

Electrical Engineering Department,

Fourth Year - Communications & Electronics.

# **EE 466 ANTENNA**

Lab#1

PREPARED BY	SECTION	SEAT.NO.
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#### 1. m File

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% Alexandria University - Faculty of Engineering
% Electrical and Electronic Engineering Department - Fourth Year -
Communications & Electronics
% Course: Antenna Lab
% Lab 1
% Name : Mahmoud Mohamed Kamal Ismail
% Section : 7
% Seat No.: 250
응응
clear, clc;
%% Part (1): Relation between received power & distance bet antennas
(r)
% Practical
r cm = [30 40 50 60 70];
s dB = [-30 -32.5 -34.25 -37 -39];
PL dB = abs(s dB-s dB(1));
figure(1);
plot(r cm, PL dB)
title('Part (1): Relation between received power & distance bet
antennas (r) - Practical', 'fontsize', 10)
xlabel('r (cm)','fontsize',10);
ylabel('|P.L| (dB)', 'fontsize', 10);
% Theoretical
r1 cm = 30;
r2 cm = [30 40 50 60 70 80 90 100];
PL dB = 20*log10(r2 cm./r1 cm);
figure(2);
plot(r2 cm, PL dB)
title('Part (1): Relation between received power & distance bet
antennas (r) - Theoretical', 'fontsize', 10)
xlabel('r (cm)','fontsize',10);
ylabel('|P.L| (dB)', 'fontsize', 10);
%% Part (3): Sketch Antenna Pattern
theta rad = [-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60]
70].*(pi/180);
        = [-52.7 -52.6 -52.5 -52 -49 -40 -33 -30 -33.5 -38 -43 -50.2]
PR dB
-52 -52.2 -52.31;
PR linear = db2maq(PR dB.*2); % OR PR linear = 10.^(PR dB/10);
PR linear = PR linear./PR linear(8);
figure(3);
polar(theta rad, PR linear)
title('Part (3): Sketch Antenna Pattern', 'fontsize', 10)
```

## 2. Part (1): Relation between received power & distance bet antennas (r) 2.1. Practical

Table 1 Readings of Part (1) - Practical

r (cm)	30	40	50	60	70
s(r) (dB)	-30	-32.5	-34.25	-37	-39
s(r) – s(30) (dB)	0	-2.5	-4.25	-7	-9

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       % Alexandria University - Faculty of Engineering
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       % Electrical and Electronic Engineering Department - Fourth Year - Communications & Electronics
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      % Course: Antenna Lab
 6
      % Lab 1
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 8
      % Name : Mahmoud Mohamed Kamal Ismail
 9
      % Section : 7
10
       % Seat No.: 250
11
       88
12
13 -
       clear, clc;
14
       \$\$ Part (1): Relation between received power & distance bet antennas (r)
15
16
       % Practical
17 -
      r_cm = [30 40 50 60 70];
18 -
      s dB = [-30 -32.5 -34.25 -37 -39];
19 -
      PL_dB = abs(s_dB-s_dB(1));
20
21 -
      figure(1);
22 -
      plot(r cm, PL dB)
23 -
      title('Part (1): Relation between received power & distance bet antennas (r) - Practical', 'fontsize', 10)
24 -
      xlabel('r (cm)','fontsize',10);
25 - ylabel('|P.L| (dB)', 'fontsize', 10);
26
```

