretch forming (2) Deep drawing	(6)
	b)	Explain the various properties of sheet metal.	(4)
11	a)	Differentiate between conventional spinning and shear spinning.	(4)
	b)	What is Heat Affected Zone (HAZ)? Explain the parameters affecting HAZ.	(6)
12	a)	How an arc is produced in arc welding process and how does penetration vary for DCSP and DCRP?	(6)
	b)	Compare leftward and rightward techniques used in gas welding.	(4)
13	a)	Why solid-state welding processes are preferred over fusion welding processes during the joining of dissimilar metals? Explain any one of the solid-state welding process and highlight their advantages.	(6)
	b)	Analyze different types of welding flames in oxy-acetylene gas welding with neat sketches.	(4)
14	a)	Differentiate between brazing and soldering and explain the role of flux in these processes.	(6)
	b)	Explain the capillary action in brazing process.	(4)

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth semester B.Tech examinations (S), September 2020

Course Code: ME220

Course Name: MANUFACTURING TECHNOLOGY (IE, ME, MA)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three questions. Each question carries 10 marks.

1	a)	With a neat diagram explain the Gating system used in sand casting process.	7
	b)	List the name of any six types pattern used for casting process?	3
2	a)	Write any six types of casting defects with simple diagram?	6
	b)	What is vacuum casting operation?	4
3	a)	Explain flat rolling process with suitable diagram.	6
	b)	Write any four differences between hot rolling and cold rolling	4
4	a)	Describe the following operations with simple diagram. (i) Ring rolling (ii) Thread rolling	6
	b)	Describe the working of planetary rolling mill with a neat sketch?	4

PART B

Answer any three questions. Each question carries 10 marks

5	a)	What are the important considerations for designing a forging die? List any four types of materials used for making forging die?	6
	b)	Explain any one type of precision forging process.	4
6	a)	With a neat sketch explain the wire drawing process.	6
	b)	Write any four differences between hot extrusion and cold extrusion.	4
7	a)	With a neat sketch explain the 3-2-1 principle of locating.	7
	b)	What are the advantages of the vacuum clamping technique?	3
8	a)	Explain the following clamping methods with suitable sketches: (i) Swing clamp (ii) Strap clamp	10

PART C

Answer any four questions. Each question carries 10 marks.

9	a)	With neat sketches illustrate the following (i) Deep Drawing process (ii) Tube Spinning		10
10	a)	Explain the process of stretch forming with a neat sketch		6
	b)	What is Heat Affected Zone (HAZ) in the welding process? Explain with suitable sketch.		4
11	a)	Write any four types of welding defects with simple diagram?		6
	b)	Write any four factors influencing the solidification of the weld metal		4
12	a)	Explain the working principle of submerged arc welding process with neat sketch; also write any two advantages and two disadvantages of the submerged arc welding process.		10
13	a)	With the help of neat diagrams illustrate the following: (i) Friction Welding (ii) Resistance Spot Welding		10
14	a)	What is the use of solders and fluxes in soldering process, explain with suitable examples.		5
	b)	List out the five differences between the welding process and the brazing process.		5