

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

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 10marks.

Marks

- | | | | |
|---|----|--|------|
| 1 | a) | During straight turning of a 24 mm diameter steel bar at 300 rpm with an HSS tool a tool life of 9 min was obtained. When another bar of same material and same dimensions was turned using the same tool at 250 rpm, the tool life increased to 48.5 min. What would be the tool life if the speed was 280 rpm? | (6) |
| | b) | Explain different types of chips formed during metal cutting. | (4) |
| 2 | a) | Following data are related to an orthogonal cutting process. Chip length 96mm, length of chip portion before cutting 240mm, rake angle 20° , find shear force, and friction angle if cutting force is 2400 N and feed force is 960 N. Draw Merchant circle diagram. | (10) |
| 3 | a) | Which are the major parts of carriage of a lathe. Explain functions of each. | (6) |
| | b) | Differentiate between forming and knurling operations | (4) |
| 4 | | What are the different types of drilling machine? explain any one with neat sketch | (10) |

PART B

Answer any three full questions, each carries 10marks.

- | | | | |
|---|----|--|------|
| 5 | a) | Explain the working of automatic feed mechanism in shaper with sketch | (6) |
| | b) | Name different types of slotting machines. | (4) |
| 6 | | Name different types of planing machines. Explain any one with sketch. | (10) |
| 7 | a) | Draw the sketch of a plain milling cutter and mark its parts, | (6) |
| | b) | Differentiate between straddle milling and face milling with sketches. | (4) |
| 8 | | Explain indexing mechanism and simple indexing in milling. | (10) |

PART C

Answer any four full questions, each carries 10marks.

- 9 a) Explain different types of grinding methods. (6)
b) How grinding wheels are specified. Explain with an example. (4)
- 10 Differentiate between lapping and honing processes with sketches. (10)
- 11 a) Explain single-spindle automatic machine tool with a sketch. (6)
b) Write any four advantages of turret lathe over centre lathe. (4)
- 12 Define digital manufacturing. Explain its concept with figure. (10)
- 13 Explain the operation reference mode of Digital manufacturing system. (10)
- 14 Draw the general function structure model of digital manufacturing system and explain (10)
