**Madan Mohan Malaviya University of Technology Gorakhpur**

**SUBJECT: Digital Communication (BEC-301) ECE-VTH SEM**

**ASSIGNMENT -3**

**Q.1** Explain the Gram-Schmidt Orthogonalization procedure with mathematics and block diagrams, Also explain the procedure to find the base function of two-dimension space with mathematical equations and vector diagrams.

**Q.2** Discuss in detail the various aspects of the matched filter. Prove that the maximum S/N ratio for the matched filter is found to be

**Q.3** Draw the block diagram of QPSK system and explain its working.

**Q.4** What is binary amplitude shift keying (BASK)? Draw ASK and PSK waveforms for a data stream 1010101.

**Q.5** Discuss concept of spread spectrum technique with its advantages and disadvantages.

**Q.6** Explain non-coherent detection methods of binary frequency shift keying (BFSK) scheme. If binary data is transmitted over a microwave link at the rate of bits/sec. Determine the probability of bit error: **(i)** For coherent FSK receiver (**ii)** For non coherent FSK receiver, given /Hz;

**Q.7** What is Matched Filter? Explain the working & its applications.

**Q.8** Explain the demodulation techniques used in frequency hopped spread spectrum. Compare fast frequency hopping and slow frequency hopping.

**Q.9** Draw the block diagram of QPSK system and explain its working.Sketch the QPSK waveform for the sequence 1101010010. Assuming the carrier frequency to be equal to the bit rate.

**Q.10** Explain the coherent and non-coherent detection of BFSK separately with suitable block diagrams and supportive expressions.

**Q.11** Draw and explain signal space diagram for the digital PSK for M=4 and M=8, with showing proper functions and amplitude.

**Q.12** Explain the working of Direct spread spectrum (DS-SS) with the help of block diagram. A DS spread spectrum system of chip rate 10MHz is used for ranging. If the reflected wave is received after 0.1 milisecond, find the probable distance of the target.

**Q.13** Compare with necessary point among ASK,FSK and PSK.