The exam will be closed book and closed notes. The following questions are representative of the type of questions that will be on the exam. A sheet summarizing C language syntax will be provided. No calculators will be allowed. There will be 10 problems on the exam: 6 multiple choice/short answer (similar to samples 1-3) and 4 analysis/programming problems (similar to samples 4-6).

1. Which of the following is not a strength of C.
   a) Efficiency
   b) Standard library
   c) Flexibility
   d) Object Oriented Support
   e) None of the above

2. A __________ translates a program into machine instructions.
   a) Compiler
   b) Preprocessor
   c) Linker
   d) Debugger
   e) none of the above

3. What would be printed by the printf() in the following code?
   ```c
   int i=2, j=1;
   switch(j%i)  
   {            
   case 0:  printf("Zero");
   case 1:  printf("One");
   case 2:  printf("Two");
   case 3:  printf("Three"); break;
   default: printf("Default");
   }
   ```
   a) Zero
   b) ZeroOneTwoThreeDefault
   c) Three
   d) OneTwoThree
   e) none of the above

4. What output does the following program fragment produce?
   ```c
   int sum = 0;
   for (int i=1; i<6; i++){
   if(i%2)
   continue;
   sum += i;
   }
   printf("%d\n", sum);
   ```
Write a program that calculates and prints the minimum, maximum and average of 10 integers entered by a user. The integers must be entered using a loop and stored in an array.

```c
#include <stdio.h>
#include <limits.h>

#define NUM_DIGITS 10

int main(void) {
    int a[NUM_DIGITS], minimum=INT_MAX, maximum=INT_MIN;
    float average, sum=0;

    for(int i=0; i<NUM_DIGITS; i++) {
        scanf("%d", &a[i]);
        sum += (float) a[i];
        if(a[i]<minimum)
            minimum=a[i];
        if(a[i]>maximum)
            maximum=a[i];
    }

    average=sum/NUM_DIGITS;
    printf("Minimum value entered: %d\n",minimum);
    printf("Maximum value entered: %d\n",maximum);
    printf("Average value: %.2f",average);
    return 0;
}
```
6. Write a program that reads a 5x5 array of integers and prints the row sums and column sums.

```c
#include <stdio.h>
#define N 5

int main(void) {
  int a[N][N], i, j, sum;

  for (i = 0; i < N; i++) {
    printf("Enter row %d: ", i + 1);
    for (j = 0; j < N; j++)
      scanf("%d", &a[i][j]);
  }

  printf("Row totals:");
  for (i = 0; i < N; i++) {
    sum = 0;
    for (j = 0; j < N; j++)
      sum += a[i][j];
    printf(" %d", sum);
  }
  printf("\n");

  printf("Column totals:");
  for (j = 0; j < N; j++) {
    sum = 0;
    for (i = 0; i < N; i++)
      sum += a[i][j];
    printf(" %d", sum);
  }
  printf("\n");
  return 0;
}
```