Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (S, FE) Examination January 2024 (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	Name any three positive displacement pumps.	(3)
2	Define basic type of accumulators used in hydraulic systems.	(3)
3	Explain two-way spool like DCV.	(3)
4	With neat symbol show any two types of mechanical actuation.	(3)
5	Explain the working of a PID controller.	(3)
6	Explain the advantages of pulse width modulation.	(3)
7	Define 1) Relays and 2) Timers.	(3)
8	Explain briefly any three methods for entering the program in to a PLC.	(3)
9	Define the function of proportional band.	(3)
10	Suggest any two causes and any two remedies for hydraulic pump with noisy operation.	(3)

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

Module I

11 a) With neat sketch describe the construction of a pressure compensated flow control valve.   (9)

   b) Explain Tandem cylinder.   (5)

OR

12 a) Explain cylinder cushioning with neat sketch draw any two cushion designs.   (7)

   b) Explain about compound relief valve with sketch.   (7)

Module II

13 a) With the help of a block diagram explain the working of an electro hydraulic servo valve.   (9)

   b) Compare hydraulic power systems & pneumatic power systems.   (5)

OR

14 a) Explain proportional pressure relief valve with schematic diagram and valve symbol. (7)

b) Explain proportional pressure reducing valve with schematic diagram and valve symbol. (7)

Module III

15 a) Describe bode plots. (5)

b) Explain Frequency response analysis of open loop systems. (9)

OR

16 a) Relate positive feedback and negative feedback in control system with schematic diagram. (6)

b) Define pulse width modulation. (4)

c) Define Dead band. (4)

Module IV

17 a) With neat sketch of hydraulic circuit and Relay ladder diagram explain the electric control for the reciprocation of cylinder using pressure switch? (7)

b) Define Karnaugh map and its application in circuit design? (7)

OR

18 a) Discuss the ladder diagram connection for a dual cylinder sequencing circuit for the following sequence of operation $A^+ B^+ B^- A^-$ (10)

b) Construct the ladder logic for the following Boolean Equations (4)
1) Y= (X1+X2).X3 2) Y= (X1.X2) +X3

Module V

19 a) Sketch the hydraulic circuit explain. (14)
1) Meter in circuit.
2) Meter out circuit.

OR

20 a) With sketch explain hydro mechanical servo valve. (8)

b) With a block diagram explain closed loop servo system. (6)

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