King Fahd University of Petroleum and Minerals

College of Computer Science and Engingeering
Information and Computer Science Department

ICS 104: Introduction to programming in python and C
Spring Semester 2020-2021 (202)
Midterm Exam, 16 March 2021
Exam Duration: 90 Minutes

Important Notes About The Midterm Exam in Term 202:

1. The exam covers all material taken in the lectures, labs and assignments, up to (and including) Chapter 3: Decisions.

2. It consists of 43 questions as follows:

5 "display the output" questions (20 points)
25 multiple choice questions with 4 choices or 5 choices (50 points)
10 multiple answer questions, where each question may have more than one correct answer. (20 points)
3 simple programming questions (10 points)

[20 points]: Enter The output of the code (4 points for each question)

1) What will be the output of the following code fragment?

```
x = 54
y = 46

if 2 * x < x + y:
    print(x - y)
elif x - y / 2 == 0:
    print(x)
else:
    print(x + y)
```

Write your answer:	.....

2) What is the output of the following code:

```
a = 3
b = 2
c = 4

z = 4//a-2*b**3/c%2%4
print("%d" %z)
```

Write your answer:	.....

3) What will be the exact output of the following python code if the user enters 4 for num1 and -4 for num2 ?

```
num1 = int(input("Enter a non-zero integer number: "))
num2 = int(input("Enter another non-zero integer number: "))
num = num1 * num2
if num < 0:
    if num1 < 0:
        signs = "NP"
        if num % 2 == 1:
            numbers = "OO"
        else:
            numbers = "EE/EO/OE"
    else:
        signs = "PN"
        numbers = "OO/OE/EO/EE"
else:
    signs = "PP/NN"
    numbers = "EE/EO/OE/OO"
print ("Signs are",signs,"Numbers are", numbers )
```

Write your answer:	.....

4) What will be the output of the following code fragment?

```
st = 'The more control you have over your attention, the more control you have over your future'

if 'ur' in st:
    print(st.count('ur'))
else:
    print('Not Found')
```

Write your answer:	.....

5) What will be the output of the following code fragment?

```
st1 = 'A'.lower()
st2 = 'B'.upper()

print(st1*2 + st2*2)
```

Write your answer:	.....

[50 points]: Choose the correct answer (2 points for each question)

6) Given the following code:

sentence = "Computer Science"

Which of the following statements correctly tests whether all the letters in the sentence variable are uppercase letters?

a)	`if sentence.upper()=True:` `  print("Uppercase letters")`
b)	`if sentence.upper()==sentence:` `  print("Uppercase letters")`
c)	`if sentence.upper()=sentence:` `  print("Uppercase letters")`
d)	`if sentence.upper():` `  print("Uppercase letters")`

7) Consider the following assignment statement:

myString = " ThisIsNumberFive "

where the string myString does not contain any spaces.
The index of the character "v" in myString is

a)	`len(myString) - 3`
b)	`len(myString) – 4`
c)	`len(myString) – 1`
d)	`len(myString) – 5`
e)	`len(myString) - 2`

8) Consider the following Python code:

name = "Muhammad Abdullah Hashim"

id = 202012134

Choose the correct answer

a)	`print(name.isalpha()) will display True`
b)	`none of the given answers is correct`
c)	`print(isalnum(id)) will display True`
d)	`print(isalpha(name)) will display True`
e)	`print(id.isdigit()) will display True`

9) _____ is the equivalent mathematical notation of the following Python expression

```
k = sqrt(n + g*sqrt(m**2/c +
32.3)/(1+c**2))
```

a)	$k = \sqrt{(n+g)\frac{\sqrt{\frac{m^2}{c}+32.3}}{1+c^2}}$
b)	$k = \sqrt{n+g\frac{\sqrt{\frac{m^2}{c+32.3}}}{1+c^2}}$
c)	$k = \sqrt{n+g\frac{\sqrt{\frac{m^2}{c}+32.2}}{1+c^2}}$
d)	$k = \sqrt{n+g\frac{\sqrt{\frac{m^2+32.3}{c}}}{1+c^2}}$

10) What is the output of the following Python code fragment?

```
print("15"*4)
```

a)	11115555
b)	15151515
c)	An error is generated, since you cannot multiply a string with an integer.
d)	15555
e)	60

11) Consider the following code fragment:

```
x = 4
y = 5
print("%2d + 4d" % (x + y))
```

a)	`  9`
b)	No output is generated due to an error
c)	`  9 + 4 d`
d)	` 4 +  9`
e)	`9`

12) After executing the following 3 python statements, what do x and y represent?

grams = 7867 # this number represent number of grams

x = grams // 1000

y = grams % 1000

Note: 1 gram = 1000 milligrams and 1 kilogram = 1000 gram

a)	x will have number of milligrams (mg) in the given grams . y will have the grams remaining after removing the milligrams (x).
b)	y will have number of Kilograms in the given grams . x will have the grams remaining after removing the Kilograms (y).
c)	y will have number of milligrams (mg) in the given grams . x will have the grams remaining after removing the milligrams (y).
d)	x will have number of Kilograms in the given grams . y will have the grams remaining after removing the Kilograms (x).

