Computer Science 217

550

Midterm Exam #1

Fall 2026

October 16, 2026

First Name: _____

Last Name: _____

ID: _____

Instructions:

- Neatly print your names and ID number in the spaces above.
- Neatly print your names and ID number on the provided bubble sheet and shade the bubbles for your ID number.
- Record your answers for all of the multiple-choice questions on the bubble sheet.
- Ensure that any errors made when recording answers on the bubble sheet are erased completely. Replacement bubble sheets are available if you are unable to completely erase your unwanted response.
- Select the **best answer** for each multiple-choice question.
- This exam consists of 8 pages, including the cover. Before answering any questions, verify that all of the pages are present.
- You have 40 minutes to complete this exam. Extra time will **not** be provided to record your answers on the bubble sheet. Ensure that all of your answers have been recorded before the time limit is reached. Only answers that are recorded on the bubble sheet will be graded.
- Each question is worth one mark unless indicated otherwise.
- This is a closed-book exam. You are not permitted to use any electronic devices or reference materials. Students are not permitted to bring blank paper into the exam.
- Double-check that you shaded the bubbles for your ID number correctly on the bubble sheet.
- **DO NOT TURN PAST THIS PAGE UNTIL YOU ARE INSTRUCTED TO BEGIN.**

Record the answers to the questions on this page on the provided bubble sheet.
Answers recorded in this question booklet will NOT be graded.

1. Which of the following is the **best** definition for a computer?
   A. A programmable device that accepts input, processes it, and presents results.
   B. A collection of relays, vacuum tubes or transistors that are connected in a manner that allows them to perform arithmetic.
   C. A boxy device with a typewriter-like interface that stores and processes information.
   D. A device, or group of interconnected or related devices, that may perform any function.
   E. An electronic device that manipulates instructions.

2. When Moore's law was stated in 1965, how long did Moore predict the doubling of complexity for minimum component cost to continue?
   A. At least 25 years
   B. At least 2 years
   C. At least 1 year
   D. At least 10 years
   E. At least 50 years

3. Race conditions and deadlock are of particular concern in which area of computer science?
   A. Distributed systems
   B. Theory of computation
   C. Human-computer interaction
   D. Software engineering
   E. Artificial intelligence

4. Which problem demonstrates exponential growth where the amount of time needed to find the solution (approximately) doubles when the problem size increases by 1 value?
   A. Halting
   B. Subset sum
   C. Seam carving
   D. Dijkstra
   E. Deadlock

5. Which of the following statements is most correct?
   A. Python is a low-level programming language.
   B. Repeatedly breaking a problem into 3-5 steps until all of the steps are small enough to perform is referred to as top-down design.
   C. There are precise rules of syntax that must be followed when describing the steps in an algorithm.
   D. A correct computer program must be semantically correct, but does not need to be syntactically correct.
   E. Programming is the process of converting computer code into an algorithm.

6. Which of the following names is a legal variable name in Python? Note that you should **not** consider whether or not the name is good, only whether Python will allow its use.
   A. Input
   B. _num
   C. E
   D. Exactly two of the above answers are correct.
   E. Answers A, B, and C are all correct.

7. Consider a program that reads the number of students enrolled in a class. Which of the following statements is the best choice for reading this value?
   A. num_students = input(float("How many students are enrolled? "))
   B. num_students = input(int("How many students are enrolled? "))
   C. num_students = input("How many students are enrolled? ")
   D. num_students = int(input("How many students are enrolled? "))
   E. num_students = float(input("How many students are enrolled? "))

8. Which of the following is not an operator in Python?
   A. **
   B. #
   C. //
   D. %
   E. +

9. Which type of error is always reported by Python?
   A. Runtime error
   B. Syntax error
   C. Type error
   D. Logic error
   E. Value error

10. Consider the following program:

```
a = input("Enter a value: ")
print("The entered value was {a}.")
```

What will the print statement display if the user enters 12 when prompted?

   A. The entered value was {a}.
   B. The entered value was 12.0.
   C. An error message is displayed.
   D. 12
   E. The entered value was 12.

Record the answers to the questions on this page on the provided bubble sheet.
Answers recorded in this question booklet will NOT be graded.

11. What is the value of 234_6 in base 10?
    A. 96_{10}
    B. 90_{10}
    C. 84_{10}
    D. 94_{10}
    E. None of the above answers is correct.

