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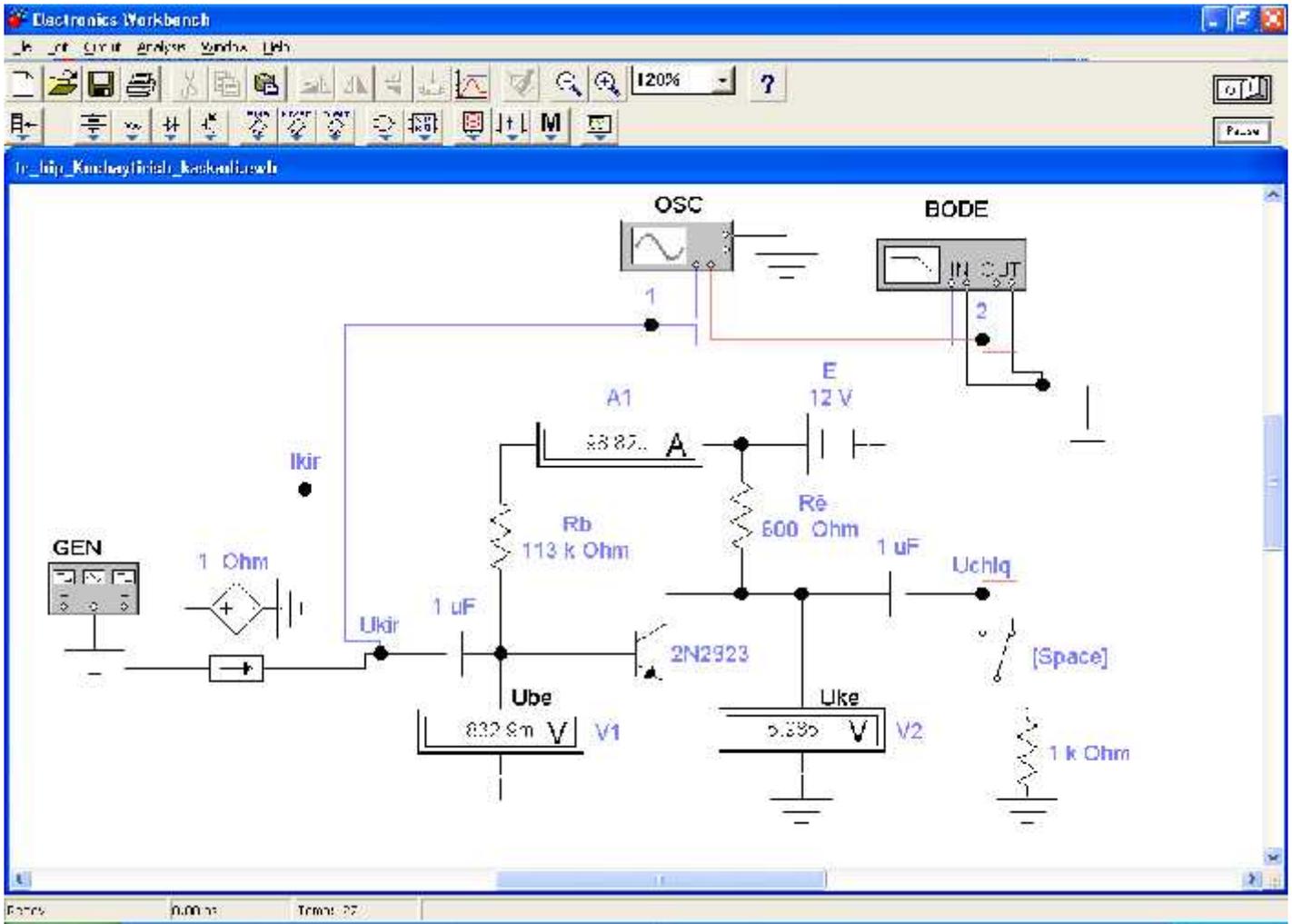
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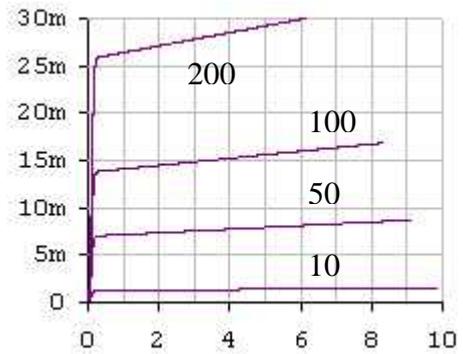
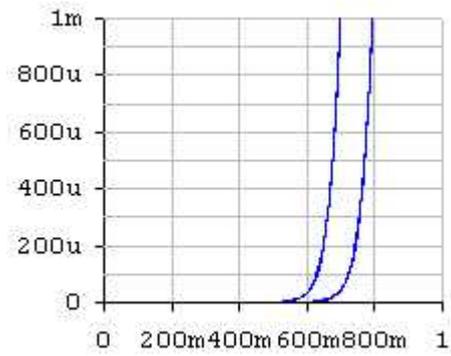
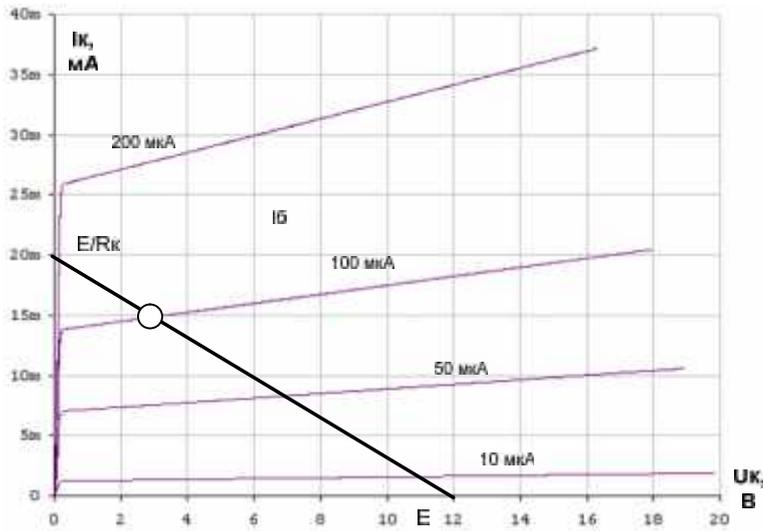
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100

