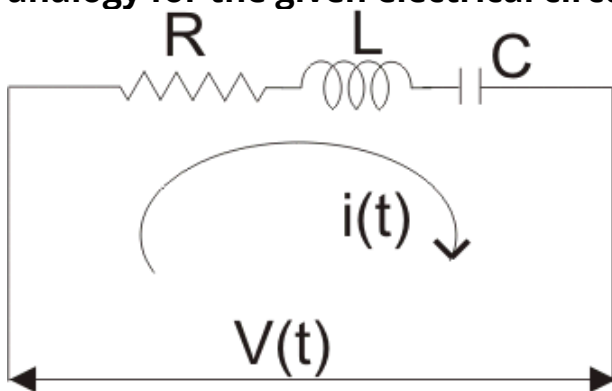


END SEMESTER ASSESSMENT (ESA) - JULY - 2023**UE18EE352 - Control Systems****Total Marks : 100.0**

1.a. Discuss open loop and closed loop control system with suitable block diagrams. (6.0 Marks)

1.b. Obtain the expression for Transfer function of a closed loop control system with negative feedback. (7.0 Marks)

1.c. Write the equation for the electrical circuit given. Obtain FV and FI analogy for the given electrical circuit with suitable equations and circuits. (7.0 Marks)



2.a. List all the four standard test signals with their mathematical and graphical representations and also obtain the relation between them.
(10.0 Marks)

2.b. Obtain the expression for the step response of a second order system.
(10.0 Marks)

3.a. Draw the root locus diagram for a closed loop system whose loop transfer function is given by:

$$G(s)H(s) = \frac{k}{s(s+5)(s+10)} \quad (10.0 \text{ Marks})$$

3.b. State RH criterion and mention its advantages and limitations. Check whether the given system is Stable or not using RH criterion, $s^4 + 2s^3 + 6s^2 + 4s + 1 = 0$
(10.0 Marks)

4.a. Using Nyquist stability criterion check the closed loop stability of the following system function given below

$$G(s)H(s) = \frac{s+2}{(s+1)(s-1)}$$

(10.0 Marks)

4.b. Sketch the Bode plot for the given system function and comment on the stability.

$$G(S).H(s) = \frac{2(S+0.5)}{S^2(S+1)(S+0.5)}$$

(10.0 Marks)

5.a. Draw the Lead compensation circuit and its transfer function. Deduce that max frequency of compensation is geometric mean of two corner frequencies.

(10.0 Marks)

5.b. Explain proportional controller and realize it using opamp circuit. Mention the effects of the proportional controller with respect to its response.

(10.0 Marks)