

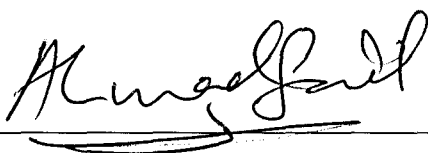
**GAMMA-RAY ACTIVITY CONCENTRATIONS, DOSE RATE AND  
HAZARD INDEX DETERMINATION OF NATURAL  
RADIOACTIVITY IN MALAYSIA'S SELECTED TOURISM  
BEACH SANDS**

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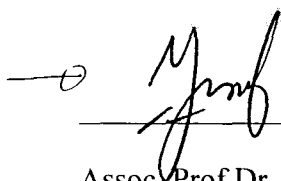
**Final Year Project Report Submitted in  
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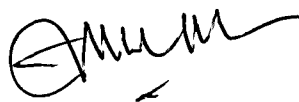
This Final Year Project Report entitle “Gamma-Ray Activity Concentrations, Dose Rate and Hazard Index Determination Of Natural Radioactivity In Malaysia’s Selected Tourism Beach Sands” was submitted by Hamimmah Bt. Hj Jamaluddin in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



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## ABSTRACT

### **Gamma-Ray Activity Concentrations, Dose Rate and Hazard Index Determination Of Natural Radioactivity In Selected Malaysia's Tourism Beach Sands**

Natural occurring radioactive element materials (NORM) is a source of continuous exposure to human. NORM can be found in rocks, soil and sand. Gamma radiation is emitted from radioactive elements such as in sands. Malaysia was known as a tropical country, which is, consists of interesting attraction such as island and beaches. The objective for this study is to measure activity concentrations radionuclides Ra-226, Th-232, K-40, hazard index and dose rate in sands samples collected from several state in peninsular Malaysia. Activity concentrations were measured by gamma ray spectrometry. The average value for concentrations of Ra-226 (Uranium series), Th-232, and K-40 were found in range  $14.22 \text{ Bq kg}^{-1}$ ,  $8.23 \text{ Bq kg}^{-1}$ ,  $70.30 \text{ Bq kg}^{-1}$  respectively. The average for dose rates is  $14.47 \text{ nGy.h}^{-1}$  and annual effective dose is  $0.02 \text{ (mSv/y)}$ . Then external hazard index for this studied, were found in normal range from 0.03 to 0.22.