10

$$I = 100 \quad U = 0.7 \quad R = 600 \quad R = (E - U) / I = (12 - 0.7) / 100 \cdot 10^{-6} =$$

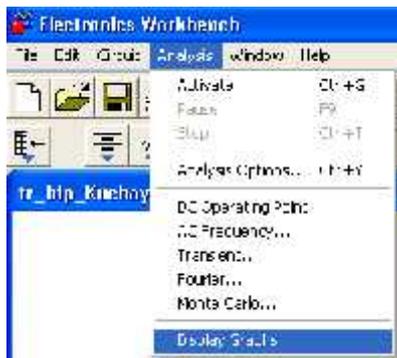
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2- .

V1 V2 . A1 - U I - U
 bode plotter .
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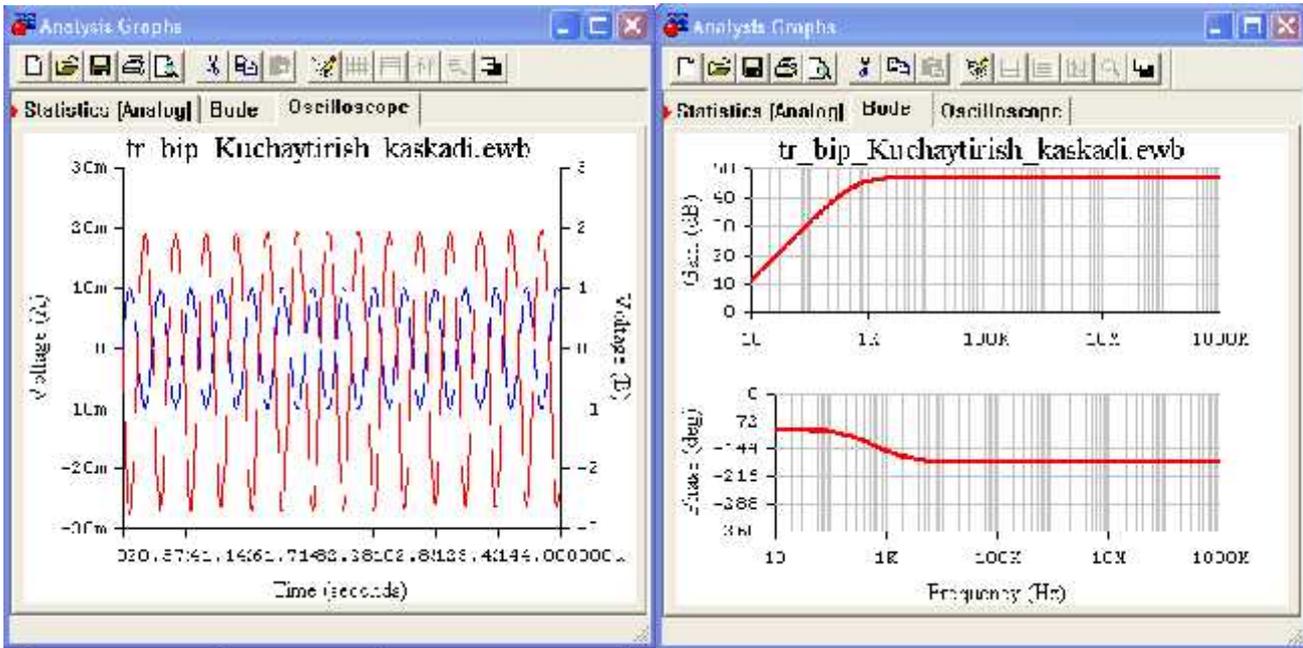
1. EWB
 2. 1-
 3. Ctrl G
 4. Ctrl T
 5. / / Analysis
- Display Graphs (3-).



3- . Display Graphs

6.

Display Graphs Oscilloscope
Bode (4-).



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7.
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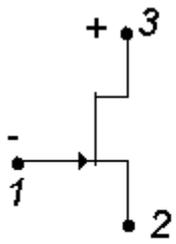
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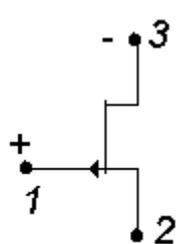
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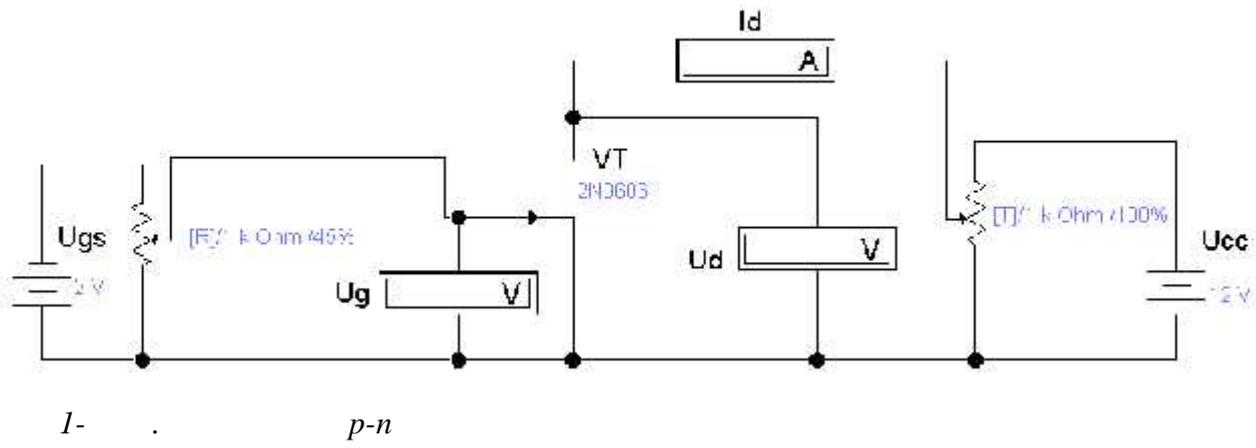
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(3),

