

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name : Control System Components

Subject Code :4TE05CSC1

Branch: B.Tech (IC)

Semester :5

Date :07/12/2015

Time :2:30 To 5:30

Marks :70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
-

Q-1

Attempt the following questions:

(14)

1. The direction of rotation of a DC motor can be determined by
 - a)Lenz's Law
 - b)Ampere's law
 - c)Fleming's right hand rule
 - d)Fleming's left hand rule
2. What is the step angle of a permanent-magnet stepper motor having 8 stator poles?
 - a) 60°
 - b) 45°
 - c) 30°
 - d) 15°
3. The rotor of a stepper motor has no
 - a) windings
 - b) commutator
 - c) brushes
 - d) all of the above
4. A variable reluctance stepper motor is constructed of material with salient poles.
 - a) paramagnetic
 - b) ferromagnetic
 - c) diamagnetic
 - (d) non-magnetic
5. The control synchro has three phase winding both on its stator and rotor.
 - a) differential
 - b) transformer
 - c) receiver
 - d) transmitter
6. A variable reluctance stepper motor takes 200 steps for completing one round.



- then step angle of that motor will be
- 2 degree
 - 1.8 degree
 - 2.4 degree
 - 3 degree
- A 2-way valve has:
 - one working port
 - two working ports
 - three working ports
 - four working ports
 - How is proximity switch differentiated from limit switch?
 - proximity switch is activated when moving parts have physical contact with it
 - proximity switch is activated when non-moving parts have physical contact
 - proximity switch is activated when moving parts are close to it
 - none of the above
 - Why are electromechanical relays more popular than solid state relays?
 - they are reliable
 - less costly
 - both a and b
 - none of the above
 - What is the DC range of solenoids in pneumatic systems?
 - 12 V and 24 V
 - 110 V and 220 V
 - both a and b
 - none of the above
 - Gyroscopic effect is not observed in which of the following actions performed by the ships?
 - Rolling
 - Pitching
 - Steering
 - All of the above
 - What is the effect of reactive gyroscopic couple when aeroplane takes right turn and propeller rotates in clockwise direction?
 - The tail of the aeroplane is dipped and nose is raised
 - The tail of the aeroplane is raised and nose is dipped
 - Reactive gyroscopic couple has no effect when propeller rotates in clockwise direction
 - None of the above
 - When the percentage of flow through a valve equals the percentage of plug movement, a valve exhibits
 - Linear flow characteristic
 - Equal percentage flow characteristic
 - Quick opening flow characteristic
 - Curved flow characteristic
 - Which of the following parts of a globe valve serves the same purpose as the disk in a butterfly valve?
 - Seat



- b) Plug
- c) Packing rings
- d) Packing flange

Attempt any four questions from Q-2 to Q-8

- Q-2** (a) Explain construction & working principle of servo motor and derive transfer function of Field Controlled D.C Servomotor with necessary diagram (14)
- Q-3** (a) List out Different types of Stepper motors. Explain any one in detail (7)
 (b) Explain flapper valve in detail with necessary diagram (7)
- Q-4** (a) Explain self latching circuit and lockout circuit of relay (7)
 (b) What is Backlash in Gears? Explain techniques to reduce backlash in gears (7)
- Q-5** (a) Explain gear terminology in detail (7)
 (b) Explain the following terms: (7)
 i) Galling
 ii) Valve Range ability
 iii) Valve Capacity
- Q-6** (a) Explain working and Construction of Butterfly valve. (7)
 (b) Explain working, construction and operating principle of Gyroscope (7)
- Q-7** (a) List different types of parameter sensitive switches. Explain any two in detail (7)
 (b) Describe the construction and working of solenoid valve (7)
- Q-8** (a) Explain nozzle valve in detail with necessary diagram (7)
 (b) Explain differences between A.C Relay and D.C Relay (7)

