National University of Computer & Emerging Sciences, Karachi
Fall-2021
School of Computing
Lab Midterm
13th November 2021, 01:30 pm – 3:00 pm

Course Code: CL1002	Course Name: Programming Fundamentals
Instructor Name: Sandia Kumari	
Student Roll No:	Section No: BCS-1K

Instructions:

- Return the question paper and make sure to keep it inside your answer sheet.
- Read each question completely before answering it. There are **3 questions and 2 pages**.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- You are **not allowed to write** anything on the question paper (except your ID and group).
- For Exam submission: Create a folder named **"your student-id" i.e. (K21-0100).** Paste the .c file for each question named as **Q1.c, Q2.c** and on so in that folder.

Time: 90 minutes **Max Marks: 30 Points**

PAPER TYPE A

Question no. 1 [30 mins, 10 Points]

Vitamin D is a unique vitamin that most people don't get enough of. In fact, it's estimated that more than 30% of Pakistani adults have a vitamin D deficiency. This vitamin is made from cholesterol in your skin when it's exposed to the sun. That's why getting enough sunlight is very important for maintaining optimal vitamin D levels. The vitamin absorbed by body is dependent on the time of sunlight we get in a day.

For first 50 minutes Vit. D 0.50 /min

For next 100 minutes Vit. D 0.75/min

For next 100 minutes Vit. D 1.20/min

For unit above 250 mints Vit. D 1.50/min

An additional of 20% is added if it's a summer season

How to calculate consumption of Vitamin D.

Question no. 2 [30 mins, 10 Points]

You are assigned a task to automate the ON/OFF process of each AC in your lab. For that you designed the given formula for reading the temperature of the lab.

$$F(n) = \sum_{i=0}^{n} \frac{1}{3\pi}(cx + i)^n$$

Here, n= is the no of samples,
C is a constant = 2,
X is a random number between [0 to 1],
and i is the timestamp which is from [0 to10] seconds to find the value of F(n).
where n is the no of samples taken from the user to iterate this process for n times.

If the value of F(n) is greater than 1, then you print the message "ON" on the screen otherwise "OFF" on the screen.

Question no.3 [30 mins, 10 Points]

Write a program for the following series using loop

(a). 0, 3, 3, 9, 6, 27, 9, 81, 12
[Hint: using + and * operator to develop the series]
(b). -9, 7, -5, 3, -1, 0, -1, 3, -5, 7, -9
[Hint: series starts from -9 and ends at 9 with alternate multiplication of +1 and -1.]