1. U_g , U_d , U_{cc} , I_d



2. U_d , I_d , U_g

3. U_g , I_d

4. $S = dI_d/dU_g$, $I_d = f(U_d)$

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- 2.
- 3.
- 4.
- 4.

3-

:
 ()
 ()
 p-n-

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(0.2...1 n- 2...4 -)

()

1. - 3-

2. U_g U_b ($I_d=f_1(U_d)$, $U_g=const$)

3. -

$$(I_d = f_2(U_g), U_d = \text{const})$$

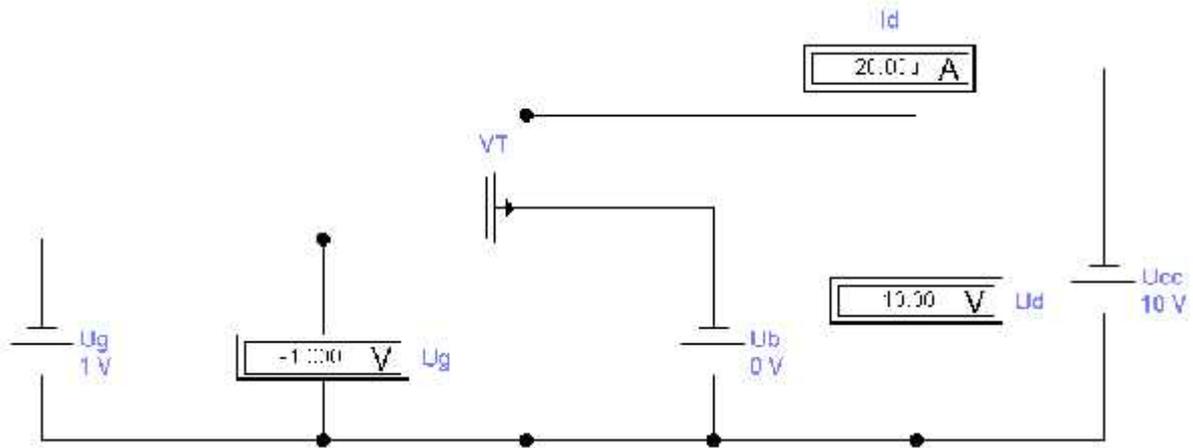
4

5.

$$S_b = dI_d / dU_g$$

6.

$$M = dU_d / dU_g$$



1.10-

1.

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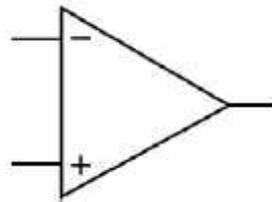
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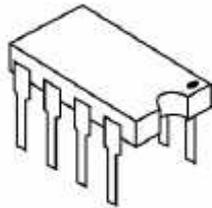
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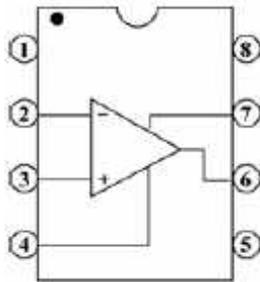
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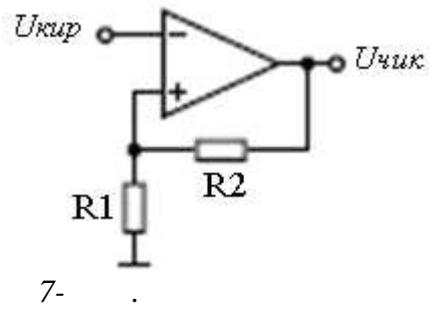


4- . 140 6

; 3- ; 6- ; 7-

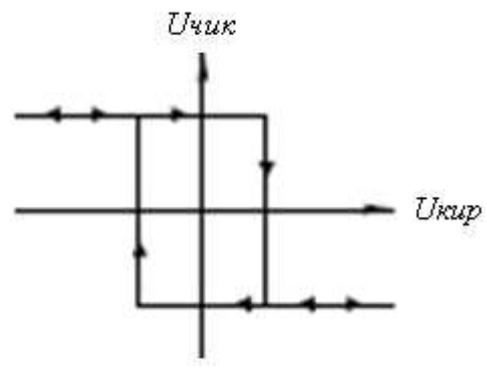
(; 4- U_+ (+15); 8-

); 1- ; 2- U_- (-15); 5-



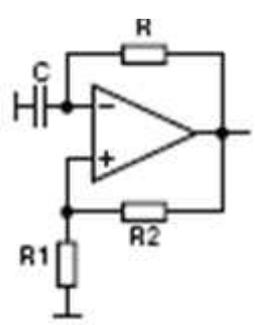
7-

(8-). ()



