(1-5) Given the following Python code:

```python
1  def payday(hours, wage):
2      '''(number) -> number
3
4      Midterm function.
5      '''
6      if hours <= 40:
7          pay = hours * wage
8      elif hours <= 60:
9          hours = hours - 40
10         pay = 40 * wage
11         pay += hours * wage * 1.5
12      else:
13          hours = hours - 60
14          pay = (40 * wage)
15          pay += (20 * wage * 1.5)
16          pay += (hours * wage * 2)
17
18      return pay
```

(1) Function parameters are
a) hours, wage  b) 40, 10  c) pay  d) payday  e) number, number

(2-5) When the following expression is entered in the Python Shell

```python
>>> payday(40, 10)
```

(2) The arguments are
a) hours, wage  b) 40, 10  c) pay  d) payday  e) None

(3) the expression on line 6 evaluates to
a) True  b) true  c) False  d) false  e) this line of code is not executed

(4) The expression on the right hand side of the assignment operator on line 9 evaluates to
a) 40  b) 30  c) 0  d) False  e) this line of code is not executed

(5) At line 18 the value of pay is
a) 400  b) 400.0  c) 550.0  d) True  e) None
(6-7) Given the following Python code:

def mars_explore_main():
    '''() -> None
    Midterm function
    >>> mars_explore_main()
    ...
    # label print output
    print('xpos', '\t', 'ypos', '\t', 'water', '\t', 'temp')
    reset(); speed('fastest')
title('Mars Rover')
display_color = 'blue'
color(display_color)
dot(10, display_color)
    for ctr in range(20):
        mars_explore()
    return None

(6) When \textit{mars\_explore\_main} is executed, how many times will function \textit{mars\_explore} be called?

a) 0  
   b) 19  
   c) 20  
   d) 21  
   e) None

(7) To vary the number of times \textit{mars\_explore} can be called each time \textit{mars\_explore\_main} is executed:

a) add a parameter to the definition of \textit{mars\_explore\_main}, e.g.,
def mars_explore_main(trips):

b) add a parameter to the definition of \textit{mars\_explore\_main} and change the \texttt{for} statement

c) define a local variable, e.g., \texttt{trips = 10}

 d) define a local variable and change the \texttt{for} statement

 e) change the name of the variable in the \texttt{for} statement, e.g.,
for trips in range(20)
(8-11) Given the following Python code:

```python
1 def q8(lead, ball, time):
2     '''(int, ??, float) -> ??
3     Midterm function."
4     calclead = lead - 3
5     if ball:
6         calclead += .5
7     else:
8         calclead -= .5
9     calclead = calclead ** 2
10    return calclead > time
```

(8) At line 14, `calclead` refers to an object of type
a) int  b) float  c) string  d) Boolean  e) function

(9) At line 8, `ball` refers to an object of type
a) int  b) float  c) string  d) Boolean  e) function

(10) The value returned at line 15 is of type
a) int  b) float  c) string  d) Boolean  e) function

(11) Which lines of code are executed when q8(5, True, 1) is entered in the Python Shell?
a) 6, 8, 9, 13, 15  b) 6, 10, 11, 13, 15  c) 6, 8, 9, 10, 11, 13, 15  d) 6, 8, 13, 15
(12-16) Given the following Python code:

```python
1  def gendigit(n):
2      '''(str) -> str
3      Midterm function.
4      >>> gendigit('321')
5      ??
6      '''
7      CHECK = 5
8      CHECKL = 3
9      nstr = n
10     check_sum = 0
11     for i in range(2, CHECKL+2):
12         next = int(nstr[-1])
13         check_sum += next * i
14         nstr = nstr[:-1]
15     adjust = check_sum % CHECK
16     checkdigit = CHECK - adjust
17     if checkdigit == 5:
18         checkdigit = 0
19     return n + str(checkdigit)
```

