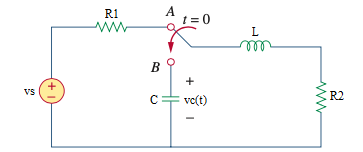
8.14 Main question



Given vs = 80 V, r1= 30 Ω, r2= 8 Ω, c = 1/4 F, l= 4 H

Find

Variables

Random variables

vs = {10:100};

r1 = {20:40};

Global variables

#vs = 80; r1 = 30; r2 = 8; c = 1/4;

l = 4; time = 1;

# t = 0-

vc0 = 0;

# t = 0+

alpha = r2/(2\*l);

w0 = 1/sqrt(l\*c);

A1 = (-vs/(r1+r2))/c;

A2 = vc0;

vct = (A2+A1\*time)\*exp(-alpha\*time);

Part (กรอกคำตอบ)

1. *vc*(0-) = vc0 = 0 V

2. *vc*(0+) = vc0 = 0 V

3. *α* = alpha = 1 s^-1

4. *ω*0 = w0 = 1 rad/s

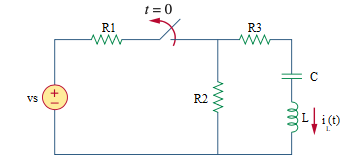
At *t* > 0

5. *vc*(*t*) = (A2+A1\*t)\*exp(-alpha\*t)

= (-8.42\*t)\*exp(-t) V

6. *vc*(time*τ*) = vct = -3.0975 V

8.16 Main question



Given vs = 30 V, r1= 10 Ω, r2= 40 Ω, r3= 60 Ω, c = 1 mF, l= 2.5 H

Find

Variables

Random variables

vs = {10:30};

r1 = {2:5};

Global variables

#vs = 30; r1 = 10; r2 = 40; r3 = 60; c = 1e-3;

l = 2.5; time = 1;

# t = 0-

vc0 = (vs\*r2)/(r1+r2);

il0 = 0;

# t = 0+

alpha = (r2+r3)/(2\*l);

w0 = 1/sqrt(l\*c);

A1 = (-1/l)\*((r2+r3)\*il0+vc0);

A2 = il0;

ilt = (A2+A1\*time)\*exp(-alpha\*time);

Part (กรอกคำตอบ)

1. *vc*(0-) = vc0 = 24 V

2. *vc*(0+) = vc0 = 24 V

3. *α* = alpha = 20 s^-1

4. *ω*0 = w0 = 20 rad/s

At *t* > 0

5. *il*(*t*) = (A2+A1\*t)\*exp(-alpha\*t)

= (-9.6\*t)\*exp(-20t) A

6. *il*(time*τ*) = ilt = -1.9787e-8 A

8.24 Main question

Chart, schematic

Description automatically generated

Given is = 4 A, r1= 20 Ω, r2= 5 Ω, c = 10 mF, l= 1 H

Find

Variables

Random variables

is = {1:5};

r1 = {1:20};

Global variables

#is = 4; r1 = 20; r2 = 5; c = 10e-3;

l = 1; time = 1;

# t = 0-

il0 = is;

# t = 0+

alpha = 1/(2\*r2\*c);

w0 = 1/sqrt(l\*c);

A1 = alpha\*A2;

A2 = il0;

ilt = (A2+A1\*time)\*exp(-alpha\*time);

Part (กรอกคำตอบ)

1. *il*(0-) = il0 = 4 A

2. *il*(0+) = il0 = 4 A

3. *α* = alpha = 10 s^-1

4. *ω*0 = w0 = 10 rad/s

At *t* > 0

5. *il*(*t*) = (A2+A1\*t)\*exp(-alpha\*t)

= (4+40\*t)\*exp(-10t) A

6. *il*(time*τ*) = ilt = 0.002 A

8.25 Main question

Schematic

Description automatically generated with medium confidence

Given vs = 30 V, r1= 2 Ω, r2= 1 Ω, c = 1 F, l= 4 H

Find

Variables

Random variables

#l < 4\*r\*r\*c Parallel, c < 4\*r\*r/l Series

vs = {10:30};

r1 = {2:5};

Global variables

#vs = 30; r1 = 2; r2 = 1; c = 1;

l = 4; time = 1;

# t = 0-

il0 = vs/(r1+r2);

vc0 = r2/(r1+r2)\*vs;

# t = 0+

alpha = 1/(2\*r2\*c);

w0 = 1/sqrt(l\*c);

A1 = alpha\*A2;

A2 = vc0;

vct = (A2+A1\*time)\*exp(-alpha\*time);

Part (กรอกคำตอบ)

1. *vc*(0-) = vc0 = 10 V

2. *vc*(0+) = vc0 = 10 V

3. *α* = alpha = 0.5 s^-1

4. *ω*0 = w0 = 0.5 rad/s

At *t* > 0

5. *vc*(*t*) = (A2+A1\*t)\*exp(-alpha\*t)

= (10+5\*t)\*exp(-0.5t) V

6. *vc*(time*τ*) = vct = 9.098 V