Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (2019 Scheme)

Course Code: MET402

Course Name: MECHATRONICS

Duration: 3 Hours

Max. Marks: 100

PART A

Answer all questions, each carries 3 marks. Marks

1		Differentiate incremental and absolute encoders	(3)
2		Define Mechatronics and describe the different realms where it finds applications.	(3)
3		What is meant by MEMS?	(3)
4		Name any three rotary actuators used in Mechatronics.	(3)
5		What are the major components of a CNC machine in a mechatronic perspective?	(3)
6		what are the advantages of a re-circulating ball screws?	(3)
7		Draw a line diagram which represents typical elements of a closed loop control.	(3)
8		Briefly describe the use of timer in a mechatronic system.	(3)
9		What is meant by image processing?	(3)
10		Mention three distinct advantages of Machine vision system.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	How Mechatronic Design Process becomes different from conventional design process? Explain with a block diagram.	(10)
	b)	What are the key elements of a mechatronic system? Explain.	(4)

OR

12	a)	What is the working principle of RTD? List out its advantages.	(7)
	b)	Describe the working of an Ultrasonic flow sensing device.	(7)

Module II

13	a)	Describe Deep reactive Ion Etching process.	(7)
	b)	What is meant by LIGA process? Explain the different steps involved in it.	(7)

OR

14 a) Describe the basic components of a hydraulic system with an example. (10)

b) Describe the working of any one of the flow control valve with line diagram. (4)

Module III

15 a) What is meant by guide ways? Explain most commonly used guide ways in CNC Machines. (7)

b) How the antifriction bearing is different from other bearings? What are the advantages of such bearings? (7)

OR

16 a) Name any two measuring systems used for CNC Machines and their use in such machines. (8)

b) Draw the mechanical translation diagram to illustrate a car suspension system as a two mass system. (6)

Module IV

17 a) Represent the engine management system as a mechatronic system and explain its working (14)

OR

18 a) What are the basic elements of a PLC? Explain with a block diagram. (14)

Module V

19 a) Explain the working of a CCD camera used in machine vision systems. (14)

OR

20 a) What is meant by contrast stretching and thresholding in machine vision system? Explain (14)

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