

C1004

Total Pages : 4

Roll No.

MIT (CS)-301

Introduction to Computing

M.Sc. Cyber Security (MSCCS-18/21)

3rd Semester Examination, 2022 (June)

Time : 2 Hours]

Max. Marks : 80

Note : This paper is of Eighty (80) 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 Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Answer the following :

- (a) Define Information Process.
- (b) What is the difference between an algorithm and a procedure?
- (c) Define a Language.

- (d) Define grammar.
- (e) Define a base case.

2. Answer the following:

- (a) Define programming languages.
- (b) Define a procedure. How it can be used to solve a problem.
- (c) What is a composite procedures? Explain with the help of a diagram.
- (d) Define a procedure, biggest, that takes three inputs, and produces as output the maximum value of the three inputs.

3. Answer the following:

- (a) What is brute-force approach?
- (b) Define Turing Machine.
- (c) Define asymptotic notations. Why they are used?

4. Answer the following:

- (a) Define a procedure binary-tree-depth that takes as input a binary tree and outputs the depth of the tree. The running time of your procedure should not grow faster than linearly with the number of nodes in the tree.
- (b) Define a procedure for finding the longest word in a document. Analyze the running time of your procedure.

5. Answer the following :

- (a) Explain Imperative Control Structure.
- (b) What is the difference between imperative programming and functional programming?
- (c) Define an order of precedence for parsing expressions.
- (d) What is lazy evaluation?
- (e) What is Universal Turing Machine?

SECTION-B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Answer the following :

- (a) Explain Recursive Transition Network with the help of an example.
- (b) What is proof by construction? Explain.

2. Answer the following :

- (a) Why Natural Languages cannot be used as programming languages?
- (b) What is a compiler? How it is different from an interpreter?

3. Answer the following:

- (a) What is a recursive problem?

- (b) Define defensive programming.
 - (c) Define data abstraction.
4. Answer the following:
- (a) Define the xor function using only nand functions.
 - (b) Explain dynamic programming.
5. Answer the following:
- (a) What is sorting? How it is performed?
 - (b) Define transitive property with the help of an example.
6. Is $\Theta(n^2)$ equivalent to $\Theta(n^{2.1})$? Either prove they are identical, or prove they are different.
7. Answer the following:
- (a) Explain Object-Oriented Programming.
 - (b) Define a class. Explain the concept of subclass and superclass in OOP.
 - (c) What is dynamic dispatch?
8. Answer the following:
- (a) Do comparison expressions have higher or lower precedence than addition expressions? Explain why using the grammar rules.
 - (b) What is Halting Problem? Explain.
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