Directions:

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

b. This exam booklet contains 40 questions, each of which will be weighted equally. The exam is worth 200 points (20% 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 (3 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.

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*  Exam Key                                                                 *
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*  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  B  C  E  C  D  A  D  E  A  C  B  E  C  A  B  E  B  E  A  C  A  D *
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*  25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40                          *
*   A  E  D  B  C  D  C  D  D  B  B  A  E  B  D  A                          *
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01. Which of the following statements about the Python code labeled "Line 1" in Figure 1 is correct?

A) It will display 1 when the program is executed.
B) It will display 4 when the program is executed.
C) It will display 7 when the program is executed.
D) It will display 10 when the program is executed.
E) None of the above.

02. Which of the following statements about the Python code labeled "Line 2" in Figure 1 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.

03. Which of the following statements about the Python code labeled "Line 3" in Figure 1 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.

04. Which of the following statements about the Python code labeled "Line 4" in Figure 1 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.
A = 0
B = 0
C = 0
D = 15

while D >= 2:
    A += 1
    if D%2 == 0:
        B += 1
    else:
        C += 1
    D -= 3

print( A )   # Line 1
print( B )   # Line 2
print( C )   # Line 3
print( D )   # Line 4

05. Which of the following statements about the Python code labeled "Line 1" in Figure 2 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.

06. Which of the following statements about the Python code labeled "Line 2" in Figure 2 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.

07. Which of the following statements about the Python code labeled "Line 3" in Figure 2 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.

08. Which of the following statements about the Python code labeled "Line 4" in Figure 2 is correct?

A) It will display 0 when the program is executed.
B) It will display 1 when the program is executed.
C) It will display 2 when the program is executed.
D) It will display 3 when the program is executed.
E) None of the above.
A = "Sir Galahad"
B = "Sir Robin"
C = len(A) < len(B)
D = A < B
E = "Five is a sufficiently close approximation to infinity."
F = "That’s no ordinary rabbit!"

print( C, D )          # Line 1
print( E[2], E[-3] )   # Line 2
print( F[-4:] )        # Line 3
print( F[:3] )         # Line 4

09. What will be displayed when the Python code labeled "Line 1" in Figure 3 is executed?
   A) True True
   B) True False
   C) False False
   D) False True
   E) None of the above.

10. What will be displayed when the Python code labeled "Line 2" in Figure 3 is executed?
    A) is close
    B) a approximation
    C) Fi ty.
    D) Fiv ity.
    E) None of the above.

11. What will be displayed when the Python code labeled "Line 3" in Figure 3 is executed?
    A) bit!
    B) bbit!
    C) s no ordinary rabbit!
    D) ‘s no ordinary rabbit!
    E) None of the above.

12. What will be displayed when the Python code labeled "Line 4" in Figure 3 is executed?
    A) it.
    B) bit.
    C) Tha
    D) That
    E) None of the above.
```python
def F( X=2, Y=3 ):
    A = 2*X
    B = A - Y
    return A * B

A = 5
B = 2
C = F( A, B )

print( A, B, C )   # Line 1

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

print( A, B, C )   # Line 2

A = 8
B = 3
C = F( Y=6 )

print( A, B, C )   # Line 3
```

13. What will be displayed by the Python code labeled "Line 1" in Figure 4?
   A) 5 2 10
   B) 5 2 80
   C) 10 8 10
   D) 10 8 80
   E) None of the above.

14. What will be displayed by the Python code labeled "Line 2" in Figure 4?
   A) 3 4 0
   B) 3 4 12
   C) 8 5 0
   D) 8 5 12
   E) None of the above.

15. What will be displayed by the Python code labeled "Line 3" in Figure 4?
   A) 4 -2 -8
   B) 4 -2 24
   C) 8 3 -8
   D) 8 3 24
   E) None of the above.

16. Which of the following is not present in the Python code shown in Figure 4?
   A) A function declaration.
   B) A keyword parameter.
   C) A function invocation.
   D) A default parameter value.
   E) A function definition.
def truncate( N, L ):
    if N < len(L):
        return L[1:N]

S1 = "Three shalt be the number thou shalt count"
A = truncate( 5, S1.split() )
S2 = "King of the Britons"
B = truncate( 4, S2.split() )

print( A )   # Line 1
print( B )   # Line 2

17. What will be displayed when the Python code labeled "Line 1" in Figure 5 is executed?
   A)  ['Three', 'shalt', 'be', 'the']
   B)  ['shalt', 'be', 'the', 'number']
   C)  ['Three', 'shalt', 'be', 'the', 'number']
   D)  ['shalt', 'be', 'the', 'number', 'thou']
   E)  None of the above.

