AV324 - Class Test 1 (5 marks)
(15 minutes)

Student Name: _____

SC code : _____

1) Consider an information source which has produced a sequence of 2 bits (B_0B_1). These bits are mapped into a baseband signal

$$X(t) = \sum_{m=0}^{1} A_m \cdot p(t - mT_b)$$

where $A_m = 1$ if $B_m = 1$ and -1 otherwise.

Suppose $p(t) = \sin(\pi t / T_b)$ for $t \in [0, T_b)$

a) Draw the block diagram of a digital communication system that will transmit these 2 bits over a baseband channel (assuming that the channel bandwidth will be large enough.)

b) If $B_0 = 1$ and $B_1 = 0$, what is the energy spectral density of $X(t)$?