Directions:

a. DO NOT OPEN YOUR EXAM BOOKLET UNTIL YOU HAVE BEEN TOLD TO BEGIN.

b. This exam booklet contains 30 questions, each of which will be weighted equally. The exam is worth 150 points (15% of your course grade).

c. You may use one 8.5" x 11" note sheet and a paper dictionary during the examination. No calculating devices or other reference materials may be used during the examination.

d. Questions will not be interpreted during the examination.

e. You should choose the single best alternative for each question, even if you believe that a question is ambiguous or contains a typographic error. If a question has more than one correct answer, full credit will be awarded for any correct answer.

f. Please fill in the requested information at the top of this exam booklet.

g. Use a #2 pencil to encode any information on the OMR form.

h. Please encode the following on the OMR form:

   -- Last name and first initial
   -- MSU PID
   -- Exam form (2 X)

i. Please sign the OMR form.

j. Only answers recorded on your OMR form will be counted for credit. Completely erase any responses on the OMR form that you wish to delete.

k. You must turn in this exam booklet and the OMR form when you have completed the exam. When leaving, please be courteous to those still taking the exam.

*****************************************************************************
*  Exam Key                                                                 *
*                                                                           *
*  01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 *
*   C  B  C  E  A  B  A  B  E  D  C  B  A  E  D  C  B  A  E  A  D  A  C  B *
*                                                                           *
*  25 26 27 28 29 30                                                        *
*   D  E  B  E  D  C                                                        *
*****************************************************************************
def F( A=6, B=2 ):
    A -= 2
    B *= A
    return A + B

A = 4
B = 7
C = F( A, B )

print( A, B, C )   # Line 1

A = 5
B = 8
C = F( B )

print( A, B, C )   # Line 2

A = 7
B = 3
C = F( B=4 )

print( A, B, C )   # Line 3

01. What will be displayed by the Python code labeled "Line 1" in Figure 1?
A) 2 14 16
B) 4 7 12
C) 4 7 16
D) 4 8 12
E) None of the above.

02. What will be displayed by the Python code labeled "Line 2" in Figure 1?
A) 4 32 36
B) 5 8 18
C) 5 8 36
D) 6 12 18
E) None of the above.

03. What will be displayed by the Python code labeled "Line 3" in Figure 1?
A) 4 16 20
B) 5 20 25
C) 7 3 20
D) 7 3 25
E) None of the above.

04. Which of the following is not present in the Python code shown in Figure 1?
A) A function definition.
B) A default parameter value.
C) A function invocation.
D) A keyword parameter.
E) A function declaration.
X = [11, 12, 13, 14, 15, 16, 17, 18]

L = len(X)

print(L, X[4])  # Line 1

for i in range(2, 6):
    X[i+1] = X[i-1] + 10

print(X[3])      # Line 2
print(X[5])      # Line 3
print(X[::2])    # Line 4
print(X[1::3])   # Line 5

05. What will be displayed by the Python code labeled "Line 1" in Figure 2?
   A) 8 15
   B) 8 14
   C) 7 15
   D) 7 14
   E) None of the above.

06. What will be displayed by the Python code labeled "Line 2" in Figure 2?
   A) 23
   B) 22
   C) 14
   D) 13
   E) None of the above.

07. What will be displayed by the Python code labeled "Line 3" in Figure 2?
   A) 32
   B) 24
   C) 16
   D) 15
   E) None of the above.

08. What will be displayed by the Python code labeled "Line 4" in Figure 2?
   A) [14, 15, 16, 17, 18]
   B) [11, 13, 23, 33]
   C) [11, 12]
   D) 13
   E) None of the above.

