A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: U4703

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

Fourth Semester

Mechanical Engineering

21UME403 - MANUFACTURING TECHNOLOGY

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. Oblique cutting is ___ dimensional metal cutting CO1 U

   (a) one (b) two (c) three (d) none of the above

2. The cutting velocity and chip velocity in metal cutting process are 2 m/s and 1.5 m/s respectively. The value of chip reduction coefficient is nearest to (assuming no side flow of chip) CO1 U

   (a) 1.5 (b) 2 (c) 0.5 (d) 1.33

3. Determine the rpm (n) of the shaft. Diameter (d)=25 mm, cutting speed(Vc)=50 m/min. CO1 U

   (a) 636.9 (b) 202.83 (c) 10.615 (d) none of the mentioned

4. Which of the following cutting tool is cannot be used on a turret lathe CO1 U

   (a) Single point cutting tool (b) Reaming tool

   (c) Drill bit (d) Broach

5. Point angles of twist drill is used for general purpose work CO1 U

   (a) 128^{o} (b) 138^{o} (c) 118^{o} (d) 108^{o}

6. Which of the following part of slotting machine supports all of the other parts of machines? CO1 U

   (a) Base (b) Column (c) Ram (d) Table

7. Cutting tool in a milling machine is fitted on CO1 U

   (a) Spindle (b) Knee (c) Column (d) Arbor

8. Which milling process the cutting is done on the end of the cutter as well as periphery? CO1 U

(a) Plain or slab milling (b) Side milling

(c) Face milling (d) End milling

9. To remove material from the work surface, the process of surface finishing using an abrasive stick is known as CO1 U

(a) surface grinding (b) honing (c)lapping (d) burnishing

10. In ultrasonic machining, magnetostictor converts magnetic energy into which type of energy? CO1 U

(a) Electrical energy (b) Mechanical energy

(c) Thermal energy (d) None of the mentioned

PART – B (5 x 2= 10 Marks)

11. Explaintool wear and tool life. CO1-U

12. A brass pin has a length of 500 mm and of 40 mm diameter. Find the turning time toreduce the pin to 38.8 mm in one pass, when cutting speed is 60 m/min and feed is 0.8mm/min. CO4- App

13. Compare shaper and planer CO1-U

14. List out the common work holding devices used on milling machines CO1-U

15. Compare the advantages and disadvantages of resin-bonded and vitrified-bonded grinding wheels. CO2-U

PART – C (5 x 16= 80 Marks)

16. (a) Explain the various types of chips produced during metal machining process with neat sketch. CO1 U (16)

Or

(b) Explain briefly about tool wear and tool life CO1 U (16)

17. (a) Explain with neat sketch for the following lathe operations CO1 U (16)
(i) Grooving
(ii) Knurling
(iii) Parting off
(iv) Reaming

Or

(b) Explain the turret indexing mechanism used in semi-automatic lathe with neat sketch . CO1 U (16)

18.	(a)	In a single pass drilling operation, a through hole of 15mm diameter is to be drilled in asteel plate of 50 mm thickness. Drill spindle speed is 500 rpm, feed is 0.2mm/rev and drill point angle is 118^{o}. Assuming 2mm clearances at approach and exit. Calculate thetotal drill time	CO4-App	(16)
		Or		
	(b)	Find the time required for drilling 18 mm hole in a workpiece having thickness 50 mm. Assume cutting speed 12 m/min and feed 0.2 mm/rev. Neglect the length of approach	CO4-App	(16)
19.	(a)	Explain different types of milling cutters with aid of diagrams	CO1 U	(16)
		Or		
	(b)	Explain gear hobbing process with a neat sketch	CO1U	(16)
20.	(a)	Explain the various types of grinding machines with neat sketch	CO2 U	(16)
		Or		
	(b)	Compare the conventional and non-conventional machining process. Explain the ultrasonic machining process with neat sketch.	CO2 U	(16)