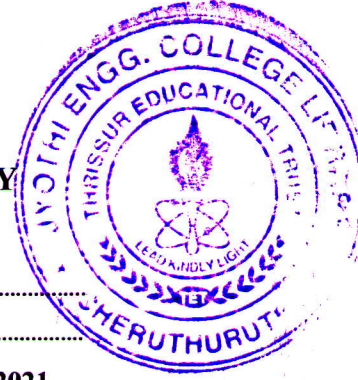


APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER



Q. P. Code : IAR0820151B-I

(Pages: 2)

Name:

Reg. No:

FIRST SEMESTER M.TECH. DEGREE EXAMINATION MARCH 2021

Branch: Mechanical Engineering

Specialization: Industrial Automation and Robotics

08ME6351(B) FLUID POWER AUTOMATION

Time: 2 hour 15 minutes

Max. Marks: 60

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q. No.	Module 1	Marks
1. a	List the advantages of hydraulic power system.	3

Answer b or c

- | | | |
|---|--|---|
| b | Explain the working of cylindrical cushioning with a neat sketch. | 6 |
| c | A pump has a displacement volume of 98.4 cm^3 . It delivers $5.152 \text{ m}^3/\text{s}$ of oil at 1000 rpm and 70 bar. If the prime mover input torque is 124.3 Nm, what is the overall efficiency of pump? What will be the theoretical torque required to operate the pump? | 6 |

Q. No.	Module 2	Marks
2. a	Briefly explain the working of Safety Relief Valve.	3

Answer b or c

- | | | |
|---|--|---|
| b | Explain different types of actuating devices used in a pneumatic system. | |
| c | Explain the constructional features of Quick Check Valve with a neat sketch. | 6 |

Q. No.	Module 3	Marks
3. a	Discuss the operating characteristics of Direction Control Valves	3

Answer b or c

- | | | |
|---|--|---|
| b | Explain different types of Direction Control Valves with the help of circuit diagrams. | 6 |
|---|--|---|

- c With the help of a neat sketch explain the working of Pressure Compensated Flow Control Valve. 6

Q. No.	Module 4	Marks
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- | | | |
|------|--|---|
| 4. a | What is meant by Pulse Width Modulation? | 3 |
|------|--|---|

Answer b or c

- | | | |
|---|---|---|
| b | What are Amplifier Cards? Discuss the principle of operation and the applications of Amplifier Cards. | 6 |
| c | How Bode Plot helps manufactures in the selection of valve? Explain. | 6 |

Q. No.	Module 5	Marks
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- | | | |
|------|---|---|
| 5. a | Define timers. Explain its importance in PLC. | 4 |
|------|---|---|

Answer b or c

- | | | |
|---|---|---|
| b | Explain the steps involved in the implementation of Closed Loop Control System using PLC. | 8 |
| c | Two motors are to be controlled in a sequence in which the second motor starts 30 seconds after the first motor. Explain the methodology and develop a PLC ladder diagram for the following cases and describe the circuit. | 8 |

Case (A): Only one motor operates at a time.

Case (B): Both the motor gets off together after 50 seconds.

Q. No.	Module 6	Marks
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- | | | |
|------|--|---|
| 6. a | Write any four applications of Servo Valves. | 4 |
|------|--|---|

Answer b or c

- | | | |
|---|--|---|
| b | Briefly explain the working of Position Control Valve, | 8 |
| c | Describe the applications of Directional Control Valves in metallurgical powder press. | 8 |