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SET - 1

[3M]

III B. Tech I Semester Supplementary Examinations, May - 2018 METAL CUTTING & MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (Part-A and Part-B)

- 2. Answering the question in **Part-A** is compulsory
- 3. Answer any **THREE** Questions from **Part-B**

What is rake angle? What is the effect of nose radius in tools?

PART -A

1	a) b)	What are the advantages of automatic lathes?	[3M]
	c)	State the difference between a vertical shaper and a slotter?	[4M]
	d)	How do you specify the grinding wheel? and explain it	[4M]
	e)	Mention four important factors that influence the selection of grinding wheel?	[4M]
	f)	Mention the main differences between CNC and NC?	[4M]
<u>PART -B</u>			
2	a)	Explain the various tool materials.	[8M]
	b)	In an orthogonal cutting test with a tool of rake angle 10°, the following observations were made: Chip thickness ratio: 0.3 Horizontal component of the cutting force = 1290 N Vertical component of the cutting force = 1650 N From Merchant's theory, calculate the various components of the cutting forces and the coefficient of friction at then chip tool interface.	[8M]
3	a) b)	Explain any four commonly used attachments on lathe. Explain the tooling layout for the production of a Hexagonal bolt in a capstan lathe.	[8M] [8M]
4	a) b)	Describe with a schematic sketch the operation of hydraulic shaper. Describe with block diagram jig boring machine.	[8M] [8M]
5	a) b)	Describe the construction of dividing head giving the applications for which it can be used What are the differences between compound indexing and differential indexing?	[8M]
	ŕ	Explain the relative merits.	
6	a) b)	Explain any one finishing operation with neat sketch. Discuss various types of abrasive materials used in grinding wheel.	[8M] [8M]
7	a)	State a few typical applications where the use of numerical control would be justified.	[8M]
	b)	What are the common types of drilling jigs? How does a template jig differ from a plate jig?	[8M]