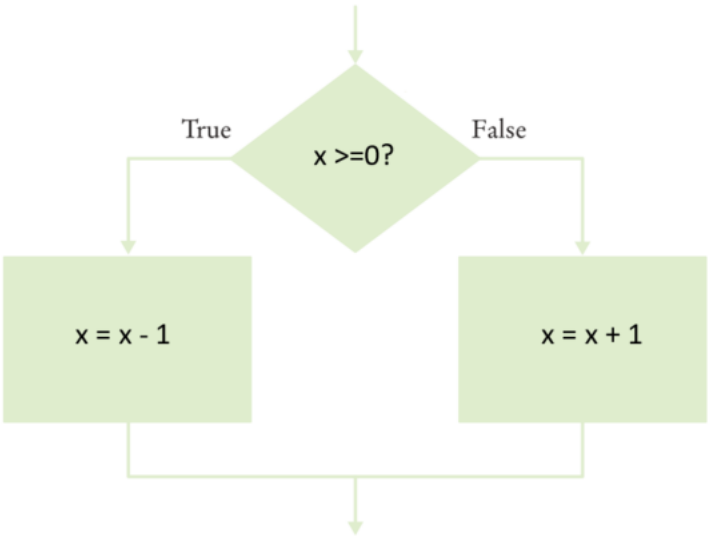
13) Select the correct option based on the below python code.

```
x = 20
y = 10

if (y ** 3 > 100 and x / 2 <= 100):
    print("first block is executed")
elif (x // 2 > 100 or y > 100):
    print("second block is executed")
else:
    print("third block is executed")
```

a)	Program will print "first block is executed."
b)	Program will print "third block is executed"
c)	Program will print "second block is executed"
d)	Program will give syntax error.

14) Which of the code fragments below corresponds to the following flowchart?



a)	`if x > 0 :`
	`    x = x - 1`
	`else:`
	`    x = x + 1`

b)	`if x <= 0 :`
	`    x = x + 1`
	`else:`
	`    x = x - 1`

c)	`if x >= 0 :`
	`    x = x - 1`
	`else:`
	`    x = x + 1`

d)	`if x > 0 :`
	`    x = x + 1`
	`else:`
	`    x = x - 1`

15) A string is stored in a variable called str.

The string starts with a number that is always 2 digits to the left of the decimal point and 2 digits to the right of the decimal point. For example:

str = "12.73 is the total"

Which of the following is the right way to extract the number and print it after multiplying it by 10.

a)	`str2 = str[0:5]`
	`n = int(str2)`
	`n2 = n * 10.0`
	`print (n2)`

b)	`str2 = str[0:5]`
	`n2 = float(n * str2)`
	`print (n2)`

c)	`str2 = str[0:4]`
	`n2 = float(n * str2)`
	`print (n2)`

d)	`str2 = str[0:5]`
	`n = float(str2)`
	`n2 = n * 10`
	`print (n2)`

16) Consider the following Python code:

```
a="Muhammad Abdullah Hashim"

b="Muhammad"
```

Choose the correct answer

a)	`print(a[0:8] in b)  will display True`
b)	`print(a[0:8] in b) will display Muhammad`
c)	`print(b in a[1:8]) will display uhammad`
d)	`print(b in a[0:8]) will display False`
e)	`none of the given answers is correct`

17) What is the output of the following python code:

```
x = 24556
y = 73454
a = 315
z = x%10 + y%10
z = z + a//100
print(z)
```

a)	`15`
b)	`25`
c)	`13`
d)	`17`
e)	`93`

18) Select the correct option based on the below python code.

```
num1 = 8
num2 = 7
num3 = 0.0

CONSTANT = 0

if num1 != num3 and num2 * 2 > CONSTANT:
    print("First block is executed.")

elif num1 <= num2 or num3 * 2 > CONSTANT:
    print("Second block is executed.")

else:
    print("Third block is executed.")
```

a)	Program will not execute and give invalid syntax error.
b)	First block is executed.
c)	Second block is executed.
d)	Third block is executed.

19) What output is generated by the following code segment?

```
average = 40.51
print("The average is %4.1f" % average)
```

a)	The average is 040.5
b)	The average is 40.5
c)	The average is 40.51
d)	The average is 0040.5
e)	The average is 4051.0

20) Which of the code correctly determines if the age entered by user is valid?