09. What will be displayed by the Python code labeled "Line 5" in Figure 2?
   A) [11, 22, 33]
   B) [11, 22, 25]
   C) [11, 14, 17]
   D) [11, 12]
   E) None of the above.
```python
def F( p1, p2, p3 ):
    if len( p1 ) > 3:
        p1 = p1[2:]
        p2[3] = "quest?"
        p3 = " ".join( p2 )
    Q = ["That", "is", "no", "ordinary", "rabbit!"]
    R = ["What", "is", "your", "name?"]
    S = "To seek the Holy Grail."
    F( Q, R, S )
    print( Q )   # Line 1
    print( R )   # Line 2
    print( S )   # Line 3
```

10. What will be displayed by the Python code labeled "Line 1" in Figure 3?
   A) [’no’]
   B) [’That’, ’is’, ’no’]
   C) [’no’, ’ordinary’, ’rabbit!’]
   D) [’That’, ’is’, ’no’, ’ordinary’, ’rabbit!’]
   E) None of the above.

11. What will be displayed by the Python code labeled "Line 2" in Figure 3?
    A) [’What’, ’is’, ’quest?’]
    B) [’What’, ’is’, ’your’, ’name?’]
    C) [’What’, ’is’, ’your’, ’quest?’]
    D) [’What’, ’is’, ’quest?’’, ’name?’]
    E) None of the above.

12. What will be displayed by the Python code labeled "Line 3" in Figure 3?
    A) What is your quest?
    B) To seek the Holy Grail.
    C) What is your quest? To seek the Holy Grail.
    D) To seek the Holy Grail. What is your quest?
    E) None of the above.
S1 = {1, 2, 3, 4}
S2 = {3, 4, 5, 6, 7}

A = len(S1)
B = len(S2)
C = S2 > S1

print( A, B, C )   # Line 1
print( S2[3] )     # Line 2
print( S2 & S1 )   # Line 3
print( S2 | S1 )   # Line 4
print( S2 - S1 )   # Line 5

13. What will be displayed by the Python code labeled "Line 1" in Figure 4?
   A)  4 5 False
   B)  4 5 True
   C)  3 4 False
   D)  3 4 True
   E)  None of the above.

14. What will be displayed by the Python code labeled "Line 2" in Figure 4?
   A)  {3, 4, 5, 6}
   B)  {3, 4, 5}
   C)  6
   D)  5
   E)  None of the above.

15. What will be displayed by the Python code labeled "Line 3" in Figure 4?
   A)  {3, 4, 5, 6, 7, 1, 2, 3, 4}
   B)  {1, 2, 3, 4, 3, 4, 5, 6, 7}
   C)  {1, 2, 3, 4, 5, 6, 7}
   D)  {3, 4}
   E)  None of the above.

16. What will be displayed by the Python code labeled "Line 4" in Figure 4?
   A)  {3, 4, 5, 6, 7, 1, 2, 3, 4}
   B)  {1, 2, 3, 4, 3, 4, 5, 6, 7}
   C)  {1, 2, 3, 4, 5, 6, 7}
   D)  {3, 4}
   E)  None of the above.

17. What will be displayed by the Python code labeled "Line 5" in Figure 4?
   A)  {1, 2, 5, 6, 7}
   B)  {5, 6, 7}
   C)  {3, 4}
   D)  {1, 2}
   E)  None of the above.
A = {}
for c in "Tim the Enchanter":
    if c in "abcdefghijklmnopqrstuvwxyz":
        if c not in A:
            A[c] = 0
        A[c] += 1

print( A['t'] )   # Line 1
print( len(A) )   # Line 3

B = []
for c,d in A.items():
    B.append( (c,d) )
B.sort()

print( B[0] )     # Line 4

18. What will be displayed by the Python code labeled "Line 1" in Figure 5?
A) 2
B) 3
C) 't': 2
D) 't': 3
E) None of the above.

19. What will be displayed by the Python code labeled "Line 2" in Figure 5?
A) 'i'
B) 'm'
C) 'i': 1
D) 'm': 1
E) None of the above.

