

SNS COLLEGE OF TECHNOLOGY



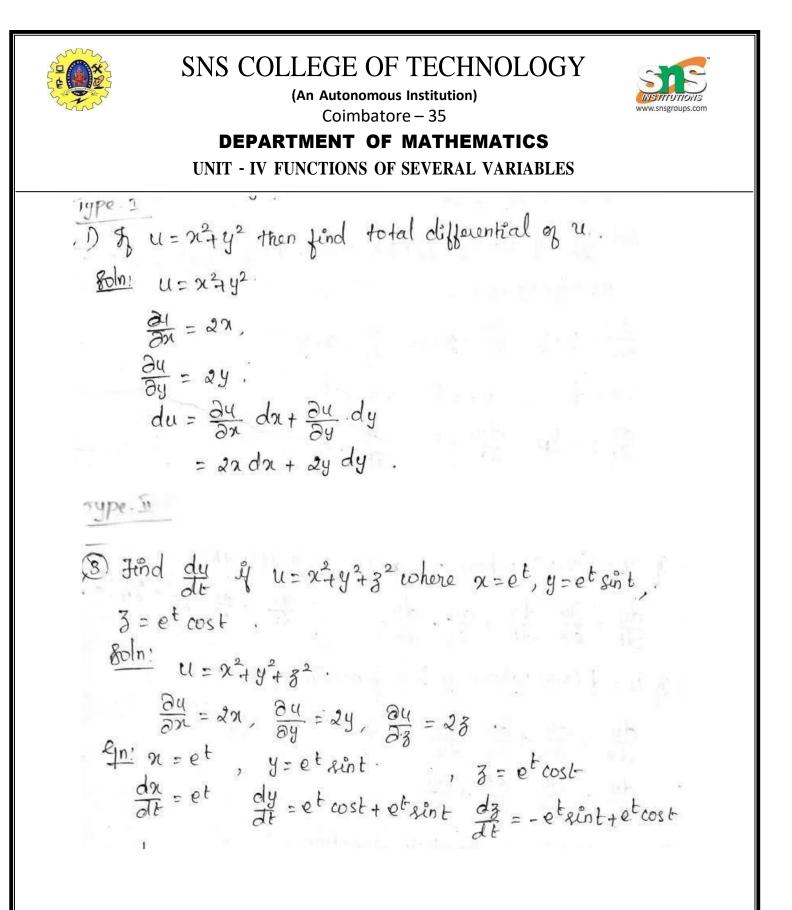
(An Autonomous Institution) Coimbatore – 35

DEPARTMENT OF MATHEMATICS

UNIT - IV FUNCTIONS OF SEVERAL VARIABLES

TOTAL DERIVATIVE

| 1) & u=z(a,y) then total differential of u is |
|--|
| $du = \frac{\partial u}{\partial x} dx + \frac{\partial u}{\partial y} dy$ |
| 2) \$ u= 2(x, y) where x= g,(t), y=g_2(t) then |
| $\frac{du}{dt} = \frac{\partial u}{\partial x} \cdot \frac{dx}{dt} + \frac{\partial u}{\partial y} \cdot \frac{dy}{dt} \qquad \qquad$ |
| 3) & u = f (1, y) where y is a function of n then |
| $\frac{du}{dx} = \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} \frac{\partial y}{\partial z} \text{ and } \qquad \underbrace{\underbrace{\partial v}}_{a} + \underbrace{\underbrace{\partial u}}_{a} \frac{\partial y}{\partial z} \underbrace{\underbrace{\partial u}}_{a} + \underbrace{\underbrace{\partial u}}_{a} \underbrace{\partial u$ |
| $\frac{du}{dy} = \frac{\partial u}{\partial x} \cdot \frac{dx}{dy} + \frac{\partial u}{\partial y}$ |
| Defferentiation ez Implicit Junction: |
| If f(x,y)=c where c may be zero or non-zero |
| is an implicit function of x & y then |
| $\frac{dy}{dn} = -\frac{\frac{\partial b}{\partial x}}{\frac{\partial b}{\partial b}}$ |
| an <u>ab</u> |
| Dy . |



23MAT101/ Matrices & Calculus

Department of Mathematics



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de = au dn + au dy dy dy dz = 22. et+ 2y. (etcost+etsint)+23. (etcost-etsint) = 20tet+ 20t sint (etcost+ etsint)+2 etcost (etcost-etsint) = 2e2t 2e2t xint/cost + 2e2t xint + 2e2t cost - 2e cost sint = 2e2t 2e2t = 4e2t 1 21 23+ ys = Baxy find dy abln: 213+ 43- 3axy=0 Let 2(x,y) = 23+y3- 3axy $\frac{\partial b}{\partial n} = 3n^2 - 3ay$ $\frac{\partial f}{\partial y} = 3y^2 - 3an$ $\frac{dy}{dn} = -\frac{\left(\frac{\partial t}{\partial n}\right)}{\left(\frac{\partial t}{\partial n}\right)} = -\frac{3\left(n^2 - \alpha y\right)}{3\left(y^2 - \alpha x\right)} = \frac{\alpha y - x^2}{y^2 - \alpha x}$

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