***Discrete***

***Logic***

|  |  |  |
| --- | --- | --- |
| ***Symbol*** | ***Meaning*** | |
|  | Not | |
|  | and | conjunction of  and |
|  | or | disconjunction of  and |
|  | or  but not both  and | exclusive or of  and |
|  | *P* is logically equivalent to *Q* | |
|  | Implication  implies | If *p* then *q* |
|  | iff  ***(iff: if and only if)*** | biconditional of  and |
|  | Equivalence of  and | |
|  | Predicate in | |
|  | Every element in the truth set for is in the truth set for | |
|  | have identical truth sets | |
|  | For all | |
|  | There exists | |
|  | Uniqueness quantification | |
| ***F*** | Contradiction | |
| ***T*** | Tautology | |
| **∴** | therefore | |
|  | Partial correctness of *S* | |

***Number Theory***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | *a*  divides |
|  | *a*  does not divide |
|  | Integer quotient of *a*  divided by |
|  | Greatest common divisor of *a*  and |
|  | Least common multiply of *a*  and |
|  | Absolute value of |
|  | is approximately equal to |
|  | Integer remainder of *a*  divided by |
|  | *a* is congruent to*b*modulo m**.** |
|  | *a* is not congruent to*b*modulo m**.** |
|  | Base *b* representation |

***Set***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | ***a*** is an element of ***A*** |
|  | ***a*** is not an element of ***A*** |
|  | The set with elements |
|  | Sets of all  in *D* for which  is true |
|  | All real numbers |
|  | Positive / Negative / nonnegative real numbers |
|  | Sets of all integers |
|  | Rational numbers |
|  | Complex numbers |
|  | Natural numbers |
|  | *A* is a proper subset of *B* |
|  | *A* is a subset of *B* |
|  | *A* is not a subset of *B* |
|  | *A* equals *B* |
|  | *A* union *B* |
|  | *A* intersect *B* |
|  | Difference of *B* minus *A* |
|  | Complement of *A* |
|  | Ordered pair |
|  | Ordered *n*-tuple |
|  | Cartesian product of *A* and *B* |
|  | Cartesian product of |
|  | Empty set or Null set |
|  | Power set of *A* |
|  | Open, closed intervals |
|  | Union of |
|  | Intersection of |
| *AB* | Symmetric difference of *A* and *B* |
|  | Cardinality of a countable set |
|  | Cardinality of |

***Sequences***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | And so forth |
|  | Summation from *k* equals *m* to *n* of |
|  | Product from *k* equals *m* to *n* of |
|  | *n* factorial |

***Counting and Probaility***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | Number of element in set *A* |
|  | Probability of a set *E* |
|  | Number of *r*-permutation of a set of *n* elements |
|  | Conditional probability of *E* given *F* |
|  | *n* choose *r*, the number of *r*-combination of a set of *n* elements |
|  | Binomial coefficient *n* over *r* |
|  | Expected value of the random variable *X* |
|  | Multinomial coefficient |
|  | Number of elements having properties |
|  | Number of elements not having properties |
|  | Null string |

***Functions***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | is a function from |
|  | Value of  at |
|  | sends  to |
|  | Image of *A* |
|  | Inverse of |
|  | Identity function of *X* |
|  | raised to the power |
|  | Logarithm with base  of |
|  | Composition of  and |
|  | Sum of the functions  and |
|  | Product of the functions  and |
|  | Image of the set  under |
|  | Floor function of |
|  | ceiling function of |
|  | Term of  with subscript |
|  | Sum of over |
|  | Minimum of  and |
|  | Maximum of  and |
| ~ | Approximately equal to |

***Relations***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | is related to by |
|  | Inverse relation of |
|  | n*th* power of the relation |
|  | connectivity relation |
|  | *m* is congruent to*n*modulo *d* |
|  | Equivalence class of |
|  | Equivalence class of  with respect to |
|  | congruence class modulo |
|  | Set of equivalence classes of integers modulo |
|  | Composite of the relation  and |
|  | Join |
| Δ | Diagonal relation |
|  | is less than |
|  | is less than or equal to |
|  | is greater than |
|  | is greater than or equal to |

***Graphs and Trees***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | Set of vertices of a graph |
|  | Set of edges of a graph |
|  | Graph with vertex set  and edge set |
|  | Directed edge |
|  | (undirected) Edge joining  and  in a simple graph |
|  | Complete graph on  vertices |
|  | Complete bipartite graph on  vertices |
|  | Degree of vertex |
|  | Walk from  to |
|  | Union of  and |

***Matrices***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | Matrix with entries |
|  | Matrix sum of  and |
|  | Matrix product of  and |
|  | Identity matrix of order |
|  | Join of  and |
|  | The meet of  and |
|  | Boolean product of  and |
|  | n*th* Boolean power of |

***Boolean Algebra***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  |  |
|  | Complement of the Boolean variable |
|  | Boolean product of  and |
|  | Boolean sum of  and |
|  | Dual of |
|  | *NAND* |
|  | NOR |
|  | inverter |
|  | OR gate |
|  | AND gate |
|  | NOR |
|  | NAND |
|  | XOR |
|  | XNOR |

***Languages and Finite-State Machines***

|  |  |
| --- | --- |
| ***Symbol*** | ***Meaning*** |
|  | Concatenation of  and |
| λ | Empty string |
|  | Length of the string |
|  | Phrase − structure grammar |
|  | production |
|  | is directly derivable from |
|  |  |