**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS**

**SCHOOL OF SCIENCE AND TECHNOLOGY**

**JUNE/JULY EXAMINATION**

**COURSE CODE: MTH311**

**COURSE TITLE: CALCULUS OF SEVERAL VARIABLES**

**TIME ALLOWED:3HOURS**

**INSTRUCTION: ANSWER ANY FIVE QUESTIONS**

1. (A) Find all the first order partial derivatives for the following functions

 -7marks (B) Differentiate the following with respect to x;

Y =  -7marks

1. (A) Differentiate with respect to x;

Y = Cos -7marks

(B) Find all the first order partial derivatives for the following functions

 -7marks

1. (A) l f z =  find  -7marks

(B)If z = tan(2x + 5y), find  -7marks

4. A Cylinder has dimensions r = 5cm, h = 10cm. Find the appropriate increase in volume by 0.2mcm and h decreases by 0.1cm. -14marks

5. lf f (a,b) =  -14marks

6. Solve the equation. Begin with  = x + y -1 -14marks

7. (A) State the Taylors series. -7marks (B) Show that, if h is small, then

tantanapproximately -7marks