

CANDIDATES MUST NOT REMOVE THIS PAPER FROM THE EXAMINATION ROOM

MATH1061

DISCRETE MATHEMATICS

(Unit Courses, B, Inf, Tech.)

Time: TWO Hours for working
Ten minutes for perusal before examination begins

00520

Check that this examination paper has 16 printed pages!

CREDIT WILL BE GIVEN ONLY FOR WORK WRITTEN ON THIS EXAMINATION PAPER!

Candidates may attempt all questions.

The marks for each question are shown; total marks are 107, but 100 marks constitute a full score.

Use the blank pages for rough work, amendments etc.

Pocket calculators allowed.

FAMILY NAME (PRINT):

Solutions

GIVEN NAMES (PRINT):

STUDENT NUMBER:

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SIGNATURE:

EXAMINER'S USE ONLY

QUESTION	MARK	QUESTION	MARK	QUESTION	MARK
1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10			
TOTAL					

MATH1061 — DISCRETE MATHEMATICS

First Semester Examination, June 2001 (continued)

1. (6 marks) Construct truth tables for the following two statement forms. Then state whether or not the given statement form is a tautology. Write your answers in the tables given below.

(a) $[\sim (p \wedge \sim q)] \leftrightarrow [q \vee (\sim p)]$

p	q	$\sim p$	$\sim q$	$p \wedge \sim q$	$\sim (p \wedge \sim q)$	$q \vee \sim p$	Given statement
T	T	F	F	F	T	T	T
T	F	F	T	T	F	F	T
F	T	T	F	F	T	T	T
F	F	T	T	F	T	T	T

Is the given statement form a tautology? (Yes or No) YES

(b) $[(a \rightarrow b) \rightarrow c] \leftrightarrow [((\sim a) \vee b) \wedge c]$

a	b	c	$a \rightarrow b$	$(a \rightarrow b) \rightarrow c$	$\sim a \vee b$	$((\sim a) \vee b) \wedge c$	Given statement
T	T	T	T	T	T	T	T
T	T	F	T	F	T	F	T
T	F	T	F	T	F	F	F
T	F	F	F	T	F	F	F
F	T	T	T	T	T	T	T
F	T	F	T	F	T	F	T
F	F	T	T	T	T	T	T
F	F	F	T	F	T	F	T

Is the given statement form a tautology? (Yes or No) NO