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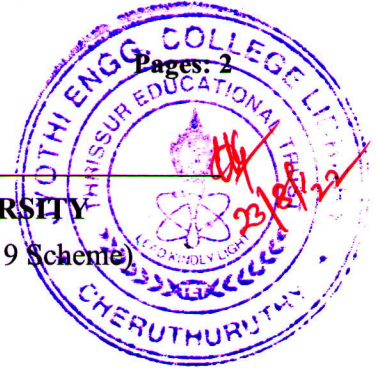
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Reg No.: \_\_\_\_\_

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
Sixth Semester B.Tech Degree Examination June 2022 (2019 Scheme)



Course Code: MRT306

Course Name: INDUSTRIAL HYDRAULICS & PNEUMATICS

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 3 marks.*

Marks

- |    |   |     |
|----|---|-----|
| 1  | With neat sketches, explain open center and closed Center design in a DCV.        | (3) |
| 2  | Explain Overlapping and under lapping spool valves with neat figure               | (3) |
| 3  | Draw the ISO symbols of any 4 DCV's.  | (3) |
| 4  | Explain the role of hydraulic and pneumatic system in automation?                 | (3) |
| 5  | What are advantages of frequency response analysis?                               | (3) |
| 6  | What is a PID Controller? State any one example of PID in Real world application? | (3) |
| 7  | Explain the principle of cascade control systems.                                 | (3) |
| 8  | What is the purpose of field bus in circuits?                                     | (3) |
| 9  | What is Ladder diagram in PLC programming?  | (3) |
| 10 | Explain the working of a pilot operated sequence valve                            | (3) |

**PART B**

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

**Module I**

- |    |  |     |
|----|--|-----|
| 11 | a) What is the function of pressure relief valve? Sketch & explain the working of pressure relief valve. | (7) |
|    | b) Explain the use of cushioning in Linear actuators with neat figure                                    | (7) |

**OR**

- |    |   |      |
|----|---|------|
| 12 | a) A gear pump has a 100 mm outside diameter a 80 mm inside diameter and a 25mm width. If the volumetric efficiency is 90% at rated pressure, what is the corresponding actual flow rate? The pump speed is 1000 rpm. | (10) |
|    | b) Explain the working principle of 4-way spool valve   | (4)  |

**Module II**

- 13 a) Differentiate between Hydraulic system and Pneumatic system (7)  
b) Explain with neat figure any two types of flow control valves in hydraulic system (7)

**OR**

- 14 a) Explain the function of DCV with neat figure (7)  
b) Differentiate between Conventional and proportional valves (7)

**Module III**

- 15 a) State and explain open loop and closed loop control systems. Also compare their merits and demerits. (14)

**OR**

- 16 a) Explain the terms ramp, gain, dead band in control system (7)  
b) Explain Bode diagrams and their use in Control system operation (7)

**Module IV**

- 17 a) Explain the use of relays, timers and counters in PLC circuits (7)  
b) Differentiate between combinational and sequential circuits (7)

**OR**

- 18 a) What is the use of Karnaugh map method in circuit design? (7)  
b) Explain the role of Ladder diagram in Industrial Control logic system (7)

**Module V**

- 19 a) What are the limitations of Hydro Mechanical Servo systems? (7)  
b) Explain the requirement of PLC Application in fluid power control with a suitable example (7)

**OR**

- 20 a) Explain Electro Hydraulic Servo system with neat figure. Also explain its use in velocity control application with suitable example. (14)

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