18. What will be displayed when the Python code labeled "Line 2" in Figure 5 is executed?
   A)  ['King', 'of', 'the']
   B)  ['of', 'the', 'Britons']
   C)  ['King', 'of', 'the', 'Britons']
   D)  ['of', 'the', 'Britons', '']
   E)  None of the above.

19. Consider the Python statement shown below:

   A_file = open( "fileA.txt", "r" )

Under what circumstances will that statement cause an exception?

   A)  When the file "fileA.txt" exists, but is empty.
   B)  When the file "fileA.txt" does not exist.
   C)  When the file "fileA.txt" exists, but is not empty.
   D)  All of the above.
   E)  None of the above.

20. Consider the Python statement shown below:

   B_file = open( "fileB.txt", "w" )

Under what circumstances will that statement cause an exception?

   A)  When the file "fileB.txt" exists, but is empty.
   B)  When the file "fileB.txt" does not exist.
   C)  When the file "fileB.txt" exists, but is not empty.
   D)  All of the above.
   E)  None of the above.
M = {}
for c in "King Arthur of Camelot and Briton":
    if c in "aeiouAEIOU":
        if c not in M:
            M[c] = 0
        M[c] += 1
print( M[‘a’], M[‘i’] )   # Line 1

L = []
for k,v in M.items():
    L.append( (v,k) )
print( len(L), max(L) )   # Line 2

S = set()
for c in "bridgekeeper":
    S.add( c )

T = set()
for c in "Britain":
    T.add( c )

print( len(S), len(T) )   # Line 3
print( S & T )            # Line 4

21. What will be displayed by the Python code labeled "Line 1" in Figure 6?
A)  2 2  
B)  3 2  
C)  ‘a’: 2  ‘i’: 2  
D)  ‘a’: 3  ‘i’: 2  
E)  None of the above.

22. What will be displayed by the Python code labeled "Line 2" in Figure 6?
A)  6 (‘u’, 1)  
B)  10 (‘A’, 1)  
C)  6 (3, ‘o’)  
D)  10 (3, ‘o’)  
E)  None of the above.

23. What will be displayed by the Python code labeled "Line 3" in Figure 6?
A)  8 6  
B)  8 7  
C)  12 6  
D)  12 7  
E)  None of the above.

24. What will be displayed by the Python code labeled "Line 4" in Figure 6?
B)  {‘b’, ’r’, ’i’, ’d’, ’g’, ’e’, ’k’, ’p’, ”t”, ’a’, ’n’}  
C)  {‘b’, ”r”, ”i”}  
D)  {’r’, ’i’}  
E)  None of the above.
# Figure 7 (contents of file "rational.py")

class Rational( object ):
    def __init__( self, numer=0, denom=1 ):
        self.__numer = 0
        self.__denom = 1

        if type( numer ) == int and type( denom ) == int:
            self.__numer = numer
            self.__denom = denom

    def __str__( self ):
        out_str = str( self.__numer )
        if self.__denom != 1:
            out_str = out_str + "/" + str( self.__denom )
        return out_str

    def values( self ):
        return (self.__numer, self.__denom)

    def __add__( self, other ):
        if type( other ) != Rational:
            other = Rational( other )

        top = (self.__numer * other.__denom) + (self.__denom * other.__numer)
        bottom = self.__denom * other.__denom

        return Rational( top, bottom )

    def __radd__( self, other ):
        return Rational( other ) + self

    def __eq__( self, other ):
        if type( other ) != Rational:
            other = Rational( other )

        top1 = self.__numer * other.__denom
        top2 = other.__numer * self.__denom

        return top1 == top2

    def __gt__( self, other ):
        if type( other ) != Rational:
            other = Rational( other )

        top1 = self.__numer * other.__denom
        top2 = other.__numer * self.__denom

        return top1 > top2
import rational  # class Rational from Figure 7

P = rational.Rational( 6, 8 )
Q = rational.Rational( 4 )

# REPLACE

Questions 25 through 30 refer to the Python code in Figure 7 (previous page) and Figure 8 (above).

25. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P.values()
   B) B = values( Q )
   C) C = P.values( 2, 3 )
   D) All of the above.
   E) None of the above.

26. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P.__numer
   B) B = Q.denom()
   C) C = P.num( 6 )
   D) All of the above.
   E) None of the above.

27. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P + Q
   B) B = P + 5
   C) C = 7 + Q
   D) All of the above.
   E) None of the above.

28. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P <= Q
   B) B = P > 2
   C) C = 3 > Q
   D) All of the above.
   E) None of the above.

29. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P.str()
   B) B = __str__( Q )
   C) C = str( P )
   D) All of the above.
   E) None of the above.

30. Which of the following is a valid replacement for the comment "REPLACE"?
   A) A = P.__add__( Q )
   B) B = Q._Rational__numer
   C) C = P.__eq__( Q )
   D) All of the above.
   E) None of the above.
class Thing( object ):
    def __init__( self, value ):
        self.value = value
    def __str__( self ):
        return str( self.value )
    def replace( self, n ):
        self.value = n
    def update( self, n ):
        self.value += n
class Gadget( Thing ):
    def replace( self, n ):
        self.value = 5*n
    def update( self, n ):
        Thing.update( self, n )
        self.value += 5*n
    def revise( self, n ):
        self.value = -1*n

A = Gadget( 20 )
A.replace( 5 )  # Line 1
print( A )      # Line 2

B = Gadget( 20 )
B.update( 6 )   # Line 3
print( B )      # Line 4

C = Gadget( 20 )
C.revise( 7 )   # Line 5
print( C )      # Line 6

D = Thing( 10 )
D.replace( 2 )  # Line 7
print( D )      # Line 8

E = Thing( 10 )
E.update( 3 )   # Line 9
print( E )      # Line 10

F = Thing( 10 )
F.revise( 4 )   # Line 11
print( F )      # Line 12
Questions 31 through 37 refer to the Python code in Figure 9 (previous page).

31. Which of the following statements is correct?
   
   A) Line 1 is not valid.
   B) Line 2 will display 5 when it is executed.
   C) Line 2 will display 25 when it is executed.
   D) Line 2 will display 30 when it is executed.
   E) None of the above.

32. Which of the following statements is correct?
   
   A) Line 3 is not valid.
   B) Line 4 will display 26 when it is executed.
   C) Line 4 will display 50 when it is executed.
   D) Line 4 will display 56 when it is executed.
   E) None of the above.

33. Which of the following statements is correct?
   
   A) Line 5 is not valid.
   B) Line 6 will display 7 when it is executed.
   C) Line 6 will display 0 when it is executed.
   D) Line 6 will display -7 when it is executed.
   E) None of the above.

34. Which of the following statements is correct?
   
   A) Line 7 is not valid.
   B) Line 8 will display 2 when it is executed.
   C) Line 8 will display 10 when it is executed.
   D) Line 8 will display 12 when it is executed.
   E) None of the above.

35. Which of the following statements is correct?
   
   A) Line 9 is not valid.
   B) Line 10 will display 13 when it is executed.
   C) Line 10 will display 15 when it is executed.
   D) Line 10 will display 28 when it is executed.
   E) None of the above.

36. Which of the following statements is correct?
   
   A) Line 11 is not valid.
   B) Line 12 will display 4 when it is executed.
   C) Line 12 will display 0 when it is executed.
   D) Line 12 will display -4 when it is executed.
   E) None of the above.

37. Which of the following statements is correct?
   
   A) Class Thing is a superclass of class object.
   B) Class Thing is a subclass of class Gadget.
   C) Class Gadget is a superclass of class object.
   D) All of the above.
   E) None of the above.
def process( A=0, B=0 ):
    try:
        R = 0
        X = float( A )
        Y = float( B )
        Z = X / Y
    except ZeroDivisionError:
        R = R+1
    except:
        R = R+2
    else:
        R = R+4
    finally:
        R = R+8
    return R

print( process( "Attempt", "#1" ) )    # Line 1
print( process( 12.5, 4 ) )           # Line 2
print( process( 7.25 ) )              # Line 3

38. Which of the following statements about the Python code labeled "Line 1" in Figure 10 is correct?

A) It will display 9 when the program is executed.
B) It will display 10 when the program is executed.
C) It will display 11 when the program is executed.
D) It will display 12 when the program is executed.
E) None of the above.

39. Which of the following statements about the Python code labeled "Line 2" in Figure 10 is correct?

A) It will display 9 when the program is executed.
B) It will display 10 when the program is executed.
C) It will display 11 when the program is executed.
D) It will display 12 when the program is executed.
E) None of the above.

40. Which of the following statements about the Python code labeled "Line 3" in Figure 10 is correct?

A) It will display 9 when the program is executed.
B) It will display 10 when the program is executed.
C) It will display 11 when the program is executed.
D) It will display 12 when the program is executed.
E) None of the above.