

Code: R7211305

R07

B.Tech II Year I Semester (R07) Supplementary Examinations, May 2013

INSTRUMENTATION AND CONTROL SYSTEM COMPONENTS

(Electronics and Control Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain in detail about the usage of left chain and friction drives in an industrial environment.
(b) Enumerate the difference between pivots and bearings.
- 2 (a) Discuss about the pneumatic relays in detail.
(b) Explain briefly the operation of safety relief and pilot valves.
- 3 (a) What is the difference between a switch and a relay?
(b) Discuss in detail about the importance of pulse transformers.
- 4 (a) A 3- ϕ variable stepper motor has following parameters:
Average phase-winding resistance = 1.5Ω
Average phase-winding inductance = 25 mH
Rated winding current = 2 A
Design a simple unipolar drive circuit, such that the electrical time constant is 3 msec, at phase turn on and 2 msec at turn off. The stepping rate is 300 steps/sec.
(b) Define step angle. What are the applications of stepper motors?
- 5 (a) Based on the characteristics, distinguish between BJT and FET.
(b) Briefly explain the construction and working principle of a varactor diode.
- 6 Draw and explain the functional diagram of a 555 timer. Also discuss briefly the different modes of operation of a 555 timer.
- 7 (a) Describe the working principle of LED with neat sketch.
(b) Explain the working of an opto-couple in detail.
- 8 Write short notes on the following:
 - (a) PIN diodes.
 - (b) Optical filters.
 - (c) Diffraction grating.
