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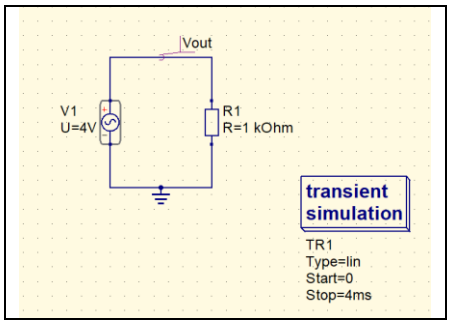
Student 1 – nume şi prenume | Student 2 – nume şi prenume | Grupa | Data

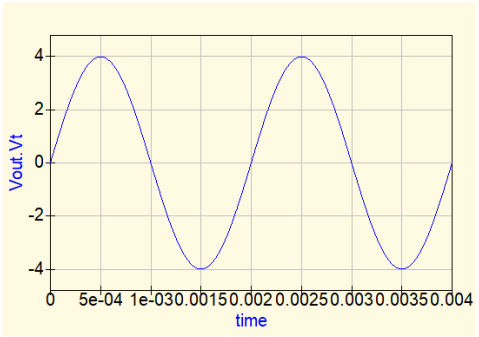
Fişă laborator 2 - online
rev. 1

ID =61

1. Vizualizarea semnalului sinusoidal

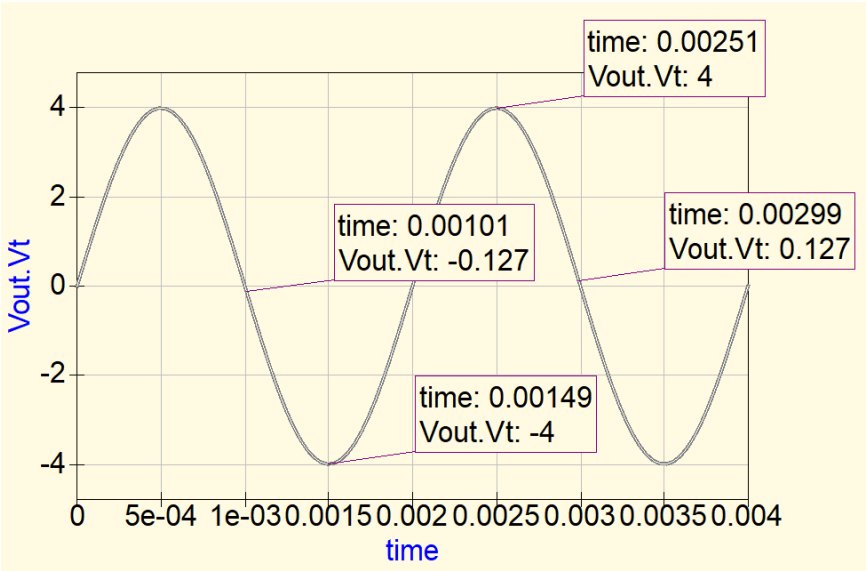
a) f_i =500Hz T_i = 2ms A_i =2V Stop =4ms





