Reg No.:_____ Name:_____

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S6 (S, FE) / S6 (PT) (S) Examination January 2024 (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 | | Differentiate between conventional and non-conventional manufacturing processes. | (3) |
| 2 | | Write the expression for Taylor's tool life equation. Define the terms. | (3) |
| 3 | | List and explain the different types of interpolation used in NC systems. | (3) |
| 4 | | Explain with examples the post processor statements and auxiliary statements used in APT language. | (3) |
| 5 | | List the properties of electrolyte used in Electro Chemical Machining (ECM). | (3) |
| 6 | | Explain the mechanism of material removal rate in Electron Beam Machining (EBM). | (3) |
| 7 | | With the help of neat sketch explain the effect of high speed on the stress strain relationship of Al. | (3) |
| 8 | | Write the expression for elastic longitudinal wave equation for a rod of infinite length and define the terms. | (3) |
| 9 | | List any 6 process parameters of Magnetic Abrasive Finishing (MAF). | (3) |
| 10 | | Explain Magneto Rheological (MR) fluid used for micro finishing operations. | (3) |

## PART B

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

### Module I

| | | | |
|---|---|---|---|
| 11 | a) | A bar of 75 mm diameter is reduced to 73 mm by a cutting tool while cutting orthogonally. If the mean length of the cut chip is 73.5 mm, find the cutting ratio. If the rake angle is 15°, find the shear angle. | (7) |
| | b) | Explain the mechanism of sintering with neat sketches. | (7) |

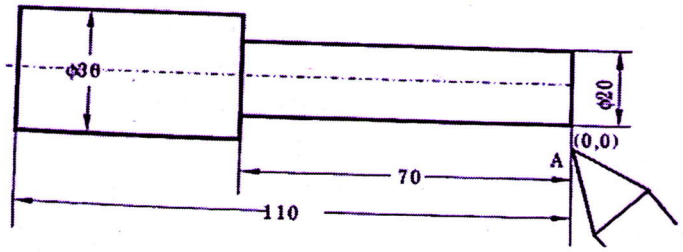
**OR**

| | | | |
|---|---|---|---|
| 12 | a) | Explain any two types of atomisation process with neat sketch. | (7) |

b) During turning a metallic rod at a given condition, tool life was fund to increase from 25 min. to 50 min. when $V_c$ was reduced from 100 m/min to 80 m/min. How much will be the life of that tool if machined at 90 m/min. (7)

**Module II**

13 Write a Manual Part Program for getting the finished component as shown in figure. Initial diameter of the rod before turning is 30 mm. (14)




**OR**

14 a) Define interpolation in NC systems? Explain different types of interpolations (7)

b) Define any three types of geometry commands used in APT language with syntax and examples. (7)

**Module III**

15 a) With a neat sketch explain Laser Beam Machining process. (7)

b) List and explain the factors affecting Heat Affected Zone and Surface quality in Ion 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) Explain Electro Magnetic Forming with neat sketches. (7)

b) How electro magnetic forming can be applied to internal, external and surface forming operations. (7)

**OR**

18 a) Derive the expression for transmitted stress waves travelling along a rod of infinite length. (7)

b) With a neat sketch explain any one explosive forming process. List and explain any three process variables affecting the process. (7)

## Module V

| | | | |
|---|---|---|---|
| 19 | a) | With a neat sketch explain elastic emission machining process. | (7) |
| | b) | List the advantages, disadvantages and applications of Stereo Lithography process. | (7) |

**OR**

| | | | |
|---|---|---|---|
| 20 | a) | Describe Laser Engineered Net shaping process with a neat figure. | (7) |
| | b) | With a neat sketch explain Diamond turn machining process. | (7) |

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