8-

9- , R, R1, R2



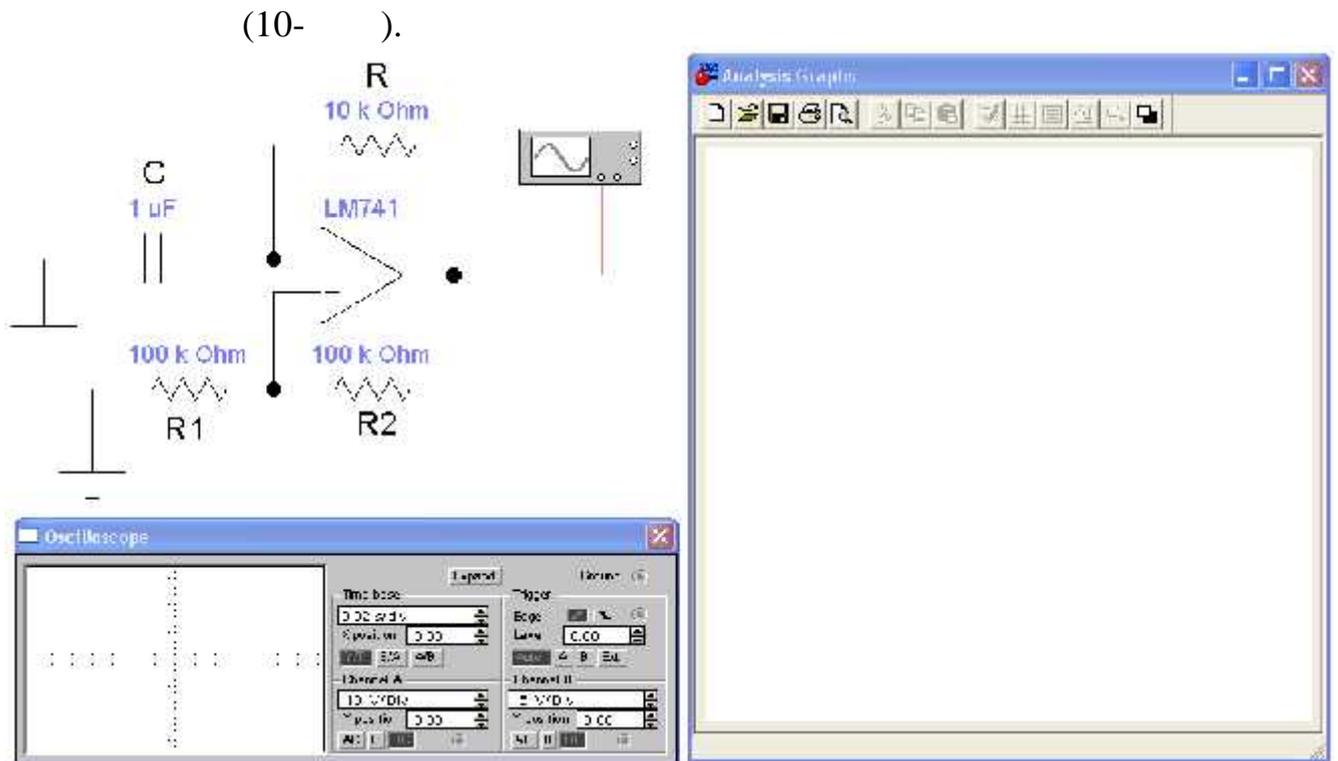
9-

RC-

$$f = \frac{1}{2RC \ln\left(1 + \frac{2R_1}{R_2}\right)}$$

1. Electronics Workbench

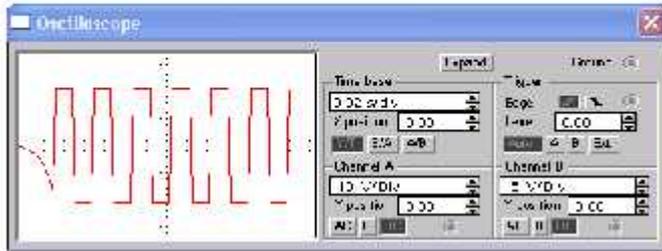
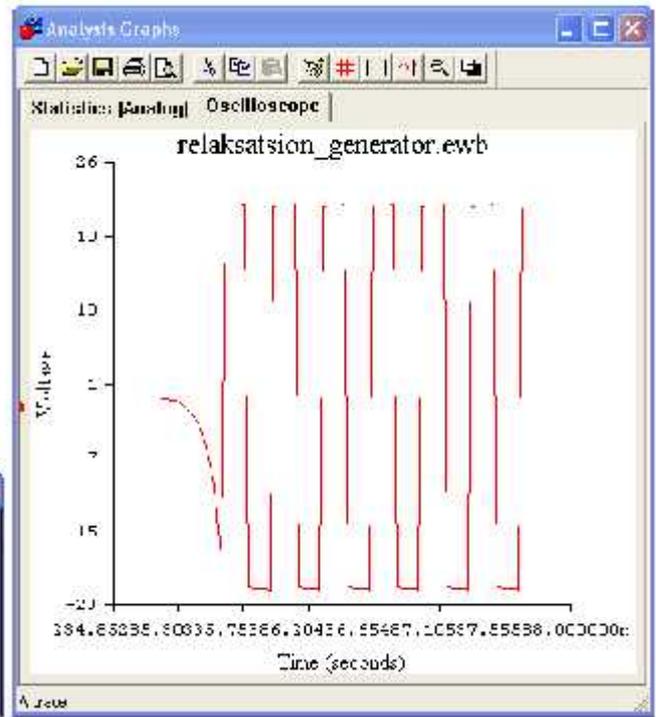
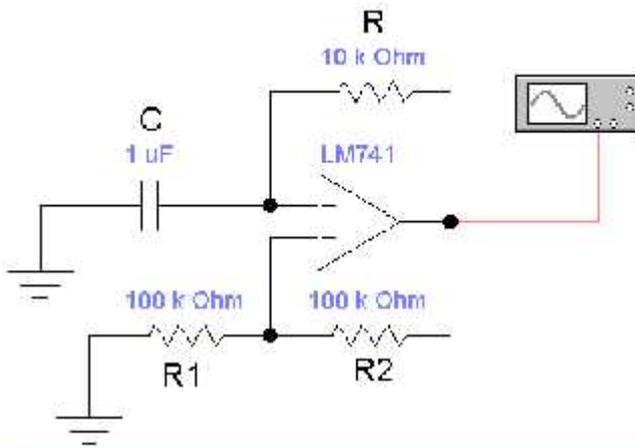
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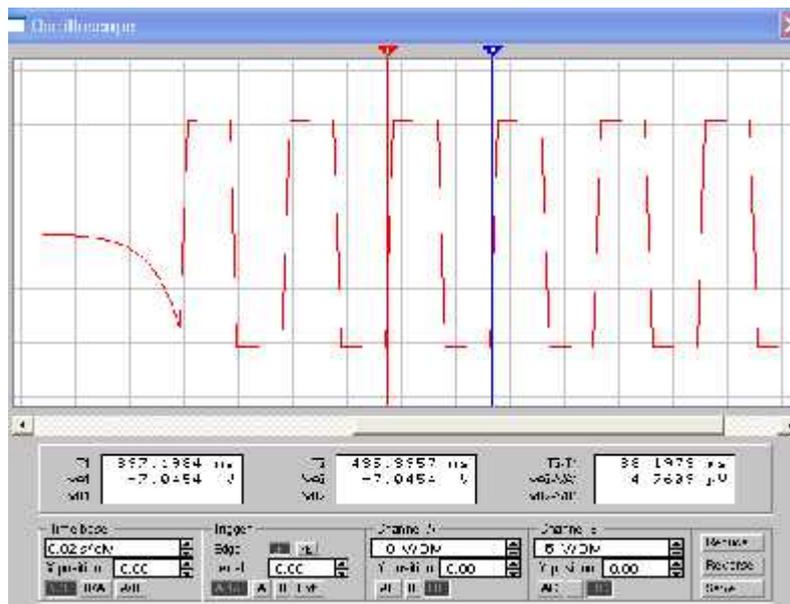
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3.

