B.E. Electronics & Telecommunication / Communication Engineering Seven Semester

EC702 – Digital Communication

P. Pages : 2 **GUG/W/18/1793**

Time : Three Hours * 1 4 0 3 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain in detail with derivation coherent MSK. Also explain block diagram of transmitter and receiver. **8**

b) A compact disk records audio signals digitally using PCM. The audio signal Bandwidth is 15 KHz. **8**

i) What is Nyquist rate?

ii) If quantization levels are 65536, determine the number of binary digits required to encode the sample.

iii) Determine the number of bits/sec. required to encode on audio signal.

OR

2. Draw the block diagram of digital communication system and explain it is detail. **16**

3. a) Draw and explain the block diagram of PCM system. Also derive an expression for SNR of PCM. **8**

b) What are the different types of quantizer. **8**

OR

4. a) Give the expression for signal to noise ratio for PCM system. Hence prove that $(S|N)d_B = (4.8 + 6V)d_B$ **8**

b) Write short note on scalar and vector quantization. **8**

5. a) Explain the concept of matched filter and explain its different properties. **8**

b) Draw and explain correlation receiver. **8**

OR

6. a) Explain ADPCM with block diagram. **8**

b) Explain the concept of delta modulation. Also calculate value of SNR. **8**

7. a) Draw the block diagram of QPSK transmitter and receiver. Describe its operation using phasor diagram. **8**

b) Explain in detail the derivation of coherent binary PSK. Also explain block diagram of transmitter and receiver. **8**

OR

8. a) Write short note on signal space representation of pulse amplitude modulated signals. **8**

b) Explain the optimum receiver for AWGN channel with block diagram. **8**

9. a) Explain probability of errors in AWGN channels. **8**

b) Differentiate between QPSK and MSK. **8**

OR

10. Write short notes on : **16**

i) Electronic Commutation.

ii) PCM Hierarchy.

iii) Byte Interleaving T_1 Carrier System.

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