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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. Explain the terms. (6)

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? Explain with suitable sketches. (10)

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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