

Printed Pages—3

IC—011

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3021

Roll No.

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B.Tech.

SEVENTH SEMESTER EXAMINATION, 2004-2005

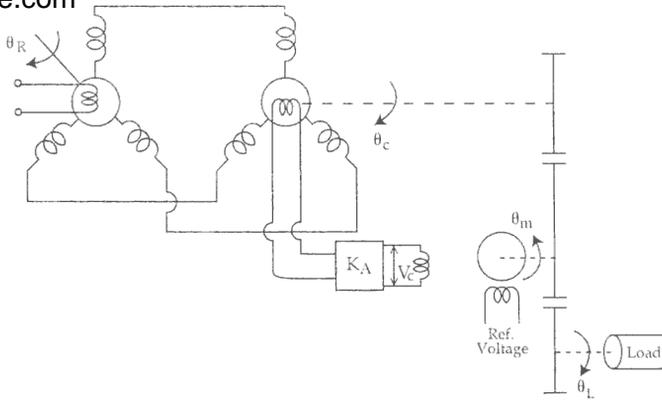
CONTROL SYSTEM COMPONENT

Time : 3 Hours

Total Marks : 100

- Note :** (i) Attempt **ALL** the questions.
(ii) All questions carry equal marks.

1. Answer *any four* parts of the following :- (5x4=20)
- (a) Give the general shape of torque-speed characteristics of two-phase induction motor. How it differs from a normal induction motor ?
 - (b) Prove that synchro transmitter-control transformer acts as an error detector.
 - (c) Compare the advantages and disadvantages of A.C. and D.C. components.
 - (d) Draw the block diagram of the system shown in figure indicating the transfer function of each block.



- (e) Discuss some of the constructional features of D.C. servomotors.
- (f) Discuss the speed-torque and load torque characteristics of D.C. servomotors.

2. Answer *any four* parts of the following :- (5x4=20)

- (a) Describe the use of stepper motors to control position and speed.
- (b) Draw and explain the torque-angle characteristics of stepper motor.
- (c) Compare the operation of elementary stepper motor types.
- (d) Explain the working of variable reluctance stepper motor.
- (e) Name the distinct different ways of using stepper motors in control systems. Explain any one of them with the help of Block diagram.
- (f) Discuss the Torque Versus Pusels characteristics for a Stepper Motor.

3. Answer *any two* parts of the following :- (10x2=20)

- (a) Derive the transfer function of hydraulic pump-motor system.
- (b) Explain with the help of diagram pneumatic flapper valve. Draw the flapper valve characteristics also.
- (c) Write short notes on :
 - (i) Twin Pressure Valve
 - (ii) Quick Exhaust Valve

4. Answer *any two* parts of the following :- (10x2=20)

- (a) Explain with the help of diagrams pneumatic actuator.
- (b) Justify the use of Relays and Limit switches as Control System Components.
- (c) Describe the construction and applications of a reluctance motors.

5. Answer *any two* parts of the following :- (10x2=20)

- (a) Describe the construction of a synchronous hysteresis motor and show that it develops a running torque both at synchronous and asynchronous speeds of the rotor.
- (b) Explain the principle of operation of an A.C. tachometer. Give the approximate analysis of the A.C. tachometer.
- (c) Explain the switching circuit of a 3 ϕ motor connected in delta.

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