4.

Expand
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(12-



12-

(2- 1)

1

. $f=1/(2- 1)$

$$f = \frac{1}{2RC \ln(1 + \frac{2R_1}{R_2})}$$

5.

6.

7.

8.

1-

1-

n/n	R,	R1,	R2,	C,
1	100	10	51	15
2	100	10	51	33
3	100	10	100	15
4	100	10	200	33
5	51	100	1000	68
6	100	51	1000	33
7	100	100	2000	15

5-

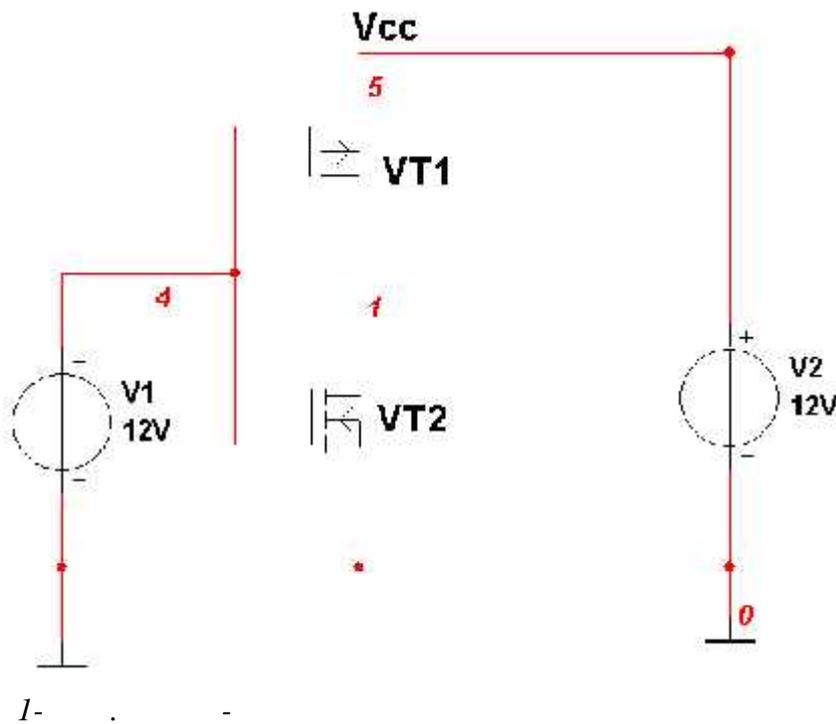
Multisim-2001

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1. Multisim-2001

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2.

