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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) (FT/WP) Examinations September 2026 (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		List some applications of Inductive sensors.	(3)
2		Explain the working of Piezoelectric sensors.	(3)
3		Identify the applications of rotary actuators.	(3)
4		Explain the different types of DCV's.	(3)
5		List the factors to be considered while determining the selection of Guideways.	(3)
6		Explain why pre-loading is necessary in ball screws.	(3)
7		Explain Timers. List some of its applications.	(3)
8		Explain any three major applications of PLC.	(3)
9		Explain the working of servo motors.	(3)
10		Explain the best suitable applications of stepper motors.	(3)

PART B

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

Module I

11	a)	Explain how Displacement, Proximity and Position sensors different? What are their specific applications?	(9)
	b)	Explain the principle and list the types of Vibration Sensors.	(5)

OR

12	a)	Compare Hydraulic and Pneumatic Actuators.	(8)
	b)	Explain any two Electrical Actuators.	(6)

Module II

13	a)	Explain working and applications of Pressure control valves. List its types.	(8)
	b)	Explain micro machining methods for MEMS systems.	(6)

OR

14	a)	Explain the principle and working of MEMS based gyroscope.	(5)

b) A double-acting cylinder guides machined axles to an assembly unit. The axle is guided when the operator presses a pushbutton and an axle is sensed by using a 3/2-way limit switch. Upon release of the pushbutton, the cylinder is retracted automatically. Design the pneumatic circuit for the given application. (9)

Module III

15. Explain the differences in construction and working of Hydrostatic and Hydrodynamic bearings. (14)

OR

16 Explain the mathematical model of an electrical system composed of different elements with the help of relevant equations and circuit diagram. (14)

Module IV

17 a) Explain the key differences between Open-loop and Closed loop control systems with the help of block diagrams and examples. (9)

b) Explain the mechatronic working of a simple car park barrier system. (5)

OR

18 a) Explain any adaptive controller with the help of block diagram. (7)

b) Explain the working of automatic digital camera in mechatronic perspective. (7)

Module V

19 a) Explain the working of any tactile sensor. (7)

b) Explain the working principle of range finders. (7)

OR

20 a) With the help of suitable diagrams, explain the working of vidicon camera. (6)

b) Explain the key difference between Histogram based stretching and Equalisation in image processing (8)