

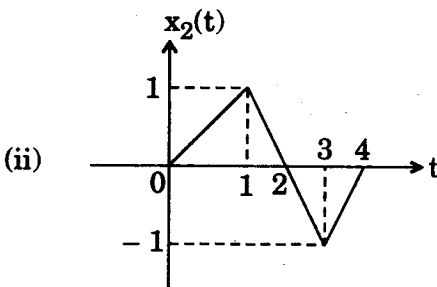
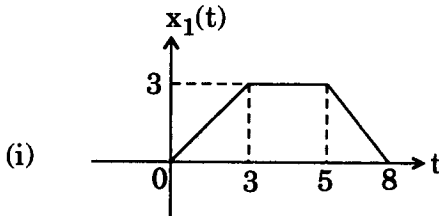
**B.Tech. – VIEP – ELECTRONICS AND  
COMMUNICATION ENGINEERING (BTECVI)****Term-End Examination**

00729

**December, 2014****BIEL-007 : SIGNALS AND SYSTEMS***Time : 3 hours**Maximum Marks : 70*

**Note :** *There are seven questions. Attempt any **five** questions. All questions carry equal marks.*

1. (a) Classify the system with examples.
- (b) Write mathematical expressions in terms of unit step and unit ramp signals of following waveforms.

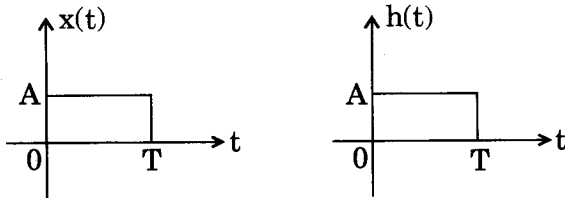
 $2 \times 7 = 14$

2. (a) Check linearity and time-invariance of following systems :

(i)  $y[n - 2] + 3y[n - 1] + 5y[n] = x[n - 2]$

(ii)  $y[n] = nx[n]$

- (b) Find convolution of  $x(t)$  and  $h(t)$ , where  $x(t)$  and  $h(t)$  are shown as waveform



$2 \times 7 = 14$

3. (a) Find the step response of an LSI system whose unit-sample response is given by

$$h[n] = (0.5)^n U[n]$$

- (b) Define impulse response of system. What is the physical significance of impulse response ?

$2 \times 7 = 14$

4. (a) Find and plot the magnitude and phase spectra of the signal

$$x(t) = A.e^{-t/T} U(t)$$

where  $A$  and  $T$  are real valued constants.

- (b) State and prove following properties of Fourier transform

(i) Linearity

(ii) Scaling

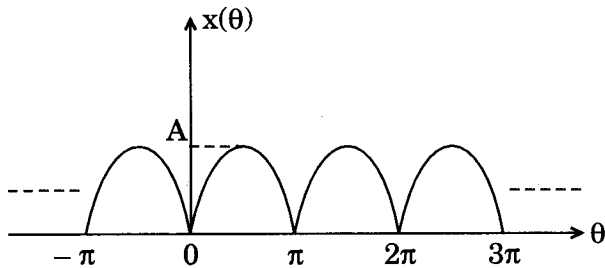
$2 \times 7 = 14$

5. (a) State and prove Convolution theorem of Z-transform.

(b) Find Z-transform and ROC for the following sequence

$$x[n] = -b^n U[-n - 1] \quad 2 \times 7 = 14$$

6. (a) Find trigonometric Fourier series of waveforms



(b) Explain and prove Parseval's theorem of Fourier transform.  $2 \times 7 = 14$

7. Write short notes of 100 words each on any **two** of the following :  $2 \times 7 = 14$

- (a) Z-transform
  - (b) Sinc and gate function
  - (c) Amplitude scaling of signals
  - (d) Fourier transform
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