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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R, S) / S6 (PT) (R) Examination June 2023 (2019 Scheme)

Course Code: MET306

Course Name: ADVANCED MANUFACTURING ENGINEERING

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1	Explain the functions of cutting fluids in metal cutting.	(3)
2	Describe the HIP technique in powder metallurgy.	(3)
3	Differentiate the point-to-point and straight-cut positioning in NC system.	(3)
4	Describe any three geometric statements in APT programming with examples.	(3)
5	Write any three differences between EDM and ECM processes.	(3)
6	Describe applications of the Ion Beam Machining process.	(3)
7	Explain the effects of high-speed forming in the stress-strain relationship of steel.	(3)
8	What are the applications of Electro Magnetic Forming?	(3)
9	Define the term micromachining. State any two requirements of micromachining.	(3)
10	Describe the Elastic Emission Machining.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	What are the powder production methods used in powder metallurgy? Explain any one method with a neat sketch.	(7)
	b)	Define tool signature. Explain the nomenclature of a single-point cutting tool with a neat sketch.	(7)

OR

12	a)	Draw the Merchant's circle diagram of an orthogonal cutting process. Derive the equation for finding the friction force and the normal reaction.	(7)
	b)	What are the materials used for making cutting tools? Describe any two of them in detail.	(7)

Module II

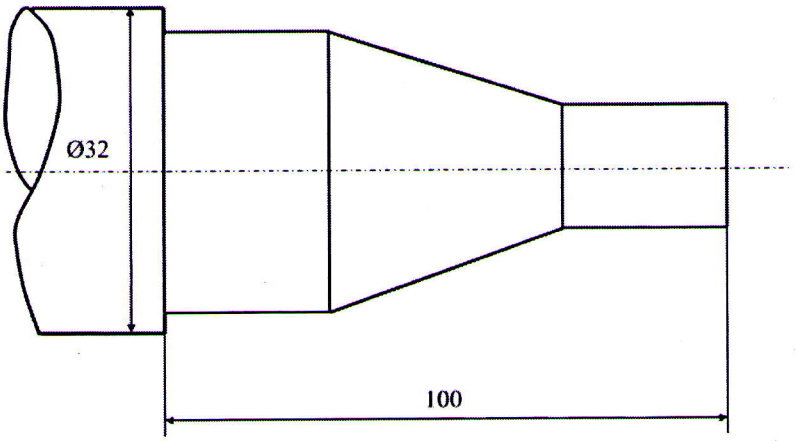
13 a) What is a Programmable Logic Controller? Explain the components of a PLC with a neat sketch. (7)

b) Draw a PLC ladder diagram to start a pump and then after a delay of 35 sec. open a valve. When the pump is switched off, there should be a delay of 5 sec. before closing the valve. Also, draw the input and output diagrams. (7)

OR

14 a) With neat sketches, explain the open-loop and closed-loop control systems in NC machines. (7)

b) Write a manual part program for the given work shown in the figure (Assume suitable dimensions), raw material size is Ø32 X 120 mm. Write the description of blocks (all dimensions are in mm) (7)



Module III

15 a) Explain the wire EDM process with a neat sketch. Also, describe its applications. (7)

b) Describe the process parameters of Abrasive Water Jet Machining. Explain the advantages and disadvantages of the process. (7)

OR

16 a) Compare and contrast the LBM and EBM processes with neat sketches. (7)

b) Explain the Plasma Arc Machining with a neat sketch. (7)

Module IV

17 a) What are the types of explosive forming? Explain any one type with a neat sketch. (7)

b) Discuss the Electro-Hydraulic Forming with a neat sketch and explain the process variables. (7)

OR

18 a) Define the stress waves in high-velocity forming. Describe its classification with neat sketches. (7)

b) Describe the features, advantages and disadvantages of the High-Velocity Forming process. (7)

Module V

19 a) With a neat sketch explain the Abrasive Flow Machining. State the applications of the process. (7)

b) Differentiate the process of Laminated Object Manufacturing from Selective Laser Sintering in terms of principle, construction and applications. (7)

OR

20 a) Discuss the Magnetorheological Abrasive Flow Finishing with a neat sketch. (7)

b) What is a Fused Deposition modelling process? Explain the process with neat sketches. Write down the applications. (7)

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