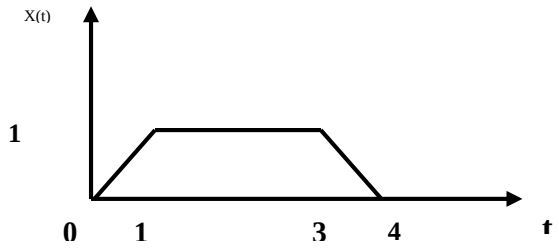
Benha University
Faculty of Engineering at Shoubra
Electrical Engineering Department
2nd Year Communications

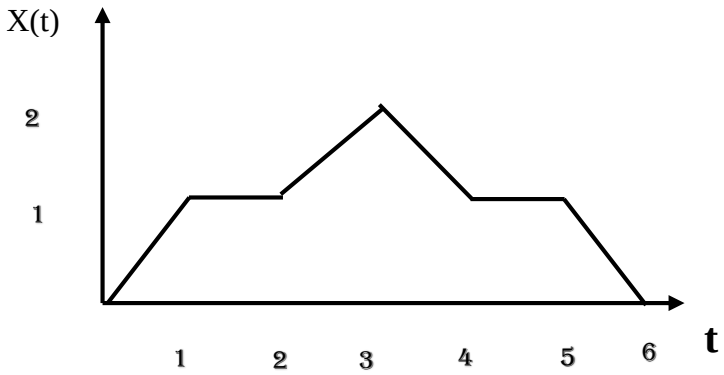
Mid Term Exam
Date: Sunday 26/3/2017
Subject: Signals
Duration: 60 Mins

- **Answer all the following questions**
- **Illustrate your answers with sketches when necessary**

1. **Describe the following signal in terms of unit step function:**



2. **For the following signal sketch:**
   - **The signal delayed by 2.**
   - **The signal Attenuated by 2.**
   - **X(t) [u(t)-u(t-3)].**
   - **The sampled version (Discrete) x1[n], (Ts = 1 sec).**
   - **The sampled version (Discrete) x2[n], (Ts = 0.5 sec).**
   - **X1[2n].**
   - **X1[n^2-2n]**



3. **State with a brief explanation if the following systems are linear/non-linear, causal/non-causal, time-invariant/time-varying.**
   a. **Y(t) = 3x(t) Cos(w_0t +20).**
   b. **Y(t) = 2 x(at).**
4. **<u>Determine</u> whether or not the signal below is periodic and if it is periodic determine the fundamental period [3 Marks]:**

$$x(n) = \cos(\frac{n\pi}{6}) + \mathrm{Re}[e^{\frac{jn\pi}{7}}] + \mathrm{Im}[e^{\frac{jn\pi}{8}}]$$

GOOD LUCK

DR. MICHAEL NASIEF