S-766

Total Pages : 4   Roll No. -------------

MCS-402/DCA-102

Introduction to Computing

(MSCIT/PGDCA/DCA)

1ST Semester, Examination 2022(Dec.)

Time: 2 Hours   Max. Marks: 70

Note : This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section – A

(Long Answer – type questions)

Note: Section 'A' contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only.

[2 x 19 = 38]

P.T.O.

Q.1.   For each question, construct a Scheme expression and evaluate it in DrRacket.

(a)   How many seconds are there in a year?

(b)   For how many seconds have you been alive?

Q.2.   Draw a parse tree for the Scheme expression
(+ 100 (* 5(+ 55))) and show how it is evaluated.

Q.3.   Define a procedure fcompose that takes three procedures as in-put, and produces as output a procedure that is the composition of the three input procedures. For example, ((fcompose3 abs inc square) -5) should evaluate to 36. Define fcompose two different ways: once without using fcompose, and once using fcompose.

Q.4.   Define a Scheme procedure that multiplies two multi-digit numbers (without using the built-in procedures except to multiply single-digit numbers). Strive for your procedure to have running time in Θ (n) where n is the total number of digits in the input numbers.

Q.5.   Define a procedure for finding the longest word in a document. Analyze the running time of your procedure.

Section – B

(Short-answer-type questions)

Note: Section 'B' contains Eight (08) short-answer-type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.

[4 x 8 = 32]

Q.1. What is the difference between an algorithm and a procedure? Define.

Q.2. What is parse tree?

Q.3. Define a procedure, cube, that takes one number as input and produces as output the cube of that number.

Q.4. What is a composite procedures?

Q.5. What is brute-force approach?

P.T.O.

Q.6.   Show how to compute the result bits for binary multiplication of two inputs of any length using only logical functions.

Q.7.   Define a Scheme procedure, logical-or, that takes two inputs and outputs the logical or of those inputs.

Q.8.   Define asymptotic notations. Why they are used?

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