電子學 試題　　（限用答案本作答）

可使用計算机

一、單選選擇題 (每題四分，共六十分)

1. (　) In a common-source amplifier, the output voltage is　(a) 180° out of phase with the input　(b) in phase with the input　(c) taken at the source　(d) taken at the drain　(e) answers (a) & (c)　(f) answers (a) and (d)

2. (　) A common source amplifier has a load resistance of 10kΩ and R_D=820Ω. If g_m=5 mS and V_{in}=500mv, the output signal voltage is (a)1.89 V (b) 2.05V (c) 25V (d)0.5V

3. (　) The common-gate amplifier differs from both the common-source and common-drain configurations in that it has a (a)much higher voltage gain　(b)much lower voltage gain (c)much higher input resistance (d) much lower input resistance

4. (　) Determine the Miller INPUT capacitance in Figure 1. (a)812pF (b) 912pF(c) 4pF (d)10 pF

5. (　) Determine the Miller OUTPUT capacitance in Figure 1. (a)812pF (b) 912pF(c) 4pF (d)10 pF

6. (　) In a step response test of a certain amplifier, rise time t_r=20ns. What is critical upper frequency f_{cu} (a) 116MHz (b) 13.5MHz (c) 17.5MHz(d) 146MHz

7. (　) A certain transistor has an unity frequency (f_T) of 175MHz. When this transistor is used in an amplifier with a midrange voltage gain of 50, what bandwidth can be achieved ideally (a)175MHz (b) 3.5MHz (c) 17.5MHz(d) 146MHz

Figure 1

8. (　) Determine the V_{out} (max) =?V of Figure 2 (a)11.4 (b)-11.4 (c)-7.94 (d)7.94 (e) none in above
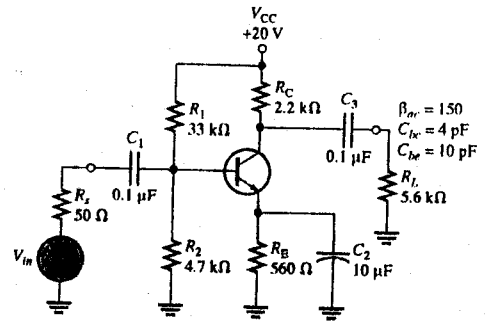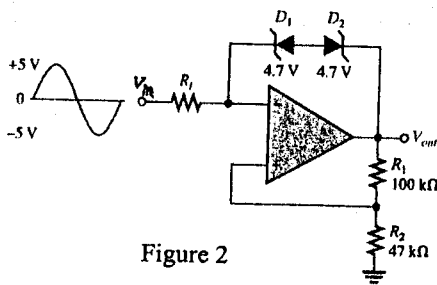

Figure 2
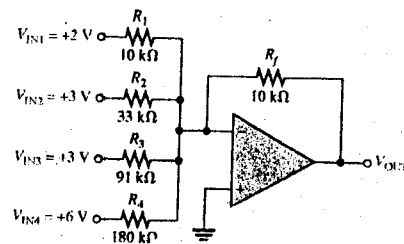

Figure 3

9. (　) In figure 3, find the output voltage when the input voltage are applied to the scaling adder.? V (a) 3.57 (b) -3.57 (c) 3.23(d)-3.23 (e) none in above

10. (　) In figure 3, what is the current (μA) through R_f (a) 35.7 (b) 357 (c) 3.57 (d) 75.3 (e) none in above

