Sub Code: R2331031 **R23** **Set No. 1**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Regular Examinations November -2025
MACHINE TOOLS AND METROLOGY
(ME)

Time: 3 hours **Max. Marks: 70**

The Question paper consists of Part A & Part B.
Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.
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1		PART-A	(20Marks)
	a)	List two function of chip breakers in machining.	[2]
	b)	Discuss any two tool wear mechanisms.	[2]
	c)	Analyze the influence of feed and depth of cut on surface roughness.	[2]
	d)	Explain how to determine machining time for a slotting operation.	[2]
	e)	Identify any two types of drilling machines with their applications.	[2]
	f)	Define up milling and down milling.	[2]
	g)	Distinguish between honing, and broaching.	[2]
	h)	Define tolerance and deviation,	[2]
	i)	Define surface roughness and surface waviness.	[2]
	j)	State the working principle of an optical comparator.	[2]
		PART-B	(50Marks)
		Question from **Unit - I**	
2	a)	With a neat sketch explain the single point cutting tool geometry.	[5]
	b)	Derive an expression for a shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio.	[5]
		(OR)	
3	a)	With a neat sketch explain the Orthogonal and oblique cutting.	[5]
	b)	Explain the Merchant's Circle diagram to determine the power requirements involved in machining operations.	[5]
		Question from **Unit - II**	
4	a)	Explain with neat diagrams, any two metal cutting operations performed on a lathe machine.	[5]
	b)	How Turret lathe differ from the Capstan Lathe.	[5]
		(OR)	
5	a)	Explain the belt drive mechanism of a planer machine.	[5]
	b)	With a neat sketch, explain crank and slotted link quick return mechanism	[5]
		Question from **Unit - III**	
6	a)	Briefly explain the working of Drilling machine	[5]
	b)	Differentiate between drilling and boring operations.	[5]
		(OR)	
7	a)	With a neat sketch explain column and knee type milling machine.	[5]
	b)	What is indexing and discuss the need of indexing.	[5]

		Question from **Unit - IV**	
8	a)	Explain the differences between Honing and broaching operations.	[5]
	b)	With the help of neat sketch describe broach tool and list its applications.	[5]
		(OR)	
9	a)	Define standards. List and explain the different standards.	[5]
	b)	Define the following terms: 1.Limits 2. Fits 3. Tolerance 4. Fundamental deviation	[5]
		Question from **Unit - V**	
10	a)	Explain the working of Talysurf for roughness measurement.	[5]
	b)	List the differences between Surface roughness and waviness with a neat sketch	[5]
		(OR)	
11	a)	Explain the functional requirements of comparators?	[5]
	b)	Explain the working principle of autocollimators.	[5]

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