



UNIVERSITI MALAYA

UNIVERSITY OF MALAYA

DEGREE OF  
DOCTOR OF PHILOSOPHY

It is hereby certified that

**JAMALLUDDIN BIN HASHIM**

having satisfied the requirements prescribed by rules of the University and with the assent of Senate, was awarded the Degree of Doctor of Philosophy on 3 October 2011.

Certified Translation

**SALMI MARSITA SHAARI**  
For Registrar

(Sgd.) Vice Chancellor  
(Sgd.) Registrar

