

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018**

**Course Code: ME306**

**Course Name: ADVANCED MANUFACTURING TECHNOLOGY (ME)**

Max. Marks: 100

Duration: 3 Hours

*Use of approved Data book permitted.*

**PART A**

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

Marks

- |   |   |      |
|---|---|------|
| 1 | a) Explain powder metallurgy process.   | (4)  |
|   | b) With neat sketches explain the principal methods used to produce metallic powders in powder metallurgy.  | (6)  |
| 2 | Draw relay ladder diagram for the following sequential operations .Start button pressed, table motor started, package moves to the position of the limit switch and stops. Auxiliary features required are emergency stop, red light to indicate stop condition and green light to indicate package moving condition. Draw input and output connection diagrams also. | (10) |
| 3 | a) What are the different word address formats used in part programming?  | (5)  |
|   | b) Mention the purpose of miscellaneous functions in part programming. Write any 2 M – codes with their applications.   | (5)  |
| 4 | What is meant by interpolation in NC systems? Explain different types of interpolations.  | (10) |

**PART B**

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

- |   |  |      |
|---|--|------|
| 5 | What are the functions and desirable properties of dielectric fluid in EDM?<br>Explain desirable properties of electrode material used in EDM? | (10) |
| 6 | a) Describe advantages and limitations of Ion beam machining.  | (4)  |
|   | b) Describe the mechanism of material removal in Ion beam machining  | (6)  |
| 7 | a) What are the advantages and disadvantages of Laser Beam Machining process?  | (4)  |
|   | b) With a neat sketch explain Electron Beam Machining process.   | (6)  |
| 8 | What are the advantages and disadvantages AWJM? Describe the applications of AWJM.   | (10) |

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 a) What is Laminated Object Manufacturing? Explain the process with sketches. (10)
- 10 a) What is LIGA process? Explain it with neat sketches. (10)
- 11 a) With neat sketch explain Abrasive Flow Finishing Process. (5)
- b) With a neat sketch explain Diamond turn machining process. (5)
- 12 Explain Magnetorheological Abrasive Flow Finishing process with suitable diagram. (10)
- 13 With a neat sketch explain Selective Laser Sintering. (10)
- 14 Explain the working of laser engineered net shaping with sketch. (10)

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

**Course Code: ME306**

**Course Name: ADVANCED MANUFACTURING TECHNOLOGY**

Max. Marks: 100

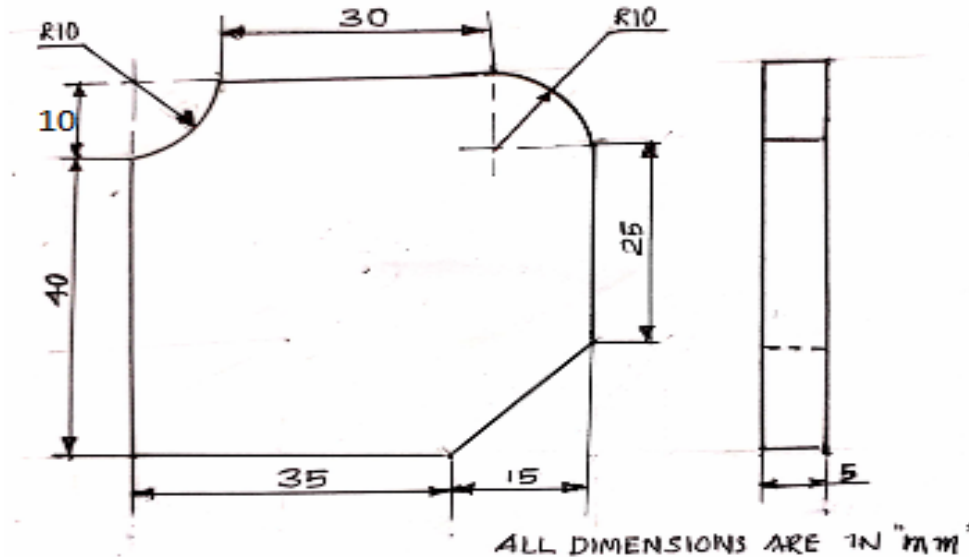
Duration: 3 Hours

**PART A**

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

Marks

- 1 a) What are the different methods of atomization for making metal powders in Powder metallurgy? (6)
- b) What are the advantages of Powder metallurgy? (4)
- 2 a) Write a Manual Part Program for the given figure. (6)



