userid: \_\_\_\_\_

V DD

V OUT

V IN
V DD

V DD

R REF

V SS

V SS

## For the above circuit

- (1) label the key voltages and current on the circuit diagram.
- (2) describe the purpose of each of the transistors and transistor groups.
- (3) supply the small signal circuit diagram for the above circuit.
- (4) supply an expression for the voltage gain
- (5) supply an expression for the output resistance