

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

- 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.*

- 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)

\*\*\*\*

00000ME303121904

VJC-VJC-VJC