Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

ME3CO07 /RA3CO07

Manufacturing Processes & Machines

Programme: B.Tech. Branch/Specialisation: ME / RA

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Material removes during machining primarily due to- **1**
(a) Shearing (b) Diffusion (c) Abrasion (d) All of these

ii. Chip thickness ratio (r) is always- **1**
(a) r >1 (b) r <1 (c) r =1 (d) None of these

iii. Which one of the following operations cannot be performed on lathe? **1**
(a) Knurling (b) Boring (c) Reaming (d) Planning

iv. Which one of the following is used for holding unsymmetrical jobs in lathe? **1**
(a) 3 Jaws chuck (b) Collets
(c) Face Plate (d) Live and Dead central

v. The cutters having a bore at center are mounted and keyed on a short shaft called_____. **1**
(a) Arbor (b) Shank (c) Knee (d) None of these

vi. In a shaper_____ movement of the drive is converted into _____ movement. **1**
(a) Rotary, reciprocating (b) Reciprocating, rotary
(c) Rotary, rotary (d) None of these

vii. The height of each tooth of a broach is- **1**
(a) Same throughout
(b) In progressively decreasing order
(c) In progressively increasing order
(d) First decreases than increases

P.T.O.

viii. Operation of finishing previously drilled hole is- **1**
(a) Turning (b) Reaming (c) Boring (d) Drilling

ix. Which of the following is called Preparatory Code? **1**
(a) G Code (b) M Code
(c) Both (a) and (b) (d) None of these

x. Which of the following Non-Conventional Machining utilize mechanical energy? **1**
(a) Ultrasonic Machining
(b) Electronic Discharge Machining
(c) Electrochemical Machining
(d) Laser beam Machining

Q.2 i. What is machinability? What are the parameters for evaluation of machinability? **3**

ii. Write the properties of tool materials. Turning tests have resulted in 1 min tool life at a cutting speed = 4.0 m/s and a 20 min tool life at a speed= 2.0 m/s. **7**
(a) Find the n and C values in the Taylor tool life equation.
(b) Project how long the tool would last at a speed of 1.0 m/s.

OR iii. Differentiate between oblique and orthogonal cutting. Derive the formula for chip thickness ratio. **7**

Q.3 i. List out the various operations performed in Lathe machine. **3**

ii. Explain the taper turning methods in detail. List out the specification of lathe machine. **7**

OR iii. Explain the formula for calculate the machining time. Also explain method of thread operation. **7**

Q.4 i. Write the difference between Shaper and Planning Machine. **3**

ii. What do you mean by milling indexing? Explain the simple and differential indexing mechanisms. **7**

OR iii. Estimate the machining time that will be required to finish a vertical flat surface of length 100 mm and depth 20 mm by an 8 teeth HSS end mill cutter of 32 mm diameter and 60 mm length in a milling machine. Assume, cutting velocity V_c = 30 m/min, and feed S_o = 0.12 mm/tooth. **7**

Q.5 Attempt any two:

i. Explain various types of bond material which holds the abrasive grains of the grinding wheels. **5**

ii. Explain marking system (wheel signature) of the grinding wheel. **5**

iii. Explain the working principle and major advantages of broaching. **5**

Q.6 Attempt any two:

i. Differentiate between non-conventional and conventional machining. **5**

ii. Explain gear shaping and gear hobbing processes. **5**

iii. Explain the G code and M Code write five G code and M Code with their explanation. **5**

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Marking Scheme

ME3CO07 /RA3CO07 Manufacturing Processes & Machines

Q.1	i.	Material removes during machining primarily due to- (a) Shearing		**1**
	ii.	Chip thickness ratio (r) is always- (b) r <1		**1**
	iii.	Which one of the following operations cannot be performed on lathe? (d) Planning		**1**
	iv.	Which one of the following is used for holding unsymmetrical jobs in lathe? (c) Face Plate		**1**
	v.	The cutters having a bore at center are mounted and keyed on a short shaft called_____. (a) Arbor		**1**
	vi.	In a shaper_____ movement of the drive is converted into _____ movement. (a) Rotary, reciprocating		**1**
	vii.	The height of each tooth of a broach is- (c) In progressively increasing order		**1**
	viii.	Operation of finishing previously drilled hole is- (b) Reaming		**1**
	ix.	Which of the following is called Preparatory Code? (a) G Code		**1**
	x.	Which of the following Non-Conventional Machining utilize mechanical energy? (a) Ultrasonic Machining		**1**
Q.2	i.	Machinability and parameters for evaluation As per the explanation		**3**
	ii.	Properties of tool materials Taylor tool life equation. And value of C	2 marks 5 marks	**7**
OR	iii.	Difference b/w oblique and orthogonal cutting Derivation of the formula for chip thickness ratio	2 marks 5 marks	**7**
Q.3	i.	List out the various operations performed in Lathe machine. As per the explanation		**3**
	ii.	Taper turning methods Specification of lathe machine	4 marks 3 marks	**7**
OR	iii.	Formula for calculate the machining time Method of thread operation	3 marks 4 marks	**7**
Q.4	i.	Difference between Shaper and Planning Machine. 1 mark for each	 (1 mark * 3)	**3**
	ii.	Milling indexing Simple indexing Differential indexing mechanisms	2 marks 2 marks 3 marks	**7**
OR	iii.	Estimate the machining time As per the solution		**7**
Q.5		Attempt any two:		
	i.	Any five types of bond material 1 mark foe each	 (1 mark * 5)	**5**
	ii.	Marking system (wheel signature) of the grinding wheel. Explanation with specification and their range		**5**
	iii.	Working principle Major advantages of broaching	3 marks 2 marks	**5**
Q.6		Attempt any two:		
	i.	Difference b/w non-conventional and conventional machining 1 mark for each	 (1 mark * 5)	**5**
	ii.	Gear shaping Gear hobbing processes	2.5 marks 2.5 marks	**5**
	iii.	Five G code and M Code with their explanation. As per the explanation		**5**

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