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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Design & Analysis of Algorithms** | **Course Code:** | **CS2009** |
| **Program:** | **BS (Computer Science)** | **Semester:** | **Spring 2023** |
| **Duration:** | **20 Minutes** | **Total Marks:** | **15** |
| **Paper Date:** | **21-Feb-2023** | **Weight** | **2.5** |
| **Section:** | **G** | **Page(s):** | **2** |
| **Exam:** | **Quiz 1** | **Reg. No.** |  |
| **Instruction/Notes:** |  | | | |

**Question 1: [5 marks]**

For the following functions f(n) and g(n), indicate whether f(n) = O(g(n)), f(n) = Ω(g(n)), or both, i.e. f(n) = θ(g(n)). Justify your answer.

f(n)= n1/2logn1/2

g(n) = 30000 n1/2log n1/4

**Question 2: [5 Marks]**

Find big-theta of the function f(n) = *n*1/2/18 – 19log*n* + 20, give the constants n0, k1 and k2.

**Question 3: [5 marks]**

**Write down the Running Time equation (T(n)) of the following algorithm and analyze its time complexity. Show complete steps. If you make any assumptions, state them clearly.**

**int algo(input, n)**

**{**

**If (n<=0)**

**{return 0}**

**X = algo(A, n-2)**

**Y = algo(A, n-4)**

**Z = A[(n-2) + (n-4) +1]**

**return (X+Y+Z)**

**}**