Q. Code:288978

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Fourth Semester

ME 18402 – MACHINE TOOLS AND MACHINING PROCESSES

(Mechanical Engineering)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	To acquire knowledge about the theory of metal cutting, mechanism of chip formation and the cutting parameters that influence the machining processes.	**3**
CO 2	Understand the types of machine tools, their specifications and operations performed.	**3**
CO 3	To choose a particular type of machine tool depending upon the surface being generated.	**3**
CO 4	To teach the students about the different gear generation methods.	**3**
CO 5	Get introduced to the non-traditional machining processes.	**3**

PART- A (10 x 2 = 20 Marks)

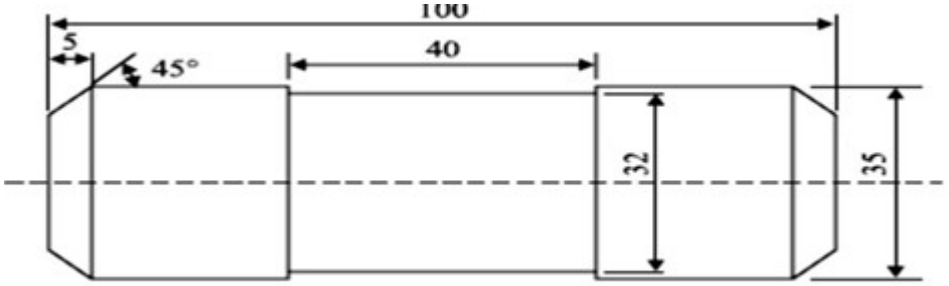
(Answer all Questions)

		CO	RBT LEVEL
1.	What are the objectives and functions of cutting fluids?	**1**	**3**
2.	State any two differences between orthogonal and oblique cutting.	**1**	**3**
3.	Explain the following parts of the lathe. (a) Lathe bed (b) Carriage	**2**	**3**
4.	What are the advantages of automatic lathes?	**2**	**3**
5.	What are the differences between drilling and reaming?	**3**	**2**
6.	What is the difference between up-milling and down-milling?	**3**	**2**
7.	What is the need of truing and dressing operations in a grinding wheel?	**4**	**3**
8.	State any four advantages of Automation.	**4**	**3**

9.	What is the need for unconventional machining processes?		**5**	**2**	
10.	What are the different dielectric media used in the EDM process?		**5**	**2**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)	**(i)**	List the various parts of the Single point tool and its nomenclature, with a neat sketch.	**(7)**	**1**	**3**
	(ii)	Write a short note on the chip formation process in machining.	**(7)**	**1**	**3**
		(OR)			
(b)		Tool life tests in turning yield the following data:(1) V =110m/min, T = 118 min;(2) V = 78 m/min, T = 26 min. (a) Determine the n and C values in the Taylor tool life equation. Based on the equation, compute (b) the tool life for a speed of 95 m/min and (c) the speed corresponding to a tool life of 18 min.	**(14)**	**1**	**3**
12. (a)	**(i)**	Explain the major parts in Lathe machine with a Neat Sketches.	**(10)**	**2**	**3**
	(ii)	State the difference between the Capstan and Turret Lathe.	**(4)**	**2**	**3**
		(OR)			
(b)		A mild steel bar 100 mm long and 38 mm in diameter is turned to 35 mm dia. And was again turned to a diameter of 32 mm over a length of 40 mm as shown in the Fig. The bar was machined at both the ends to give a chamfer of 45°× 5 mm after facing. Calculate the machining time. Assume cutting speed of 60 m/min and feed 0.4 mm/rev. The depth of cut is not to exceed 3 mm in any operation.	**(14)**	**2**	**3**



13. (a)	**(i)**	Explain the various operations that can be performed in a milling	**(7)**	**3**	**4**

machine with neat sketches.

	(ii)	Explain the quick return mechanism in shaper with neat sketches.	**(7)**	**3**	**4**

(OR)

(b)		Explain the working principle of gear hobbing operation with a neat diagram.	**(14)**	**3**	**4**

14. (a)	**(i)**	Describe gear cutting by forming and shaping.	**(7)**	**4**	**3**
	(ii)	Give the specification of the Grinding wheel.	**(7)**	**4**	**3**

(OR)

(b)		Explain the CNC Machine, its Construction details and Special features with a neat diagram.	**(14)**	**4**	**3**

15. (a)		Compare and contrast the various unconventional machining process based on the type of energy employed, material removal rate, transfer media, and economical aspects.	**(14)**	**5**	**3**

(OR)

(b)		Draw the schematic layout of AJM and explain its operating characteristics. What are methods adopted to have effective control over the mass flow rate of the abrasive?	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.		Jewellery applications require the grinding of diamonds into desired shapes. How is this done, since diamond is the hardest material known?	**(10)**	**4**	**4**

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