Desk Number _____

Student Number _____

Student Name _____

School of Science and Engineering

MIDTERM EXAMINATION

Semester 1, 2022

CSC1001 Introduction to Computer Science

Examination Duration: 120 minutes

Reading Time: 10 minutes

This examination has __3__ questions.

Exam Conditions:

This is a FORMAL Examination

This is a RESTRICTED OPEN BOOK Exam. Maximum of one (1) sheet of handwritten notes double sided are permitted

Materials Permitted In The Exam Venue:

Maximum of one (1) sheet of handwritten notes double sided are permitted. **NO OTHER MATERIALS PERMITTED**

Any calculators without the functionalities of programming and file storage are permitted.

Materials To Be Supplied To Students:

1 × 12 Page Answer Booklet

Question 1. (10 × 3% = 30%)

Pick the correct option in each of the following sub-questions. Note that only ONE option is correct.

1.1) Which of the following statement is true?

A. The Von Neumann architecture contains a graphical processing unit to play the video.

B. Modern computers can only process binary data in the low level.

C. Computers must have an operating system to work.

D. In Von Neumann architecture, ALU is used to fetch commands from the memory.

1.2) The signals shown in the following figure can be translated into NRZI code as:

A. 1101100010 B. 1011011110 C. 0010011101 D. 0100100001

1.3) Hexadecimal number AB.D equals to binary number:

A. 10111100.1110 B. 10111100.1101 C. 10101011.1100 D. 10101011.1101

1.4) Binary number 101101.101 equals to decimal number:

A.45.875 B.45.625 C.45.125 D.45.5

1.5) Concerning the information unit, which of the following statement is incorrect?

A. 1 GB = 2^{10} MB.

B. Byte is the smallest information unit in computer programming.

C. 1TB = 2^{40}bit.

D. 1MB = 1024KB.

1.6) Which of the following is correct?

A. High-level languages must be converted into low level languages first since low level languages have higher development efficiency.

B. The operating system is a high-level program which provides all basic services for managing and controlling a computer's activities.

C. Lower-level languages have lower language efficiency.

D. An assembly language is a low-level programming language.

1.7) Which of the following codes in Python will raise an error?

A. num = 1 B. __age__ = 24 C. // year = 365 D. # account =+ 1

1.8) What is the output of the following Python program?

```
1. a = 2
2. b = 5
3. c = 9
4. print(c//a+b*c%b**a)
```

A. 4 B. 24 C. 84 D. 49

1.9) Which command below closes the already open file "myText.txt" if the following code has already been written?

```
1. ref_file = open("myText.txt", "r")
```

A. "myText".close() B. ref_file.close()

C. close(ref_file) D. close("myText.txt")

1.10) What will be the output of the following Python code?

```
1. def func(a, b=5, c=10):
2.     print('a is', a, 'and b is', b, 'and c is', c)
3. func(3, 7)
4. func(25, c=24)
5. func(c=50, a=100)
```

A.
a is 7 and b is 3 and c is 10
a is 25 and b is 5 and c is 24
a is 5 and b is 100 and c is 50

B.
a is 3 and b is 7 and c is 10
a is 25 and b is 5 and c is 24
a is 100 and b is 5 and c is 50

C.
a is 3 and b is 7 and c is 10
a is 5 and b is 25 and c is 24
a is 50 and b is 100 and c is 5

D.
None of the mentioned

Question 2. (10 × 4% = 40%)

Pick the correct option/s in each of the following sub-questions. Note that there may be MULTIPLE correct options for each sub-question.

2.1) Which of the following codes in Python will raise an error?

A.

```
s = 'abc'
s[1] = "d"
```

B.

```
s = "abc"
s[1] = 'd'
```

C.

```
s = ('a', 'b', 'c')
s[1] = 'd'
```

D.

```
s = ["a", "b", "c"]
s[1] = 'd'
```

2.2) Concerning the following program, which of the following statement(s) is/are correct?

```
a = float('7.07')
b = int(a)
c = int('369.g')
print(a)
print(b)
print(c)
```

A. All three print() statements will output a number;

B. After the program has been executed, variable a is of float type;

C. After the program has been executed, variable c is of integer type;

D. Function float() is used for data type conversion;

2.3) Concerning the following program, which statement(s) is/are incorrect?

```
str1 = "abc"
str2 = " "
str3 = "123"
print(str1 + str2 + str3)
print(str1 * 2 + str3)
print(str1 * str3)
```

A. The output of the first print() statement is:

abc 123

B. The output of the second print() statement is:

abcabc 123

C. The second print() statement will raise an error;

D. The third print() statement will cause an error;

2.4) Which of the following output(s) is/are correct?