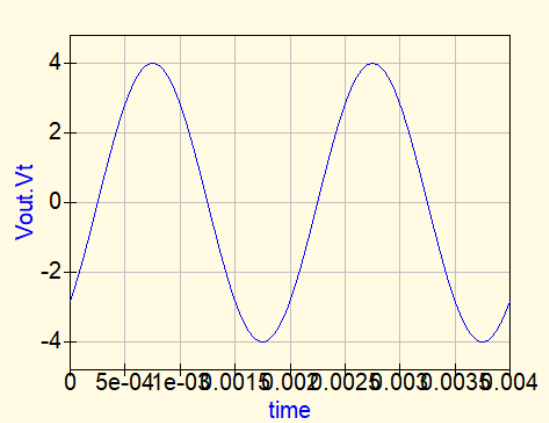
schemă montaj *grafic V_{out}*

b) $A_{măs}$ =[4-(-4)]/2=4V $T_{măs}$ =0.00299-0.00101=0.00198=1.98ms

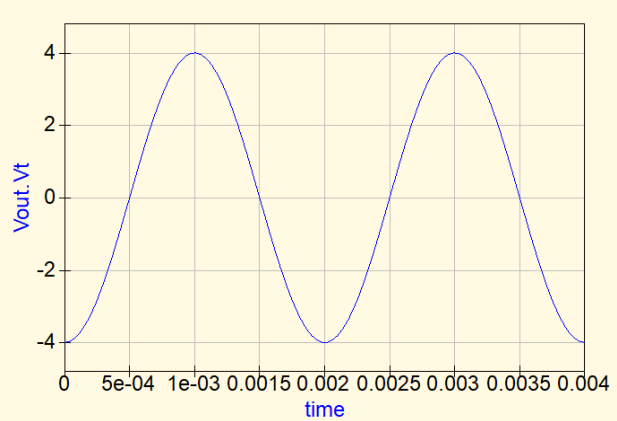


grafic V_{out} cu markeri

c) Δt_1 =0.000242s



Δt_2 =0.000485s



grafic V_{out} cu faza = -45 grade
relație Δt_1 , T_i : $\Delta t_1 = Ti*\varphi/360$
Explicații imagine
In prima imagine putem vedea faptul ca semnalul este deplasat putin spre dreapta din cauza faptului ca avem faza=-45 de grade, sinusoida fiind in continuare cuprinsa intre -4 si 4 .

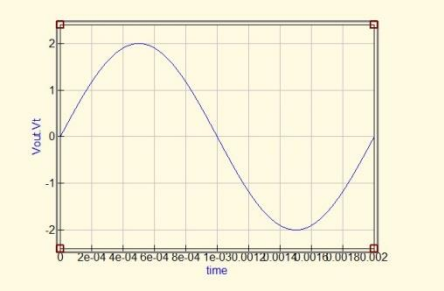
grafic V_{out} cu faza = -90 grade
relație Δt_2 , T_i : $\Delta t_2 = Ti*\varphi/360$
Explicații imagine:
In a doua imagine putem vedea faptul ca semnalul este deplasat mai mult spre dreapta din cauza faptului ca avem faza=-90 de grade, sinusoida fiind in continuare cuprinsa intre -4 si 4.

$\Delta t_{1\_calculat}$ =0.000250s

$\Delta t_{2\_calculat}$ =0.000500s

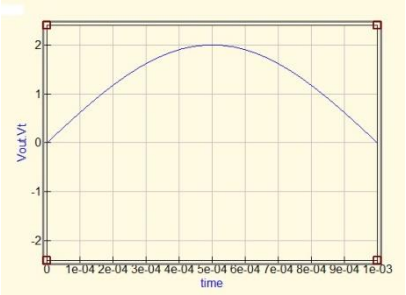
d) N_x =5 div C_x =4ms/div $T_{i\_măs}$ =20ms

e) *Stop = T_1 =0.002s* *Step =0.0002s*



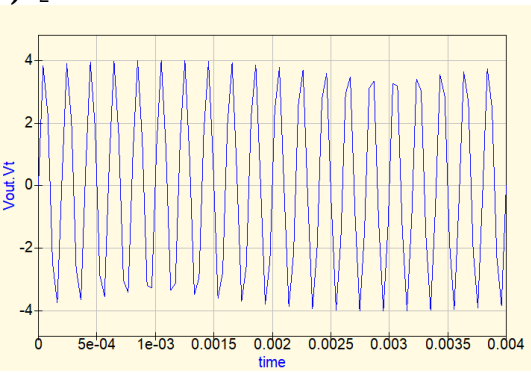
N_x =10 div C_x =0.2ms/div $T_{i\_măs}$ =2ms