When `>>> gendigit('321')` is entered into the Python Shell

(12) The value of `n` at line 9 is

a) `n` is not defined  b) 321  c) '321'  d) 5  e) True

(13) When the for statement executes, the value of `i` is

a) 2  b) 5  c) 2 then 3 then 4  d) 2 then 3 then 4 then 5  e) `i` is not defined

(14) The value of `check_sum` after line 16 is executed the first time is

a) 0  b) 2  c) -2  d) '1'  e) '11'

(15) The value of `n` at line 25 is

a) `n` is not defined  b) 321  c) '321'  d) '3210'  e) '3215'

(16) The value returned at line 25 is

a) None  b) 321  c) '321'  d) '3210'  e) '3215'
(17-19) Given the following Python code:

```python
def transcribe(dna):
    '''(str) -> ??
    Midterm function
    '''
    rna = ''
    ctr = 0

    while ctr < len(dna):
        if dna[ctr] == 'A':
            rna += 'U'
        elif dna[ctr] == 'C':
            rna += 'G'
        elif dna[ctr] == 'G':
            rna += 'C'
        elif dna[ctr] == 'T':
            rna += 'A'
        ctr += 1

    return rna
```

(17) In function transcribe, line 8 through 17 could be replaced with

a) for chr in dna:  
    if chr == 'A':  
        rna += 'U'  
    elif chr == 'C':  
        rna += 'G'  
    elif chr == 'G':  
        rna += 'C'  
    elif chr == 'T':  
        rna += 'A'

b) ctr = 0
    for chr in dna:  
        if chr == 'A':  
            rna += 'U'  
        elif chr == 'C':  
            rna += 'G'  
        elif chr == 'G':  
            rna += 'C'  
        elif chr == 'T':  
            rna += 'A'

c) for chr in dna:  
    if chr == 'A':  
        rna += 'U'  
    elif chr == 'C':  
        rna += 'G'  
    elif chr == 'G':  
        rna += 'C'  
    elif chr == 'T':  
        rna += 'A'

d) none of these

(18) What is the result of executing the following code

```python
>>> transcribe('TTt ACT')
```

a) 'AAUGA'  
b) 'AAT UGA'  
c) 'TTtACT'  
d) 'AAT UGA'

(19) Complete the type contract:

a) int  
b) float  
c) string  
d) Boolean  
e) None
(20-21) Given:

def q20(astring):
    """(str) -> Boolean

    Midterm function.
    """

    ctr = 0

    for nextch in astring:
        if nextch.isdigit():
            ctr += 1

    return ctr >= 2

What will be the result when the following code is executed:

(20) >>> q20('Lillis 182')

a) 3  b) 'true'  c) 'false'  d) True  e) False

(21) >>> q20('Lillis Atrium')

a) 3  b) 'true'  c) 'false'  d) True  e) False

(22) Given:

def q22(astring):
    """(str) -> Boolean

    Midterm function.
    """

    ctr = 0

    for nextch in astring:
        if nextch.isdigit():
            ctr += 1

    return ctr >= 2

What will be the result when the following code is executed:

>>> q22('Lillis 282 ')

a) 3  b) 'true'  c) 'false'  d) True  e) False
(23) Given:

def q23(greeting, name):
    '''(str, str) -> str

        Midterm function.
        '''
greeting = greeting.capitalize()
name = name.capitalize()
hi = greeting + ', ' + name

return hi

What will be the result when the following code is executed:

```python
>>> q23('ciao', 'ducks')
```

a) None  b) 'CIAO'  c) 'Ciao, Ducks'  d) 'hi'
e) 'CIAO, Ducks'

24) Given:

def q24(s1, s2):
    '''(str, str) -> ??

        Midterm function.
        '''
q24str = ''
for i in s1:
    if i in s2:
        q24str += i

return len(q24str)

What will be the result when the following code is executed:

```python
>>> q24('yellow', 'green')
```

a) 1  b) 5  c) 6  d) 'yellowgreen'  e) NameError
(25) Given:

def q25(x):
    '''(str) -> number

    Midterm function.
    '''
    x = 2 * len(x)
    return x

What is the value of y after the following Python code is executed:

```python
>>> y = 'The end.'
>>> y = q25(y) + q25(y)
```

a) None b) 2 c) 8 d) 16 e) 32