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RELIABILITY ANALYSIS OF FRAMED STRUCTURES

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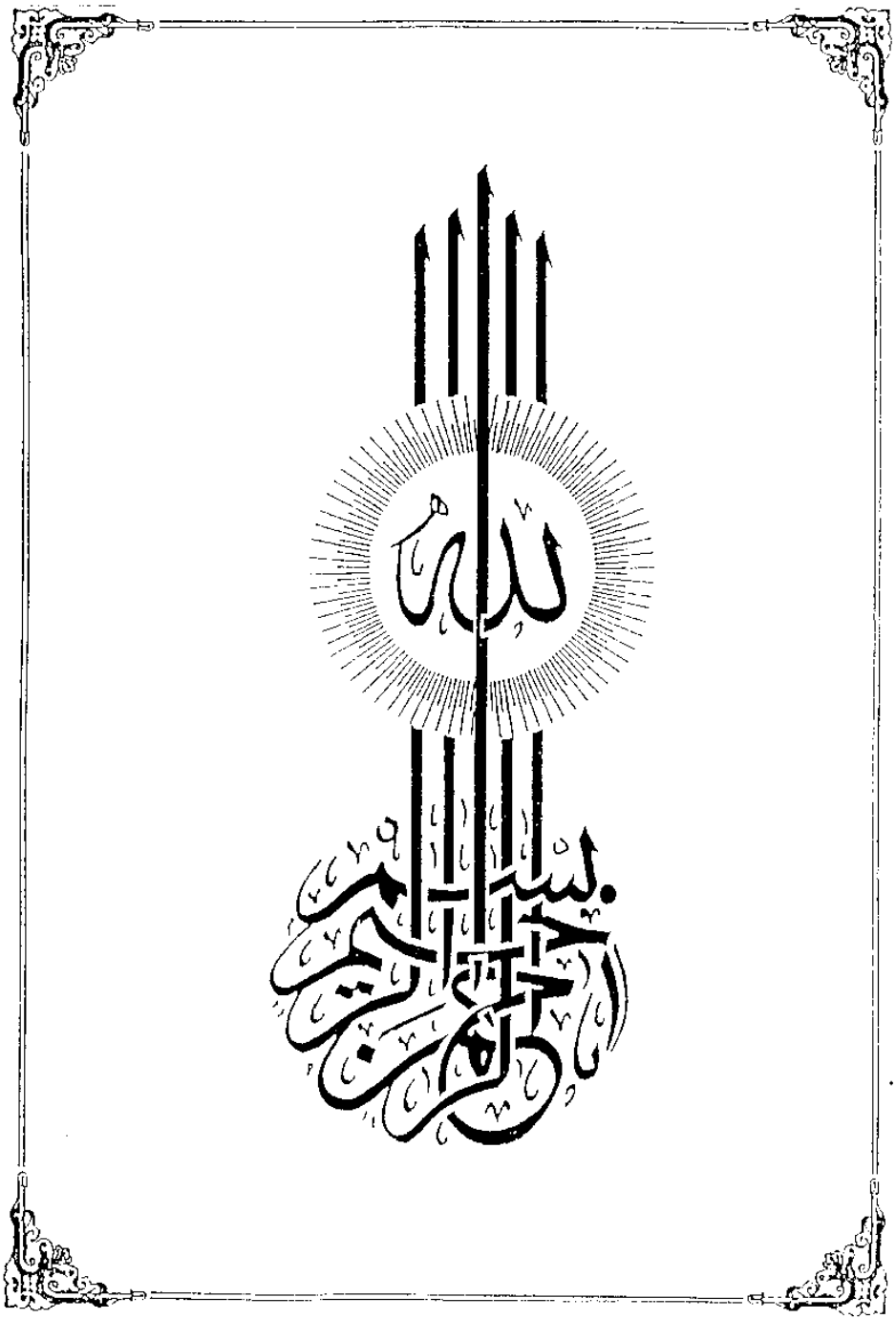

S T A T E M E N T

This dissertation is submitted to Ain Shams University for degree of Master of Science in Structural Engineering.

The work included in this thesis was carried out by the author in the department of Structural Engineering. Ain Shams University from January 1992 to September 1993.

No part of this thesis has been submitted for degree or a qualification to any other University or Institution.

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A B S T R A C T

The present thesis deals with the reliability analysis of the framed structures taking into account the uncertainties in the structural parameters. A reliability analysis technique was presented using Monte-Carlo simulation method. The values of the proposed random variables were generated using normal probability distribution function. The limit state functions were derived especially for the space truss element. A computer program was prepared according to the proposed technique. Two special types of the framed structures were studied. The first was a single layer reticulated shell affected by several types of initial imperfections in its geometrical shape. Each type of imperfection was studied separately to clarify its effect on the reliability values. The second structure was an offshore jacket structure modeled as space truss. An analytical form was used for the spatial distribution of the correlation between the nodal wave forces. A parametric study was carried out to investigate the effect of the correlation variation on the reliability measures.

A brief summary and discussion of the results was presented. Suggestions for future extension to the work were given.

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