University of Central Punjab

Assignment No.3

Course Code	CSSS2733	SMESTER	Fall-22	Section	C7
Course Title	MVC				
Resource Person	Tahir Rasheed				
Total Marks	30				
Instructions	• Write your complete name, student ID, and page number on all pages. • Read questions carefully and keep in mind the marks distribution for each question.				

Q.NO.1. [10 marks] Calculate $f_{xx}(1,-3), f_{yy}(1,-3)$ and $f_{xy}(1,-3)$ where $f(x,y) = xe^y + y\,ln(xy) + 1$. Also check either $f_{xy} = f_{yx}$ or NOT? Justify your answer.

Q.NO.2. [10 marks] Two products are manufactured in quantities q_1 and q_2 and sold at prices of p_1 and p_2 respectively. The cost of producing them is given by

$$C = 2{q_1}^2 + 2{q_2}^2 + 10$$

(i) Find the maximum profit that can be made assuming the prices are fixed.

(ii) Find the rate of change of that maximum profit as p_1 increases.

Q.NO.3 [10 marks] Calculate $\frac{\partial u}{\partial x}$, $\frac{\partial u}{\partial y}$ and $\frac{\partial u}{\partial z}$ where

$$u = e^{qr}\sin^{-1}p, \quad p = \sin x, \quad q = z^2 lny, \quad r = 1/z\ ; \quad (x,\ y,\ z) = (\pi/4,\ 1/2, -1/2)$$

Also evaluate $\frac{\partial u}{\partial x}$, $\frac{\partial u}{\partial y}$ and $\frac{\partial u}{\partial z}$ at point $(x,\ y,\ z)$.