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 complier_____.

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]**

i) Array is derived data type. It has memory wastage and no bounds check as its limitation_____

ii) Functions can return multiple values, passes multiple values_____.

iii) Functions can return multiple values only if pointers are used

iv) 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.

v) 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.	0 (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)

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