The Chinese University of Hong Kong

Department of Computer Science and Engineering

CENG2030 Fundamentals of Embedded System Design

Lab 4: Basic Circuit Analysis

Answer Sheet

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1. **KVL and KCL [54%]**
   1. Create and upload the TSC circuit file. [10%]
   2. Voltage measurement

Vcc: \_\_\_5V\_\_\_\_\_\_\_\_ [4%]

V1: \_\_\_\_\_3.33V\_\_\_\_ [4%]

V2: \_\_\_\_1.67V\_\_\_\_\_ [4%]

V3: \_\_\_1.67V\_\_\_\_\_\_ [4%]

Equation: Vcc = \_\_\_\_V1+V3\_\_\_\_\_ [4%]

* 1. Current measurement

I0: \_\_\_\_\_\_-3.33mA\_\_\_\_\_\_\_ [4%]

I1: \_\_\_\_\_\_3.33mA\_\_\_\_\_\_\_ [4%]

I2: \_\_\_\_\_\_-1.67mA\_\_\_\_\_\_\_ [4%]

I3: \_\_\_\_\_\_1.67mA\_\_\_\_\_\_\_ [4%]

Equation: I0 = \_\_\_\_\_\_\_\_\_-I1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [4%]

Equation: I1 = \_\_\_\_\_\_\_\_\_\_I3-I2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [4%]

1. **Passive Low Pass Filter [46%]**
   1. Create and upload your circuit in TSC file. [10%]
   2. Frequency Response
      1. Collected Data [12%]

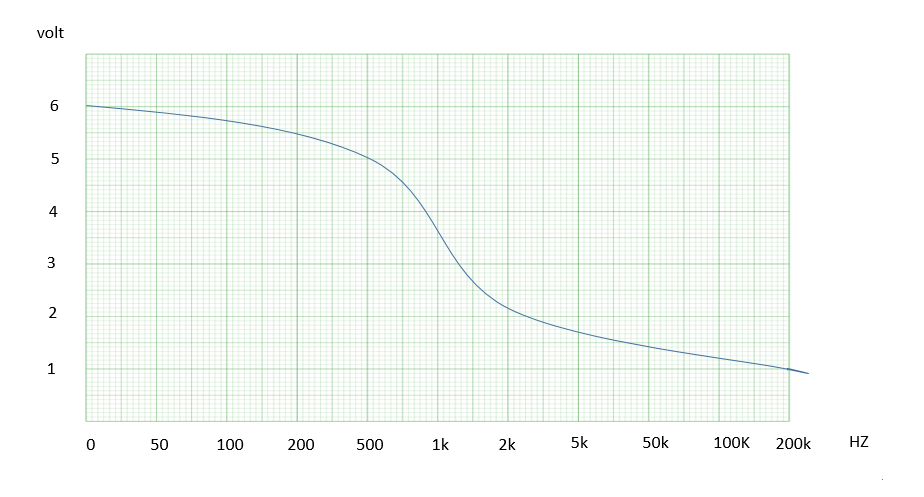
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Frequency of Vin  (Hz) | 50 | 100 | 200 | 500 | 1k | 2k | 5k | 10k | 20k | 50k | 100k | 200k |
| V**p** of Vout  (V) | 5.99V | 5.95V | 5.82V | 5.08V | 3.74V | 2.22V | 943.06mV | 475.96mV | 238.54mV | 95.48mV | 47.74mV | 23.87mV |

1. Cut-off Frequency

fc: = \_\_\_745.7747\_\_\_ [4%]

Vout at fc: \_\_\_\_\_4.24V\_\_\_ [4%]

1. Graph Plotting [16%]



THE END