DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

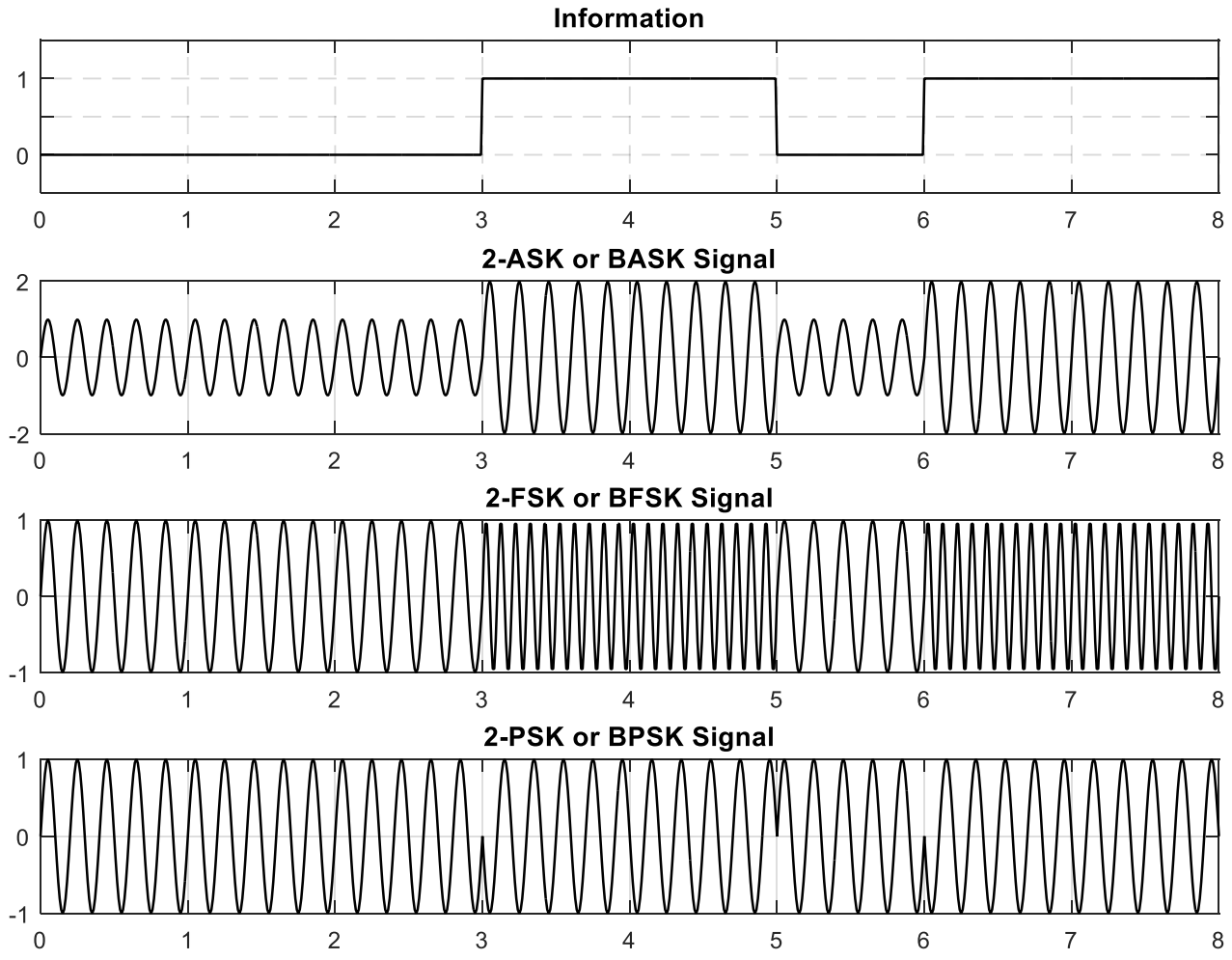
NORTH SOUTH UNIVERSITY

EEE 321, ETE 321 – Introduction to Communication Systems

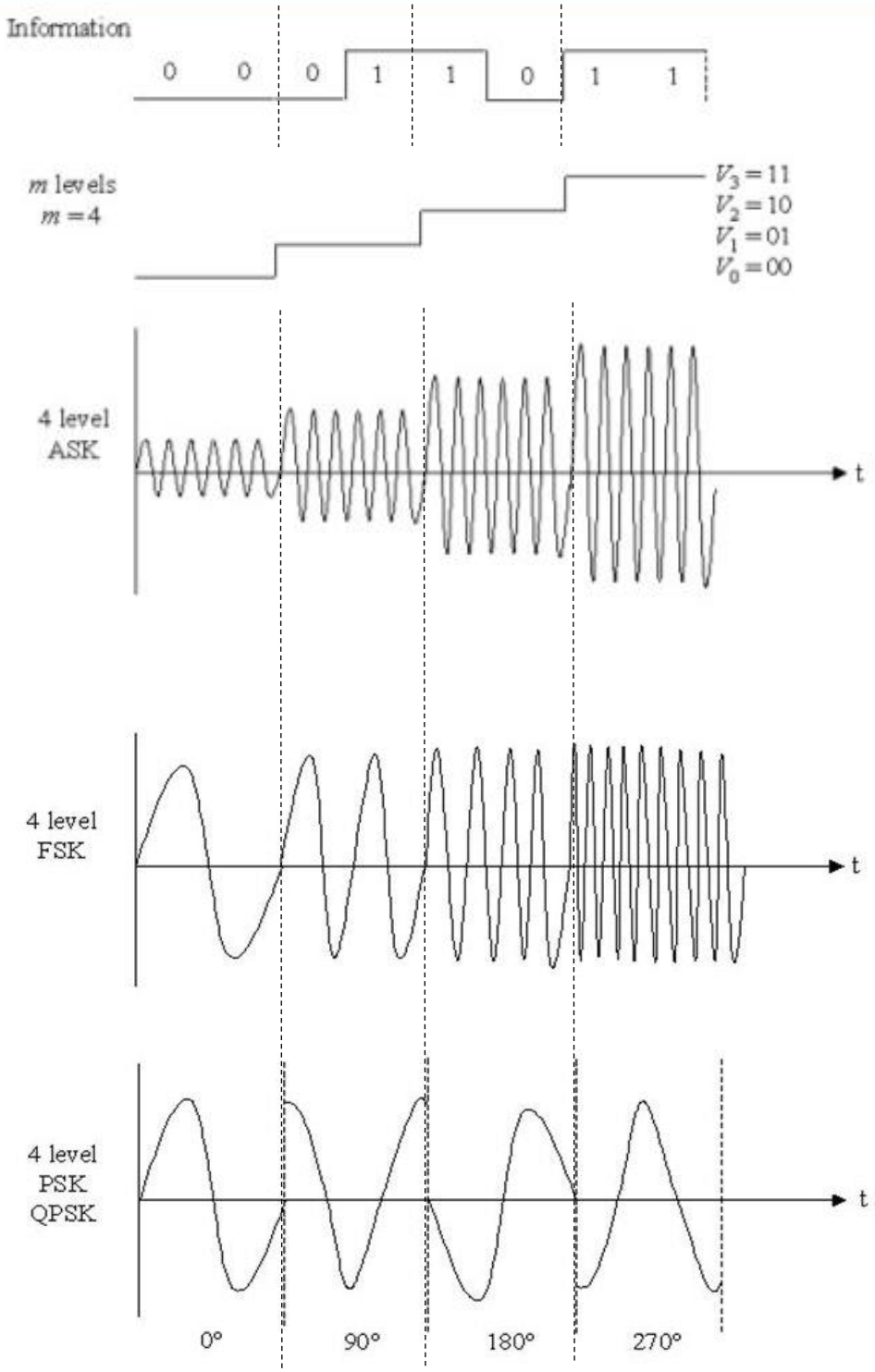
Experiment No: 7

Digital Modulation

Modulation Types – 2 Level ASK, FSK, PSK



Modulation Types – 4 Level ASK, FSK, PSK



	ASK	FSK	PSK
Bandwidth requirement	Less	More	Less
Data Rate	Low	High	High
Power Efficiency	Low	High	High
Noise Immunity (SNR)	Low	High	High
Application	Low data radio Optical fiber comm. Remote control	Radio comm. Bluetooth	Wi-Fi EDGE

Visit:

1. http://techiesms.com/explained/practical-application-modulation-techniques/
2. http://www.rfwireless-world.com/Terminology/ASK-vs-FSK-vs-PSK.html
   - to know more

MATLAB Program:

```
clc; clear all

b = [0 1 0 1 1 0 1 1];     % digital bits
n = length(b);

mt = [];
for i = 0: 1: n-1;
    mt( (i*100)+1 : 1 : ((i+1)*100)+1 ) = b(i+1);
end

t = 0 : (1/100) : n;                % t = linspace(0,n,n*100);
fc = 5;
ct = sin(2*pi*fc*t);                              % carrier signal

ask = (1+mt).*ct;                                 % ASK signal

f_dev = 5;
fsk = sin( 2*pi*(fc + f_dev*mt).*t );             % FSK signal

p_dev = pi;
psk = sin(2*pi*fc*t + p_dev.*mt);                 % PSK signal

subplot(411)
plot(t, mt, 'k', 'linewidth',2); grid on;
title('Information [0 1 0 1 1 0 1 1]');
ylim([-0.5 1.5]);

subplot(412)
plot(t, ask, 'k', 'linewidth',2); grid on;
title('2-ASK or BASK Signal');
ylim([-2 2]);

subplot(413)
plot(t, fsk, 'k', 'linewidth',2); grid on;
title('2-FSK or BFSK Signal');
ylim([-1 1]);

subplot(414)
plot(t, psk, 'k', 'linewidth',2); grid on;
title('2-PSK or BPSK Signal');
ylim([-1 1]);
```