CPSC 217 L01 Midterm

Duration: 50 minutes

4 March 2010

• This exam has 55 questions and 10 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.
• Assume numbers are base ten unless stated otherwise.

Data Representation, Number Conversion, and Bases

1. TRUE/FALSE: Floating point numbers can precisely represent any real number.

2. The number of values that can be represented in 9 bits is
   (A) 9
   (B) 512
   (C) 0...511
   (D) $2^9 - 1$
   (E) $2^9 - 1$

3. AC3 is a hexadecimal number. What is it in octal?
   (A) 3035
   (B) 2755
   (C) 175
   (D) 5303
   (E) 3443

4. 42 is a base ten number. In binary, as a 6-bit unsigned integer it is
   (A) 101010
   (B) 010101
   (C) 000110
   (D) 011100
   (E) too large to represent

5. 42 is a base ten number. In binary, as a 6-bit signed integer in sign/magnitude representation it is
   (A) 101010
   (B) 010101
   (C) 000110
   (D) 011100
   (E) too large to represent
6. -13 is a base ten number. In binary, as a 5-bit signed integer in sign/magnitude representation it is
   (A) 01101
   (B) 11011
   (C) 01011
   (D) 11101
   (E) too large to represent

7. -13 is a base ten number. In binary, as a 5-bit signed integer in two's-complement representation it is
   (A) 10101
   (B) 00101
   (C) 10011
   (D) 10010
   (E) too large to represent

8. The largest negative value that can be represented in a 16-bit signed integer using two’s-complement representation is
   (A) -16
   (B) -32767
   (C) -32768
   (D) -65535
   (E) -65536

9. 217 is a base eight number. In base ten it is
   (A) 24
   (B) 143
   (C) 134
   (D) 331

10. 444 is a base five number. In base ten it is
    (A) 120
    (B) 888
    (C) 3234
    (D) 124
    (E) 4323

11. Ken Follett’s book *World Without End* has 1014 pages. It is heavy enough to stun a rhinoceros. The smallest number of bits needed to represent any page number in the book is
    (A) 9
    (B) 10
    (C) 11
    (D) $2^{1014}$
    (E) 1014
Python, Part 1

12. TRUE/FALSE: \((5 \times 1.0 / 3) == (5 / 3)\)

13. TRUE/FALSE: The statement \(x = 99999999999999999999999999999\) results in an error because the number is too large.

14. TRUE/FALSE: if is not a valid variable name.

15. TRUE/FALSE: The length of a string can be zero.

16. TRUE/FALSE: YoYo refers to the same variable as Yoyo.

17. TRUE/FALSE: \([2,1,1][2] == (4,3,2)[1] - 1\)

18. TRUE/FALSE: \(2 ** 5 > 3 ** 3\)

19. TRUE/FALSE: A variable can be used before a value is assigned to it.

20. TRUE/FALSE: True != False

21. TRUE/FALSE: 'f'.isalpha() == False

22. TRUE/FALSE: The print statement is not useful for debugging.

23. TRUE/FALSE: Black-box testing does not require examining a program’s code.

24. In the following code, for debugging info to be printed out, what must XXX be?

```python
debug = XXX
if debug:
    print 'debugging info'
```

(A) 0  
(B) True  
(C) False  
(D) something else

25. How many times is foo printed by the following code?

```python
step = -1
i = 1
while i != 0:
    i = i - step
    step = step * -1
    print 'foo'
```

(A) none  
(B) one  
(C) two  
(D) an infinite number
26. What does the following code print?

```python
print 42 - 2 * 5
```

(A) 32  
(B) 52  
(C) 200  
(D) 42 - 2 * 5

27. In the following code, what input will cause all six statements in the program to be run?

```python
line = raw_input()  
words = line.split(' ')  
if len(words) < 2:
    print 'error'
for word in words:
    print word
```

(A) pressing the return key only  
(B) foo  
(C) foo bar  
(D) foo bar baz  
(E) there is no input that does this

28. In the following code, what does the input yyc 2 yow cause the program to print?

```python
s = raw_input()  
for ch in s:
    if ch in 'aeiou':  
        break  
    print ch,
```

(A) nothing  
(B) y y c 2 y  
(C) y y c 2 y o  
(D) y y c 2 y w  
(E) y y c 2 y o w

29. With the input foo, what does the following code print?

```python
s = raw_input()  
for ch in s:
    if ch in 'aeiou':  
        break  
    print ch,
```

(A) foo  
(B) f o o  
(C) nothing  
(D) nothing; there is an error

30. What does the following code print?

```python
def print_x(x):
    return
    print x
print_x(123)
```
31. What is printed when this code is run?

```python
x = 12
if x > 10 / 2:
    print x,
    x = 17
if x != 6 * 2:
    print x,
else:
    print x + 1
```

