

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()
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(_)
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)
print(random.randint(5, 15))
random.seed(x)
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.

(D) Prints out the same pseudo-random integer twice.

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

```
for i in range(3):  
    for j in range(i):  
        print('x')
```

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

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

16. What type is `x` after this code is run?

```
x = '23'  
x = int(x)  
x = x / 2
```

(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 `x` after this code is run?

```
x = '23'  
x = int(x)  
x = x // 2
```

(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 π ? (A:Q33,B:Q3,C:Q29,D:Q35)

- (A) `import math`
`print(math.pi)`
- (B) `import math`
`print(pi)`
- (C) `print(math.pi)`
- (D) `print(pi)`
- (E) `from math import pi`
`print(math.pi)`

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 2 3 4 5 6...

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')
```

(A:Q26,B:Q22,C:Q6,D:Q38)

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

23. What does this code print when run?

```
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?

```
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?

```
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)

- (A) None of the shapes listed here
- (B) A rectangle
- (C) A triangle
- (D) The letter “H”
- (E) The letter “I”

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.

```
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.

```
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)

- (C) `range(1, 7)`
- (D) `range(8)`
- (E) `range(1, 8)`

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.

```
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
```

(A:Q7,B:Q16,C:Q13,D:Q23)

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

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:

9
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.