

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: ME303**Course Name: MACHINE TOOLS AND DIGITAL MANUFACTURING**

Max. Marks: 100

Duration: 3 Hours

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

Marks

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| 1 | a) A single point cutting tool is designated as: 6-10-7-7-10-30-9.5. Explain each terms used in that and mark those in cutting tool geometry. | (7) |
| | b) Write any three cutting tool material with their applications. | (3) |
| 2 | a) With the help of Merchant circle diagram explain the forces involved in orthogonal cutting. Derive force relations in orthogonal cutting. | (7) |
| | b) List the different types of tool wear occurred in single point cutting tool. | (3) |
| 3 | a) Explain different types of work holding devices used in lathe. | (5) |
| | b) What are the different taper turning methods used in lathe? Explain any two with sketch. | (5) |
| 4 | a) With neat sketch explain any four operations that can be carried out in drilling machine. | (4) |
| | b) A HSS tool gave a tool life of 120min at 15m/min and 25min at 70m/min. Calculate i) C and n for Taylor's equation. ii) Cutting speed for 1min tool life. | (6) |

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

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| 5 | a) Differentiate between shaping and planing operations. | (5) |
| | b) With the sketch of crank and slotted link mechanism, explain how the quick return motion possible in shaping operation. | (5) |
| 6 | a) What are the different slotter operations? | (4) |
| | b) What are the different types of planing machines? Explain with their application. | (6) |
| 7 | a) Explain the work holding devices on milling machine. | (4) |
| | b) Explain the indexing mechanism used in milling. | (6) |
| 8 | a) Differentiate between up milling and down milling. | (4) |

- b) What are the different milling cutters used? Explain based on the operation they performed. (6)

PART C

Answer any four full questions, each carries 10 marks.

- 9 a) What is centre less grinding? Write the advantages and disadvantages. (4)
b) Explain the different centreless grinding operations with sketch? (6)
- 10 a) Write an example for designation of conventional abrasive grinding wheel. (6)
Explain the terms.
b) Explain multi spindle automatic machines. (4)
- 11 a) What is lapping operation? Explain the different methods of lapping. (6)
b) Differentiate between capstan and turret lathe? (4)
- 12 a) Define digital manufacturing. Explain the digital manufacturing ideas? (4)
b) Explain operation reference mode of digital manufacturing. (6)
- 13 a) What are the different modelling techniques used in digital manufacturing? (10)
Explain with suitable sketches.
- 14 a) Explain the basic architecture model of digital manufacturing. (5)
b) Explain the organisation model of digital manufacturing system. (5)

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