Figure 1 Code of Part (1) - Practical

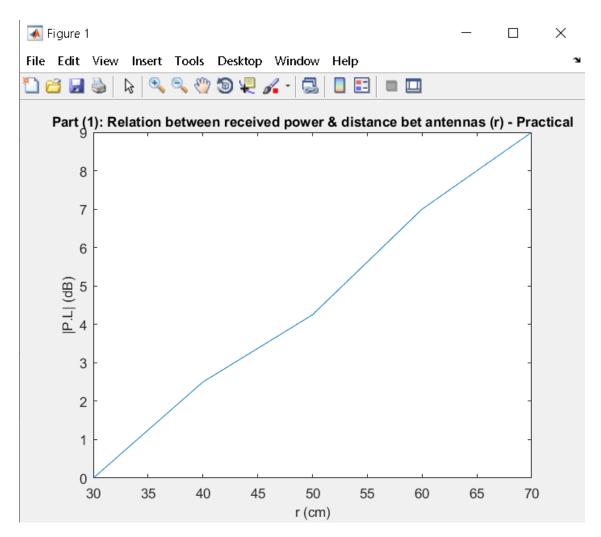


Figure 2 Relation between received power & distance bet antennas (r) - Practical

### 2.2. Theoretical

Table 2 Readings of Part (1) - Theoretical

r1 (cm)	30							
r2 (cm)	30	40	50	60	70	80	90	100
P.L (dB)	0	2.4988	4.437	6.0206	7.3595	8.5194	9.5424	10.4576

```
27
       % Theoretical
28 -
       r1_cm = 30;
29 -
       r2 cm = [30 40 50 60 70 80 90 100];
30 -
       PL_dB = 20*log10(r2_cm./r1_cm);
31
32 -
       figure(2);
33 -
       plot(r2_cm,PL_dB)
34 -
       title('Part (1): Relation between received power & distance bet antennas (r) - Theoretical', 'fontsize', 10)
35 -
      xlabel('r (cm)','fontsize',10);
36 -
       ylabel('|P.L| (dB)','fontsize',10);
37
```

Figure 3 Code of Part (1) - Theoretical

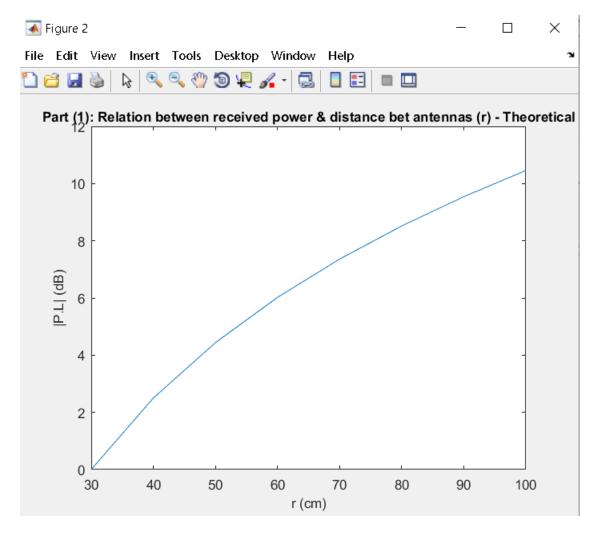


Figure 4 Relation between received power & distance bet antennas (r) - Theoretical

### 3. Part (3): Sketch Antenna Pattern

Table 3 Readings of Part (3)

θ	$P_R$ (dB)
-70°	-52.7
-60°	-52.6
-50°	-52.5
-40°	-52
-30°	-49
-20°	-40
-10°	-33
0°	-30
10°	-33.5
20°	-38
30°	-43
40°	-50.2
50°	-52
60°	-52.2
70°	-52.3

```
28
       %% Part (3): Sketch Antenna Pattern
29
       theta_rad = [-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70].*(pi/180);
30 -
       PR dB = [-52.7 -52.6 -52.5 -52 -49 -40 -33 -30 -33.5 -38 -43 -50.2 -52 -52.2 -52.3];
31 -
32 -
       PR_linear = db2mag(PR_dB.*2); % OR PR_linear = 10.^(PR_dB/10);
33 -
       PR_linear = PR_linear./PR_linear(8);
34
35 -
      figure(2);
36 -
       polar(theta_rad,PR_linear)
37 -
       title('Part (3): Sketch Antenna Pattern','fontsize',10)
38
```

Figure 5 Code of Part (3)

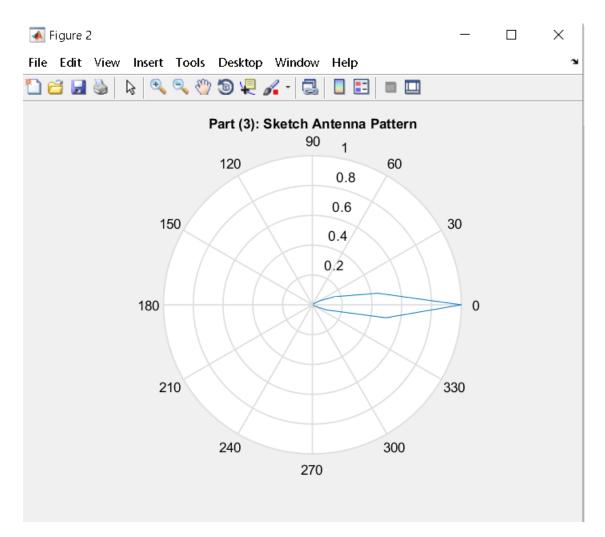


Figure 6 Antenna Pattern