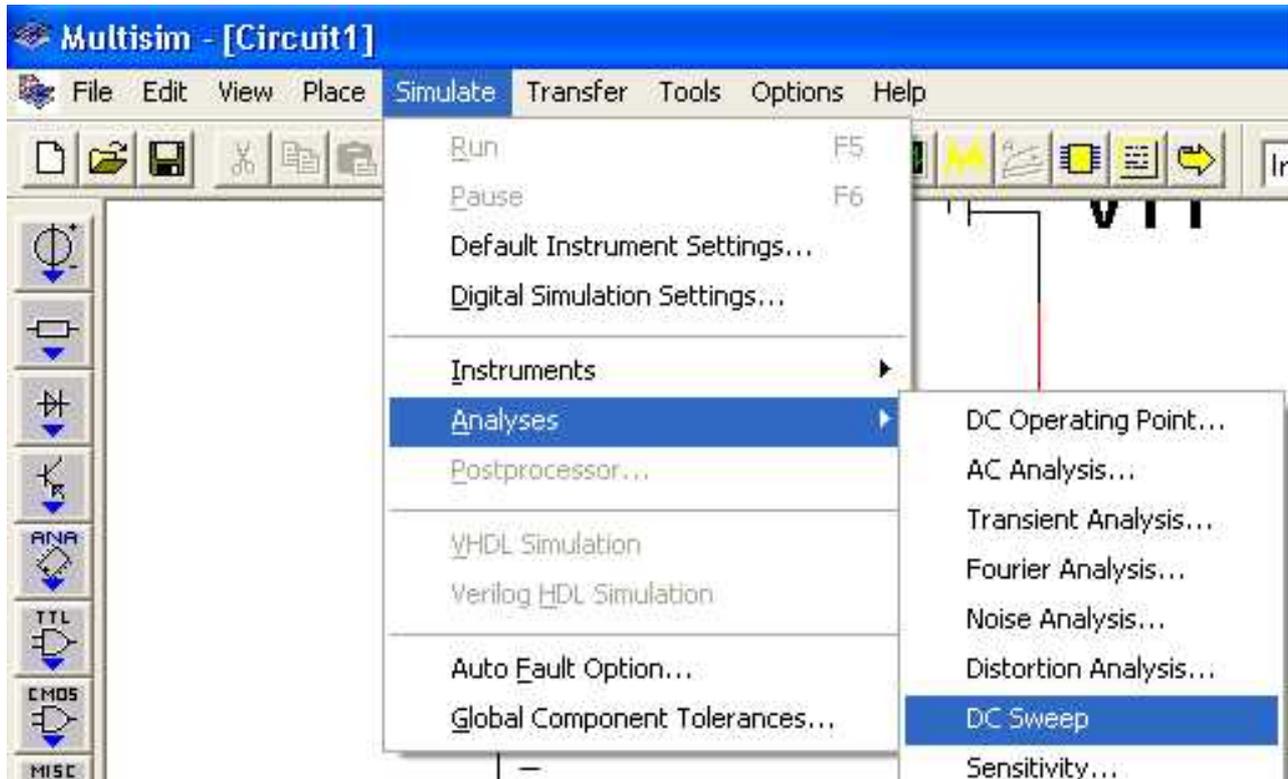
Analyses

DC Sweep

Multisim-2001

Simulate

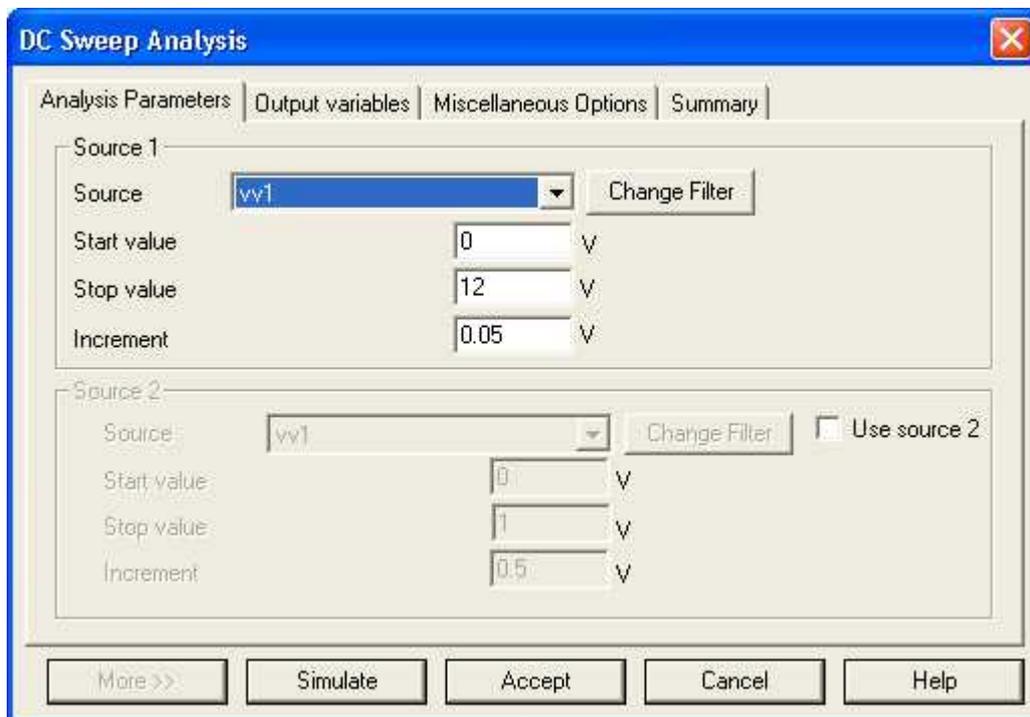
(2-).