A.

```
x = ['ab', 'cd']
for i in x:
    x.append(i.upper())
print(x)
```

Output:

[‘ab’, ‘cd’, ‘AB’, ‘CD’]

B.

```
i = 2
while True:
    if i % 3 == 0:
        break
    print(i)
    i += 2
```

Output:

2

4

C.

```
for i in range(2):
    print(i)
```

Output:

0

1

D.

```
i = 0
while i < 5:
    print(i)
    i += 1
    if i == 3:
        break
```

Output:

0

1

2

2.5) Which of the following is/are valid string manipulation function(s) in Python?

A. count() B. upper() C. strip() D. reverse()

2.6) Concerning the following program, which of the following statement(s) is/are incorrect?

```
1.  def question(a, b, c):
2.      a = 4
3.      b[1] = a**a
4.      c *= a
5.      print(a, ',', b, ',', c)
6.  a = 3
7.  b = [2, 8]
8.  c = "9"
9.  question(a,b,c)
10. print(a, ',', b, ',', c)
```

A. The output of the print() in line 5 is

4 , [2, 16] , 9999

B. The output of the print() in line 5 is

4 , [2, 256] , 9999

C. The output of the print() in line 10 is

3 , [2, 256] , 9

D. The output of the print() in line 10 is

4 , [2, 16] , 999

2.7) Which of the following statement(s) is/are correct?

```
1.  lst1 = [1,2,3,4,5]
2.  print(len(lst1[1:-2]))  # 1
3.  string = "my name is x"
4.  print(string[1])  # 2
5.  for i in string.split():
6.      print(i, end=", ")  # 3
```

A. The output of the first print(): 2
B. The output of the second print(): name
C. The output of the third print(): my, name, is, x,
D. The output of the third print(): m, y, n, a, m, e, i, s, x,

2.8) Which of the following codes in Python will NOT raise an error?

A. a,b = (1,2) B. a,b = 1.2 C. a,b = [1,2] D. a = b = 1

2.9) Which of the following statement will output True?

A. >>> 'a' in ['a', 'p', 'p', 'l', "e"]

B. >>> 'key1' in {'key1': 1, 'key2': 2}.items()

C. >>> 'umbrella'.find('u') == 1

D. >>> "umbrella"[2:-1] == 'brell'

2.10) Concerning the following program:

```
1.  nums = []
2.  while 1:
3.      input_value = input('Enter a number:')
4.      if input_value == 'done': break
5.      value = float(input_value)
6.      nums += [value]
7.      c = sum(nums) / len(nums)
8.      print('The value of c is ', c)
```

Which of the following statements are correct?

A. The purpose of this program is to calculate the average of your inputted numbers.

B. Line 4 is used to break the while loop.

C. The list “nums” stores all your keyboard input numbers.

D. Line 6 is used to add the inputted number to the summation.

Question 3. (5% + 15% + 10% = 30%)

3.1) Answer the following questions:

(a) How to write comments in Python code? Show all possible ways. (3 marks)

(b) Draw the figure of the following NRZI code. (2 marks)

0 1 0 0 1 1 0 0 0 1 1

3.2) Read the following programs and write the correct output. (5 marks * 3)

(a)

```
1.  x = 5 // 2
2.  for i in range(10):
3.      for j in range(-1, -10, -1):
4.          x += 1
5.  print(x)
```

(b)

```
1.  sentence = "nothingisimpossible"
2.  d = dict()
3.  for char in sentence:
4.      if char not in d:
5.          d[char] = 1
6.      else:
7.          d[char] = d[char] + 1
8.  print(d['s'])
9.  print(d.get('d', 0))
```

(c)

```
1.  def func(var):
2.      try:
3.          result = int(var)
4.          print(result)
5.      except ValueError:
6.          print("Error in ", var)
7.      else:
8.          print("No error")
9.  func("xyz")
10. func("134")
```

3.3) Concerning the following program and answer the following questions. (10 marks)

```
1.  myDict = {"Amy": 18, "Barak": 21, "Caroline": 17, "Daniel": 25}
2.  mySeq = list(myDict.items())
3.  list1 = list()
4.  list2 = list()
5.  for i in range(len(mySeq)):
6.      key, value = mySeq[i]
7.      list1.append((key, value))
8.      if value < 18: continue
9.      list2 += [(value, key)]
10. print(list1)
11. print(list2)
12. list3 = sorted(list1)
13. list4 = sorted(list2)
14. print(list3)
15. print(list4)
```

A. How many elements are there in list2 and list4? (2.5 marks)

B. What are the outputs of the last two print()? (2.5 marks)

C. What are the data types of elements in list1 and list3? (2.5 marks)

D. What are the outputs of the first two print() if we change the code in line 3 and line 4 to the code below? Please explain your judgment briefly. (2.5 marks)

list1 = list2 = []