- 3 a) Write any Five preparatory function code in manual part programming and its explanation (5)
- b) Write any two methods of specifying a line in an APT language. (5)
- 4 a) Explain the different stages of sintering process in Powder metallurgy with a neat sketch (6)
- b) Differentiate the impregnation and infiltration process in Powder metallurgy (4)

**PART B**

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

- 5 a) Write the working principle of Abrasive Jet Machining with neat figure. (5)
- b) What are the process parameters in Abrasive Water Jet Machining? (5)
- 6 a) What are the characteristics of Electro Discharge Machining (EDM)? (6)

- b) Write the applications of Wire Cut Electro Discharge Machining. (4)
- 7 a) Explain Ultra Sonic Machining with a neat figure (5)
- b) How the amplitude and frequency of vibration effects on material removal rate in Ultra Sonic Machining. (5)
- 8 a) Explain the mechanism of material removal in Plasma arc machining (4)
- b) Explain solid state Laser Beam Machining Process with neat figure (6)

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 a) Explain the two Techniques in Explosive forming process. (6)
- b) Explain the Electro hydraulic forming process. (4)
- 10 a) Explain Electro Magnetic Forming and show that it can be applied to internal, external and surface forming operations. (10)
- 11 a) Explain the LIGA and its application. (6)
- b) Write a note on Elastic Emission Machining. (4)
- 12 a) Explain two way Abrasive Flow Machining with neat figure (6)
- b) Differentiate P Wave and S wave in High Velocity Forming. (4)
- 13 a) Explain the Magnetic Float Polishing with neat figure (7)
- b) Write any six material addition process in Additive Manufacturing (3)
- 14 a) Explain the laser welding process (5)
- b) Describe the Laminated Object Manufacturing Process. (5)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

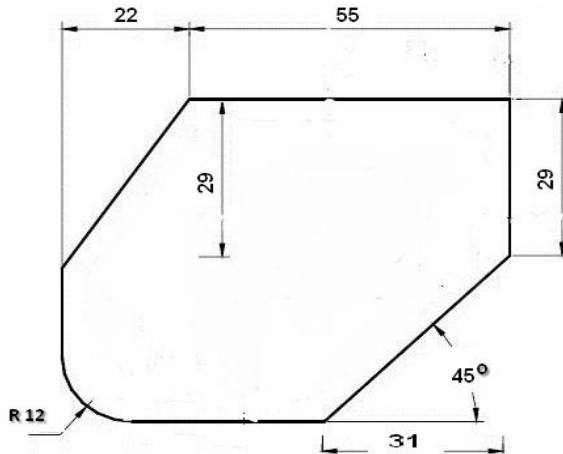
**Course Code: ME306****Course Name: ADVANCED MANUFACTURING TECHNOLOGY**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any three full questions, each carries 10 marks.*

- |   |   | Marks |
|---|---|-------|
| 1 | a) How carbonyls are useful in powder metallurgy?   | (5)   |
|   | b) Differentiate between open loop and closed loop CNC with sketches  | (5)   |
| 2 | Draw a PLC ladder logic diagram to get the reciprocating motion of a punching machine using following sequential operations. One of the two motors operates when power is supplied. Motor drives the punch to one side. When it completes the required movement in one direction, a limit switch detect the position of the punch. First motor is get deactivated. Second motor starts and moves the punch to the opposite direction. When it completes required movement in opposite direction, a second limit switch detects the position of the punch .Second motor is get deactivated and first motor is started again and the process continues so as to get a continuous reciprocating motion. Also draw the input and output diagrams. | (10)  |
| 3 | a) Explain the working of DDA integrator with schematic diagram and flow chart.   | (6)   |
|   | b) A DDA contains 8 bit registers. The value of its $p$ register is constant and $P=150$ and the clock frequency is 10240pps. Calculate the output frequency of DDA   | (4)   |
| 4 | Write a manual part program for the given work shown in figure , material thickness is 20mm.Show the tool movement path and write the description of blocks (all dimensions are in mm)  | (10)  |



