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

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2022

ME6CW07 Advanced Manufacturing Technology

Programme: Ph.D. Branch/Specialisation: ME (Course Work).

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. Machining processes with consideration of environment are called as: **1**

(a) Hybrid machining (b) Sustainable machining
(c) Advanced machining (d) None of these

ii. HSM means: **1**

(a) High speed machining (b) Hot sintered machining
(c) High Steel Machining (d) None of these

iii. What is the key element of water jet machining for material removal? **1**

(a) Tool holder (b) Workpiece
(c) Water jet (d) Power source

iv. Which of these advanced manufacturing process comes under chemical energy? **1**

(a) USM (b) EDM (c) ECM (d) All of these

v. In diamond turning, as the effective undeformed chip thickness can be reduced to the submicron and nanometer scales, **1**

(a) Burr formation can be greatly reduced
(b) Burr formation can be greatly increased
(c) Burr formation can have no effect
(d) None of these

vi. Abrasive jet micromachining (AJMM) works on the principle of: **1**

(a) Electrolysis (b) Thermal
(c) Mechanical (d) All of these

P.T.O.

vii. A computer will perform the data processing functions in which scenario? **1**
(a) NC (b) CNC (c) DNC (d) All of these

viii. During the execution of a CNC part program block N020 G02 X45.0 Y25.0 R5.0 the type of tool motion will be: **1**
(a) Circular Interpolation – clockwise
(b) Circular Interpolation – counter clockwise
(c) Linear Interpolation
(d) Rapid feed

ix. Which of the following is not Powder-Based RP system? **1**
(a) Stereolithography Apparatus (SLA)
(b) Laminated Object Manufacturing (LOM)
(c) Solid Ground Curing (SGC)
(d) Solid Object Ultraviolet-Laser Printer (SOUP)

x. In a typical coordinate measuring machine (CMM), the interfacing hardware, control box, processing computer and software, are parts of which unit? **1**
(a) Probing unit (b) Detecting unit
(c) Scanning unit (d) Processing/control unit

Q.2 i. What are the advantages of non-conventional machining process? Write the difference between conventional and non-conventional machining processes. **4**

ii. Classify non-conventional machining based on energy utilized. What do you mean by high-speed machining? **6**

OR iii. What are the parameters used to evaluate machinability? What is cryogenic machining? **6**

Q.3 i. List out the name of non-conventional machining based on electro-thermal energy. **2**

ii. Define the mechanism of material removal for water jet machining with block diagram. List the advantages and disadvantages of WJM. **8**

OR iii. Explain the working principle of ultrasonic machining and list out effect of process parameters? **8**

Q.4 i. Explain Micromachining and its need in present scenario? Highlights the problems in micromachining. **4**

ii. Explain the effect of tool edge radius on diamond turn machining? Explain machine tool characteristics for diamond turn machining process. **6**

OR iii. Explain magneto rheological nanofinishing process with neat sketch. Also explain its limitations. **6**

Q.5 i. Explain the following: **4**
Group technology and Artificial intelligence in manufacturing

ii. Explain with the neat sketch, working principle of electron beam micromachining. Also explain the cause effect diagram, effect of the various process parameters for electron beam micromachining. **6**

OR iii. Explain with the neat sketch, working principle of magnetic float polishing for ceramic balls. Also explain the cause effect diagram, effect of the various process parameters for magnetic float polishing for ceramic balls. **6**

Q.6 Attempt any two:

i. Coordinate Measuring Machine **5**

ii. 4-D printing **5**

iii. Any two Rapid Prototyping Methods **5**

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Scheme of Marking

MEDI-CAPS UNIVERSITY Knowledge is Power	Faculty of Engineering End Sem (Even) Examination May-2022 EN6ME07 Advanced manufacturing Technology Programme: Ph.D. (Course Work). | | Branch/Specialisation:

Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i.	b) Sustainable machining	1
	ii.	a) High speed machining	1
	iii.	c) water jet	1
	iv.	c) ECM	1
	v.	b) burr formation can be greatly reduced	1
	vi.	c. Mechanical	1
	vii.	c. CNC	1
	viii.	c) circular Interpolation – clockwise	1
	ix.	d. Solid Object Ultraviolet-Laser Printer (SOUP)	1
	x.	d Processing/control unit	1
Q.2	i.	Advantages of non-conventional machining 2 marks Difference between conventional and non-conventional machining processes 2 marks	4
	ii.	Classification based on energy 3 marks, High speed machining 3 marks.	6
OR	iii.	Machinability parameters 3 marks, Cryogenic Machining 3 marks	6
Q.3	i.	3 names 2 marks	2
	ii.	mechanism of material removal for water jet machining with block diagram 4 marks List the advantages and disadvantages of WJM 4 marks	8
OR	iii.	Working principle of ultrasonic machining 4 marks list out effect of process parameters 4 marks	8
Q.4	i.	Micromachining and its need in present scenario 2 marks	4
		Highlights the problems in micromachining 2 marks	
	ii.	Effect of tool edge radius on diamond turn machining 3 marks Explain machine tool characteristics for diamond turn machining process 3 marks	6
OR	iii.	Magneto rheological nanofinishing process with neat sketch 4 marks, limitations 2 marks.	6
Q.5	i.	Group technology 2 marks Artificial intelligence in manufacturing 2 marks	4
	ii.	working principle 2 marks, cause effect diagram 2 marks, process parameters 2 marks	6
OR	iii.	working principle 2 marks, cause effect diagram 2 marks, process parameters 2 marks	6
Q.6			
	i.	Coordinate Measuring Machine diagram 1 marks, principle 2 marks, Working 2 marks	5
	ii.	diagram 1 marks, principle 2 marks, Working 2 marks	5
	iii.	diagram 1 marks, principle 2 marks, Working 2 marks	5

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