EE230 Analog Lab   **Spring 2018**
Endsem exam - Part A   **07/04/2018**
Name, roll number:

Notes:
This part is for 1 hour, and carries maximum of 20 points.
You must use ground, and **NOT** use $-12V$ as the negative supply rail for opamps.

1. (5 points) Design an inverting Schmitt trigger circuit, with supply rails as mentioned in the note above. The switching thresholds must be $+8V$ and $+4V$. Sketch the expected output waveform for input sinusoidal signal V_i of $10V\,p-p$, $200Hz$ frequency with a DC offset of $+5V$. **Your circuit must use only $100k\Omega$ resistors.**
   This part should require approximately 20 minutes.

   Ans.

2. Use your circuit from question 1 in the figure below.

   (a) (3 points) What function does block A perform? (take V_c as input, V_i as output, and ignore the MOSFET connection for this part)

   (b) (12 points) For the **entire** circuit, what would be the waveforms for output voltage V_o for following cases: (i) $V_c = 2Vp - p$, $50Hz$ square wave with $2V$ DC offset, (ii) $V_c = 1V$ DC, and (iii) $V_c = 2V$ DC? (*4 points per case*)
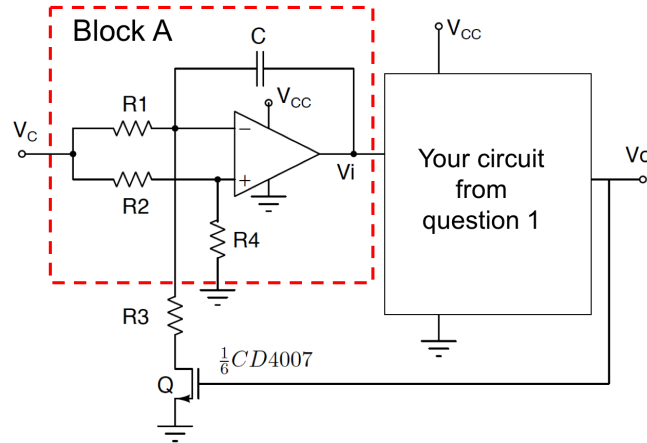

Figure 1: Use R1=100$k\Omega$, C=2.2nF, R2=R3=R4=50$k\Omega$

Ans. Use attached sheet of paper if more space is needed.