CPSC 217 Midterm

Duration: 30 minutes

10 February 2012

- This exam has 40 questions and 11 pages.
- 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. An algorithm is (A:Q28,B:Q39,C:Q16,D:Q34)
   (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

2. A program is (A:Q4,B:Q2,C:Q19,D:Q13)
   (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. Floating point numbers are the same as real numbers. (A:Q25,B:Q11,C:Q4,D:Q27)
   (A) True
   (B) False

4. The code foo = 'bar' is a Boolean expression comparing the variable foo with the string 'bar'. (A:Q18,B:Q24,C:Q33,D:Q32)
   (A) True
   (B) False

5. False and True (A:Q15,B:Q6,C:Q21,D:Q7)
   (A) True
   (B) False

6. False or True (A:Q20,B:Q10,C:Q37,D:Q40)
   (A) True
   (B) False

7. False or not True (A:Q16,B:Q8,C:Q31,D:Q36)
   (A) True
   (B) False

8. Python is a dynamically-typed language. (A:Q27,B:Q23,C:Q39,D:Q22)
   (A) True
   (B) False

9. A sentinel is (A:Q6,B:Q4,C:Q20,D:Q15)
   (A) a unique value that signals the end of input items.
   (B) a unique value that signals the end of file (EOF).
   (C) the Boolean expression that is checked by an if statement.
   (D) a count of the number of data items that follow.

10. What is the result of this program if the user types 2 as input?
n = input()
print( n ** 2 + 1 * 3 )

(A:Q5,B:Q12)

(A) 7  
(B) 24  
(C) 32  
(D) None of the numbers listed here

11. What is the result of this program if the user types 3 as input?

n = input()
p = print( n ** 2 + 1 * 3 )

(C:Q18,D:Q31)

(A) 12  
(B) 81  
(C) 243  
(D) None of the numbers listed here

12. '9' < '1' + '0' (A:Q2,B:Q5,C:Q34,D:Q16)

(A) True  
(B) False

13. What does the following code do when run?

_ = 'Name?'
in = input(_)
p = print(in)

(A:Q21,B:Q26,C:Q2,D:Q37)

(A) Prompts the user to input a name, then prints it out.  
(B) Gives an error because _ is not a valid variable name.  
(C) Gives an error because in is not a valid variable name.  
(D) Gives an error because _ and in are not valid variable names.

14. What does the following code do when run?

x = 32
import random
random.seed(x)
p = print(random.randint(5, 15))  
random.seed(x)
p = print(random.randint(5, 15))

(A:Q31,B:Q40,C:Q7,D:Q30)

(A) Prints out two random integers.  
(B) Prints out two pseudo-random integers.  
(C) Prints out the same random integer twice.
15. How many times does this code print \texttt{x} when run?

\begin{verbatim}
for i in range(3):
    for j in range(i):
        print('x')
\end{verbatim}

(A:Q36,B:Q9,C:Q32,D:Q29)

(A) 1 time
(B) 3 times
(C) 6 times
(D) 9 times

16. What type is \texttt{x} after this code is run?

\begin{verbatim}
x = '23'
x = int(x)
x = x / 2
\end{verbatim}

(A:Q19,B:Q25,C:Q23,D:Q33)

(A) Floating point
(B) Integer
(C) String
(D) Something other than floating point, integer, or string

17. What type is \texttt{x} after this code is run?

\begin{verbatim}
x = '23'
x = int(x)
x = x // 2
\end{verbatim}

(A:Q14,B:Q7,C:Q5,D:Q19)

(A) Floating point
(B) Integer
(C) String
(D) Something other than floating point, integer, or string

18. Which code prints out the value of \pi? \(A:Q33,B:Q3,C:Q29,D:Q35\)

(A) \begin{verbatim}
import math
print(math.pi)
\end{verbatim}

(B) \begin{verbatim}
import math
print(pi)
\end{verbatim}

(C) \begin{verbatim}
print(math.pi)
\end{verbatim}

(D) \begin{verbatim}
print(pi)
\end{verbatim}

(E) \begin{verbatim}
from math import pi
print(math.pi)
\end{verbatim}

19. What does this code print when run?
for i in range(3):
    break
    print(i)

(A:Q1,B:Q21,C:Q36,D:Q11)

(A) Nothing
(B) 0
(C) The sequence 0 1
(D) The sequence 0 1 2
(E) The sequence 0 1 2 3

20. What does this code print when run?

    i = 0
    while i > 2:
        print(i)

(A:Q34,B:Q36,C:Q40,D:Q20)

(A) Nothing
(B) An error is reported
(C) An infinite number of 0s
(D) The sequence 0 1 2 3 4...
(E) The sequence 0 1 2 3 4...

21. What does this code print when run?

    i = 3
    while i < 10:
        print(i)
        if i % 2 == 0:
            i = 7
            continue
        i = i + 3

(A:Q3,B:Q34,C:Q17,D:Q39)

(A) The sequence 3 6 7 10
(B) The sequence 3 6 9
(C) The sequence 3 7 10
(D) The sequence 3 6 7
(E) The sequence 3 7 7 7 7 7...

