COMSATS UNIVERSITY ISLAMABAD (CUI)
DEPARTMENT OF COMPUTER SCIENCE
FINAL EXAMINATION SPRING -2023
BS (CS)– I SEMESTER

Course: CSC101-Introduction to ICT
Maximum Marks: 50
Time Allowed: 180 minutes

Instructor: *Dr. Majid Iqbal Khan*
Dated: June 23, 2023

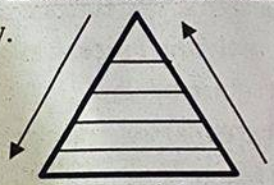
- *All questions are self-explanatory and require no further explanations during exam time.*
- *Make sure that you have signed the attendance sheet before leaving the examination room.*
- *Return the question paper along with the answer sheet.*
- *Attempt all questions.*
- *Calculators are NOT allowed*

(CLO – 1: Explain the basic computing models and its related hardware)

Q.# 1. Provide short answers to the following **[2+2+1=5 Marks]**

(a) Why storage devices are not used by processor to fetch and store processed data. Although. storage devices have more storage capacity as compared to RAM

(b) We have studied different types of memory in class. Complete the pyramid given below with respect to cost, size and access time. Which of these attributes increases or decreases down the hierarchy.



(c) Differentiate between Random and Sequential access in storage devices.

(CLO –2: Work out with different number systems and codes)

Q.# 2. Convert the following into the specified number system and perform the stated arithmetic operations. Clearly show complete calculation. No marks will be awarded on direct conversions. **[2+1+1+1=5 Marks]**

(a) $(43.5)_{10}$ into Binary.
(b) Binary obtained above into Hexadecimal.
(c) Subtract $(3527)_8$ From $(12565)_8$
(d) Add $(CA8F)_{16}$ and $(EBAC)_{16}$

(CLO –3: Describe the fundamental concepts of ICT domains)

Q.# 3. Provide short answers to the following **[1+2+2=5 Marks]**

(a) Suppose you are sending an email and it is suspected that there are intruders who can intercept your message. Which measures you will take to prevent your data even if information theft occurs.

(b) Suppose you have opened an excel sheet for a bank transaction system and found out that same customer information is stored in multiple tables. Identify the issue and how Relational Database Management Systems (RDBMS) resolves this problem?

(c) You are working on a project, when you started implementation, you realized that the particular technology required to create the project does not even exist. In your opinion root cause of this problem lies in which step of software development life cycle and how that should have been dealt with.

(CLO –4: Solve computing problems using problem-solving process)

Q.# 4. Construct the flowcharts for the following **[6+6=12 Marks]**

(a) A change-counting game that prompts the user to enter the number of coins required to make exactly one dollar. The program should ask the user to enter the number of pennies, nickels, dimes, and quarters. If the total value of the coins entered is equal to one dollar, the program should congratulate the user for winning the game. Otherwise, the program should display a message indicating whether the amount entered was more than or less than one dollar.
100 pennies, 20 nickels, 10 dimes, or 4 quarters; each = 1 dollar.

(b) You have to design a system that calculates the final grades for a class of students based on their individual scores in different assignments and exams. The system has the following requirements:

i. The program should prompt the user to enter the total number of students in the class.
ii. For each student, the program should ask for their name, followed by their scores on three assignments (out of 100), a midterm exam (out of 100), and a final exam (out of 100).
iii. The program should calculate the average assignment score for each student by taking the average of the three assignment scores.
iv. The program should calculate the overall course grade for each student using the following weights: assignments (25%), midterm exam (25%), and final exam (50%).
v. The program should display the final course grade (out of 100) for each student.

Q.# 5. Write the python program for the following: **[8+7=15 Marks]**

(a) You are a software developer tasked with creating a Python program that simulates a simple banking system. The program should allow users to perform basic banking operations such as creating an account, depositing money, withdrawing money, and checking the account balance. You have decided to implement the program using functions to ensure modularity and code reusability. Write a Python program that fulfills the following requirements:

i. Implement a function named **create_account** that takes two parameters: **name (string)** and **initial_balance (float).** This function should create a new account with the given name and initial balance and return the account number.

ii. Implement a function named **deposit** that takes two parameters: **account_number (integer) and amount (float).** This function should add the specified amount to the account balance and return the updated balance.

iii. Implement a function named **withdraw** that takes two parameters: **account_number (integer) and amount (float).** This function should subtract the specified amount from the account balance and return the updated balance. Ensure that the account has sufficient funds before making the withdrawal; otherwise, display an appropriate error message.

iv. Implement a function named **check_balance** that takes one parameter: **account_number (integer).** This function should return the current balance of the account.

v. Write a **main** function that acts as the program's entry point. Inside the main function, prompt the user to perform the following actions:
   a. Create an account by providing a name and initial balance.
   b. Deposit money into an existing account by specifying the account number and amount.
   c. Withdraw money from an existing account by specifying the account number and amount.
   d. Check the balance of an existing account by specifying the account number.
   e. Exit the program.

(b) Write a python code which calculates measurements of a shape for N number of times and then prints out a table given below, the formulae are as follows:
Rectangle: Area = length x width
Circle: Area = πr^2, Circumference = $2\pi r$
Sphere: Area = $4\pi r^2$, Volume = $4/3\ \pi r^3$, Circumference = $2\pi r$

i. A loop should go over N number of times asking the user each time if the user wants to calculate the measures of a particular shape or not. The shape should be a user input asked in each iteration of the loop.
ii. Based on the user choice of shape, the area/volume/circumference should be calculated.
iii. After each calculation results of each iteration should be printed in the form of a table shown below:

#	Area	Volume	Circumference
Circle	7		12.57
Rectangle	324		
Sphere	50.28	33.52	12.57

(CLO –5: Describe the concepts of variables, conditionals, repetitive structure and functions using a programming language)

Q.# 6. Write the output of following python code chunks. In case of error, explain the error. Marks will not be given without explaining the error. **[8 Marks]**

a)
```
print("value:", round(5.4666, 2))
```
[0.5]

b)
```
print(eval("2*1") + int(2.5))
```
[0.5]

c)
```
count = 0
while count > 0:
    print(count)
count += 1
print(count)
```
[0.5]

h)
```
n = 1
for i in range(n):
    while i <= n:
        print(n)
        n -= 1
    print(i)
```
[0.5]

c)
```
names = ["abc", "xyz", "ab"]
print(names[3])
```
[0.5]

d)
```
s1 = "programming in python"
i = s1.index("in")
print(s1[:i])
```
[0.5]

e)
```
temperature = 50
if temperature >= 100:
        print("too hot")
elif temperature <= 40:
        print("too cold")
else:
        print("just right")
```
[0.5]

f)
```
numerator = 10
denominator = 0
result = numerator / denominator
print(result)
```
[0.5]

g)
```
for i in range(5):
    print(i + "x" + i + "=" + i*i)
```
[1]

h)
```
def getMax(value1, value2, max):
    if value1 > value2:
        max = value1
    else:
        max = value2
    return max
main()
    max = 0
    print(getMax(1, 2, max))
```
[1]

i)
```
x=10
while x>=1:
    x=x-1
    if(x%3!=0):
        continue
    print(x)
```
[1]

j)
```
for i in range(10, 11):
    for j in range(i+1, 12):
        print(j)
    print(i)
```
[1]

*******BEST OF LUCK*******