

**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)**



M.Tech. (Second Semester) Regular Examinations, July - 2025
24MMTPC12001 - Metal Cutting - Theory and Practice
(Manufacturing Technology)

Time: 3 hrs

Maximum: 60 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. Explain about types of forces acting during cutting.	CO1	K2
b. List the characteristics of cutting fluid.	CO2	K2
c. What is the Flank wear?	CO3	K1
d. Differentiate between up milling and down milling.	CO4	K2
e. Define the process of self sharpening of the grinding wheel?	CO4	K1

PART – B**(10 x 5=50 Marks)**Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Show the geometry of the cutting tool with neat sketch in ORS system	5	CO1	K2
b. Find an expression for velocity relationship in metal cutting with neat sketch. (OR)	5	CO1	K2
c. The following data from the orthogonal cutting test is available. Rake angle = 100, chip thickness ratio = 0.35, uncut chip thickness = 0.51, width of cut = 3 mm, yield stress of work material = 285 N/mm ² , mean friction co-efficient on tool force = 0.65, Determine (i) Cutting force (Fc) (ii) Radial force (Ft) (iii) Normal force (N) on tool and (iv) Shear force on the tool (Fs).	5	CO1	K2
d. With neat sketch explain the mechanism of machining	5	CO1	K3
3.a. Briefly explain various types of tool material with suitable example.	5	CO2	K2
b. Derive the expression for Minimum cost and Maximum production. (OR)	5	CO2	K2
c. What are the factors affecting the tool life.	5	CO2	K1
d. Draw the merchant circle and express the normal and shear forces, cutting forces and thrust force.	5	CO2	K3
4.a. Explain the various types chip with the conditions.	5	CO3	K2
b. Define the various forms of wear found in cutting tools? Show with a neat sketch. (OR)	5	CO3	K2
c. Derive the expression for drilling torque and drilling power.	5	CO3	K2
d. Estimate the moment, thrust force and power required for 12.7 mm drill having a feed of 0.254 mm/rev, turning at 100 rpm, cutting a steel of brinell hardness 200.	5	CO3	K3
5.a. Explain the procedures to classify milling cutters.	5	CO4	K1
b. Differentiate between surface grinding and cylindrical grinding (OR)	5	CO4	K1

c.	Explain the procedures to classify milling cutters.	5	CO4	K2
d.	Find an expression for velocity relationship in metal cutting with neat sketch?	5	CO1	K2
6.a.	State the abrasives used in manufacture of grinding wheels.	5	CO4	K1
b.	Briefly explain various types of tool material with suitable example.	5	CO4	K1
(OR)				
c.	Give the nomenclature of Milling cutter with neat sketch.	5	CO3	K2
d.	Explain the various types chip with the conditions.	5	CO2	K2

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