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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

Course Code: RAT418

Course Name: MECHATRONIC SYSTEM DESIGN

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

PART A

Answer all questions, each carries 3 marks. Marks

1	Mention the features of load cell diaphragm transducers	(3)
2	Discuss about the different classification of transducers	(3)
3	Mention the features of rack and pinion	(3)
4	Explain how electromechanical actuators are working and what are the different types of electromechanical actuators are available?	(3)
5	What are the features of PID control?	(3)
6	Discuss in detail about the different approaches of FDI.	(3)
7	Discuss in detail about advanced actuator.	(3)
8	Give brief on validation methodology	(3)
9	Describe about sea scheme	(3)
10	Give a brief on prognostics	(3)

PART B

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

Module I

11 a) Draw and explain in detail about piezoelectric transducer and hall-effect transducer (14)

OR

12 a) What is capacitance ? Explain in detail about any two type of capacitive transducer with (14)

an relevant application

Module II

13 a) Discuss in detail about any two types of DC machines with their detailed   (14)
working

principle

OR

14 a) Describe about cams and followers with relevant sketch   (7)

b) Discuss in detail about belt and chain mechanism   (7)

Module III

15 a) Elaborate the details about Analog and Digital control methods in FDI.   (7)

b) Discuss in details about supervised and unsupervised learning in ANN with   (7)
the example also list out the three advantages and disadvantages of the ANN.

OR

16 a) What is fuzzy logic? Explain in details about different stages of FLC? explain   (14)
with relevant diagram.

Module IV

17 a) Explain in detail about system validation with its scheme also explain in   (14)
detailed about the fusion technique with the relevant sketch

OR

18 a) Explain how components-based modular design is integrated into drilling   (7)
machine

Explain the role of industrial robots in manufacturing   (7)

Module V

19 a) What is a realisation study? Discuss the parameters that are monitored and   (14)
controlled in the context of remote monitoring and control.

OR

20 a) Discuss in detail about the dynamic modelling of HSSS   (14)

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