Requirements for valid age are:

Age only contains digits

Age is above 24 and less than equal 45

a)	`age = int(input('Please enter you age'))`
	`if age.isdigit():`
	`    if age >= 25 and age <= 45 :`
	`        print("Valid Age")`

b)	`age = input('Please enter you age')`
	`if age.isdigit():`
	`    age = int(age)`
	`    if age >= 25 or age <= 45 :`
	`        print("Valid Age")`

c)	`age = input('Please enter you age')`
	`if age.isdigit():`
	`    age = int(age)`
	`    if age >= 25 and age <= 45 :`
	`        print("Valid Age")`

d)	`age = int(input('Please enter you age'))`
	`if age.isdigit():`
	`    if age >= 25 or age <= 45 :`
	`        print("Valid Age")`

21) _____ represents the following expression in Python:

$$F = \frac{N - 1 + \left(\frac{A - B}{A}\right)^2}{G} \times M - C^2$$

a)	`F = (N-1 + ((A-B)/A)**2/G) * M - C**2`
b)	`F = (N-1 + (A-B/A)**2)/G * M - C**2`
c)	`F = (N - 1 + ((A - B) / A)**2) / G * M - C**2`
d)	`F = (N-1 + ((A-B)/A)**2)/G * (M - C**2)`

22) What will be the output of the following print statement:

```
print('ICS%d'%(104),  'Test%4s'%('01'))
```

a)	`ICS104Test 01`
b)	`ICS104 Test  01`
c)	`ICS104 Test01`
d)	`ICS 104 Test01`

23) Suppose we have a string variable ***str*** and it contains the string value '***Hero You***'. Consider the code snippet below

```
str = str.replace('You', 'me')
print(str)
```

What **print** statement will show on the output cell?

a)	`Hero You`
b)	`Hero me`
c)	`Hero Youme`
d)	`Hero meYou`

24) What will be the result if you try to run the following python code?

```
w = 12
z = 0
if w != z or w/z > 0:
    print ("w = ", w)
else:
    print ("z = ", z)
```

a)	`Division by zero error  message`
b)	`Syntax error  message`
c)	`z =  0`
d)	`None of the given answers is correct`
e)	`W =  12`

25) What is the expected output printed after executing the following Python code fragment?

```
firstName = "Ahmad"
middleName = "Saleem"
lastName = "Abdullah"
print("The full name is",firstName+middleName,lastName)
```

a)	`The full name is AhmadSaleem Abdullah`
b)	`The full name isAhmad SaleemAbdullah`
c)	`The full name is AhmadSaleemAbdullah`
d)	`The full name is Ahmad Saleem Abdullah`

26) What will be the output of the following Python code

```
x = 3.1415926535897932 38
x += 5
print(round(x,5))
```

a)	`The program will generate a syntax error`
b)	`8.5`
c)	`None of the given answers is correct`
d)	`3.14159`
e)	`8.14159`

27) What string method can be used to determine if the string contained in the variable name password only consists of digits?

a)	`password.isupper()`
b)	`password.isalpha()`
c)	`password.isalnum()`
d)	`password.isdigit()`

28) Which of the following is True:

a)	`not isdigit(19)`
b)	`'19.8'.isdigit()`
c)	`"365".isalnum()`
d)	`isdigit(19)`
e)	`none of the given answers is correct`

29) What will be the output of the following print statement:

```
print('welcome to', 'ICS', '104')
```

a)	`welcome to ICS 104`
b)	`welcometo ICS 104`
c)	`welcometoICS104`
d)	`welcome to ICS104`

30) Assuming that the user provides **PHYS261Energy** as input, what will be the value of the variable title after executing the following code snippet :

```
title = input("Enter a string: ")
x = title.lower()
```

a)	`PHYS261Energy`
b)	`physenergy`
c)	`nergy`
d)	`phys261energy`

[20 points]: multiple answer questions. Check all the correct answers (2 points for each question)

31) Select all correct statements for the following Python code

```
a = 5
b = 0
c = "0"
if(a<10):
    a = a + 2
if(a<10):
    b = "c"
    a = a + a//2
    if(b==c):
        print(c)
if(a<=10):
    print(b+c)
```

☐	the program will run, but will not produce any output
☐	the output is "c0"
☐	only the first if statement is evaluated
☐	all if statements are evaluated
☐	the output is "0"

32) Which of the following are needed to run Python code? (mark all answer parts that you believe are correct):

☐	The virtual machine
☐	A DVD disk
☐	Python compiler
☐	A flash disk

33) Which of the following are parts of the problem solving process using software development (mark all answer parts that you believe are true):

