Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) / S6 (PT) / (WP) Exam April 2025 (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	List and explain any three characteristics of fine powder	(3)
2	Differentiate conventional and non-conventional manufacturing processes	(3)
3	Explain G90, G91 and G92 in NC manual part program.	(3)
4	Explain the components of PLC with the help of a sketch.	(3)
5	Explain the functions of dielectric fluid used in EDM.	(3)
6	Explain the process parameters of LBM.	(3)
7	Explain the types of elastic body waves in high-velocity forming.	(3)
8	Compare conventional and high velocity forming methods.	(3)
9	Write a note on material addition processes	(3)
10	Define the term micromachining. State any two requirements of micromachining.	(3)

PART B

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

Module I

11 a) In an orthogonal cutting process, the following data has been observed: (8)

Uncut chip thickness: 0.127 mm, width of cut 6.35 mm, cutting speed: 2 m/s, rake angle= 10 degree, cuffing force, Fc: 567 N, thrust force, Ft: 227 N, chip thickness: 0.228 mm. Determine the following: shear angle, friction angle, power for cutting operation, chip velocity and chip shear strain.

b) What are the assumptions made in Merchant's theory? Draw the (6)
   Merchant's circle diagram for an orthogonal cutting and also write
   the procedure of construction.

OR

12 a) With neat sketches explain any three principal methods used to (7)
   produce metallic powders in powder metallurgy

b) Explain the CIP and HIP techniques in powder metallurgy with neat (7)
   sketches.

Module II

13 Write a Manual program for milling the shape given in figure. The Z (14)
   Position is zero at 60 mm above the table surface. All dimensions are
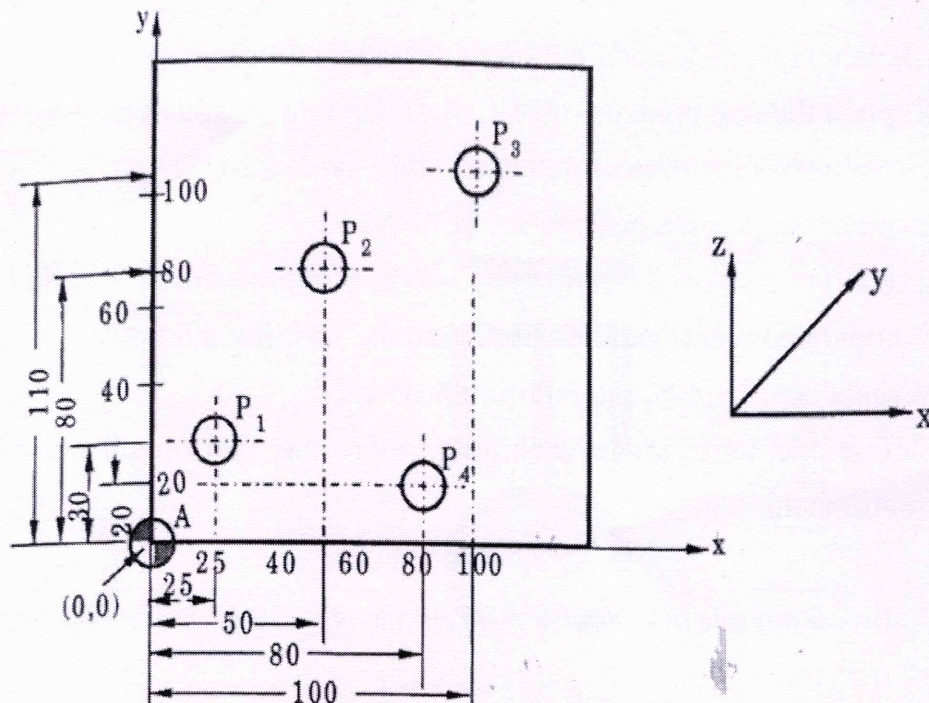
in mm.

OR

14 a) Write a PLC ladder logic program to obtain a continuous (7)
   reciprocating motion for a plunger driven by an electric motor.
   Assume suitable switches and also draw the input and output
   diagrams.

b) What are the four basic types of statements in the APT language? Explain any two types with examples. (7)

Module III

15 a) Describe Electron Beam Machining process with neat sketch. (7)

b) List and explain the factors affecting material removal rate and surface quality in electron beam machining. (7)

OR

16 a) Describe Plasma Arc Machining process with neat sketch. (7)

b) List and explain the factors affecting material removal rate and surface quality in plasma arc machining. (7)

Module IV

17 a) With the help of a neat sketch explain electro hydraulic forming. (7)

b) Compare the deformation velocity, strain distribution and formability of high velocity forming with the conventional forming methods. Also discuss the effects of high velocity in metal forming. (7)

OR

18 a) With a neat sketch explain the standoff explosive forming process. List out the advantages of the process. (7)

b) Differentiate the Electro-Hydraulic Forming and Electro-Magnetic Forming processes with neat sketches. (7)

Module V

19 a) With the help of a neat sketch explain Selective Laser Sintering. (7)

b) Explain the working of Fused Deposition Modelling with a neat sketch. (7)

OR

20 a) Describe the material removal mechanism in Diamond turning. List the applications of the process. (7)

b) What is Laser engineered net-shaping? Explain the process with a neat sketch (7)

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