

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (R,S) (FT/WP/PT) Examinations April 2026 (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 How is flowability of metal powder sample measured? Why is this property significant? (3)
- 2 What are the important sources of heat generation in metal cutting? (3)
- 3 Distinguish between absolute and incremental positioning in NC systems. What are the G codes used for them? (3)
- 4 Discuss any three applications of DDA integrator. (3)
- 5 Give a comparison between traditional and non-traditional machining operations. (3)
- 6 What is a wire EDM process? (3)
- 7 How do work-coil relative positions differ in electromagnetic compression and electromagnetic expansion? (3)
- 8 Write a note on transverse and longitudinal waves. (3)
- 9 Why is a magnetorheological fluid regarded as a smart fluid? (3)
- 10 Explain the key aspects of LIGA process. (3)

PART B

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

Module I

- 11 a) With the help of a flowchart, explain the various steps involved in manufacturing by powder metallurgy. (9)
- b) A tool gave a life of two hours while cutting at 48m/min. For Taylor's exponent value of 0.27, find the tool life when the same tool was used at a cutting speed 20% greater than previous one. Also to get a tool life of three hours, what should be the cutting speed? (5)

OR

- 12 a) Explain orthogonal cutting process with a neat sketch. For an orthogonal cutting (9)

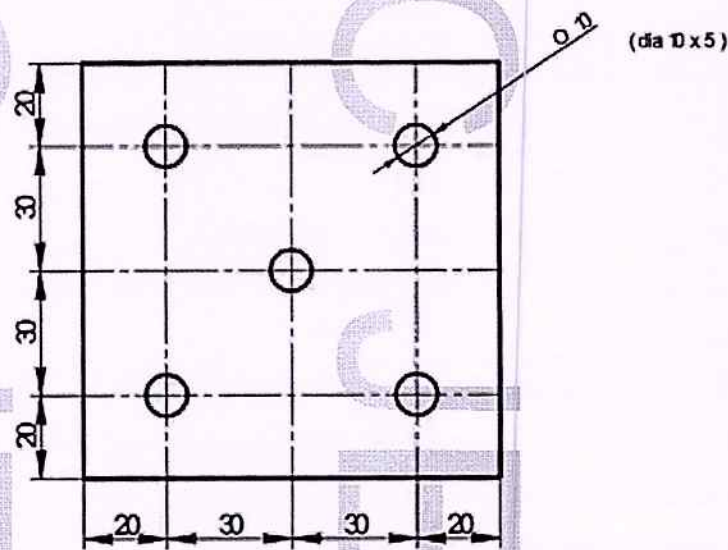
operation, the following data are given: depth of cut 0.3 mm, chip thickness 0.6 mm, rake angle of tool 20° , cutting velocity 102 m/min, horizontal and vertical components of force are 300 N and 120 N respectively. Find shear angle, shear strain, work done in shear and velocity of chip along tool face.

- b) Write a note on tool signature. (5)

Module II

- 13 Write a NC part program for performing the following drilling operations. (14)
Briefly explain each block of the program.

Assume Thickness: 10mm



All the dimensions are in mm

OR

- 14 a) Explain in detail geometry and motion statements used in APT programming. (9)
b) What is a programmable logic controller? What are its components? (5)

Module III

- 15 a) Sketch and explain the components and mechanism of metal removal in an AJM process. (9)
b) Why is LBM suitable for drilling extremely small-diameter, high-aspect-ratio holes? (5)

OR

- 16 a) Sketch and explain the mechanism of machining in an IBM process. How does it differ from an EBM process? (9)

- b) Explain the features of a torch used in plasma arc machining process. (5)

Module IV

- 17 a) Sketch and explain the arrangement used in high velocity forming of a metal by standoff explosive forming process. (9)
- b) How is the energy required for forming generated in electrohydraulic forming? (5)

OR

- 18 a) What is strain rate? What is the impact of strain rate on stress-strain curve of a material? (9)
- b) Give a comparison of high velocity forming with conventional forming. (5)

Module V

- 19 a) With the help of neat sketches, explain the key aspects of abrasive flow machining process and process parameters. (9)
- b) What is a flexible magnetic abrasive brush? (5)

OR

- 20 a) What is rapid prototyping? Compare fused deposition modelling and selective laser sintering as rapid prototyping methods. (9)
- b) Brief the salient features of stereolithography process. (5)
