Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 101- Q3 Date: 11-11-2014

SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERS NOT SUPPORTED BY WORK.

7 points each except the first problem Which carries only 5 points

(1) If $y = x^{e} - 2^{x} + \pi^{3}$ find y'.

(2) Find the slope of the line tangent to the curve $y\,e^{x} = x^{2}y^{2} + 1$ at the point P(0,1).

(3) If $y = \sin(u^{2} + u)$ and $u = xe^{2x}$, find $\left.\dfrac{dy}{dx}\right|_{x=0}$.

(4) If $y = (1+\tan x)^{\ln x}$, find $\left.\dfrac{dy}{dx}\right|_{x=1}$

(5) If $y = \log_3 \sqrt{\left(\dfrac{7x}{2x^2+3}\right)^{\ln 3}}$, find $y'(1)$.

(6) Find the limit if it exists $\lim\limits_{x \to \frac{\pi}{4}} \dfrac{4\sin x - 2\sqrt{2}}{4x - \pi}$.