(A) 12 18
(B) 13
(C) 12 17
(D) 17 17
(E) 17 18

32. What is printed when this code is run?

```python
for i in range(5):
    print i,
```

(A) 0 1 2 3 4 5
(B) 0 1 2 3 4
(C) 1 2 3 4 5
(D) 1 2 3 4
(E) 1 2 3 4 5 6

33. How many x's are printed by this code?

```python
for i in range(5):
    print 'x'
```

(A) none
(B) four
(C) five
(D) six

34. What does this code print?

```python
L = ['a', 'b', 'c', 'd', 'e']
T = []
for elem in L:
    T = T + [elem]
print T
```

(A) ['a']
(B) ['a', 'b', 'c', 'd', 'e']
(C) ['e', 'd', 'c', 'b', 'a']
(D) Nothing – Python reports an error
Python, Part 2

Use the following code for the questions in this section.

```python
p = raw_input()
for i in p:
    if i == '0':
        n = 0
    elif i == '1':
        n = n + 1
    elif i == 'x':
        break
    elif i == 'p':
        print n
```

35. The input `p` results in the output
   (A) 0
   (B) 1
   (C) there is no output
   (D) none; there is an error

36. The input `0111xp` results in the output
   (A) 0
   (B) 3
   (C) there is no output
   (D) none; there is an error

37. The input `0111110p` results in the output
   (A) 0
   (B) 5
   (C) there is no output
   (D) none; there is an error

Python, Part 3

Use the following code for the questions in this section. The program should read input and print it out until the sentinel EOF is reached.

```python
while XXX:
    s = raw_input()
    if YYY:
        break
    print s
```

38. XXX is
   (A) True
   (B) False
   (C) s
   (D) s == SENTINEL
   (E) s != SENTINEL
39. YYY is
   (A) not EOF
   (B) s == EOF
   (C) s != EOF
   (D) s == 'EOF'
   (E) s != 'EOF'

Python, Part 4

Use the following code for the questions in this section. The program should print the list elements out backwards.

```python
L = ['o', 'o', 'f']
i = WWW
while XXX:
    print YYY
    i = ZZZ
```

40. WWW is
   (A) 0
   (B) 1
   (C) len(L) + 1
   (D) len(L) - 1

41. XXX is
   (A) 1
   (B) i > 0
   (C) i >= 0
   (D) i == 0

42. YYY is
   (A) L
   (B) L[]
   (C) L[i]
   (D) L[i-1]

43. ZZZ is
   (A) i
   (B) i - 1
   (C) i + 1
   (D) -1
Python, Part 5

Use the following data for the questions in this section. All the fields are tab-separated. The data is located in a file called datafile, and the file is piped into the Python programs below as it was on the second assignment, using cat datafile | python program.py.

```
17  9  2
26 19  4
 3 27  6
12 16 22
```

44. What does this code do?

```python
def printline(flag):
    line = raw_input()
    if flag == True:
        print line
printline(False)
printline(True)
printline(False)
printline(True)
```

(A) Prints the first and third lines
(B) Prints the first and second lines
(C) Prints the second and fourth lines
(D) Prints the fourth line only
(E) Prints nothing

45. What does this code do?

```python
def rl1():
    raw_input()

def rl2():
    raw_input()

def rl3():
    rl2()
    raw_input()
rl3()
s = raw_input()
print s
```

(A) Prints the first line
(B) Prints the second line
(C) Prints the third line
(D) Prints the fourth line
(E) Nothing – Python reports an error
46. What does this code print?

```python
n = 0
sum = 0
index = 1
while 1:
    line = raw_input()
    fields = line.split('t')
    n = n + 1
    sum = sum + int(fields[index])
    index = index + 1
    if index >= 3:
        index = 0
    if n == 4:
        break
print sum
```

(A) 16
(B) 32
(C) 54
(D) 58
(E) 71

**Python, Part 6**

Use the definition of L below to answer the questions in this section.

```python
L = [3, 1, 4, 1, 5, 9]
```

47. What is L[5]?

(A) 3
(B) 1
(C) 4
(D) 5
(E) 9

48. What is L[-4]?

(A) 3
(B) 1
(C) 4
(D) 5
(E) 9

49. What is L[1:4]?

(A) [1, 4]
(B) [3, 1, 4]
(C) [1, 4, 1]
(D) [3, 1, 4, 1]
(E) [1, 4, 1, 5]
(F) An error
Python, Part 7

Use the definition of D below to answer the questions in this section.

```python
D = { 1: 2, 3: 4, 5: 3 }
```

50. TRUE/FALSE: `len(D) == 6`

51. TRUE/FALSE: 'foo' in D

52. What does this code print?
```python
if len(D) > 2:
    if len(D) < 4:
        print 'x'
    else:
        print 'y'
```

(A) x
(B) y
(C) Nothing
(D) Nothing – Python reports an error

53. What does this code print?
```python
for k in D:
    print k,
```

(A) 1 2 3
(B) 1 3 5
(C) 2 4 3
(D) 2 1 4 3 3 5
(E) 1 2 3 4 5 3

54. What does this code print?
```python
if 4 in D:
    print 'yes'
else:
    print 'no'
```

(A) yes
(B) no
(C) Nothing
(D) Nothing – Python reports an error

55. What does this code print?
```python
    print 'x'
else:
    print 'y'
```

(A) x
(B) y
(C) Nothing
(D) Nothing – Python reports an error