[Max. Marks: 30

1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Draw well labeled diagram wherever necessary.

Q1) a) Explainfôllowing Data Structures with examples foreach.
i) Linear \& Non-linear
ii) Persistent \& Epheneral
b) Discuss with examples time complexity \& space complexity of an algorithm.
c) $\ltimes$ Enlist differences between Data \& Data Object.

Q2) a) In a matrix of order $5 \times 5$, having base address 6500 , for storing characters, compute the address of element of stored at $4^{\text {th }}$ row and $3^{\text {rd }}$ column. (Say if the array is alpha [5][5], then find address of alpha [4][3]). Use column-major method.
b) Discuss how frequency count is used to study time complexity.
c) Write Sudd code to add ane element at near end in singly circular list [ 3 ]

Q3) a) Enlist \& Explain charactertics of sorting algorithms.
b) Discuss with examples Quick sort \& Merge sort algorithms.
c) Explain with example difference between linear search \& binary search. [3]

OR
Q4) a) Demonstrate how Quick sort is performed following set of nos $50,70,45,68,30,90,20,79$
b) Explain time complexitier of following sorting algorithms.
i) Insertion sort
ii) Shellsort
c) Write sudo code for fibonacci search.

