1. (a) What is system? Discuss about the different types of systems.
   (b) Prove whether $x(t) = \cos^2(2t - (\prod/3))$ is periodic or not.

   8+2=10

2. Define convolution? Find the output $y[n]$ of an LTI System whose impulse response

   i. $h[n] = \{\underset{\uparrow}{3}\ 2\ 1\}$ and input signal $x[n] = \{\underset{\uparrow}{3}\ 1\ 2\}$

   ii. $h[n] = a^n u[n]$, $|a| < 1$, $x[n] = u[n]$

   2+5+3=10

3. What do you understand by discrete Fourier transform? Explain in brief the properties of DFT. 3+7=10

   or

   $\boxed{\text{DFS}}$