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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R,S) Exam April 2025 (2019 Scheme)

Course Code: MRT204

Course Name: SENSORS AND ACTUATORS

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks) Marks

1		Differentiate between hard magnetic materials and soft magnetic materials	(3)
2		Define hall effect with suitable diagram.	(3)
3		List any three types of variable reluctance sensor and mention their applications	(3)
4		Explain the working of a Variable reluctance sensor	(3)
5		Depict the working principle of a solenoid actuator	(3)
6		List some of the applications of solenoid actuators	(3)
7		Define a rotary actuator. Mention types of rotary actuators	(3)
8		Enlist few applications of disk rotary actuators.	(3)
9		Define Coanda effect	(3)
10		Explain numerical control. list some of its applications	(3)

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	Differentiate between paramagnetic, diamagnetic and ferromagnetic materials	(9)
	b)	Explain the classification of magnetic materials based on coercivity	(5)
12	a)	Compare a sensor and an actuator with examples	(7)

	b)	Differentiate between a latching type and pull type solenoid	(7)

Module -2

13	a)	Illustrate the construction of a Variable reluctance sensors with appropriate figures	(8)
	b)	Define sensor sensitivity and flux sensitivity	(6)
14	a)	"E shaped magnetic structure has superior performance than front mounted magnetic structure". Validate the statement with figures	(8)
	b)	Illustrate the working of a hall effect sensor	(6)

Module -3

15	a)	Discuss in detail the disk and plunger type configurations of solenoid actuators	(14)
16	a)	With suitable figures write down the electrical network equations for linear actuators	(7)
	b)	Briefly explain about applications of solenoid actuators	(7)

Module -4

17	a)	Illustrate the working of disk rotary actuator	(14)
18	a)	With a neat sketch, explain the construction and working principle of Cylindrical rotary actuator	(14)

Module -5

19	a)	Illustrate the working of an interruptible jet sensor and cone jet proximity sensor	(7)
	b)	Define fluidics. Briefly explain any two types of fluidic gates	(7)
20	a)	Explain the working and various types of encoders	(7)
	b)	List down the components of numerical control and explain them	(7)

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