Data Structures and Algorithm (DSA)MID Term Examination 2021

SUBMISSION PROCEDURE:
- WRITE ALL YOU ANSWERS ON PAPER.
- SCAN YOUR ANSWERS USING CAMSCANNER
- RENAME YOUR DOCUMENT WITH YOUR REGISTRATION NUMBER
- SEND THE DOCUMENT VIA EMAIL TO "DSA.DCSEUET@GMAIL.COM" within the allocated time.

Your email will be recorded when you submit this form
Not **19pwcse1795@uetpeshawar.edu.pk**

Q1,2

Question 1: **[5+5 = 10]**

Carefully explain under what circumstances each of the following searching algorithms would perform best asymptotically.

a) Linear (Sequential) Search b) Binary search

Question 2: **[15]**

Write a program for linear search which:

a) Statically initialize an array with digits of your registration number avoid redundant entry (i-e if your number is 19pwcse1234 then array would be {1 ,9,2,3,4})
b) Statically Initialize integer K as a Key with 2nd last digit of array (e.g in present case k should be K=3)
c) Perform reverse Linear(sequential) search for K
d) Compute Complexity of your code
e) Write expected output of your program

Q3,4

Question 3: **[15]**

Write a program for Binary search which:

a) Reads your registration number
b) Split registration number and displays numbers of alphabets and digits in your registration.
c) Copy digits of your registration to an array.
d) Apply linear search for duplicate digits. Then display duplicate digits with its count (i-e if your registration number is 19pwcse1234 then it will show 1 occurred twice and one of it will be discareded as 91234)
e) Statically Initialize integer K as a Key with 2nd last digit of your registration (e.g if 19pwcse1234 is your registration then k should be K=3)
f) Perform Binary search for K
g) Find Complexity of your code
h) Write expected output

Question 4: **[15]**

Replace redundant alphabets of your name by single alphabet then put that alphabets in array (hint: if your name is **AllAMA IQBAL** then it will becomes **ALMIQBL** and array size will becomes **7**)

Array:

Initailize Key with 2nd last alphabet of filled array, Then perform detailed step by step Binary search for Key.

first:

last:

mid:

list[mid]:

key:

Q5,6,7

Question 5: **[15]**

Fill the array with digits of your registration number ((i-e if your number is 19pwcse1234 then array would be {1 ,9,2,3,4}). Then perform detailed step by step Quick sort

Question 6: **[15]**

write a Recursive Selection Sort program for scenario discussed in Q5. Sorting array should be statically initialized with your registration number

Question 7: **[15]**

Pick 7 numbers, starting with digits of your registration number avoid redundant entry (i-e if your number is 19pwcse1234 then array would be {1 ,9,2,3,4}. Pick unordered, random numbers between 10 to 100 to make a total 7 number. Perform step by step Bubble sort.

Initailize Key with 2nd last alphabet of filled array, Then perform detailed step by step Binary search for Key.

first:

last:

mid:

list[mid]:

key: