CPSC 231 Midterm 1

Duration: 40 minutes

12 February 2016

• This exam has 29 questions and 9 pages.

• You may use one single-sided 8.5x11” piece of paper with whatever you want written on it. Apart from that, this exam is closed book. No notes, books, calculators or electronic devices, or other assistance may be used.

• Mark your answers on the supplied answer sheet.

• If you think there are multiple correct answers to a question, select the best answer.

Due to the number of people in the room, you must stay for the entire exam.
Part 1

1. Floating point numbers are not the same as real numbers.
   (A) True
   (B) False

2. An algorithm is
   (A) a set of instructions in a computer language
   (B) a series of steps followed to solve a problem
   (C) a file whose name ends with .py
   (D) something that implements the IPO model

3. False and True
   (A) True
   (B) False
   (C) There is an error when this code is run

4. 'abc' == "abc"
   (A) True
   (B) False
   (C) There is an error when this code is run

5. 4 <= 2
   (A) True
   (B) False
   (C) There is an error when this code is run

6. 4 => 2
   (A) True
   (B) False
   (C) There is an error when this code is run

7. 4 % 5 > 0
   (A) True
   (B) False
   (C) There is an error when this code is run

8. What does this code print when run?

```python
x = 1
for i in range(2):
    x = x + 1
    for j in range(3):
        x = x + j
print(x)
```
   (A) 7
   (B) 8
9. What does this code print when run?

```python
x = 1
for i in range(2):
    for j in range(3):
        x = x + i + j
print(x)
```

(A) 8
(B) 10
(C) 22
(D) 9
(E) 21

10. What does this code print when run?

```python
a = True
b = True
if a and b:
    print('x')
elif a or b:
    print('y')
else:
    print('z')
```

(A) x only
(B) x, then y
(C) y, then z
(D) z only
(E) x, y, and z, in that order

11. What does this code print when run?

```python
a = True
b = True
if a and b:
    print('x')
if a or b:
    print('y')
else:
    print('z')
```

(A) x only
(B) x, then y
(C) y, then z
(D) z only
(E) x, y, and z, in that order
12. What does this code print when run?

```python
fore = 4
for four in range(fore):
    print(fore-four)
```

(A) The sequence 4 3 2 1
(B) The sequence -4 -3 -2 -1
(C) The sequence 4 4 4 4
(D) The sequence 0 1 2 3
(E) The sequence 1 2 3 4

13. What is the value of L after this code is run?

```python
L = ['a']
L.append(99)
L = L + L
```

(A) ['a', 99]
(B) ['a', 99, 'a', 99]
(C) ['a', 'a', 99, 99]
(D) [99, 'a']
(E) There is an error when this code is run

14. How many of the following programs will print the numbers from 1 to 10, inclusive, when they are run?

```python
i = 1
while i <= 10:
    print(i)
    i = i + 1
```

```python
i = 1
while i <= 10:
    i = i + 1
    print(i)
```

```python
i = 0
while i < 10:
    print(i)
    i = i + 1
```

```python
for i in range(1, 10):
    print(i)
```

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

Part 2

The `dir` function that you have seen returns a list of strings; calling `dir` on an imported module will yield a list of strings that are names available in the module. You notice that when you are using Python’s interactive interpreter, the variable `ps1` is present in `sys`, but not at other times. Use the following code to answer the questions in this section. It should print whether or not Python’s interactive interpreter is being used.
AAA
if BBB:
    print('interactive interpreter')
else:
    print('not using interactive interpreter')

15. What should AAA be replaced with?
   (A) import sys
   (B) import ps1
   (C) import sys.ps1
   (D) import sys, ps1
   (E) Nothing

16. What should BBB be replaced with?
   (A) 'ps1' in dir(sys)
   (B) 'ps1' == dir(sys)
   (C) 'ps1' not in dir(sys)
   (D) 'ps1' != dir(sys)
   (E) sys.ps1

Part 3

A truth table for Boolean variables is a table that shows all possible combinations of some Boolean variables (here, x and y), and the result of computing a Boolean function for each set of values. Starting with the following:

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>x or y</th>
</tr>
</thead>
<tbody>
<tr>
<td>False</td>
<td>False</td>
<td>AAA</td>
</tr>
<tr>
<td>False</td>
<td>True</td>
<td>BBB</td>
</tr>
<tr>
<td>True</td>
<td>False</td>
<td>CCC</td>
</tr>
<tr>
<td>True</td>
<td>True</td>
<td>DDD</td>
</tr>
</tbody>
</table>

17. What should AAA be replaced with?
   (A) True
   (B) False

18. What should BBB be replaced with?
   (A) True
   (B) False

19. What should CCC be replaced with?
   (A) True
   (B) False

20. What should DDD be replaced with?
   (A) True
   (B) False
A data file contains integers, one per line, ending with the sentinel \(-1\). You have seen this format before in lectures. The data file, cleverly called `datafile`, currently contains

\[
\begin{align*}
4 \\
5 \\
4 \\
9 \\
-1
\end{align*}
\]

The programs in this section are run as

```
python3 program.py < datafile
```

21. What does the following code print when run as stated above?

```python
i = 0
while True:
    n = int(input())
    if n == -1:
        break
    if i % 2 == 1:
        print(n)
    i = i + 1
```

(A) The sequence 5 9  
(B) The sequence 4 4  
(C) The sequence 4 5 4 9  
(D) Nothing  
(E) There is an error when it is run

22. What does the following code draw when run as stated above?

```python
import turtle
while True:
    n = input()
    if n == '4':
        turtle.fd(10)
    elif n == '5':
        turtle.lt(90)
    elif n == '9':
        turtle.home()
```

(A) A triangle  
(B) A line  
(C) A square  
(D) A line, followed by an error  
(E) A triangle, followed by an error
Part 5

A data file’s format begins with the number of data values, followed by that many integers. You have seen this format before in lectures and tutorials. The data file, called datafile, currently contains

```
4
5
4
9
-1
```

The programs in this section are run as

```
python3 program.py < datafile
```

23. What does this code print when run as stated above?

```
n = int(input())
acc = 1
while n > 0:
    acc = acc * int(input())
n = n - 1
print(acc, n)
```

(A) Nothing listed as an option here
(B) -180 0
(C) 180 0
(D) 180 1
(E) -180 1

24. What does the following code print when it is run as stated above?

```
a = input()
input()
input()
b = input()
c = input()
print(a + c + b)
```

(A) There is an error when it is run
(B) 494
(C) 445
(D) 17
(E) 13

Part 6

A data file’s format begins with the number of data values, followed by that many integers. You have seen this format before in lectures and tutorials. The data file, called datafile, currently contains

```
4
5
4
9
-1
```
The program in this section is run as

```python
python3 program.py < datafile
```

It is supposed to print the total of all the data values except the second last one; in this particular data file, 9 would not be added to the total. Starting with the following code:

```
AAA
for i in BBB:
    data = input()
    if CCC:
        DDD
    EEE
print(acc)
```

25. What should AAA be replaced with?
   (A) `acc = 0
   n = int(input())`
   (B) `acc = 0
   n = input()`
   (C) `n = 0`
   (D) `acc = input()`
   (E) `acc = int(input())`

26. What should BBB be replaced with?
   (A) `range(n)`
   (B) `n`
   (C) `n - 1`
   (D) `range(n - 1)`
   (E) `range(4)`

27. What should CCC be replaced with?
   (A) `i == n - 2`
   (B) `i == n - 1`
   (C) `i == 9`
   (D) `int(input()) == 9`
   (E) `i == 2`

28. What should DDD be replaced with?
   (A) `continue`
   (B) `break`

29. What should EEE be replaced with?
   (A) `acc = acc + int(data)`
   (B) `acc = int(input())`
   (C) `acc = data`
   (D) `acc = acc + data`
   (E) `acc = int(data)`
Answer Key

Q1: A; Q2: B; Q3: B; Q4: A; Q5: B; Q6: C; Q7: A; Q8: D; Q9: B; Q10: A; Q11: B; Q12: A; Q13: B; Q14: B; Q15: A; Q16: A; Q17: B; Q18: A; Q19: A; Q20: A; Q21: A; Q22: E; Q23: B; Q24: B; Q25: A; Q26: A; Q27: A; Q28: A; Q29: A.

End of questions. Remember that you must stay for the entire exam.