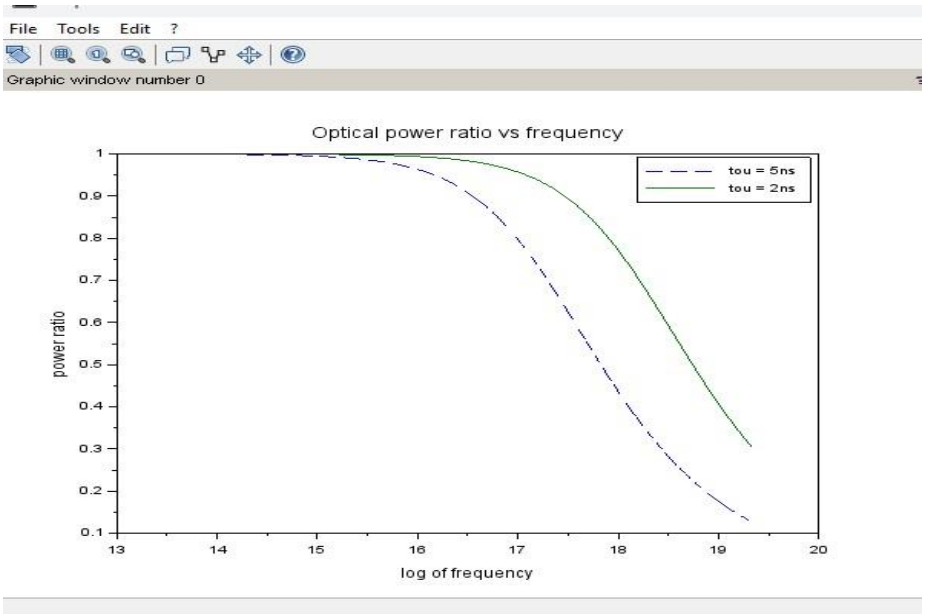
Experiment No. 5

Code1:-

```
Clc;clear;close;
Pdc = 300e-6;
F = 1e6:1e3:250e6;
Tou1 = 5e-9;
Pew1 = Pdc./sqrt(1+(2*%pi*f*tou1).^2);
Ratio1 = Pew1./Pdc;
Tou2 = 2e-9;
Pew2 = Pdc./sqrt(1+(2*%pi*f*tou2).^2);
Ratio2 = Pew2./Pdc;
Plot(log(f),ratio1,'—',log(f),ratio2,'-');
Legend("tou = 5ns","tou = 2ns");
Xlabel("log of frequency");
Ylabel("power ratio");
Title("Optical power ratio vs frequency");
```

Output:-



Code2:-

```
clc;clear;close;
Pdc = 300e-6;
disp("parameters at tou = 5ns");
tou = 5e-9;
f1 = 20e6;
```

```
Pew_20MHz = Pdc/sqrt(1+(2*%pi*f1*tou)^2);
disp("output power in uW at 20MHz",Pew_20MHz*1e6);
f2 = 100e6;
Pew_100MHz = Pdc/sqrt(1+(2*%pi*f2*tou)^2);
disp("output power in uW at 100MHz",Pew_100MHz*1e6);
f3 = 200e6;
Pew_200MHz = Pdc/sqrt(1+(2*%pi*f3*tou)^2);
disp("output power in uW at 200MHz",Pew_200MHz*1e6);
BWopt = sqrt(3)/(2*%pi*tou);
disp("Optical Bandwidth in MHz", BWopt*1e-6);
BWelec = BWopt/sqrt(2);
disp("Electrical Bandwidth in MHz",BWelec*1e-6);
disp("parameters at tou = 2ns");
tou1 = 2e-9;
f1 = 20e6;
Pew_20MHz = Pdc/sqrt(1+(2*%pi*f1*tou1)^2);
disp("output power in uW at 20MHz",Pew_20MHz*1e6);
f2 = 100e6;
Pew_100MHz = Pdc/sqrt(1+(2*%pi*f2*tou1)^2);
disp("output power in uW at 100MHz",Pew_100MHz*1e6);
f3 = 200e6;
Pew_200MHz = Pdc/sqrt(1+(2*%pi*f3*tou1)^2);
disp("output power in uW at 200MHz",Pew_200MHz*1e6);
BWopt = sqrt(3)/(2*%pi*tou1);
disp("Optical Bandwidth in MHz", BWopt*1e-6);
BWelec = BWopt/sqrt(2);
disp("Electrical Bandwidth in MHz",BWelec*1e-6);
```

Output:-

```
“parameters at tou = 5ns"
 "output power in uW at 20MHz"
  254.01990
 "output power in uW at 100MHz"
  90.994341
 "output power in uW at 200MHz"
  47.153018
 "Optical Bandwidth in MHz"
  55.132890
 "Electrical Bandwidth in MHz"
  38.984840
 "parameters at tou = 2ns"
 "output power in uW at 20MHz"
  290.95165
 "output power in uW at 100MHz"
  186.80310
 "output power in uW at 200MHz"
  110.90935
 "Optical Bandwidth in MHz"
  137.83222
 "Electrical Bandwidth in MHz"
  97.46210
```