

Control Logic and PLC's – Quiz 1 Review Sheet

Chapter 16 (Timers)

- know about the five types of timers (dashpot, synchronous clock, solid state, solid state programmable, and the timing functions available in PLC's (programmable logic controllers) (fig 16-1)
- know and understand the four types of timing logic: on-delay (fig. 16-6), off-delay (fig 16-10 & 11), one-shot (fig 16-17), and recycling (fig 16-19)

* you will be given a simple circuit to design a solution for that requires a timer

- the difference between retentive and non-retentive timers (pg 368)
- know about the two types of counters (count up & count down) (pg. 370 & 371)

Pneumatic Trainer / Chapter 7 (Solenoid operated directional control valves) , handout, and pg 50

- know what is inside a directional control valve (valve spool) and some of the ways the valve spool can be shifted (solenoid, spring, lever, etc.) (fig 7-13)
- know what is meant by "ways" and "positions" (fig 7-11 and 7-18)
- know how solenoids are used to shift valve spools (fig 7-14, examples on our trainers) and how to troubleshoot the solenoids (fig 7-20 and 7-21)
- know the difference between linear actuators (cylinders that move in and out) and rotary actuators (motors whose shaft spins around) (examples of both are on the pneumatic trainers)
- know the difference between single acting and double acting cylinders (single acting only are controlled with a single solenoid and a spring / double acting require solenoids to both extend and retract)
- know how a pressure switch could be used to help automate a cylinder's motion (pg. 156 and 158)

Chapter 24 – Photoeyes (pg. 505 to 508 & pg 511 to 521) / Chapter 21 (Hall Effect Sensors and Prox. Switches) (pg 447-457)

Chap 24.

- what photoeyes are (pg. 511) and the advantages they have over other types of sensing devices (bottom of pg 505 and fig 24-19) (can sense without touching, sense from long distances, etc.)
- the 6 scanning techniques (direct, retro-reflective (which is the one on our trainers), polarized, specular, diffuse, and convergent beam) (fig 24-20 and figs 24-21 through 24-26)

- photoeye application circuits (fig 24-23 & 24-24)
- dark operated logic vs light operated logic (pg. 519)
- what fiber optics are (pg. 510) and what their advantage is
- modulated vs unmodulated light signals (fig 24-29) and which is used for high speed applications

Chap 21

- know what Hall Effect Sensors are (see the three paragraphs under "Hall Effect Sensors" on pg. 447 and fig 21-14)
- know some of the many applications Hall Effect sensors are used in (ex. Fig 21-20, 21-24, & 21-27)
- inductive proximity switches (fig 21-29) (only sense metal objects) - vs - capacitive proximity switches (fig 21-30) (which can be tuned to sense a variety of materials) (fig 21-31)
 - * unlike photoeyes (which can sense from long distances) prox sensors have to be within about $\frac{1}{2}$ " of what they are trying to sense

In general

- how solenoids, contactors, and motor starters work
- ladder diagrams vs wiring diagrams
- draw the correct symbols for pushbuttons, selector switches, prox. switches, solid state timers, counters, photoeyes, contactors, solenoids, motor starters, buzzers, and overloads