M.C.A. SEM - I (CHOICE BASED CREDIT SYSTEM 2011 & 2012 COURSE) : SUMMER - 2018
SUBJECT: ELEMENTARY ALGORITHMICS

Day:	**Saturday**		**02.00 PM TO 05.00 PM**
		S-2018-1783	Time:
Date:	**28/04/2018**		Max. Marks: 100

N.B.:

1) Attempt any **FOUR** questions from Section–I and any **TWO** questions from Section–II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q.1 Perform the following for Bubble Sort (or Exchange Sort) algorithm: **(15)**
    i) Draw Flow-chart   ii) Write Pseudo-code

Q.2 Discuss Time Complexity of an algorithm in detail. Provide an appropriate **(15)** example to support your discussion.

Q.3 "Find MAXIMUM from three integers". **(15)**
Perform the following for above mentioned problem:
    i) Write Pseudo-code   ii) Trace your Pseudo-code

Q.4 What is an Iteration? Explain different iterative structures along with their **(15)** respective Flow-chart symbols.

Q.5 What is the Time Complexity of Binary Search algorithm? Justify your **(15)** answer.

Q.6 Write short notes on any **THREE** of the following: **(15)**

    a) Data Types
    b) Syntax and Semantic Errors
    c) Space Complexity
    d) Character Set, Tokens, Keywords and Identifiers

SECTION-II

Q.7 **a)** Explain the Transform-and-Conquer algorithm design method in detail. **(10)**
    b) Provide justification for the following statement: **(10)**
    "Sequential Search follows Brute-Force algorithm design method."

Q.8 **a)** Discuss the mechanism behind recursion (execution of a recursive program) **(10)** along with an appropriate example.
    b) Write a recursive function (in Pseudo-code or C Language) to compute the **(10)** SUM of first N terms (where N>=1) from following series:
SUM = N + (N-1) + (N-2) + ... + 3 + 2 + 1
(e.g. if N is 1 then SUM would be 1)
(e.g. if N is 3 then SUM would be 3+2+1=6)
(e.g. if N is 6 then SUM would be 6+5+4+3+2+1=21)

Q.9 Develop an Algorithm, Draw Flow–chart and write corresponding Pseudo- **(20)** code for following problem:
Print first N values (where N>=1) from the sequence -
1 -1 1 -1 1 -1 1 -1 ....
(e.g. if N is 1 then print 1)
(e.g. if N is 3 then print 1 -1 1)
(e.g. if N is 6 then print 1 -1 1 -1 1 -1)

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