Stop = $T_1/2$ =0.001s *Step =0.0001s*

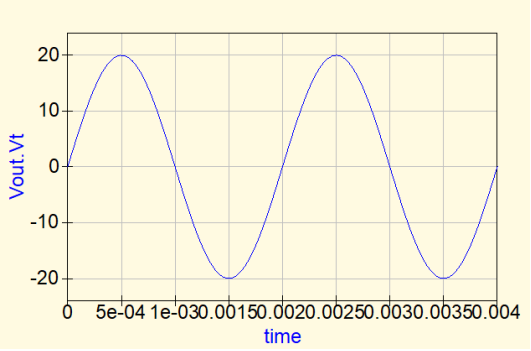


N_x =20div C_x = 0.1ms/div $T_{i\_măs}$ =2ms

f) f_2 =5000Hz

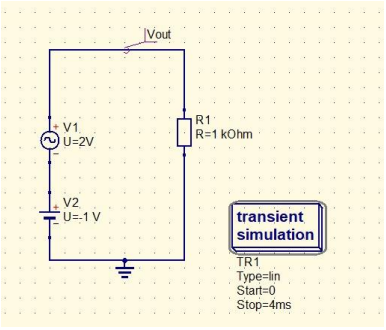


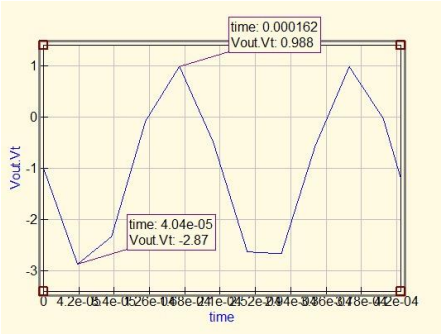
A_2 =10V



2. Setarea și măsurarea unui semnal sinusoidal cu componentă continuă

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

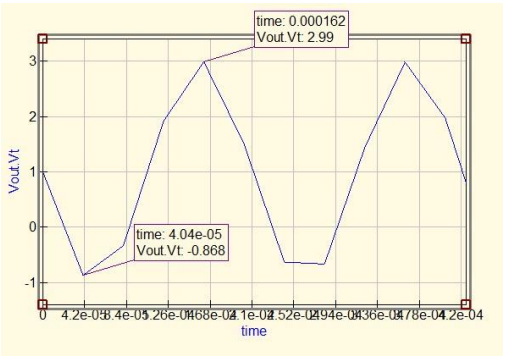




schemă grafic *u(t)* cu cursori

U_{max} = 0.988V U_{min} =-2.87V

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

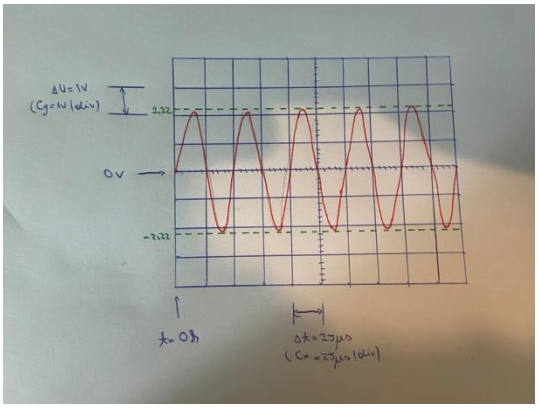


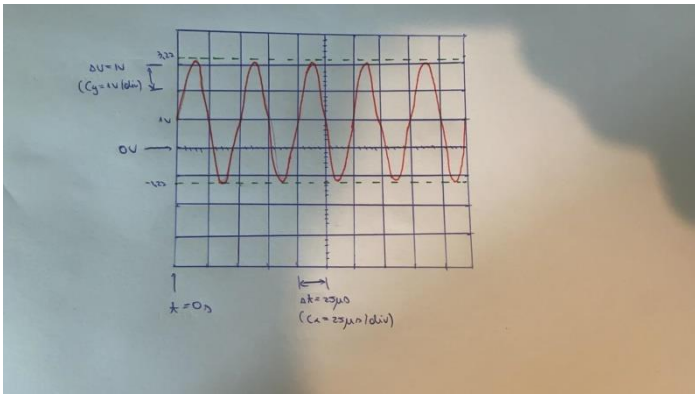
U_{max} = 1.99V U_{min} =-1.87V U_{max} = 2.99V U_{min} =-0.868V

Explicați efectul c.c. asupra graficelor:
Prin efectul c.c. putem observa faptul ca intregul grafic se deplaseaza in sus cu o singura diviziune, fapt ilustrat si comparand cele 2 imagini de mai sus.

Explicație comutare AC → DC cînd U_{CC}= +1V:
Cand butonul de cuplaj este trecut de pe pozitia AC(fara c.c) pe pozitia DC(cu c.c.) semnalul sinusoidal se deplaseaza pe verticala in sus cu Ny=1div.componenta continua are valoare pozitiva)