22. What does this code print when run?

    f = True
    if f == True:
        print('a')
    f = False
    elif f == False:
        print('b')
23. What does this code print when run?

```python
f = True
if f == True:
    print('a')
    f = False
if f == False:
    print('b')
```

(A:Q30,B:Q33,C:Q22,D:Q14)

(A) Nothing
(B) a only
(C) b only
(D) a, then b

24. How many times does this code print x when run?

```python
i = 7
while i > 0:
    print('x')
    i = i - 1
```

(A:Q37,B:Q35,C:Q28,D:Q9)

(A) 0 times
(B) 7 times
(C) 6 times
(D) 8 times

25. How many times does this code print x when run?

```python
i = 0
while i < 4:
    print('x')
    i = i + 1
```

(A:Q17,B:Q14,C:Q3,D:Q28)

(A) 0 times
(B) 3 times
(C) 4 times
(D) 5 times

26. What does this code print when run?
x = 'a'
B = 'b'
b = 'c'
x = B + x + B + x
print(x)

(A:Q29,B:Q15,C:Q30,D:Q18)

(A) Nothing; there is an error
(B) baba
(C) caca
(D) babba
(E) cacca

27. What does this code print when run?

for i in range(5):
    if i < 5:
        continue
s = 'abcde'
for c in s[i+2:5]:
    x = { c: ord(c)+2, }
print(chr(x[c]))

(A:Q35,B:Q20,C:Q24,D:Q17)

(A) Nothing
(B) cde
(C) c
(D) ab only
(E) The letter c five times

28. What is the correct translation of \( x = 2y^{n+1} - 3 \) to Python code, assuming y and n are already defined?

(A:Q24,B:Q13,C:Q38,D:Q21)

(A) \( x = 2 * (y ** (n + 1)) - 3 \)
(B) \( x = 2 * (y ** n + 1) - 3 \)
(C) \( x = 2 * y ** n + 1 - 3 \)
(D) \( x = 2 * (y ** (n + 1 - 3)) \)

29. What shape does this code draw when run?

import turtle
turtle.fd(50)
turtle.bk(25)
turtle.rt(90)
turtle.fd(50)
turtle.lt(90)
turtle.fd(25)
turtle.bk(50)

(A:Q32,B:Q37,C:Q35,D:Q12)
30. A user types

a
b
c
d

as input into the following code:

W = input()
X = input()
Y = input()
Z = input()

What line should be added at the end of the program to print out b and d? (A:Q23,B:Q1,C:Q1,D:Q8)

(A) print(X, Z)
(B) print(X, Y)
(C) print(W, X)
(D) print(W, Z)
(E) print(Y, Z)

31. Which code draws a diamond shape? (A:Q22,B:Q38,C:Q15,D:Q10)

(A) import turtle
   for i in range(4):
       turtle.fd(45)
       turtle.lt(90)

(B) import turtle
   for i in range(4):
       turtle.lt(45)
       turtle.fd(90)
       turtle.lt(45)

(C) import turtle
   for i in range(4):
       turtle.fd(90)
       turtle.lt(45)

(D) import turtle
   for i in range(4):
       turtle.fd(45)
       turtle.lt(45)
Part 2

Use the following code to answer the questions in this section.

```python
if 'ab' in s:
    print('foo')
if a or b:
    print('bar')
else:
    print('baz')
```

32. To have foo printed by this program when it is run, what definition should be added at the beginning? (A:Q38,B:Q30,C:Q25,D:Q1)
   (A) s = 'bad'
   (B) s = 'a'
   (C) s = 'b'
   (D) s = 'squab'

33. Assuming that a is True, to have bar printed by this program when it is run, what value must b have? (A:Q40,B:Q32,C:Q26,D:Q2)
   (A) False
   (B) True
   (C) It doesn’t matter: either False or True
   (D) No value of b will make this happen

34. To have baz printed by this program when it is run, what values must a and b have? (A:Q39,B:Q31,C:Q27,D:Q3)
   (A) a must be True; b must be False
   (B) a must be False; b must be True
   (C) a must be True; b must be True
   (D) a must be False; b must be False

Part 3

Use the following code to answer the questions in this section. It should print the numbers from 1 to 7, inclusive.

```python
AAA
for i in BBB:
    print CCC
```

35. What should AAA be replaced with? (A:Q12,B:Q27,C:Q10,D:Q4)
   (A) i = 0
   (B) i = 1
   (C) import turtle
   (D) Nothing
   (E) import math

36. What should BBB be replaced with? (A:Q11,B:Q28,C:Q9,D:Q6)
   (A) range(0, 8)
   (B) range(7)
37. What should CCC be replaced with? (A:Q13,B:Q29,C:Q8,D:Q5)  
   (A) (i)  
   (B) ('i')  
   (C) ('"i")  
   (D) i  
   (E) 'i'  

Part 4  

Use the following code to answer the questions in this section.

```python
import turtle
n = int(input())
for i in range(n):
    x = input()
    if x == 'r':
        turtle.fd(100)
    elif x == 'g':
        turtle.lt(90)
    elif x == 'b':
        turtle.rt(90)
    else:
        turtle.home()
```

This program is stored in `question.py`, and run by typing

```
python3 question.py < datafile
```

38. What is drawn if `datafile` contains the following:

```
3
  g
  g
  b
```

(A:Q9,B:Q18,C:Q12,D:Q25)  
   (A) Nothing  
   (B) A triangle  
   (C) A line  
   (D) A square  
   (E) A pentagon  

39. What is drawn if `datafile` contains the following:

```
2
  g
  g
  r
```
40. What is drawn if datafile contains the following:

```
3
b
r
x
```

(A:Q8,B:Q19,C:Q14,D:Q24)

(A) Nothing
(B) A triangle
(C) A line
(D) A square
(E) A pentagon

41. What is drawn if datafile contains the following:

```
g
r
b
r
b
b
g
r
b
r
```

(A:Q10,B:Q17,C:Q11,D:Q26)

(A) Nothing
(B) A triangle
(C) A line
(D) A square
(E) A pentagon

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