

Serial No.: \_\_\_\_\_ Student Name: \_\_\_\_\_ Student Number: \_\_\_\_\_  
Instructor: M. Z. Abu-Sbeih Math 101- Q4 Date: 10-11-2019

**SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERES WITHOUT JUSTIFICATIONS**

**Problem 1:** (8 points) If  $y = (x + \ln x)^x$  find  $y'(1)$ .

**Problem 2:** (8 points) Two people met at the same point. One started walking north at 2 km/h, and the other started walking east at 4km/h. How fast the distance between the two is changing after half an hour?

**Problem 3:** (6 points) valuate the limit if it exists

$$\lim_{n \rightarrow \infty} \left( \frac{n+3}{n+1} \right)^{5n}$$

**Problem 4:** (8 points) If  $f(x) = (\sin x + \cos x)^2$ , find  $f^{(123)}(0)$

**Problem 3:** (10 points) The position function of a particle is  $s = f(t) = t^3 - 9t^2 + 15t + 10$ , where  $t$  is measured in seconds and  $s$  in meters.

(a) Find the displacement after the first 5 seconds.

(b) Find the distance traveled in the first 5 seconds.