Kafrelsheikh University
Faculty of Engineering
Department of electrical eng.
Year: 2nd Subject: Electronic eng.
Examiner: **Dr. Bedir Bedir Yousif**

Date: 14/1/2017
Time allowed: 3 Hours
Full mark: 70 Mark
Final term: Two pages
Academic Number:ECE2103

Solve the following questions:-

Question One (20 Mark)

1. Determine the output voltage for the circuit in Fig. 1, (6 marks)

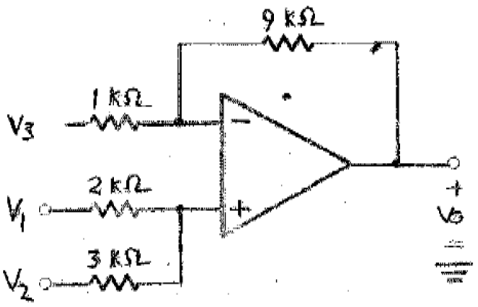


Fig . 1

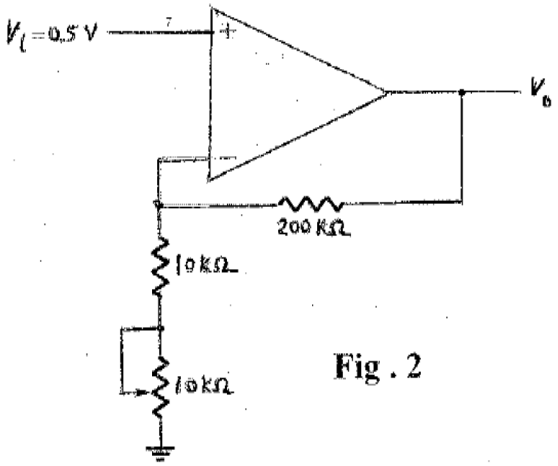


Fig . 2

2. What range of output voltage is developed in the circuit of Fig. 2 (7 marks)
3. Define CMRR and how to experimentally measure CMRR? (7 marks)

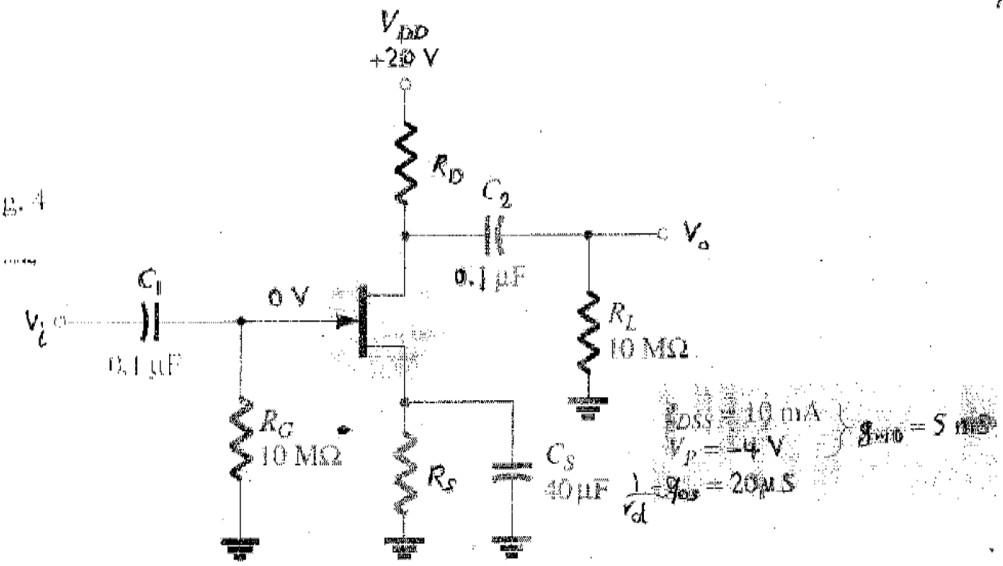
Question Two (30 Mark)

1. Calculate the efficiency of a class B amplifier for a supply voltage of V_{CC} =22 V driving a 4 Ω load with peak output voltages of: a. $V_L(p) = 20$ V. b. $V_L(p) = 4$ V.
2. A transformer-coupled class A amplifier drives a 16- Ω speaker through a 3.87:1 transformer. Using a power supply of $V_{CC} = 36$ V, the circuit delivers 2 W to the load. Calculate:
   a. P(ac) across transformer primary.
   b. V_L(ac).
   c. V(ac) at transformer primary.
   d. The rms values of load and primary current.
3. Explain briefly three different configurations of practical class B power amplifier

Question Three (30 Mark)

1- Choose the values of R_D and R_S for the network of Fig. 3 that will result in a gain of 8 using a relatively high level of g_m for this device defined at $V_{GSQ} = 0.25V_P$.

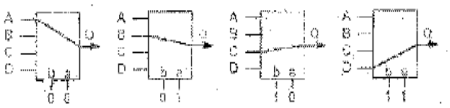
Fig. 4



2- An analog switch uses an n-channel MOSFET with $V_{GS(th)} = 4$ V. A voltage of +8 V is applied to the gate. Determine the maximum peak-to-peak input signal that can be applied if the drain-to-source voltage drop is neglected.

3- An analog switch is used to sample a signal with x(t)=10+5cos2000t + 8 cos 8000t. Determine the minimum frequency of the pulses applied to the MOSFET gate.

4- Design a quad time division multiplexer using an n-channel MOSFET with $V_{GS(th)} = 3$ V. A voltage of +8 V is applied to the gate of each MOSFET during 0.25 μs. Calculate the sampler frequency and maximum signal frequency.



Best wishes of success

Dr. Bedir yousif

$V = 2 \times \frac{V_2}{5}(1+9) = 4V_2$

$= \frac{3V_1}{5}(1+9) = 6V_2$