1125-26-2897 **Udita N. Katugampola*** (`udita@udel.edu`), Department of Mathematical sciences, University of Delaware, Newark, DE 19716. *Can we generalize the limit-definition of the derivative? II.* Preliminary report.

We consider the operator defined by

$$\mathcal{D}_\omega f(x) = \lim_{\epsilon \to 0} \frac{f(x + \epsilon\, \omega(x)) - f(x)}{\epsilon},$$

relative to a weight function ω, which acts as a `catalyst` and controls the convergence rate. Such a derivative obeys familiar properties such as the product rule, quotient rule, power rule, chain rule, Rolle's Theorem and Mean Value Theorems. It is interesting to note that the case of $\omega(x) = x^{1-\alpha}$, $\alpha \in \mathbb{R}$, is now known as the `conformable fractional derivative` though it lacks some key properties of a standard fractional derivative. Newly defined derivative is a close resemblance of several existing derivatives, namely, the directional derivative, the Fréchet and Gâutaux derivatives. We also define the corresponding weighted ω-integral in a weighted-space X_ω and discus some properties related to differential equations governed by $\omega-$derivatives. It is also interesting to observe that such an integral appears in several unrelated topics such as *Stochastic integrals*, the *Brunn-Minkowski theory*, *Wulff shapes*, *Bihari's inequality* and *Variational Calculus*. (Received September 20, 2016)