**Assignment on IA-1 Portion**

***Answer the following and submit the scanned report in GCR***

1. Give data rate formula suggested by Nyquist and Shannon. Low pass communication has BW of 1 MHz. What is Shannon capacity of channel if SNR is 40 db? What bit rate are Attainable using 8-level pulses?
2. a) A voice grade channel of a telephone network has a bandwidth 0f 3.4 kHz.

(i) Calculate channel capacity for S/N= 30dB

(ii) Calculate S/N required to support information transfer at 4800 bps.

b) Suppose a signal travels through a transmission medium and its power is reduced to one-half. Calculate attenuation (loss of power)?

c) In a digital transmission, the receiver clock is 0.1 percent faster than the sender clock. How many extra bits per second does the receiver receive if the data rate is 1 kbps? How many if the data rate is 1 Mbps?

1. Protocol layering can be found in many aspects of our lives, assume any real time application and explain with neat diagram (layers).
2. Represent the given sequence 01001110 in unipolar, polar and bipolar schemes?