☐	Understanding the problem
☐	Testing the algorithm with simple inputs
☐	Analyzing the outputs of the Python code
☐	Analyzing the inputs of the Python code

34) The following identifiers are all correct variable names (even if they do not follow the recommended conventions), except (Choose ALL correct answers)

☐	numberOf5$Bills
☐	numberof5dollarbills
☐	_numberOf5DollarBills
☐	5DollarBillsNumber
☐	numberOf5DollarBills

35) Which of the following are true about the nested if statements? Choose ALL correct answers

☐	If the condition of the outer if is evaluated to False, the condition of the inner if will be tested.
☐	The outermost else corresponds to the outermost if
☐	The condition of the inner if is always tested, regardless of the evaluation of the condition of the outer if.
☐	Used to implement a decision with multiple alternatives
☐	An if statement within another if statement

36) Select all correct statements for the following Python code

```
a = 5
b = 3
if (a<10):
    print("pass2")
    b = b + 10
if (b<a):
    print("pass1")
```

☐	value of variable (b) cannot be changed in the body of an if statement
☐	the output is "pass1"
☐	the output is "pass2"
☐	the program will run without any errors
☐	the program will produce an error

37) Which of the following are true regarding an algorithm (mark all answer parts that you believe are true):

☐	Can be executed using Jupytor
☐	Can be represented using a flow chart
☐	Can be translated into Python code
☐	A general and abstract sequence of steps that leads to a useful interpretation of the data

38) For the following Python code fragment:

Which value(s) of the variable count produce(s) a result of 11 in variable result? Choose ALL correct answers

```
count = int(input("Enter a value of count: "))
if (count < 5) :
    result = count + 10
elif (count < 10) :
    result = count + 2
elif (count < 15) :
    result = count - 3
elif (count < 20) :
    result = count - 8
else :
    result = count // 2
```

☐	18
☐	1
☐	8
☐	9
☐	19

39) The following identifiers follow the recommended conventions for variable names, constant variables or user-defined data types, except (Choose ALL correct answers)

☐	DebtToEquity
☐	DEBT_TO_EQUITY
☐	DEBTTOEQUITY
☐	D_T_E
☐	DTE

40) For the following Python code fragment:

Which value(s) of the variable price produce(s) the item "ice cream"? Choose ALL correct answers

```
price = int(input("Enter a value of price: "))
if (1 < price < 7) :
    item = "drink"
elif (5 < price < 15) :
    item = "fries"
elif (10 < price < 20) :
    item = "ice cream"
else :
    item = "happy meal"
```

☐	20
☐	11
☐	18
☐	15
☐	13

[10 points]: Simple programming questions.

41) Write one if statement with a condition using logical operators to check if a certain day is not a weekend.[2 points]

Notes:

Weekdays are Sunday through Thursday
Weekends are Friday and Saturday
use the variable today in your condition

Write your code below:
.....
.....
.....
.....
.....
.....

42) Write a Python code fragment that asks the user to input a number, and then stores it as an integer value. [2 points]

```
Write your code below:
```

.....

.....

.....

.....

.....

.....

43) Consider a program where the variables - **product1** and **product2** will contain the names (can be of maximum 6 characters) of two different products (entered by the users). The user will also input an integer number for the variable - **Price1** and a float number of the variable - **Price2** [The integer number can be of maximum 6 digits and the float number can be of maximum 5 digits including two decimal digits].

Using the print function along with the required string format operator (only), you need to produce outputs so that the Product names are **left**-aligned and the Prices are **right**-aligned as displayed in the sample-outputs [The sample-output table exactly shows the spaces and alignments required for the Product names and Prices (in Line1 & Line2) but you don't need to print the position values]. [6 points]

Sample Input 1:

Enter the name of the Product1: MILK
Enter the name of the Product2: EGG
Enter an integer value: 120
Enter a float value: 90.56

Sample Output 1:

Position	0	1	2	3	4	5	6	7	8	9	10	11	12
Line 1	M	I	L	K							1	2	0
Line 2	E	G	G						9	0	.	5	6

Sample Input 2:

Enter the name of the Product1: TEA
Enter the name of the Product2: MEAT
Enter an integer value: 21
Enter a float value: 150.78

Sample Output 2:

Position	0	1	2	3	4	5	6	7	8	9	10	11	12
Line 1	T	E	A									2	1
Line 2	M	E	A	T				1	5	0	.	7	8

PROGRAM CODES:

```
product1 = input("Enter the name of product1: ")
product2 = input("Enter the name of product2: ")
price1 = int(input("Enter an integer value: "))
price2 = float(input("Enter a float value: "))
```

Write your code below:

.....

.....

.....

.....

.....

.....