



Istanbul University-Cerrahpasa  
Engineering Faculty  
Final Exam – Spring 2019

Course Title: **Calculus II— Sample Exam**

Student's name:

Date of Examination: 10.04.2019

Student's ID:

Time duration: 75 Minutes

Q.1) Find the Maclaurin series for the function  $f(x) = \ln((x+1)(2x+1))$ .

(25 Points)

Q.2) If  $u = xe^{ty}$ , where  $x = \alpha^2\beta$ ,  $y = \beta^2\gamma$ , and  $t = \gamma^2\alpha$ , find the partial derivatives  $\frac{\partial u}{\partial \alpha}$ ,  $\frac{\partial u}{\partial \beta}$ ,  $\frac{\partial u}{\partial \gamma}$  when  $\alpha = -1$ ,  $\beta = 2$ ,  $\gamma = 1$ .

(25 Points)

Q.3) A company produces two types of computers; desktops and laptops. Its revenue  $R$  (in thousand dollars) is given by

$$R(x, y) = x(20 - 5x) + y(4 - 2y)$$

where  $x$  and  $y$  are the number of desktops and laptops, respectively, produced and sold. The corresponding cost (in thousand dollars) of producing these units is given by

$$C(x, y) = 2xy + 4$$

What should  $x$  and  $y$  be to maximize profit? What is the maximum profit?

(25 Points)

**Çözüm:**

Q.4) Find the volume of the solid that lies under the paraboloid  $z = x^2 + y^2$ , above the  $xy$ -plane, and inside the cylinder  $x^2 + y^2 = 2x$ .

(25 Points)

---

Dr. Uğur Odabaşı