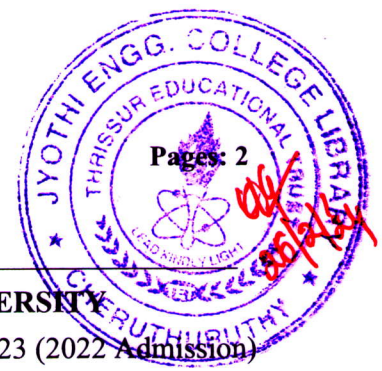


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Reg No.: \_\_\_\_\_

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Third Semester B.Tech (Minor) Degree Examination December 2023 (2022 Admission)

**Course Code: MRT281**

**Course Name: INTRODUCTION TO SENSORS AND ACTUATORS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions. Each question carries 3 marks*

Marks

- |    |  |     |
|----|--|-----|
| 1  | Mention the application of soft magnetic materials.                      | (3) |
| 2  | Explain in short about Linear Solenoid Actuators                         | (3) |
| 3  | List the applications of Solid-state sensors                             | (3) |
| 4  | Mention the requirements of magnetic speed sensor.                       | (3) |
| 5  | What is VR sensor noise?   | (3) |
| 6  | Write short notes on transmission solenoids.                             | (3) |
| 7  | What is disk rotatory actuator?  | (3) |
| 8  | Draw and explain the toothed magnetic part of claw pole rotary actuator. | (3) |
| 9  | Mention the application of Resolvers?                                    | (3) |
| 10 | Discuss about backpressure sensor.                                       | (3) |

**PART B**

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

**Module 1**

- |    |   |      |
|----|---|------|
| 11 | Short notes on  | (14) |
|    | a. hard and soft magnetic materials.  |      |
|    | b. Linear and latching solenoid actuators.                                  |      |
| 12 | Explain in detail about Stepper Motors with operation and its applications. | (14) |

**Module 2**

- |    |  |      |
|----|--|------|
| 13 | What is VR? Explain in detail about magnetic sensor, analysis and its application with an-example. | (14) |
| 14 | Write in detail about magnetic Speed and position sensor with neat sketch                          | (14) |

**Module 3**

- |    |  |      |
|----|--|------|
| 15 | Explain in detail about fast acting solenoid actuators.        | (14) |
| 16 | Explain in detail about Natural gas and Diesel fuel Injectors. | (14) |

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**Module 4**

- 17 Write in detail about disk rotatory actuators and its analysis with electromagnetic excitation circuit. (14)
- 18 Explain in detail about cylindrical rotatory actuators design and its analysis with an application. (14)

**Module 5**

- 19 Short notes on: (14)
- a. Encoders
  - b. Tacho generators
- 20 Write in detail about: (14)
- a. Fluid logic gates.
  - b. Fluidic sensor