UNIVERSITY OF SASKATCHEWAN
ELECTRICAL ENGINEERING 362.3

Assignment Quiz 2
February 4, 2003

Instructor: B.L. Daku
Time: 10 minutes
Aids: Calculator

2/12

Name:
Student Number:

1. Suppose that MATLAB is used to plot a sinusoidal signal. The following MATLAB code generates a signal $x[n]$ and plots it.

```
last=0.08;
tt=[0:T:last];
Fo=600;
xx=9*imag(exp(j*(2*pi*Fo*tt+pi/2)));
stem(xx)
```

Unfortunately, one statement was corrupted in the file, but we do know the $n = 0, 1, 2$ sample values of xx to the first four decimal places and they are

```
9.0000    -7.2812     2.7812
```

(a) For the above code determine the correct formula for the discrete-time signal in the form:

$$x[n] = A\cos(2\pi f_o n + \phi)$$

(b) We also know that the discrete-time signal was due to folded aliasing. What was the original continuous-time signal in trigonometric form?

(c) What is the missing statement in the MATLAB code?

a) $2\cos(\omega_0) = \dfrac{x[n-1] + x[n+1]}{x[n]} = \dfrac{9.000 + 2.7812}{-7.2812}$

$\therefore \omega_0 = 143.9948 = 2\pi f_0 \quad \therefore f_0 = \dfrac{143.9948}{2\pi} = 22.92\ \text{Hz}$

$x[n] = 9\cos(2\pi(22.92)n + \phi)$

?

B) $x(t) = 9\cos(2\pi f_0 t + \pi/2) = 9\cos(2\pi(22.92\ \text{Hz})t + \pi/2)$