

Total No. of Questions : 4]

SEAT No. :

P-5389

[Total No. of Pages : 3

[6186]-515

S.E. (E&TC / Electronics) (Insem)

DATA STRUCTURES

(2019 Pattern) (204184) (Semester-III)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) Solve Q1 or Q2, Q3 or Q4.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable data, if necessary.

Q1) a) State true or false. (each 5 mark) [5]

- i) Variable names are given to memory location_____.
 - ii) No commas or blanks are allowed within constant and variable declaration_____.
 - iii) If no sign precedes constant it is assumed to be positive_____.
 - iv) Underscore (___) symbol is allowed as part of variable name_____.
 - v) If a character constant is declared as '10' it is correct_____.
 - vi) It is '5' = 5 and '5' = "5" acceptable by compiler_____.
 - vii) 3 && 4 and 3 & 4 are same instructions_____.
 - viii) C= a.b and c= a*b both are same_____.
 - ix) / (division operator) returns **quotient** and % (modulus) operator returns **remainder** after division_____.
 - x) While loop is entry control loop and do while is exit control loop_____.
- b) Describe operations on file as open and close. State various modes, explain append in file mode? [5]
- c) Declare and define structure, structure variable to demonstrate the following: A car manufacturing company maintains its database as chassis no, model name, price as information. Explain use of dot operator and arrow operator to initialize one record in table. [5]

OR

P.T.O.

- Q2)** a) Declare character array of size 10, state various ways to initialize it? Write user defined function to find length of given string? [5]
- b) State true or false. (each 1 mark) [5]
- Array is derived data type. It has memory wastage and no bounds check as its limitation_____
 - Functions can return multiple values, passes multiple values_____.
 - Functions can return multiple values only if pointers are used
 - To find memory address of any array element following formula can be used_____.
- Memory add (i) = base address + size of (datatype) / location number
where i is the location for which address to be found.
- Unions do not have separate locations for each of their members, so their size or equal to the size of largest member among all data members_____.
- c) Classify various datatypes used in C programming (in tree form)? List various format specifiers used to access primary data types.
- Write storage size required for primary data types in terms of bytes for 32/64-bit system? [5]

- Q3)** a) What is stable sorting? Explain all passes/iterations for selection sort with following array Arr [5] = {50 40 30 20 10}; Order in ascending. [5]
- b) Write algorithm for binary search on array? [5]
- c) Match the algorithm with algorithmic complexity. [5]

Algorithm		Complexity (Worst Case)
A.	Bubble, Selection, Insertion sort	1. $O(n \log(n))$
B.	Merge sort	2. $O(n^2)$
C.	Quick sort	3. $O(\log(n))$
D.	Linear search	4. $O(n^2)$
E.	Binary search	5. $O(n)$

OR

- Q4)** a) Write pseudo code algorithm for insertion sort? [5]
- b) Explain bubble sort with suitable example. Demonstrate all iterations and passes by suitable drawings. Arrange all elements in ascending order. Let array [5] = {50 40 30 20 10}. [5]
- c) Given array is A [10] = {3, 5, 0, 10, 8, 15, 7, 6, 20, 4} Apply binary search for given array to search following cases, write detail steps to search number. [5]
- i) Search 0 (extreme left)
 - ii) Search 20 (extreme right)
 - iii) Search 6 (at middle)

