JSPM's
JAYAWANTRAO SAWANT COLLEGE OF ENGINEERING
Sr. No. 58, Handewadi Road, Hadapsar, Pune, Maharashtra 411028
Department of Electronics and Telecommunication Engineering

Code :

Define new function, File New Function meas_continuous_PDP and save the below code

```
function [meanDelay,rmsDelay,symbolRate,coherenceBW] =
meas_continuous_PDP(fun,lowerLim,upperLim)
%Function to calculate mean Delay, RMS delay spread, maximum symbol
%rate that a signal can be transmitted without ISI and the coherence
%BW for the PDP equation specified as function handle(fun)
% example: fun = @(tau) exp(-tau/0.00001); %given PDP equation
%lowerLim - lower limit for integration
%upperLim - upper limit for integration
moment_1 = @(x) x.*fun(x);
meanDelay = integral(moment_1,lowerLim,upperLim)/integral(fun,lowerLim,upperLim);
moment_2 = @(y) ((y-meanDelay).^2).*fun(y);
rmsDelay = sqrt(integral(moment_2,lowerLim,upperLim)/integral(fun,lowerLim,upperLim));
symbolRate = 1/(10*rmsDelay); %maximum symbol rate to avoid ISI
coherenceBW = 1/(50*rmsDelay);%for 0.9 correlation
%coherenceBW = 1/(5*rmsDelay);%for 0.5 correlation
endfunction
```

Run following script after saving above function in a file

```
fun = @(tau) 2*exp(-tau/1e-6);
[meanDelay, rmsDelay, symbolRate, coherenceBW] = meas_continuous_PDP(fun,0,10e-6);
tau = [0:0.01e-6:5e-6];
fun1 = 2*exp(-tau/1e-6);
plot (tau, fun1, 'r', 'LineWidth', 2);
title ('Power vs Delay', 'Fontsize',20);
xlabel ('Delay', 'Fontsize',16);
ylabel('Power(dBm)', 'Fontsize',16);
```

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Output :