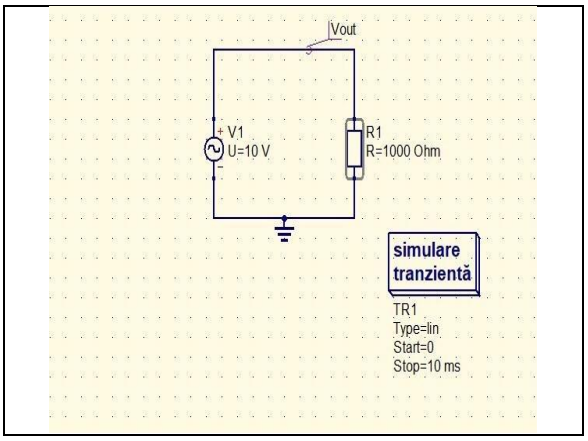
Stuparu Elena Natalia | Stoica Radu Iulian | 412D | 6.04.2021
Student 1 – nume și prenume | Student 2 – nume și prenume | Grupa | Data

Fișă laborator 2 - online
rev. 1

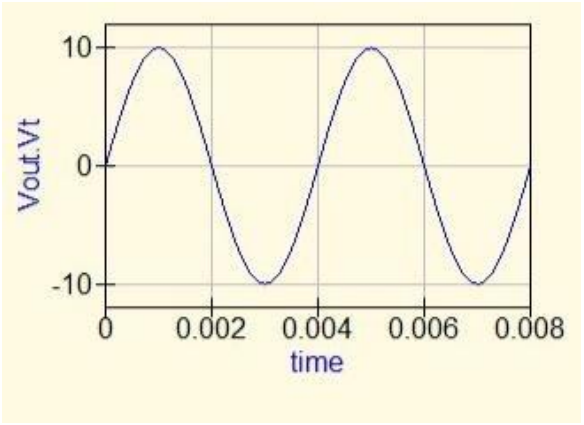
ID =69

1. Vizualizarea semnalului sinusoidal

a) f_i =250Hz T_i = 4ms A_i =10V Stop =2T=8ms

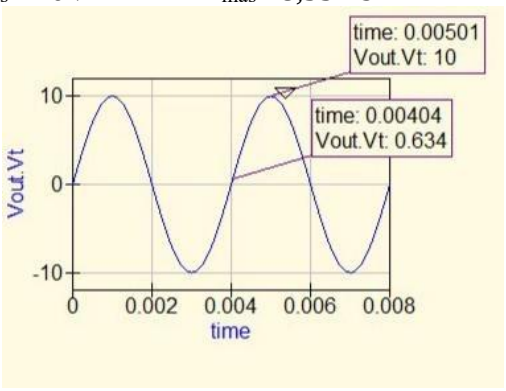


Schema montaj



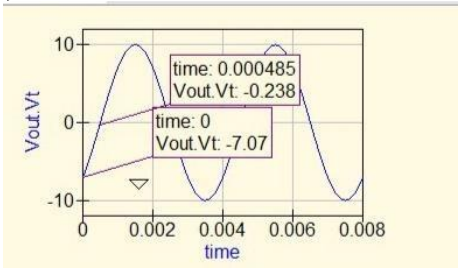
grafic V_{out}

b) $A_{măs}$ =10V $T_{măs}$ =8,99ms



grafic V_{out} cu markeri

c) Δt_1 =0,485ms



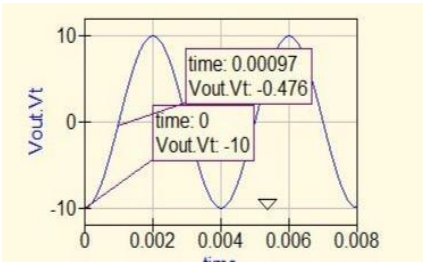
grafic V_{out} cu faza = -45 grade

relație Δt_1 , T_i : $\Delta t_1 = T_i \frac{-45}{360}$

Explicații imagine:

Cu un defazaj de -45 grade, semnalul sinusoidal Va porni de la -7,07. Astfel se produce o intarziere (Δt1) intre momentul 0 si momentul in care Semnalul trece prima data prin valoarea 0.

