Reg. No.															

Question Paper Code	14497

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Fourth Semester

Mechanical Engineering

24MEPW401 – MACHINE TOOL TECHNOLOGY WITH LABORATORY

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART – A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	Continuous chips are usually produced while machining _____ materials. a) Brittle b) Ductile c) Ceramic d) Composite	1	K2	CO1
2.	Merchant's circle is used to analyze _____ in machining. a) Heat treatment b) Tool balancing c) Casting defects d) Cutting forces	1	K1	CO1
3.	Heat generated during machining is mainly due to _____. a) Lubrication b) Friction and plastic deformation c) Oxidation d) Vibration	1	K1	CO1
4.	The bed of a lathe is generally made of _____. a) Cast iron b) Brass c) Aluminum d) Copper	1	K1	CO2
5.	The quick change gear box is used to change the _____. a) Tool angle b) Feed and thread pitch c) Coolant flow d) Spindle diameter	1	K1	CO2
6.	Swiss type automatic lathe is mainly used for machining _____ components. a) Large shafts b) Heavy castings c) Small precision parts d) Thick plates	1	K1	CO2
7.	The ram of a shaper carries the _____. a) Workpiece b) Chuck c) Cutting tool d) Motor	1	K1	CO3
8.	Tapping is the process of producing _____ threads. a) External b) Internal c) Square d) Helical	1	K1	CO3
9.	Lapping of gears is mainly done to reduce _____. a) Noise b) Diameter c) Tooth thickness d) Speed	1	K1	CO3
10.	Aluminum oxide grinding wheels are commonly used for grinding _____ materials. a) Soft metals b) Non-metallic materials c) High tensile materials d) Plastics	1	K2	CO4

11.	The process of removing loaded chips from a grinding wheel is called _____.		*1*	*K1*	*CO4*
	a) Truing	b) Dressing			
	c) Honing	d) Buffing			
12.	Continuous broaching machines are suitable for _____ production.		*1*	*K1*	*CO4*
	a) Small batch	b) Medium scale			
	c) Mass production	d) Prototype			
13.	Point-to-point control system is mainly used in _____ machines.		*1*	*K2*	*CO5*
	a) Drilling	b) Grinding			
	c) Shaping	d) Broaching			
14.	G00 command in CNC programming indicates _____ movement.		*1*	*K2*	*CO5*
	a) Linear interpolation	b) Circular interpolation			
	c) Rapid traverse	d) Tool change			
15.	Water Jet Machining is mainly suitable for cutting _____ materials.		*1*	*K2*	*CO6*
	a) Hardened steel	b) Soft materials			
	c) Carbides	d) Conductive ceramics			
16.	Laser Arc Machining is mainly used for cutting _____ materials.		*1*	*K2*	*CO6*
	a) Conductive	b) Non-conductive			
	c) Rubber	d) Wood			

PART – A (ii) (Short Answer Questions)
(6 × 3 = 18 Marks)
Answer ALL Questions

17.	Compare orthogonal and oblique cutting processes.	*3*	*K2*	*CO1*
18.	Build different taper turning methods used in lathes.	*3*	*K3*	*CO2*
19.	Summarize the various operations performed on a shaper.	*3*	*K2*	*CO3*
20.	Construct the concept of surface integrity in machining.	*3*	*K3*	*CO4*
21.	Identify the purpose of wafer machining.	*3*	*K3*	*CO5*
22.	Interpret the limitations of ultrasonic machining.	*3*	*K2*	*CO6*

PART - B (Descriptive Answer Questions)
(6 × 11 = 66 Marks)
Answer ALL Questions

23.	a) (i)	Build the mechanics of chip formation in metal cutting with a neat diagram.	*6*	*K3*	*CO1*
	(ii)	Build the geometry of a single-point cutting tool with nomenclature.	*5*	*K3*	*CO1*
		OR			
	b) (i)	Construct the types of tool wear and explain them.	*8*	*K3*	*CO1*
	(ii)	Apply tool life equations to determine the optimum cutting conditions.	*3*	*K3*	*CO1*
24.	a)	Identify the constructional features of a centre lathe with a neat sketch.	*11*	*K3*	*CO2*
		OR			
	b)	Develop the construction and working of capstan and turret lathes.	*11*	*K3*	*CO2*

25.	a)	Apply the advantages of milling over other machining processes and explain the various milling operations with neat sketches.	*11*	*K3*	*CO3*
		OR			
	b)	Build the gear hobbing and gear shaping processes with a neat sketch.	*11*	*K3*	*CO3*
26.	a)	Apply grinding wheel specifications to select a suitable wheel for a given job.	*11*	*K3*	*CO4*
		OR			
	b)	Choose how broaching improves productivity and accuracy, and explain push and pull broaching machines	*11*	*K3*	*CO4*
27.	a)	Build the differences between NC and conventional machine tools, and explain the key features of CNC machine tools.	*11*	*K3*	*CO5*
		OR			
	b) (i)	Construct the steps involved in CNC program for simple pocket milling.	*6*	*K3*	*CO5*
	(ii)	Build the importance of micromachining in modern technology.	*5*	*K3*	*CO5*
28.	a)	Identify the factors affecting material removal rate in jet machining and explain the working principle of Abrasive Jet Machining with a neat sketch.	*11*	*K3*	*CO6*
		OR			
	b)	Utilize the factors affecting MRR and surface finish in ECM and explain its working principle.	*11*	*K3*	*CO6*