Tutorial No. – 13

question no. 01 ⟹ Let us assume that the signal $x(n)$ with spectrum $X(\omega)$ is to be downsampled by an integer factor 3. If the continuous-time signal $x(t)$ has been sampled at a rate F_x to generate discrete-time signal $x[n]$, then follow the decimation procedure to convert the sampling-rate from F_x to $F_y = F_x/3$.

question no. 02 ⟹ Let us assume that the signal $x(n)$ with spectrum $X(\omega)$ is to be upsampled by an integer factor 5. If the continuous-time signal $x(t)$ has been sampled at a rate F_x to generate discrete-time signal $x[n]$, then follow the interpolation procedure to convert the sampling-rate from F_x to $5F_x = F_y$.

question no. 03 ⟹ The sampling-rate corresponding to the discrete-time signal $x[n]$ is F_x. Perform the sampling-rate conversion by a rational factor $(5/3)$, following the appropriate procedure. (i.e., $F_y = \frac{5}{3} F_x$).