JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MAKE UP EXAMINATION APRIL 2018

B.Tech IV Sem, (CSE/IT)

COURSE CODE: 10B11EC301 MAX. MARKS: 25

COURSE NAME: Signals & Systems COURSE CREDITS: 04

MAX. TIME: 1.5 Hrs

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. (a) Differentiate between energy signal and power signal. [2]

(b) Show that a discrete time differentiator given by $y[n] = x[n] - x[n-1]$ is dynamic, linear and time invariant. [3]

Q2. (a) Proof the Frequency shifting property of Fourier transform. [3]

(b) Using Fourier series, calculate the coefficient a_k for the periodic signal $x(t)$ whose amplitude is 1.5 for $0 \leq t \leq 1$ and -1.5 for $1 \leq t \leq 2$. [2]

Q3. (a) Determine the impulse response of the system defined by the difference equation:

$$y[n] = \frac{3}{4}y[n-1] - \frac{1}{8}y[n-2] + 2x[n]$$ [3]

(b) Explain the properties of Convolution sum [2]

Q4. Obtain the Fourier Transform of signal $x(t) = \frac{1}{(1+jt)}$ [5]

Q5. Using DTFT, prove that the convolution in time domain is equal to the multiplication in frequency domain. [5]