

**UNIVERSITI TEKNOLOGI MARA**

**TECHNICAL REPORT**

**NUMERICAL SOLUTION FOR PAINLEVÉ  
EQUATIONS II BY USING  
INTEGRAL ITERATIVE METHOD**

**P13S19**

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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## ABSTRACT

Painlevé Equations I, II, III, IV, V and VI are solution of nonlinear second-order ordinary differential equations. However, in solving nonlinear problem by using iteration method as one of the solution, the convergence is difficult to achieve. Moreover, the previous method such as Adomian Decomposition Method (ADM), Homotopy Perturbation Method (HPM), Variational Iteration Method (VIM) and Sinc-Collocation with Padé used to solve the Painlevé Equation also quite difficult and the calculation takes large memory in computer. By focusing on solving Painlevé Equation II, Integral Iterative Method (IIM) was used to prove in the solving nonlinear differential equation based on the accuracy, efficiency and reliability. Absolute error was used to determine the accuracy and efficiency of Integral Iterative Method (IIM) by computing difference value of Runge-Kutta Method (RK4) and Integral Iterative Method (IIM). Then the value of error will be compared with error of RK4 with other methods such as Daftardar-Gejji and Jafari Method(DJM), Optimal Homotopy Asymptotic Method (OHAM) and Sinc-Collocation. IIM is additionally a handy technique in contrast with DJM, OHAM and Sinc-Collocation. The end result is comparable in the direction of DJM. However, IIM are easier to implement as a substitute than DJM. It also show as a dependable approach in fixing Painlevé Equation II