The Examination Paper of Jinan University

Score	Evaluator	Section I : (40 points)

NO.1 (6pts)
Let R_1 and R_2 be relations on a set A represented by the matrices

$$\mathbf{M}_{R_1} = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix} \quad \text{and} \quad \mathbf{M}_{R_2} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

Find the matrices that represent
a) $R_1 \cup R_2$ b) $R_1 \cap R_2$ c) $R_2 \circ R_1$
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.
.
NO.8 (4pts)
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Score	Evaluator	Section II : (30 points)

NO.1 (5 pts)
Use a K-map to minimize the sum-of-products expansion:
$xyz + x\overline{y}z + x\overline{y}\,\overline{z} + \overline{x}yz + \overline{x}\,\overline{y}\,\overline{z}$
.
.
.

NO.6 (5 pts)
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The Examination Paper for **Discrete Mathematics II** A of JNU

Student Name _____, Student No.___

Score	Evaluator	Section III: 30 points

NO.1

Fill in the blanks (15 pts)

1. Find a production such that S→ 1S, S→ 0A, A→_____produces $\{1^n00 \mid n \geqq 0\}$.
2. If G is a planar connected graph with 20 vertices, each of degree 3, _____ then G has regions.

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NO.2

True / False (15 pts)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

(write T/F in the above table)

1. 110100 does not belong to the regular set 1*0*1.
2. All graphs must have edges.

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