2- . Multisim-2001 Simulate

3. Analysis Parameters

Stop value (, Start value (3-) Increment

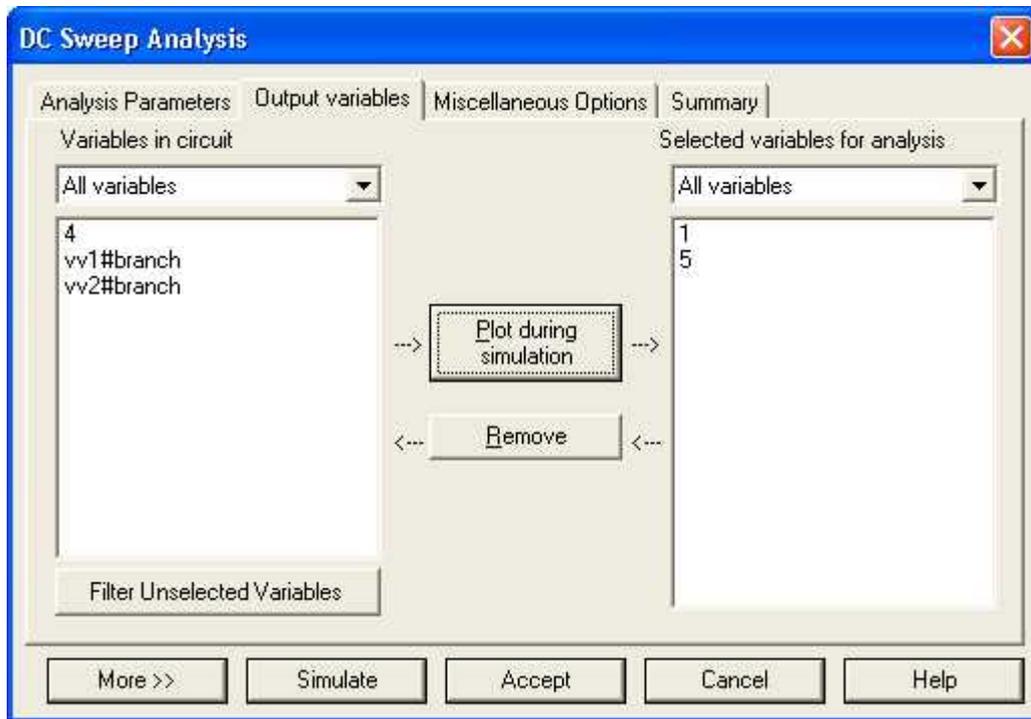


3- . Multisim-2001 Analysis Parameters

4. Output variables
Variables in circuit

Plot during simulation
Selected variables for analysis

(4-).

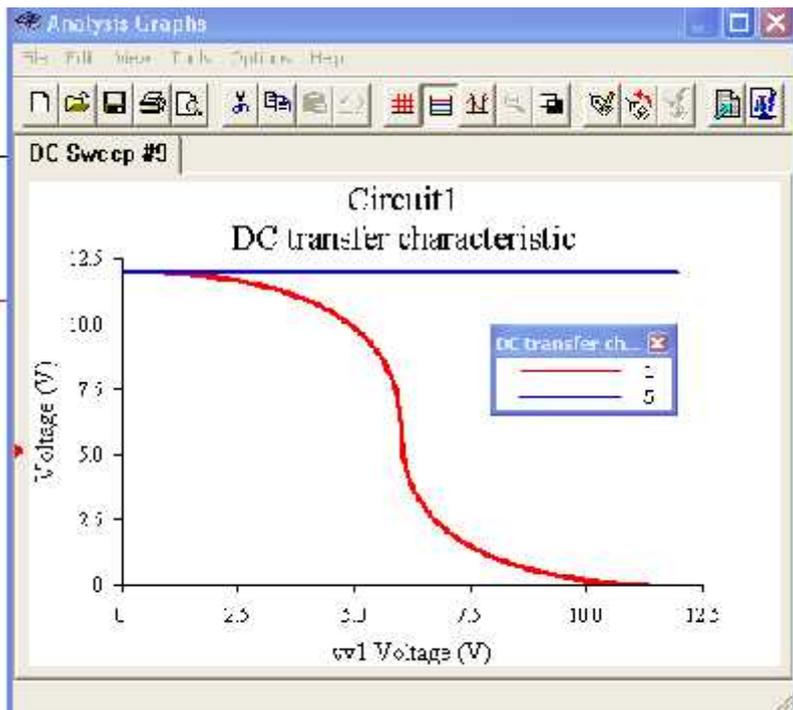


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5.

Simulate

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6. - - n- - (6-).

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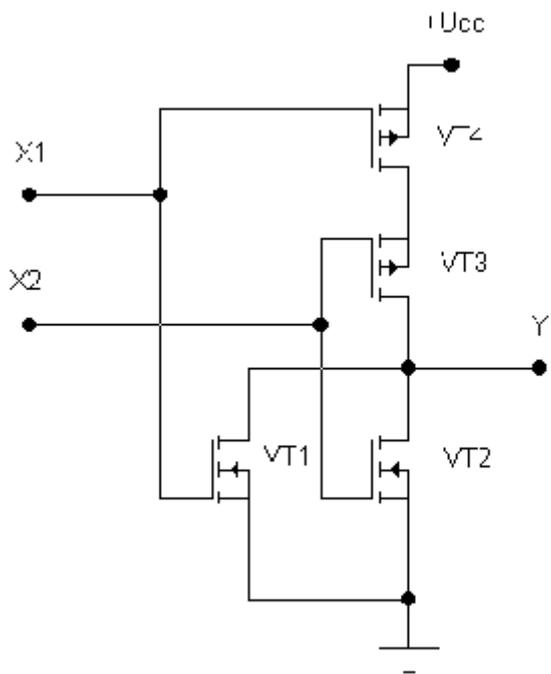
7. - 1 VT1

VT4

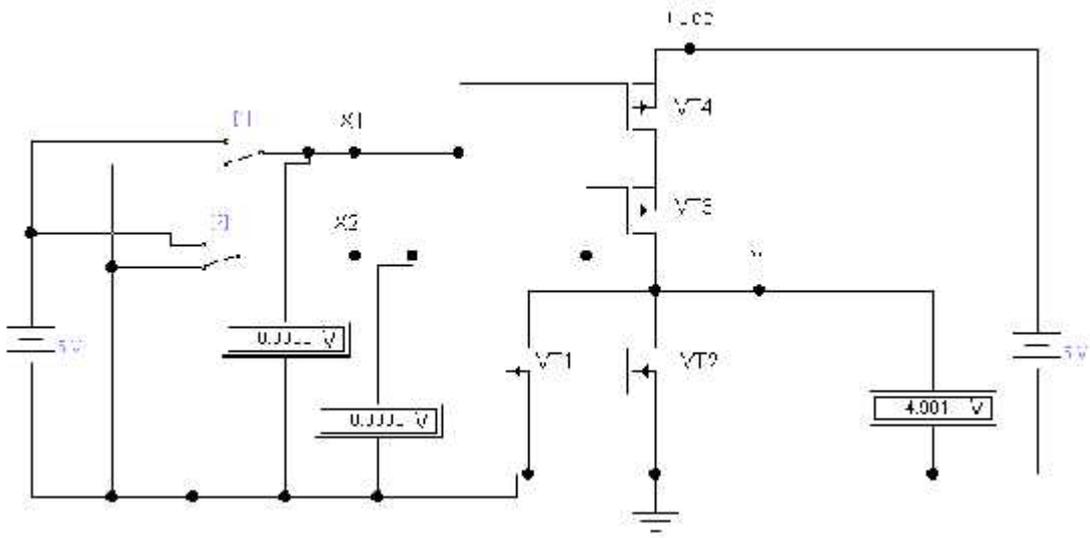
8.

