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BIEL-035

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)

Term-End Examination

June, 2015

00896

BIEL-035 : DIGITAL COMMUNICATION

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. **1** is **compulsory**.*

1. Choose the correct answer : *7×2=14*

(a) Spread spectrum modulation technique utilizes

(i) direct sequence modulation

(ii) pseudorandom sequence modulation

(iii) double modulation

(iv) wideband modulation

(b) The maximum possible time interval between two successive samples of a 2 kHz signal is

(i) 0·25 ms

(ii) 0·125 ms

(iii) 0·5 ms

(iv) 1 ms

(c) Nyquist rate is the minimum sampling rate to avoid

(i) amplitude distortion

(ii) foldover distortion

(iii) frequency distortion

(iv) phase distortion

(d) In PCM, the quantization noise mainly depends on

(i) sampling rate

(ii) signal power

(iii) number of quantization levels

(iv) number of bits per sample

(e) Flat top sampling leads to

(i) aliasing error

(ii) aperture effect

(iii) signal level attenuation

(iv) quantization error

(f) Which encoding method uses alternative positive and negative values for 1's ?

(i) NRZ-1

(ii) RZ

(iii Manchester

(iv) AMI

(g) How many different symbols are possible at the output of a 16-QAM modulator ?

(i) 8

(ii) 16

(iii) 64

(iv) 256

2. (a) Define Entropy. Define different properties of entropy.

(b) For a source transmitting two independent messages M1 and M2 having probability of P and (1 – P) respectively, prove that the entropy is maximum when both the messages are equally likely. *2×7=14*

3. (a) The output signal to quantizing noise ratio $(SNR)_0$ in a PCM system is defined as the ratio of average signal power to average quantizing noise power. For full scale sinusoidal modulating signal with amplitude A, prove that

$$(SNR)_0 = (S/N_q)_0 = (3L^2)/2,$$

where L is the number of quantizing levels.

(b) Discuss the need of companding in PCM system. *2×7=14*

4. What are the different types of digital modulation techniques ? Explain any two techniques. *14*

5. (a) Define line coding. The binary data 101100110101 is transmitted over a base band channel. Draw the waveform for the transmitted data using the following formats :

(i) UNIPOLAR-RZ

(ii) BIPOLAR-RZ

(iii) SPLIT PHASE MANCHESTER

(b) What is the difference between bit rate and baud rate ? Define ADPCM briefly. *2×7=14*

6. (a) Distinguish between FSK and MSK. What is the advantage of MSK ?

(b) What is the need of multiplexing ? Compare FDM and TDM. *2×7=14*

7. What is spread spectrum communication ? Name various commonly used spread spectrum techniques and also write the advantages of spread sprectrum communication. *14*

8. Write short notes on any ***four*** of the following : *4×3 $\frac{1}{2}$ =14*

(a) Run Property

(b) Channel Coding

(c) PN-Sequence

(d) Processing Gain

(e) PAM

(f) Companding