M.C.A. SEM - I (CHOICE BASED CREDIT SYSTEM 2011 & 2012 COURSE) : WINTER - 2017

SUBJECT: ELEMENTARY ALGORITHMICS

Day: **Saturday** | Time: **02.00 PM TO 05.00 PM**

Date: **11/11/2017** | **W-2017-1686** | 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 Selection Sort algorithm: **(15)**
i) Draw Flow-chart ii) Write Pseudo-code

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

Q.3 "Print digits of input integer in reverse order." **(15)**
(e.g. if input integer is 1234 then output should print 4321)
Perform the following for above mentioned problem:
i) Write Pseudo-code ii) Trace your Pseudo-code

Q.4 Explain the following Structured Programming Constructs along with their respective Flow-chart symbols: **(15)**
i) Sequence ii) Decision/Selection

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

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

a) Semantic and Logical Errors
b) Parameter Types
c) Array and Record
d) Local and Global Variables

SECTION-II

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

Q.8 **a)** Discuss the relationship between Recursion and Iteration along with an appropriate example. **(10)**
b) Write a recursive function (in Pseudo-code or C Language) to print the following output for input N (where N >=1): **(10)**
N N-1 N-2 N-3 ..... 4 3 2 1 1 2 3 4..... N-3 N-2 N-1 N
(e.g. if N is 1 then the output should be 1 1)
(e.g. if N is 3 then the output should be 3 2 1 1 2 3)
(e.g. if N is 6 then the output should be 6 5 4 3 2 1 1 2 3 4 5 6)

Q.9 Develop an Algorithm, draw Flow-chart and write corresponding Pseudo-code for following problem: **(20)**
Compute the SUM of first N (where N>=1) terms from following series:
SUM = 1 + 3 + 5 + 7 + ...
(e.g. if N is 1 then SUM should be 1)
(e.g. if N is 3 then SUM should be 1+3+5=9)
(e.g. if N is 6 then SUM should be 1+3+5+7+9+11=36)

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