Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: ME303

Course Name: MACHINE TOOLS AND DIGITAL MANUFACTURING (IE, ME)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks. Marks

1 a) With the help of a neat diagram explain the nomenclature of a single point cutting tool. (5)

b) Discuss about the basic mechanism of chip formation. (5)

2 a) With a neat diagram discuss merchant force circle. (5)

b) The following equation for tool life has been obtained for a certain tool material. (5)

$$VT^{0.13} . f^{0.6} . d^{0.3} = C$$

A 60 min tool life was obtained using the following cutting conditions

V = 40m/min, f = 0.25mm, d= 2.0mm

Calculate the effect of each parameter on tool life if speed, feed and depth of cut are increased individually by 25%.

3 a) List out the necessary prerequisites before performing turning operations on a lathe. (4)

b) Illustrate different methods for taper turning with neat diagrams. (6)

4 a) What are the advantages of radial drilling machine over other conventional drilling machines? (4)

b) Explain with neat sketch the following drilling machine operations a) Tapping b) Trepanning c) Counter-sinking (6)

PART B

Answer any three full questions, each carries 10 marks.

5 a) Discuss the importance of Clapper box in a shaping machine. (4)

b) Write the fundamental difference between a planer & a Shaper. (6)

6 a) Describe different work holding devices used in a shaper. (4)

b) Describe different types of planer machines. (6)

7 a) Explain any three milling operations performed on a Horizontal milling machine & Vertical milling machine. (6)

	b)	Explain with neat sketch straddle milling & form milling.	(4)
8	a)	Explain the working of Simple indexing mechanism.	(7)
	b)	Classify different types of milling machines.	(3)

PART C

Answer any four full questions, each carries 10 marks.

9	a)	A grinding wheel is specified as 250 x 30 x 35 WA40L4V18. Explain.	(6)
	b)	Differentiate between centerless grinding & cylindrical grinding.	(4)
10	a)	Compare truing & dressing of a grinding wheel.	(4)
	b)	Distinguish between turret & Capstan lathe.	(6)
11	a)	Explain the working of a semi-automatic lathe.	(5)
	b)	Discuss the advantages & disadvantages of lapping.	(5)
12	a)	'Manufacturing is now a science'. Discuss.	(7)
	b)	Write about the R& D status of Digital manufacturing.	(3)
13	a)	Illustrate with a neat diagram the concept of digital manufacturing.	(6)
	b)	List the features of Digital manufacturing.	(4)
14	a)	Explain the architecture of a DM system.	(7)
	b)	Explain GRAI modelling method.	(3)

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