الدرجة
25

Suez Canal University

Faculty of Computers & Informatics

First Semester; First Level

Date: 12-11-2023; Time: 1.5h

الاسم كاملا باللغة العربية .....

Mid-Term Exam (10/25) + Academic Assignments (15/25)

Mid-Term Exam of Discrete Math (BSD-103)

Module-B **Module-B**

First Question (10 Marks)

❶ Use mathematical induction to prove that $1^2 + 2^2 + 3^2 + \cdots + n^2 = \frac{1}{6}n(n+1)(2n+1)$ for $n = 1, 2, 3, \ldots$

- For the relation R on $X = \{1, 2, 3, 4\}$ and $Y = \{1, 2, 3\}$ defined by the rule $(x, y) \in R$, $x + y \leq 5$.

① Find R ② Give the matrix representation of R

③ Identify that if R is reflexive, symmetric or transitive. ④ What does R^{∞} equal?

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Second Question (15 Marks)

❶ Prove that if n is an odd positive integer, then n^2 is odd also.

❷ Let $S_n = \{k\, n^{n+1} | k = 1, 2\}$, find $\bigcup_{n=0}^{2} S_{n+1}$

❸ Prove that $P \wedge (P \rightarrow Q) \rightarrow Q$ represents a tautology and then verify your answer by using the truth table.

انتهت الأسئلة

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