Printed pages: 01 **Sub Code: MTAR041**

Paper Id | 2 | 7 | 5 | 2 | 0 | 5 | **Roll No.** | | | | | | | | | | |

M. TECH.
(SEM -II) THEORY EXAMINATION 2018-19
PNEUMATIC & HYDRAULIC CONTROL

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) Write the application of pneumatics.
(b) What are the important factors while selecting pneumatic pipes?
(c) Define the term fluidic.
(d) Define the term logic function or gate.
(e) What is an actuator?
(f) State Pascal's law.
(g) What is the purpose of providing cushioning in cylinder?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Compare Characteristics of hydraulic and pneumatic systems with mechanical system.
(b) Explain the working of Quick Exhaust Valve with a neat sketch.
(c) Explain the application of AND Valve with a typical circuit.
(d) Draw symbolic representation of Hydraulic Power Pack unit.
(e) Define control system and its types with their utility.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Construct a hydraulic circuit to explain the application of regenerative system in a drilling machine.
(b) Explain signal elimination using reversing valves.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain with the help of a hydraulics circuit, How the cylinder speed can be controlled by metering in oil from the cylinder?
(b) Explain with neat circuit diagram, Two-handed safety control system.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Give comparison among Pneumatic valves, Moving part logic elements and Fluidics.
(b) Explain briefly air following fluidic amplifiers:
(i) Turbulence amplifier **(ii)** Vortex amplifier

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Two double acting hydraulic cylinders are synchronized by connecting them in series. The load acting on each cylinder is 3000 N. Cylinder 1 has the piston diameter 55 mm and rod diameter 23 mm. If the cylinder extends 200 mm in 0.06 seconds, and the following:
(i) The pressure requirements of the pump. **(ii)** Flow capacity of the pump. **(iii)** Pump output. **(iv)** Capacity of motor driving pump if overall efficiency of pump is 85%.
(b) In a semi-automatic machine, a double acting hydraulic cylinder has a reciprocating motion. The forward motion is obtained using a regenerative circuit. The load during the forward stroke is 10 kN. The total stroke of 60 cm is to be completed in about 5 sec. The return speed is to be as fast as possible. Draw a hydraulic circuit to achieve the given objective. Select different components you have used in the circuit from the data given. Mention ratings of the components in case it is not available in the given Data.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss air-oil cylinder type of Hydro pneumatic system with neat sketch. Mention its drawbacks.
(b) What is signal overlap? Explain the methods of solution to signal overlapping.

www.aktuonline.com

http://www.aktuonline.com