NOTATION

(This sheet may be consulted during the course; you will *not* have access to it during the exam.)

1. General equality

$=$	Equality (numbers, Booleans, sets, etc.)
$\neq$	Inequality

2. Numeric operations

$+$	addition
$-$	subtraction
$*$	multiplication
$/$	division
$\uparrow$	exponentiation
$!$	factorial
$\sin$	sine
$\cos$	cosine
$\tan$	tangent
$<$	less than
$\leq$	less than or equal
$>$	greater than
$\geq$	greater than or equal
$\not<$	not less than
$\not\leq$	not less than or equal
$\not>$	not greater than
$\not\geq$	not greater than or equal

3. Set theory

$\mathbb{N}$	the set of natural numbers
$\mathbb{P}$	the set of positive integers
$\mathbb{Z}$	the set of integers
$\mathbb{Q}$	the set of rational numbers
$\mathbb{R}$	the set of real numbers
$\emptyset$	the empty set
U	a universal set
$\{a_1, a_2, \ldots\}$	extensional set definition (by enumeration)
$\{x \mid \ldots x \ldots\}$	intensional set definition (by defining property)
$'$	set complement
$\cup$	set union
$\cap$	set intersection
$\setminus$	set difference
$\wp$	power set
card	set cardinality
$\in$	set membership
$\notin$	negation of set membership
$\subseteq$	subset
$\not\subseteq$	negation of subset
$\subset$	proper subset
$\not\subset$	negation of proper subset
$\supseteq$	superset
$\not\supseteq$	negation of superset
$\supset$	proper superset
$\not\supset$	negation of proper superset

4. Relations and functions

$\langle a_1, a_2, \ldots, a_n \rangle$	n-tuple
$\times$	Cartesian product
A^n	n-ary Cartesian product of n identical sets A
$R : A_1 \leftrightarrow A_2$	introducing relation R with domain A_1 and codomain A_2
$F : A_1 \rightarrow A_2$	introducing function F with domain A_1 and codomain A_2
$a_1 \mapsto a_2$	member to member association in a relation or function
Dom(R)	domain of relation R
Cod(R)	codomain of relation R
Def(R)	definition domain of relation R
Ran(R)	range of relation R
Im(R, A)	the image of set A under relation R
$R_2 \circ R_1$	relation composition
R^{-1}	inverse of relation
RC(R)	reflexive closure of relation R
TC(R)	transitive closure of relation R
RTC(R)	reflexive transitive closure of relation R
$f(a)$	application of function f to a (or to $\langle a \rangle$)
$f(a_1, a_2, \ldots, a_n)$	application of function f to $\langle a_1, a_2, \ldots, a_n \rangle$

5a. Propositional logic and first-order predicate logic (object language)

t	proposition symbol that denotes the wff that is always true
f	proposition symbol that denotes the wff that is always false
$\neg$	negation
$\wedge$	conjunction
$\vee$	disjunction (inclusive-or)
$\Rightarrow$	conditional
$\Leftrightarrow$	biconditional
$\oplus$	exclusive-or
$\Uparrow$	nand
$\Downarrow$	nor
$\Leftarrow$	reverse conditional
$\not\Rightarrow$	inhibition
$\not\Leftarrow$	reverse inhibition
$\forall$	universal quantifier
$\exists$	existential quantifier

5b. Propositional logic and first-order predicate logic (metalanguage)

$\mathcal{I}$	interpretation
$\mathcal{U}$	universe of discourse
T	true
F	false
$\models$	logical consequence (semantic turnstile)
$\equiv$	logical equivalence
$\vdash$	deduction (syntactic turnstile)

6. Other

$\triangleq$	equal to by definition
$()$	parentheses for 'punctuation'