20. What will be displayed by the Python code labeled "Line 3" in Figure 5?
A) 9
B) 11
C) 15
D) 17
E) None of the above.

21. What will be displayed by the Python code labeled "Line 4" in Figure 5?
A) 'E': 1
B) 'a': 1
C) ('E', 1)
D) ('a', 1)
E) None of the above.
>>> help(Square)
Help on class Square in module __main__:

class Square(builtins.object)
 |
| Methods defined here:
|   __init__(self, length=0)
|       Initialize the length of a Square’s side.
|   __str__(self)
|       Return a string representing a Square.
|   area(self)
|       Return the area of a Square.
|   equal(self, other)
|       Decide if two Squares have the same dimensions.
|   side(self)
|       Return the length of a Square’s side.

>>> X = Square(2.5)
>>> Y = Square(8)

22. Consider the information in Figure 6, which is from a session in the Python shell. Which of the following is a valid statement which could be entered as the next shell command?

A) my_length = X.side()
B) print(side(X))
C) perimeter = X.side * 4
D) All of the above.
E) None of the above.

23. Consider the information in Figure 6, which is from a session in the Python shell. Which of the following is a valid statement which could be entered as the next shell command?

A) S = X.str()
B) X.side() = 10
C) S = str(X)
D) All of the above.
E) None of the above.

24. Consider the information in Figure 6, which is from a session in the Python shell. Which of the following is a valid statement which could be entered as the next shell command?

A) print(equal(X,Y))
B) print(X.equal(Y))
C) print(X.equal() == Y.equal())
D) All of the above.
E) None of the above.
class Rectangle( object ):
    def __init__( self, length=0, width=0 ):
        self.__length = length
        self.__width  = width
    def length( self ):
        return self.__length
    def width( self ):
        return self.__width

#--------- main program -----------------------------------------------

### Line 1 ###
R = Rectangle( 4, 7 )

### Line 2 ###
def compare( One, Two ):
    """ Decide if two Rectangles have the exact same dimensions. """
    ### Line 3 ###
    return F

25. Consider the Python code in Figure 7. Which of the following is a valid replacement for the comment labeled "### Line 1 ###"?
A) X = Rectangle()
B) X = Rectangle( 5 )
C) X = Rectangle( length=4, width=8 )
D) All of the above.
E) None of the above.

26. Consider the Python code in Figure 7. Which of the following is a valid replacement for the comment labeled "### Line 2 ###"?
A) W = R.__width
B) print( R.__length )
C) W = width( R )
D) All of the above.
E) None of the above.

27. Consider the Python code in Figure 7. Which of the following is a valid replacement for the comment labeled "### Line 3 ###"?
A) F = One.__length == Two.__length and One.__width == Two.__width
B) F = One.length() == Two.length() and One.width() == Two.width()
C) F = length(One) == length(Two) and width(One) == width(Two)
D) All of the above.
E) None of the above.
class Square( object ):
    def __init__( self, length=0 ):
        """ Initialize the length of a Square’s side. """
        self.__length = length

    def side( self ):
        """ Return the length of a Square’s side. """
        return self.__length

    def __str__( self ):
        """ Return a string representing a Square. """

    ### Line 1 ###

    def area( self ):
        """ Return the area of a Square. """

    ### Line 2 ###

    def equal( self, other ):
        """ Decide if two Squares have the same dimensions. """

    ### Line 3 ###

28. Consider the Python code in Figure 8. Which of the following is a valid replacement for the comment labeled """"### Line 1 ###""""?

A) return self.__length
B) return side( self )
C) return self.length
D) All of the above.
E) None of the above.

29. Consider the Python code in Figure 8. Which of the following is a valid replacement for the comment labeled """"### Line 2 ###""""?

A) return self.__length * self.__length
B) return self.__length ** 2
C) return self.side() * self.side()
D) All of the above.
E) None of the above.

30. Consider the Python code in Figure 8. Which of the following is a valid replacement for the comment labeled """"### Line 3 ###""""?

A) return self.side == other.side
B) return side( self ) == side( other )
C) return self.__length == other.__length
D) All of the above.
E) None of the above.