Δt_2 =0,97ms



grafic V_{out} cu faza = -90 grade

relație Δt_2 , T_i : . $\Delta t_2 = T_i \frac{-90}{360}$

Explicații imagine:

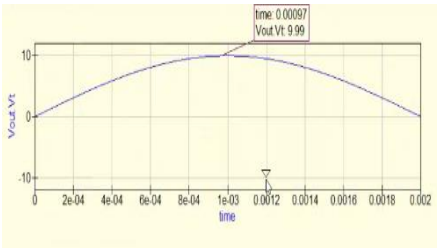
Cu un defazaj de -90 grade, semnalul sinusoidal va porni de la -10. Astfel se produce o Intarziere.

$\Delta t_{1\_calculat}$ =0,5 ms $\Delta t_{2\_calculat}$ =1ms

d) N_x = *5div* C_x = ***0,8ms/div*** $T_{i\_măs}$ ***=4ms***

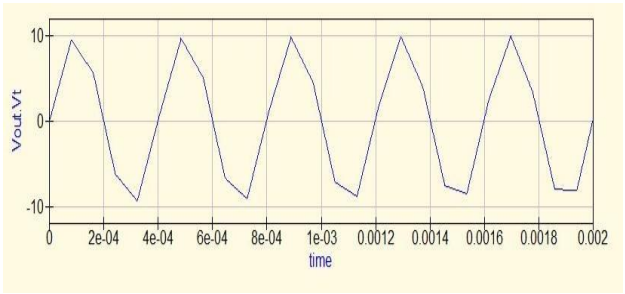
e) *Stop =* T_1 *=4ms Step =0,4ms*

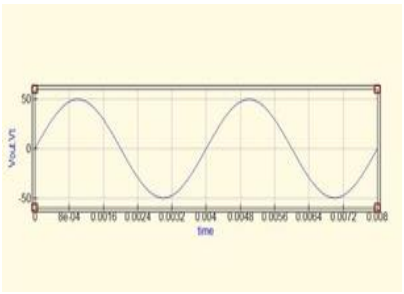
Stop = $T_1/2$ *=2ms Step =0,2ms*



N_x ***=5div*** C_x ***=0,4ms/div*** $T_{i\_măs}$ ***=4ms*** N_x = *10div* C_x = ***0,2ms/div*** $T_{i\_măs}$ ***=2ms***

