# BAHRIA UNIVERSITY,

**(Karachi Campus)**

*Department of Software Engineering*

**Assignment #01– Spring 2022**

COURSE TITLE:

**D &AA** COURSE CODE:

**C SC-321**

Class: **BSE 4** Shift: **Morning** Course Instructor: **ENGR. BUSHRA FAZAL KHAN** Assignment Date: **17-Apr-2022** Max. Marks: **5 Points(CLO4)** Assignment Due: **25-Apr-2022**

1. Consider the following version of an important algorithm (1)

**ALGORITHM** *GE(A*[0*..n* − 1*,* 0*..n*]*)*

//Input: An *n* × *(n* + 1*)* matrix *A*[0*..n* − 1*,* 0*..n*] of real numbers

**for** *i* ←0 **to** *n* − 2 **do**

**for** *j* ←*i* + 1 **to** *n* − 1 **do**

**for** *k*←*i* **to** *n* **do**

*A*[*j, k*]←*A*[*j, k*]− *A*[*i, k*] ∗ *A*[*j, i*]*/ A*[*i, i*] What is the efficiency class of this algorithm?

1. Solve the following recurrence relations using Master Theorem. (2) a. x(n) = 9x(n/3) + 5 for n > 1, x(1) = 0

b. x(n) = x(n/2) + n for n > 1, x(1) = 1

c. x(n) = x(n/3) + 1 for n > 1, x(1) = 1

d. x(n) = 4x(n/2) + n2 for n > 1, x(1) = 1

1. Consider the following recursive algorithm. (2)

**ALGORITHM** *Q(n)*

//Input: A positive integer *n*

**if** *n* = 1 **return** 1

**else return** *Q(n* − 1*)* + 2 ∗ *n* – 1

* 1. Draw a tree of recursive calls for this algorithm and compute its time complexity using Tree method.
  2. Compute complexity using induction method

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