9. (1 2) (7-)

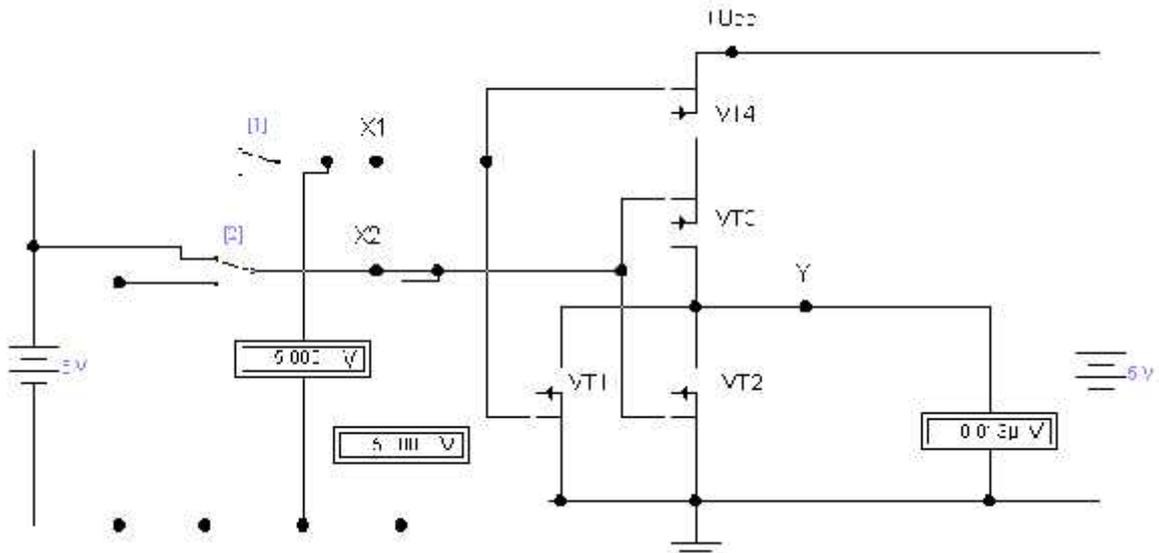
10. (8-)



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7- . . -



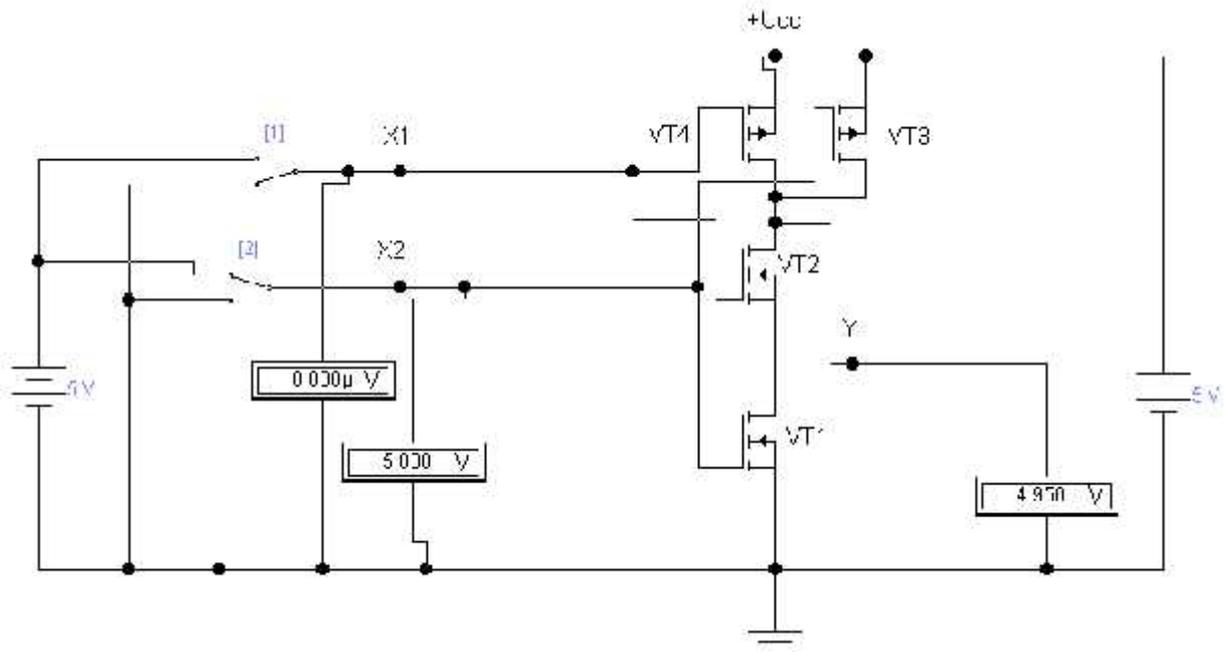
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11. - (9-) n-

12.

13. (1 2)

14.



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