1995 Paper 5 Question 9

Logic and Proof

Describe the main features and applications of ordered binary-decision diagrams (OBDDs). [3 marks]

Describe an algorithm for computing OBDDs efficiently. Be careful to distinguish optimisations from essential features of the data structure. [6 marks]

Give an example to demonstrate how the variable ordering can affect the size of the OBDD. [3 marks]

Using the alphabetic ordering on variables, construct OBDDs for

$$[(P \wedge Q) \wedge R] \rightarrow [(R \wedge Q) \wedge P]$$

and

$$(P \vee Q) \wedge (Q \rightarrow P)$$

[4 + 4 marks]