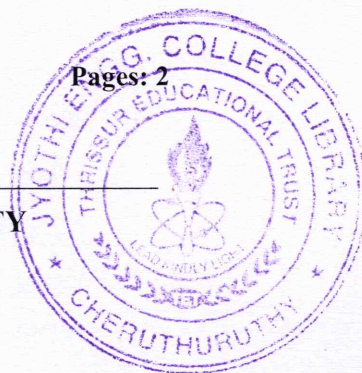Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (R,S) Exam April 2025 (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	What is the function of pressure reducing valve? Explain it.	(3)
2	Draw the symbol of hydraulic pump also write the operating principle of hydraulic pump.	(3)
3	Draw and write about the basic hydraulic system.	(3)
4	Write three advantages and limitations of pneumatic system.	(3)
5	Write about Response time and Calibration & Tuning method.	(3)
6	With the help of neat diagram write about the closed loop control system.	(3)
7	Discuss about the terms relays and solenoids.	(3)
8	Explain about coordinated sequence motion of two cylinders with neat sketch.	(3)
9	Compare hydro mechanical servo systems and electro hydraulic servo systems.	(3)
10	List out and write the PLC applications in fluid power control.	(3)

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

Module I

11 a) A gear pump has a 150 mm outside diameter a 90 mm inside diameter and a 30mm width. If the volumetric efficiency is 92% at rated pressure, what is the corresponding actual flow rate? The pump speed is 1100 rpm   (8)

   b) Discuss about 'power packs' and list out the application of hydraulic power pack.   (6)

OR

12 a) List out the types of accumulators also write the construction and working details of each one with neat drawing.   (14)

Module II

13 a) List out the types of proportional control valve also discuss about the working of proportional control valve.   (5)

b) With the help of neat drawing explain any two types of proportional control valves in detail. (9)

OR

14 a) Discuss about the selection criteria for hydraulic and pneumatic system. (6)

b) Write about the use of check valve and shuttle valve also write about closed centre valve and its application with the help of neat sketch (8)

Module III

15 a) Draw and discuss about the block diagram and components of closed loop electro-hydraulic servo system. (7)

b) Write about the advantages of frequency response analysis. How is phase margin determined from Bode plots? (7)

OR

16 a) Write about, what is analog circuits and digital circuits? Also explain the detailed comparison between analog circuits and digital circuits. (9)

b) Discuss and write positive feedback and negative feedback in control system with schematic diagram. (5)

Module IV

17 a) Draw and explain about the architecture of programmable logic controller. Also write about operation cycle of PLC. (10)

b) Explain about the benefits of using field busses in circuits. (4)

OR

18 a) Discuss about the role of Ladder diagram in Industrial Control logic system (6)

b) Write about Karnaugh map method of circuit design. (8)

Module V

19 a) Give an idea about how can low cost automation be achieved using pneumatics? (7)

b) List out the advantages of servo system also point out the limitations of Hydro Mechanical Servo systems. (7)

OR

20 a) Explain the control of a hydraulic cylinder using a single limit switch by using appropriate ladder diagrams, and Boolean equations. (14)

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