(7) $Amount\ of\ sinking\ fund,\ M = \frac{A}{r}[(1+r)^n - 1]$

(8) $Present\ value\ of\ perpetuity,\ V = \frac{A}{r}$

(9) $Present\ value\ of\ deferred\ perpetuity,\ V = \frac{A}{r(1+r)^m}$

$where,\quad A = Amount\ of\ each\ instalment$

$V = Present\ value\ of\ annuity$

$M = Future\ amount\ of\ annuity$

$r = Rate\ of\ interest\ p.a.$

$n = Number\ of\ instalment$

$m = Payment\ start\ after\ which\ deferring\ interval$

(4) Application of Derivative in Commerce & Economics

(1) $Total\ cost,\ TC = C(x)$

(2) $Total\ fixed\ cost,\ TFC = [C(x)]_{x=0}$

(3) $Total\ variable\ cost,\ TVC = TC - TFC$

(4) $TC = TFC + TVC$

(5) $Average\ cost,\ AC = \frac{C(x)}{x}$

(6) $Average\ fixed\ cost,\ AFC = \frac{TFC}{x}$

(7) $Average\ variable\ cost,\ AVC = \frac{TVC}{x}$

(8) $AC = AFC + AVC$

(9) $Cost\ function = C(x)$

(10) $Demand\ function,\ x = f(p)$

(11) $Price\ function,\ p = f(x)$

(12) $Revenue\ function,\ R(x) = px$

(13) $Average\ revenue,\ AR = \frac{R(x)}{x} = p$

(14) $Profit\ function,\ P(x) = R(x) - C(x)$

(15) $Average\ profit,\ \frac{P(x)}{x} = \frac{R(x)}{x} - \frac{C(x)}{x}$

$$\Rightarrow AP = AR - AC$$

(16) $Breakdown\ point,\ R(x) = C(x)\ \ i.e.,\ P(x) = 0$

(17) $Marginal\ cost,\ MC = \frac{dC}{dx}$

(18) $Marginal\ revenue,\ MR = \frac{dR}{dx} = p\left(1 + \frac{x}{p}.\frac{dp}{dx}\right)$