### PART B

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

- 5 Differentiate between EDM and Wire cut EDM with sketches (10)
- 6 Describe the working of ECM with example and a neat sketch (10)
- 7 Explain the working of IBM with sketch. Which are the factors affecting its MRR (10)
- 8 Explain the working of AJM .Write its applications and advantages (10)

### PART C

*Answer any four full questions, each carries 10 marks.*

- 9 a) Compare conventional and high velocity forming methods (5)
- b) Explain different types of elastic body waves (5)
- 10 Explain explosive forming techniques with figure (10)
- 11 Explain electro hydraulic forming with a neat sketch. Write its applications (10)
- 12 a) What is magneto rheological fluid (5)
- b) Explain Magneto rheological finishing with sketches (5)
- 13 Explain stereolithography process with sketches (10)
- 14 What is Laser engineered net shaping? Write its advantages and limitations (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Sixth semester B.Tech degree examinations (S), September 2020

**Course Code: ME306**

**Course Name: ADVANCED MANUFACTURING TECHNOLOGY**

Max. Marks: 100

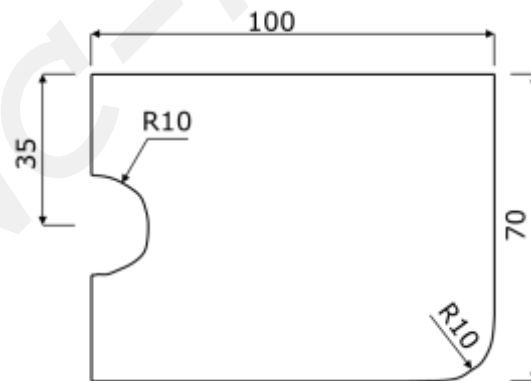
Duration: 3 Hours

**PART A**

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

Marks

- |   |   |      |
|---|---|------|
| 1 | a) Explain the importance of micro and nano manufacturing in modern manufacturing industries.   | (5)  |
|   | b) What is atomization in powder metallurgy? Explain Gas atomization method in powder metallurgy.   | (5)  |
| 2 | a) What are the different motion control systems in NC machine? Explain with figures.   | (5)  |
|   | b) Draw ladder logic diagrams for AND gate and OR gate.   | (5)  |
| 3 | Write a manual part program for milling the shape given in figure .Show the tool path and explain the block .Thickness of work piece is 20 mm. All dimensions are in mm | (10) |



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|---|---|-----|
| 4 | a) A simple integrator in which p is a constant is performed with a DDA integrator. Calculate the output $\Delta Z$ at the first 8 iterations. The DDA contains 3 bit register which are initially set p =5 and q=0. If each iteration is executed in 1 ms, draw the accumulated output $\Delta Z$ versus time. | (5) |
|   | b) Write any FIVE Post processor statement used in APT and its functions.   | (5) |

**PART B**

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

- 5 Explain the parts and functions of EDM with neat sketch. (10)
- 6 a) What are the functions of electrolyte in ECM? What are the properties to be considered while selecting electrolytes in ECM? (5)
- b) What are the process parameters affecting the performance of USM. Explain. (5)
- 7 Explain the working of IBM with sketch. Which are the factors affecting its MRR. (10)
- 8 a) Explain the mechanism of metal removal in AWJM. (5)
- b) Write the advantages of laser beam machining. (5)

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 a) What is High velocity forming? Write its advantages and disadvantages. (5)
- b) Explain the types of elastic body waves. (5)
- 10 Draw and explain the effect of high speed on stress strain relationship of mild steel and copper. (10)
- 11 Name different types of HERF used for sheet metal work. Explain explosive forming types with neat sketches. (10)
- 12 Explain abrasive flow finishing with neat sketches. (10)
- 13 Explain the working of elastic emission machining with sketch. (10)
- 14 What is material addition process? Name different material addition processes. Explain any one process with neat sketch. (10)

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