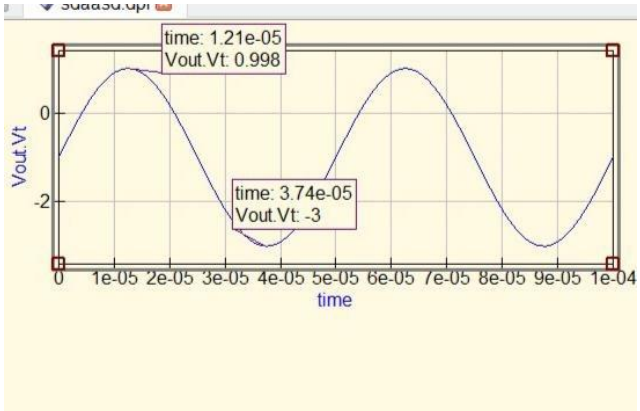
f) f_2 =2500Hz A_2 =50V





2. Setarea și măsurarea unui semnal sinusoidal cu componentă continuă

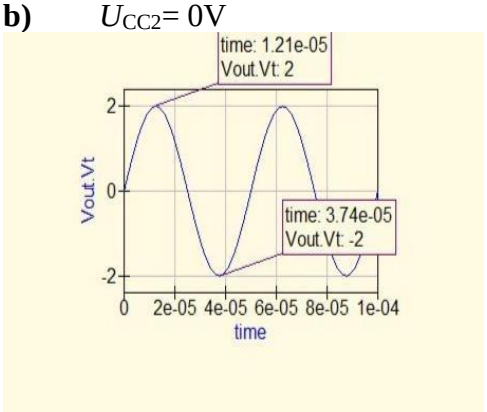
a) f_1=20kHz U_V=2V U_{CC1}= -1V

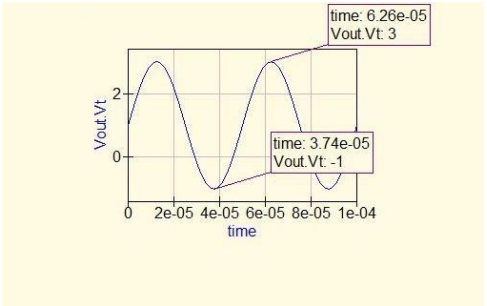


schemă grafic *u(t)* cu cursori

U_{max} =0,998V U_{min} =-3V

b) U_{CC2}= 0V U_{CC3}= 1V





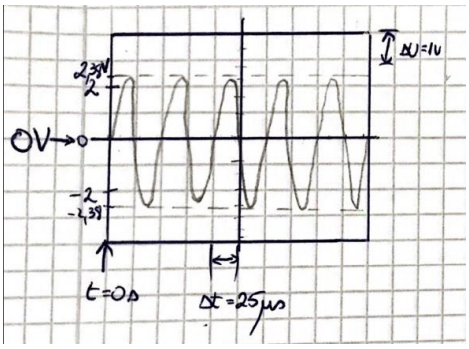
U_{max} = 2V U_{min} =-2V U_{max} =3V U_{min} =-1V

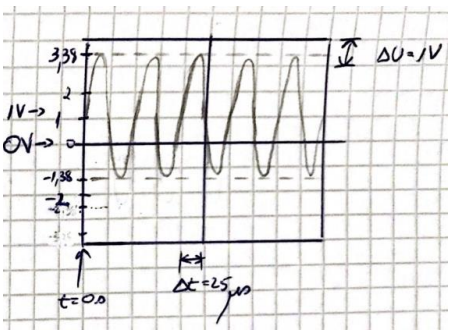
Explicați efectul c.c. asupra graficelor:

Introducerea unei componente continue produce simetria graficului fata de nivelul care ia valoarea lui U_{cc}.

Explicație comutare AC → DC cînd U_{CC}= +1V:
Graficul se deplaseaza in sus cu o diviziune.

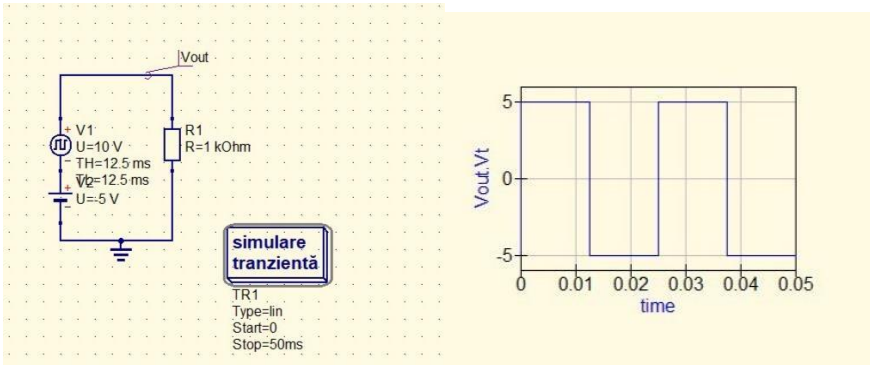
c) U_{CC2}= 0V U_{CC3}= 1V





3. Setarea unui semnal dreptunghiular; factorul de umplere

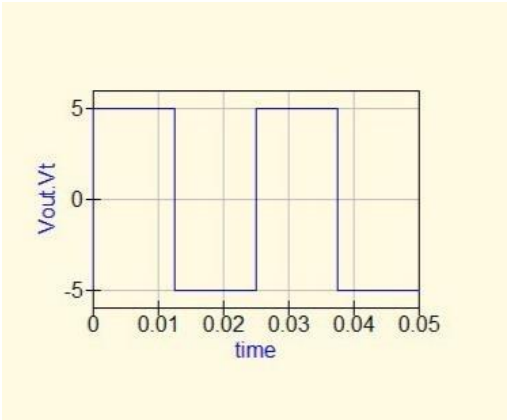
a) A_i =5V f_i = 40Hz T_i = 0,025s Stop =50ms



schemă

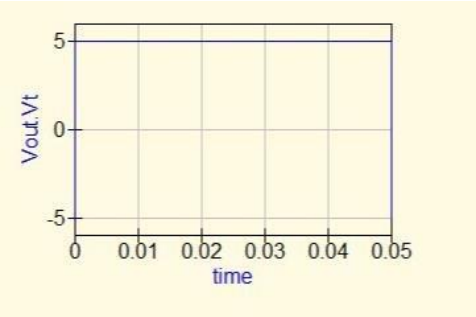
τ_1 = 0,00625s T_1 =0,0125s η_{m1} =50%

b) η_i = 50%



τ_2 =0,00625s T_2 =0,0125s η_{m2}=50%

Explicație valori extreme η :

