



Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
B.Tech Degree S8 (R,S) Examinations April 2026 (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  | Discuss about the different classification of transducers                                     | (3) |
| 2  | Differentiate traditional and mechatronics design approaches.                                 | (3) |
| 3  | Describe about cams and followers   | (3) |
| 4  | What is an actuator? Explain the types of actuators on the basis of the motion of the object. | (3) |
| 5  | Describe the advantages and disadvantages of artificial neural networks.                      | (3) |
| 6  | What is a control system? Explain it using a suitable example.                                | (3) |
| 7  | Write notes on Validation methodology   | (3) |
| 8  | Conceptualize the components-based modular design view  | (3) |
| 9  | What is bearing friction? Explain the signs of loss due to bearing friction                   | (3) |
| 10 | Describe the four layers of automation services in the design of a control system             | (3) |

**PART B**

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

**Module I**

- 11 a) What is inductance? Explain in detail about any two types of inductive transducers with a relevant application (14)

**OR**

- 12 a) Explain how bimetallic strip works on the principle of thermal expansion and Discuss the properties of bimetallic strip. (14)

**Module II**

- 13 a) Explain with the neat sketch in detail about Fluid power actuators and piezoelectric actuators (14)

**OR**

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

**Module III**

- 15 a) Explain the architectural concept of the artificial neural network (ANN) and list out the three advantages and disadvantages of the ANN. (14)

**OR**

- 16 a) What is fuzzy logic? Explain the architectural concept of fuzzy logic system (14)

**Module IV**

- 17 a) With a neat sketch, explain the working of the drilling machine and also mention its advantages and disadvantages. (14)

**OR**

- 18 a) What are the issues faced in the design of conveyor-based material handling system? Propose a solution to address any one of the concerns discussed. (14)

**Module V**

- 19 a) What is Sea scheme? Explain in detail with relevant diagram (14)

**OR**

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

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