

CSE 130

Sample Exam-1

This exam has 3 pages.

(1) [5 points] Mark Yes or No.

(a) The keyboard is an input device. Y N

(b) % is a logical operator. Y N

(c) The C compiler requires that there is at least one comment in each program. Y N

(d) i++ and ++i will have the same effect on variable i, after execution of each. Y N

(e) Every for-loop can be converted to a while-loop. Y N

(2) [10 points] Determine the value of each expression. It could be an integer value or a logical value (true/false).

int a = 6, b = 9, c = 4, d = 2;

(a) !(c > d) _____ (c) (b > 4) || a + d*d > 10 _____

(b) d % b + a _____ (d) d % b == c - 2*d && a > d _____

(3) [8 points] Write a switch statement to calculate annual union dues for an employee that belongs to one of 2 different classes (categories). For class-1 employees, dues are \$100 plus 2% of the salary. For class-2 employees, dues are \$50 plus 1% of the salary. The **default option** should print an error message 'Wrong Class'. Use of **proper syntax** is required.

```
float salary, dues;    int class;
//Assume salary and class have been initialized.
```

(4) [8 points] Some of these declarations/statements contain errors. Indicate which have errors and state the error. **If there is no error, then state that as well.**

(a) int i, j = 0; (b) character c = 'H';

(c) constant float f = 10.0; (d) if (x != 4) x = x+1;

(5) [8 points] You are given a program with **two nested for loops**. The second loop header is not complete. One printf statement is not complete. Also { } are missing in some places. Complete the program by adding whatever is necessary, so that we get the printed output shown on right.

| | |
|--|--|
| <pre># include <stdio.h> int main () { int i, j; int a[5] = {0, 1, 2, 3, 4}; for (i = 4; i >= 0; i--) for (j =) printf(" ", a[j]); printf("\n"); return 0; }</pre> | Printed Output (Blank lines in between) 4 3 2 1 0 3 2 1 0 2 1 0 1 0 0 |
|--|--|

(6) Consider the following program with a do-while loop.

(a) [2 points] Let $n = 4$. What is the value in sum after the do-while loop ends? _____

(b) [2 points] Let $n = -3$ (negative). What is the value in sum after the do-while loop ends? _____

(c) [5 points] Convert this to a program that uses a while loop and calculates the same value for sum. You may rearrange/move statements from the body of the do-while loop.

Program with do-while loop

Program with while-loop: **Part(c)**

```
int sum = 0, n;
n = ??? // Part(a), (b)
```

```
do
{ if (n < 0) n = - n;
  sum = sum + n;
  n = n - 1; }
while (n > 0);
```

```
// Print sum.
```

(7) [10 points] Complete the following program that reads distance in miles, and speed in miles per hour (both integers) from the user. It then calculates the time required to travel in hours and minutes (both integers) as follows. It first calculates time as a decimal number. From 'time', it calculates hours and minutes as integers. At the end it prints hours and minutes using. printf statement. **Any casting of types must be explicit. You do not need extra variables.** For example, if user inputs distance = 230, and speed = 50 then it prints 'Time required: 4 hours and 36 minutes. **Complete the scanf and the last printf statement as well.**

```
#include <stdio.h>
main ()
{ int distance, speed, hours, minutes;
  float time;

  printf ("Enter distance and speed: ");
  scanf ("

  time = ((float)distance)/speed;

  printf ("
}
```

(8) [2+3 points] Write an integer function **even** with one integer parameter m. This function returns 1 if m is even. It returns 0 otherwise. First write the header, and then the body. You do not need any local variables.

(9) Consider the following program that works with the given one dimensional array A of size 7. Assume array A has been initialized with some values. Program reads p and q.

(a) [3 points] Complete the program such that it swaps the pth element with the qth element of the array.

```
#include <stdio.h>

int main (void)
{ int A[7], temp;
  // Initialize array A with some values.
  // Read p and q from keyboard. Assume p and q are within limits.
  // Write code for swap using temp variable.

  return 0;
}
```

(b) [4 points] Suppose we want to check if p and q are within limits (no errors), after user types them in. Write just **one if** statement to check that in the space below. Assume that user types some integer values for p and q (positive or negative). If p or q are not within limits, set error = 1 else set error = 0.

