

PRINCE SULTAN UNIVERSITY
Department of Mathematical Sciences
(Term 151) MATH 225 Second Major Exam
November 2015

Time allowed: 50 minutes

Maximum points: 45

Dr. Bahaa Eldin Abdalla

Section #

Student Name:

ID #

1. (20 points) Determine the general solution of $y^{(6)} + y''' = 2t$.
2. (6 points) Find the Laplace transform of $f(t) = \int_0^t e^{-(t-\tau)} \sin 2\tau d\tau$.
3. (9 points) Find all singular points of $x^2(1-x^2)y'' + \frac{2}{x}y' + 4y = 0$ and determine whether each one is regular or irregular. (Find each limit explicitly).
4. (10 points) Determine the indicial equation and the recurrence relation for $x^2y'' + (x^2 + \frac{1}{4})y = 0$.