Course's Name : *Engineering Mathematics 2*
Course's Number :
Exam's Period : *1 Hour*
Questions' Number :
Total Mark :30
Pages' Number :

Palestine Technical University - Kadoorie

First Exam
Second Semester 2016/2017

Instructor's Name :.....
Student's Name: .....
Student's Number: .....
Section's Number: .....
Exam's Date :16/3/2017
Form :A

Question one: (8 points)

Decide whether each of the following statements **True** or **False**

1- The wronskian of a fundamental set of $t^2y^{(3)}+ty''-4y=0, t>0$ is ct

2- The functions $f_1=e^{2+2t}$, $f_2=e^t$ and $f_3=e^{2t}$ are linearly independent

3- The form of y_p for $y'''-3y''+2y'=t$ is At^2+Bt

4- x = -1 is a Regular Singular Point for $(x+1)^2y''+3y'+(x+1)y=0$

5- The radius of convergence of the taylor series for $(x^2+1)^{-1}$ about $x=0$ is 1

6- $\left|1+3\sqrt{2}\,i\right|=\sqrt{19}$

7- The second term(a_2) for the initial value problem $y''-xy'+3y=0,\quad y(0)=1,\quad y'(0)=0$ is 2

8- the Euler form for $w=\dfrac{(1+i)^2}{(\sqrt{3}-i)^4}$ is $\frac{1}{2}e^{-i\frac{\pi}{6}}$

Question Two: (10 points)

a) Solve the following equation **:**

$$y^{(6)} + y^{(3)} = 0$$

b) Find the the largest interval such that solutions are sure to exist

$$(x-1)y^{(4)} + (x+1)y'' + (\tan x)y = 0 \quad , \quad y(\tfrac{5\pi}{4}) \quad \text{on } [0,2\pi]$$

Question Three: (12 points)

a) Find the indicial equation, then find the roots for the following equation

$(1-x^2)y''-2y'+y=0$

b) Determine a suitable form for y_p if the method of undetermined coefficients is to be used (do not evaluate the coefficients)

$y^{(5)}+y^{(3)}=\cos t+\sin t+t^3+1$

c) Solve the following ordinary differential equation

$$x^2y'' + 5xy' + 3y = 2xy' \quad , x > 0$$

Good Luck