Department of Computer Systems Engineering
University of Engineering & Technology
Peshawar, PAKISTAN

Subject: Signal and Systems (4th Semester)

Exam: Final Term (Spring 2020)

Max Marks: 20

Time allowed : one (1) hour

Note: Write your registration number on the top of your answer sheet

Question 3:

1) Draw the block diagram of the following difference and differential equations. **(1+1 Marks)**

$$y[n] - 3y[n-1] = \frac{2}{3}x[n] + 2x[n-1]$$

$$3\frac{dy(t)}{dt} + 2y(t) = 5x(t)$$

2) Draw the magnitude and phase spectrum of the signal x(t) given bellow. Also find the response y(t) when the signal x(t) is passed through the LTI system with impulse response h(t) given bellow. (CLO4) **(5 Marks)**

3) A = Smaller among the digits at units and tens places of your registration number

4) B = Bigger among the digits at units and tens places of your registration number

Hint: Convert the signal into exponential form and for finding output use Laplace transform

$$x(t) = \mathrm{A} + \mathrm{B}\cos\left(\frac{\pi}{4}t + \frac{\pi}{6}\right) + \mathrm{B}\cos\left(\frac{\pi}{2}t + \frac{\pi}{2}\right) + A\sin\left(\frac{3\pi}{4}t + \frac{\pi}{4}\right)$$

$$h(t) = e^{-2t}u(t)$$