CCNW ASSIGNMENT II Date: 23—8-2014

Each question carry 2 Marks (Duration 10 minutes)

1. Consider an channel with bandwidth 50 MHz, received signal power 10 mW, and noise density No= $10^{-9}$ W/Hz. How much does capacity increase by doubling the received power? How much does the capacity increase by doubling the channel bandwidth?

2. Early satellite systems used large 20m-diameter parabolic dishes to receive signals at 4 GHz. What is the antenna gain in dB of these dishes assuming an efficiency of 50%?

3. Consider a cellular system in which two users simultaneously transmit to a single base station. Assume that the users have equal transmit power so that the received power at the base station for each transmission is 10mW. Assume that the noise level as 0.1 mW and the channel bandwidth for each user is 20 MHz. What is the capacity of the user's channel ? Note: consider the interference noise also.

4. For the bit stream 01001110, sketch the waveform in NRZ-L, NRZI, Bipolar AMI, Pseudoternary. Assume that the signal level for the preceding bit for NRZI was high, the most recent preceding bit (AMI) has a negative voltage; and the most recent preceding 0 bit (pseudoternary) has a negative voltage.

5. For the given the pattern 01101, encode the data using ASK, FSK, PSK and DPSK.