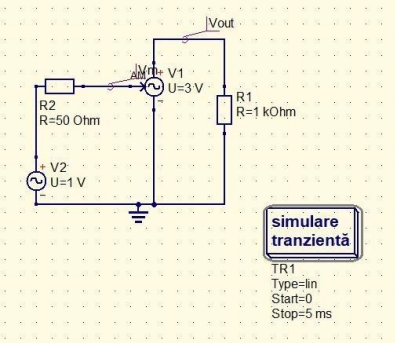


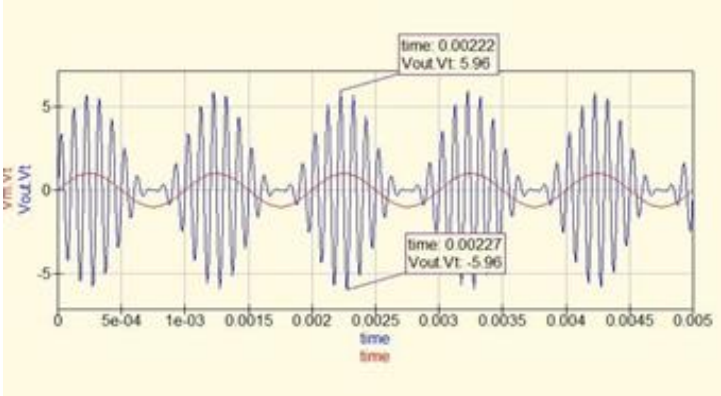
Cand factorul de umplere ajunge la valoarea 100%, semnalul devine constant in timp, luand valoarea amplitudinii semnalului dreptunghiular, iar in cazul in care ajunge la valoarea 0%, semnalul va fi tot constant in timp, dar de data aceasta va lua valoarea amplitudinii componentei continue.

4. Generarea unui semnal modulat în amplitudine

a) $U_1 = 3V$ $f_1 = 20\ kHz$ $m=1$ $U_2 = 1V$ $f_2 = 1\ kHz$

Stop = 5ms *Step =0,5ms*





schema

$A(t) = A*(1+m*f(t)) = A(1+1*U_2)$

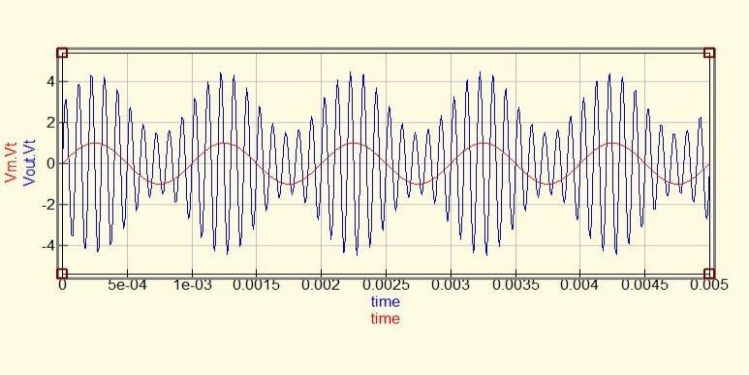
$u(t) = A(t)*\sin(wt)$

limitele u(t): *măsurate* $A_{min} = -5,96$ V $A_{max} = 5,96$V

calculate: $A_{min_calc} = -6$V $A_{max_calc} = 6$V

b) $m=0.5$

Stop =5ms *Step =0,5ms*



A_{min} = -4,43V A_{max} =4,42V A_{min_calc} = -4,5V A_{max_calc} =4,5V

Explicație *m* :Indicele de modulatie arata cat de mare e deviatia de frecventa fata de frecventa semnalului informational.

Explicație *m=0* :Daca indicele de modulatie este egal cu 0, amplitudinea creste cu m=0, deci amplitudinea lui V_m comanda amplitudinea semnalului $V_{out.}$