12. What is 102_{10} in base 13?
    A. $A7_{13}$
    B. $B7_{13}$
    C. $7A_{13}$
    D. AB_{13}
    E. $7B_{13}$

13. Which of the following is not a valid sequence of digits in base 7?
    A. 70
    B. 16
    C. 10
    D. 34
    E. 0

14. Which of the following statements is most correct?
    A. When a floating-point number is stored, the bits are divided between the number's sign, fraction, base, and exponent.
    B. Hexadecimal can be used as a shorthand for binary by representing groups of 8 bits with one hexadecimal digit.
    C. Eight bits are required to represent each ASCII character.
    D. A UTF-8 character may occupy 4, 8, 12 or 16 bits.
    E. There are several different techniques that can be used to represent negative numbers.

15. Which of the following types of data is commonly represented using three 8-bit values?
    A. ASCII characters
    B. Colors
    C. Images
    D. Floating-point numbers
    E. Integers

16. Which of the following is **not** an example of a relational operator?
    A. ==
    B. =
    C. !=
    D. <=
    E. >=

17. Consider the program below:

```
n = int(input("Enter an integer: "))

_____________________________________
    print("Ones")
else:
    print("Something other than ones")
```

It is supposed to print out 'Ones' when either -1 or 1 is entered. Otherwise the program should display 'Something other than ones'. Which statement should be placed on the blank so that this is achieved?

A. if n == -1 or 1:
B. if n == -1 xor 1:
C. if n == -1 or n == 1:
D. if n = -1 or n = 1:
E. if n = -1 xor n = 1:

18. Consider the following program:

```
a = int(input("Enter an integer: "))

if a == 2:
    print("X")
    a = a - 1

elif a == 1:
    print("Y")
    a = a - 1

if a == 0:
    print("Z")
```

Which letter(s) are displayed if the user enters 2?

A. Y and Z
B. X and Z
C. X, Y, and Z
D. X
E. X and Y

19. Which of the following is **not** a white-box / clear-box test coverage level?
A. Condition coverage
B. Statement coverage
C. Path coverage
D. Value coverage
E. None of the above answers is correct (answers A, B, C and D are all examples of test coverage levels)

20. Consider the following program:

```
if a == 1:
    print("V")
    a = a + 1
    if a == 2:
        print("W")
        a = a - 1
else:
    print("X")
    if a == 1:
        print("Y")
        a = a + 1
    elif a == 2:
        print("Z")
        a = a - 1
```

What letters are displayed when it executes if a is initially 1?

A. V and W
B. V, W, Y, and Z
C. V, W, X, Y, and Z
D. V, W, and X
E. V

21. Consider the program below that reads an integer, n, from the user.

```
n = int(input("Enter an integer: "))

_____________________________________________
    print("X")
    print("X")
    n = n - 1
```

Which statement should be placed on the blank so that the program prints out twice as many Xs as the number entered by the user when the user enters a non-negative integer. For example, if the user enters 5 then the program should print out 10 copies of X. The program should not display any output if the number entered by the user is negative.

A. while n >= 0:
B. while n != 1:
C. while n > 0:
D. while n <= 1:
E. while n < 0:

22. Consider the program below that reads (x, y) coordinates from the user and reports the distance from each point to (0, 0).

```
import math

x = float(input("Enter the x-coordinate: "))
y = float(input("Enter the y-coordinate: "))

_____________________________________________
    distance = math.sqrt(x * x + y * y)
    print("The distance to that point is", distance)

    x = float(input("Enter the x-coordinate: "))
    y = float(input("Enter the y-coordinate: "))
```

Which statement should be placed on the blank so that the program continues to read x and y values from the user until the user enters 0 for both coordinates?

A. while x == 0 and y == 0:
B. while x == 0 or y == 0:
C. while x != 0 and y != 0:
D. while x != 0 or y != 0:
E. while x and y == 0:

23. Which of the following statements is most correct?
A. A loop that never terminates is referred to as a boundless loop.
B. A while loop is an example of a post-tested loop.
C. The condition on a while loop must include a relational operator.
D. An if statement may be nested inside a while loop.
E. More than one of the above statements is correct.

24. Consider the following code segment:

```
x = 16
result = 0

while x > 1:
    x = x / 2
    result = result + x

print(result)
```

What value does it display?
A. 15.0
B. 1.0
C. 7.0
D. 31.0
E. No value is displayed.

25. Consider the following code segment:

```
x = 5
result = 0

while x != 0:
    result = result + x
    x = x - 2

print(x)
```

What value does it display?

A. 9
B. 3
C. 5
D. 8
E. No value is displayed.

[0 marks] If you have any comments on the course so far, or suggestions for improving it, you are welcome to include them below. The comments you provide (or the choice not to provide any comments) will **not** have any impact on your mark on this exam. Complete this question only after reviewing your answers to all graded questions and completing your bubble sheet.