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

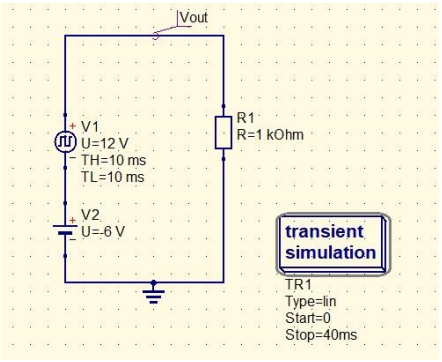


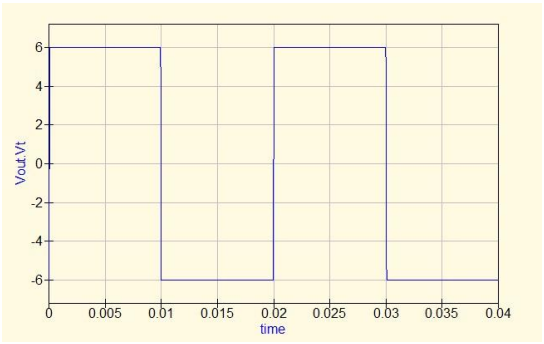


desenați obligatoriu săgeata corespunzătoare nivelului de 0 !

3. Setarea unui semnal dreptunghiular; factorul de umplere

a) A_i =6V f_i =50Hz T_i =0.02s Stop =40ms





schemă

τ_1 = 0.01s T_1 =0.02s η_{m1} =50%

b) η_i =25

τ_2 =0.005s T_2 =0.01s η_{m2}=50%

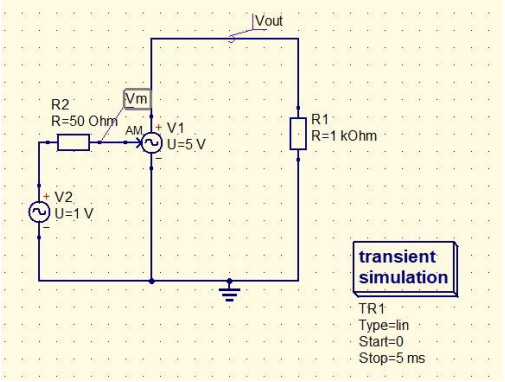
Explicație valori extreme η :

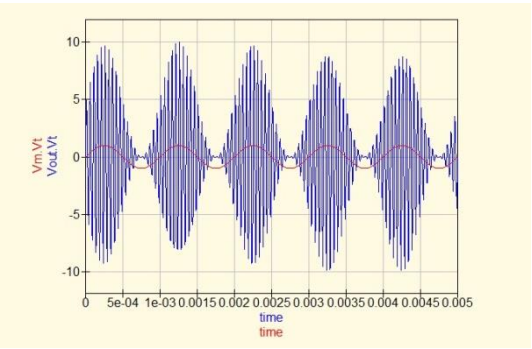
Daca η = 100% atunci raportul τ/T=1=> τ=T ceea ce este eronat, iar in cazul in care η = 0% inseamna ca τ=0 ceea ce din nou este eronat.

4. Generarea unui semnal modulat în amplitudine

a) U_1 =5V f_1 = 20 kHz m=1 U_2 =1V f_2 = 1 kHz

Stop =5ms *Step* =0.5ms





schema

$A(t) = A(1+f(t)) = A(1+\text{Asin}(\omega t)) = U(1+Usin(2\pi f))$

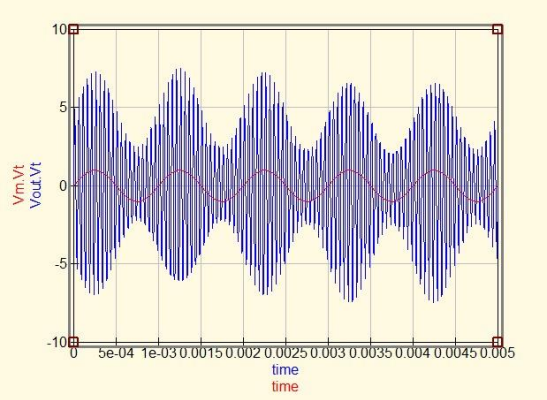
$u(t) = U(1+Usin(2\pi f))\sin(2\pi f)$

limitele u(t): *măsurate* A_{min} = -10V A_{max} =10V

calculate: A_{min_calc} = -9.92 A_{max_calc} =9.92

b) *m=0.5*

Stop =5ms *Step* =0.5ms



A_{min} = -7V A_{max} =7V A_{min_calc} = -6.95V A_{max_calc} =6.95V

Explicație *m* :Cand m scade, A scade.

Explicație *m=0* :A(t)=A