

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER M. TECH DEGREE EXAMINATION**  
**Electronics & Communication Engineering- Interdisciplinary Engineering**  
**(Robotics & Automation)**  
**04EC6905 - Fluid Power Automation**

Max. Marks : 60

Duration: 3 Hours

**PART A**

*Answer All Questions*

*Each question carries 3 marks*

1. List the main components of a fluid power system and their functions.
2. How power packs are important in hydraulic systems?
3. Give a short note on spool valves in hydraulics.
4. How a single stage servo valve works?
5. Design an AND, and OR gate using DCV's.
6. Give a practical example for hydraulic cylinder sequencing circuits.
7. Draw the schematic for interfacing of Hydraulic/Pneumatic components with PLC.
8. What are the functions of timer in PLC?

**PART B**

*Each question carries 6 marks*

9. A hydraulic pump delivers 12 L of fluid per minute against a pressure of 100 bar. (a) Calculate the hydraulic power. (b) If the overall pump efficiency is 60%, what size of electric motor would be needed to drive the pump?

OR

10. How positive displacement and non positive displacement hydraulic pumps differs. Explain in detail.
11. Explain about different classifications of linear actuators.

OR

12. A cylinder with bore diameter of 1.5 in and a rod diameter of 0.7 in is to be used in a system with a maximum pressure of 3000 psi. What are the maximum extension and retraction forces?
13. Discuss the working of the following with neat hydraulic circuit sketches. (a) Counter balance valves (b) Sequence valves (c) Pressure reducing valves.

OR

14. Explain the construction details and working of a flow control valve.
15. Explain about the characteristics and performance of electro hydraulic servo valves.

OR

16. What are the different methods for shifting servo valve tool? Explain with neat schematics.
17. Discuss about the combinational logic circuit design using cascade method.

OR

18. Give an example for cascade method for pneumatic circuit design with neat circuit diagrams.
19. Share your ideas on electrical control of pneumatic and hydraulic circuits in fluid power industry.

OR

20. Double acting cylinder is used to perform to and fro operation. Cylinder has to move forward when PB1 button is pressed and continue to and fro motion till 10 cycles of operations is performed. Draw the PLC wiring diagram and ladder diagram to implement this task.

