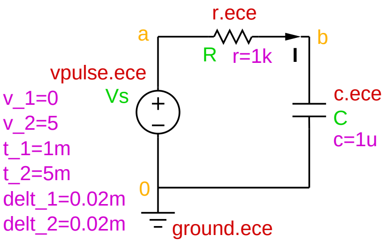
# SEQUEL exercise




Output variables

v_a=nodev_of_a

v_b=nodev_of_b

i_R=i1_of_R

Solve sections

transient simulation

back_euler=yes

t_start=0

t_end=10m

delt_const=0.05m

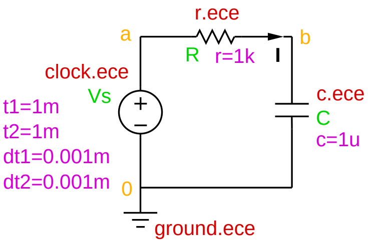
output block:

filename=rc1.dat

variables: v_a v_b i_R

1. Plot v_a and v_b (versus time) on the same plot.
2. Plot i_R in a separate plot.
3. Plot v_a, v_b, i_R on the same plot.
4. Change R to 0.1 K, and see its effect on the results.

# SEQUEL exercise




Output variables

v_a=nodev_of_a

v_b=nodev_of_b

i_R=i1_of_R

Solve sections

transient simulation

back_euler=yes

t_start=0

t_end=10m

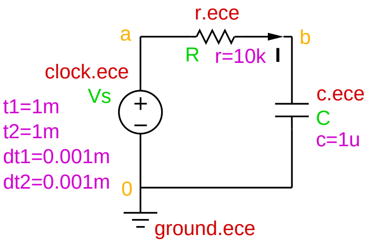
delt_const=0.001m

output block:

filename=rc1.dat

variables: v_a v_b i_R

1. Plot v_a and v_b (versus time) on the same plot.
2. Plot i_R in a separate plot.
3. Plot v_a, v_b, i_R on the same plot.
4. Change R to 0.1 K, and see its effect on the results.




Output variables

v_a=nodev_of_a

v_b=nodev_of_b

i_R=i1_of_R

Solve sections

SSW analysis

back_euler=yes

t_start=0

ssw_period=2m

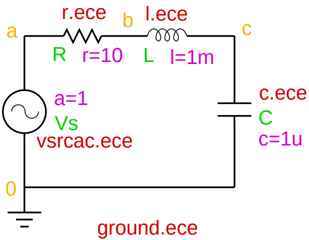
delt_const=0.001m

output block:

  filename=rc1.dat

  variables: v_a v_b i_R

1. Plot v_a and v_b (versus time) on the same plot.
2. Plot i_R in a separate plot.
3. Derive a general expression for the lower and upper limits between which v_b varies in the steady state.



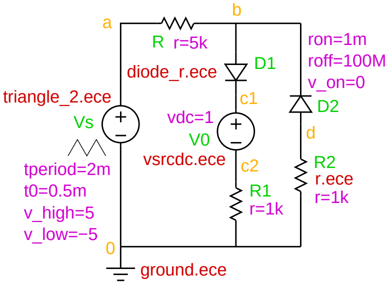

Output variables

i_R_ac=i1ac_of_R

1. Plot |i| as a function of frequency (semi−log).
2. Plot angle(i) as a function of frequency (semi−log).
3. Decrease R by a factor of 2 and repeat.
   (Plot the two cases together.)

Solve sections

AC simulation
vary_frequency
    100 to 100k
    type=log
    n_points=500
output block:
    filename=rlc1.dat
    variables:
        phase_of_i_R_ac
        mag_of_i_R_ac




Output variables

v_a=nodev_of_a

v_b=nodev_of_b

i_D1=i1_of_D1

i_D2=i1_of_D2

Solve sections

transient simulation

back_euler=yes

t_start=0

t_end=2m

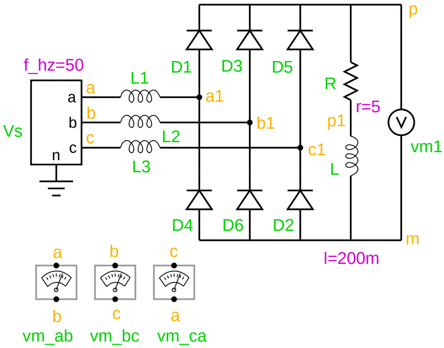
delt_const=1u

output block:

variables: v_a v_b i_D1 i_D2

1. Plot v_a and v_b versus time.
2. Plot v_b versus v_a. Explain the plot.
3. Plot i_D1 and i_D2 versus v_a.
4. Change v_on from 0 to 0.7 and repeat.
5. Replace diode_r.ece with diode_spice_1.ece and repeat.

# SEQUEL exercise




Output variables

i_D1=i1_of_D1
v_ab=v1_of_vm_ab
i_L1=i1_of_L1
v_out=v1_of_vm1
(etc)

Solve sections

SSW analysis
back_euler=yes
t_start=0
ssw_period=20m
delt_const=0.02m
output block 1
    variables: v_out v_ab
chk_rhs2=no
chk_delx_volt=yes
delxmax_volt=0.1
ssw_norm=1e−12

Elements

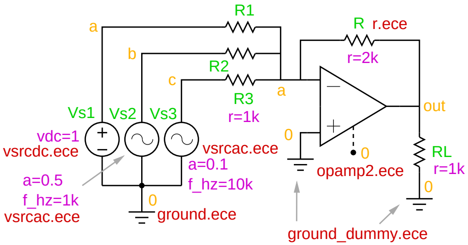
vsrcac3.ece
l.ece, r.ece
diode_r.ece
voltmeter.ece
vdiff.ece

Global parameters

1. For Vs, v_a=v_b=v_c=v0=560
2. For diodes, ron=r_on=0.1m
3. For diodes, roff=r_off=1M
4. For diodes, v_on=v_on=0
5. L1=L2=L3=L0=1u

1. Plot v_out and v_ab versus time.
2. Plot i_D1 versus time.
3. Make L0=0.5m and repeat.

# SEQUEL exercise




Output variables

v_a=nodev_of_a
v_b=nodev_of_b
v_c=nodev_of_c
v_o=nodev_of_out

Solve sections

transient simulation
back_euler=yes
t_start=0
t_end=5m
delt_const=1u
output block:
variables: v_a v_b v_c v_o

1. Note the use of ground_dummy.ece.
2. opamp2.ece is a linear Op Amp model.
3. Plot v_a, v_b, v_c, v_o versus time