Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S) Examination September 2025 (2019 Scheme)

Course Code: MET402

Course Name: MECHATRONICS

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1		**Explain cushioning in pneumatic actuators.**	(3)
2		**Explain significance of grey codes in an absolute optical encoder.**	(3)
3		**Name any 3 rotary actuators used in Mechatronics.**	(3)
4		**What do you mean by MEMS?**	(3)
5		**Explain stick slip phenomenon in frictional guideways.**	(3)
6		**What are the advantages of recirculating ball screws?**	(3)
7		**What is the use of timer in Mechatronics system?**	(3)
8		**Explain XOR logic using ladder diagram & truth table.**	(3)
9		**What do you mean by image processing?**	(3)
10		**Explain functioning of a tactile sensor.**	(3)

PART B

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

Module I

11	a)	**Explain the key elements of a mechatronics system?**	10
	b)	**Explain working of any one non-contact temperature measurement system.**	4

OR

12	a)	**Explain the working principle of LVDT.**	7
	b)	**Explain working of RTD's.**	7

Module II

13	a)	**What is LIGA process? Explain different steps involved in it.**	10
	b)	**Explain DRIE process.**	4

OR

14	a)	**Illustrate working of any one kind of MEMS based pressure sensor.**	10
	b)	**Explain working of a process control valve.**	4

Module III

15	a)	**Explain most commonly used Guide ways in CNC machines**	10
	b)	**What are the factors to be considered while designing guideways?**	4
		OR	
16	a)	**Explain about anti friction bearings & how it is different from other bearings.**	10
	b)	**What are the advantages of hydrostatic & hydro dynamic bearings**	4
		Module IV	
17	a)	**What are the basic elements of PLC? Explain with a block diagram**	10
	b)	**Explain latching in PLC programming.**	4
		OR	
18	a)	**Explain working of an automatic camera.**	10
	b)	**Sketch & label the parts of a pick & place robot.**	4
		Module V	
19	a)	**Explain the working of CCD camera used in machine vision system.**	10
	b)	**Explain the working of a CID camera.**	4
		OR	
20	a)	**Explain various image processing techniques.**	10
	b)	**Explain bout ultrasonic & light-based range finders.**	4

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