Model Question Paper

Faculty Name : Deepak Agrawal   **Sub: Control System**
VI SEM ECE

Q1. Distinguish between open loop and closed loop system

Answer.

Open loop system	Closed loop system
1. Inaccurate	Accurate
2. Simple and economical	Complex and costlier
3. The changes in output due to external disturbance are not corrected	The changes in output due to external disturbances are corrected automatically
4. They are generally stable	Great efforts are needed to design a stable system

2. Write the analogous electrical elements in force voltage analogy for the elements of mechanical translational system.

Answer
- a. Force-voltage e
- b. Velocity v-current i
- c. Displacement x-charge q
- d. Frictional coefficient B-Resistance R
- e. Mass M- Inductance L
- f. Stiffness K-Inverse of capacitance 1/C

3. Write the analogous electrical elements in force current analogy for the elements of mechanical translational system.

Answer
- a. Force-current i
- b. Velocity v-voltage v
- c. Displacement x-flux

d. Frictional coefficient B-conductance 1/R

e. Mass M- capacitance C

f. Stiffness K-Inverse of inductance 1/L

4. Write Masons Gain formula.

Answer

Masons Gain formula states that the overall gain of the system is

$$T = P_k \Delta_k / \Delta$$

k- Forward path in the signal flow graph

P_k- Forward path gain of kth forward path

Δ = 1-[sum of individual loop gains] +[sum of gain products of all possible combinations of two non touching loops]-[sum of gain products of all possible combinations of three non touching loops]+…

Δ_k = for that part of the graph which is not touching k^{th} forward path.