Faculty of Computers & Artificial Intelligence
2ⁿᵈ Term (2019-2020) Final Exam
Information Security and Digital Forensics Program
Course Code: FBS102   **Level:** 1ˢᵗ level
Subject: Discrete Mathematics

Benha University
Final Date: 7 / 6 /2020
Total Marks: Pass / Fail
Examiner(s): Dr. Metwally Rashad

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Research submission: From 31 May to 7 June 2020

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a) Write a research project in ONE of the following topics:

Topic No. 1

Tc1. "The Foundations of Discrete Mathematics"

- **This topic must contain that: -**
  1. Propositional Logic and its Applications
  2. Sets and its Operations
  3. Cardinality of Sets
  4. Functions
  5. Sequences and Summations
  6. Matrices

Topic No. 2

Tc2. "Algorithms for solving many different types of problems in Discrete Mathematics"

- **This topic must contain that: -**
  1. The concept of algorithm.
  2. Algorithms for many problems in discrete mathematics
  3. Recursive algorithms with examples
  4. Complexity of Algorithms with some examples

Topic No. 3

Tc3. "Mathematical Induction in Discrete Mathematics"

- **This topic must contain that: -**
  1. The principle of mathematical induction
  2. Examples of Proofs by Mathematical Induction
  3. Examples of strong induction

Topic No. 4

Tc4. "Graph structure in Discrete Mathematics"

- **This topic must contain that: -**
  1. Graphs and Graph Models
  2. Special Types of Graphs
  3. Representing Graphs and Graph Isomorphism with examples
  4. Graph Connectivity with some examples
  5. Shortest-Path Problems with graph

Topic No. 5

Tc5. "Tree structure in Discrete Mathematics"

- **This topic must contain that: -**
  1. Introduction to Trees
  2. Applications of Trees
  3. Tree Traversal with examples
  4. Spanning Trees

b) <u>**Notes: please, your research must contain the following elements:**</u>
- **Explain each point with examples**
- **State the applications of each point**

GOOD LUCK,

Examiner(s)   **Program Coordinator**

Dr. Metwally Rashad   **Dr. Ahmed Taha**