ZJU-UIUC Institute
Final Exam, ECE 220

Wednesday 2 January 2019

Name (pinyin and Hanzi):

Student ID:

- **Be sure that your exam booklet has 12 pages.**

- **Write your name and Student ID on the first page.**

- **Some of C's I/O routines and an LC-3 ISA guide are provided. Unlike the first midterm, Patt and Patel's Appendix A will not be available during the exam.**

- **Do not tear the exam apart other than to remove the last two reference pages.**

- **This is a closed book exam. You may <u>not</u> use a calculator.**

- **You are allowed THREE handwritten A4 sheets of notes (both sides).**

- **YOU MAY NOT USE EXTRA PAPER! WRITE ON THE EXAM!**

- **Absolutely no interaction between students is allowed.**

- **Show all work, and clearly indicate any assumptions that you make.**

- **Don't panic, and good luck!**

Problem 1   25 points   _____

Problem 2   15 points   _____

Problem 3   20 points   _____

Problem 4   25 points   _____

Problem 4   15 points   _____

Total   100 points   _____

some of the routines from C's standard I/O library

```
// returns new stream, or NULL on failure
FILE* fopen (const char* path, const char* mode);

// returns 0 on success, or EOF on failure
int fclose (FILE* stream);



// returns char, or EOF on failure
int fgetc (FILE* stream);

// returns s, or NULL on failure
char* fgets (char* s, int size, FILE* stream);

// returns # of elements read, or 0 on failure
size_t fread (void* ptr, size_t size, size_t nmemb, FILE* stream);

// returns # of conversions, or -1 on failure (no conversions)
int fscanf (FILE* stream, const char* format, ...);

// returns # of conversions, or -1 on failure (no conversions)
int sscanf (const char* str, const char* format, ...);



// returns c, or EOF on failure
int fputc (int c, FILE* stream);

// returns value >= 0 on success, < 0 on failure
int fputs (const char* s, FILE* stream);

// returns # of elements written, or 0 on failure
size_t fwrite (const void* ptr, size_t size, size_t nmemb,
               FILE* stream);

// returns # of characters printed, or negative value on failure
int fprintf (FILE* stream, const char* format, ...);

// returns # of characters printed, or negative value on failure
int snprintf (char* str, size_t size, const char* format, ...);
```