Printed Pages – 3 **IC – 011**

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

PAPER ID : 3021 Roll No. | | | | | | | | | | |

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.

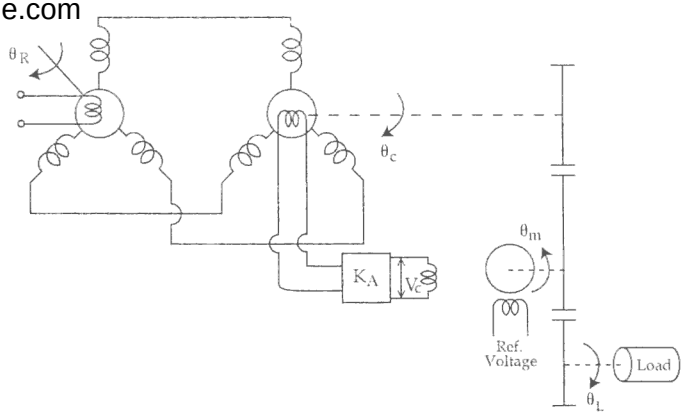
1. Answer *any four* parts of the following :- **(5x4=20)**

(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 characterisitcs 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 value. Draw the flapper value characteristics also.

(c) Write short notes on :

(i) Twin Pressure Value

(ii) Quick Exhaust Value

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 hysterisis 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 3ϕ motor connected in delta.

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