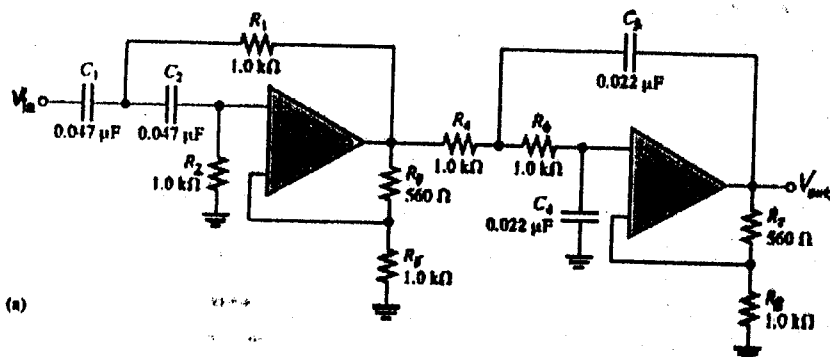11. (　) determine the center frequency of figure 4? kHz (a) 3.39 (b) 7.23 (c) 45 (d) 4.95

figure 4

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12.(　　) Discuss the low-frequency response of the BJT amplifier in figure 5.　The critical frequency of input network of C_1 is (a) 578Hz (b) 6.89kHz (c) 177Hz (d) 410Hz (e) 102kHz

13.(　　) In figure 5, the critical frequency of ouput network of C_3 is (a) 578Hz (b) 6.89kHz (c) 177Hz (d) 410Hz (e) 102kHz

14.(　　) In figure 5, the critical frequency of bypass network of C_2 is (a) 578Hz (b) 6.89kHz (c) 177Hz (d) 410Hz (e) 102kHz

15.(　　) What is the voltage gain of figure 5 (a)34.7 (b)86.6 (c)66.7 (d)90.1

Figure 5

$\beta_{DC} = \beta_{ac} = 125$
$C_{be} = 25$ pF
$C_{bc} = 10$ pF
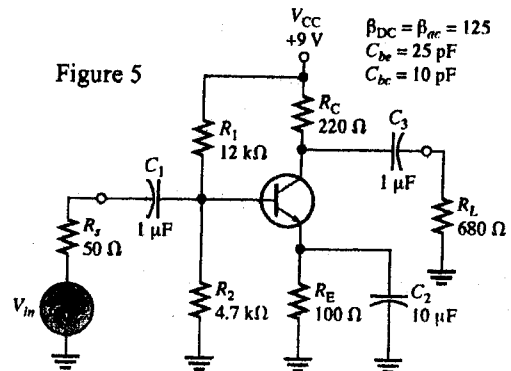
二、非選擇題(共四十分)

1. Drawing the R_L waveform for each circuit and indicate the peak values. (Assume voltage drop is 0.7 when diode foreword bias). (10 分)
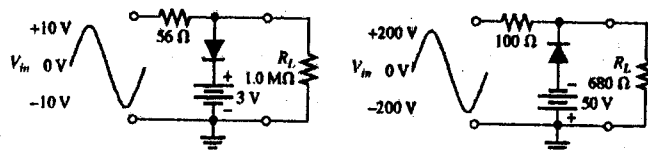

Figure 6 (a)　　　　　　　　　figure 6(b)

2. Determine transistor terminal voltages V_B in figure 7 with respect to ground and I_C.　Do not neglect the input resistance at the base or V_{BE} (10 分)
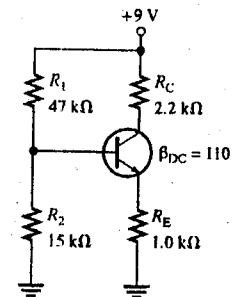

Figure 7

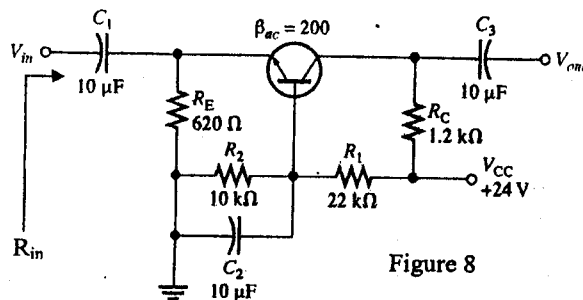3. In Figure 8, find Rin=? Ω and find $A_v(V_{out}/V_{in})$=? Current gain=? Power gain=? (20 分)

Figure 8

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