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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

Department of Electrical and Electronics Engineering

Fourth Semester

EE8401- Communication Engineering

(Regulation R2012.)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Write about auto correlation property of pseudo random bit sequence.
2. Give the expressions for number of users in FDMA and no of time slots in TDMA communication systems
3. Differentiate DM and PCM with respect to bit rate .
4. Draw the block diagram of pulse position modulator.
5. Define Hamming distance and Hamming weight.
6. What should be the minimum bandwidth required to transmit a signal of 10 KHz bandwidth using AM and FM.
7. Mention the property of entropy of the source .
8. Define Hard Hand Off and Soft Hand Off.
9. Write the operating spectral range and output power range of LED and LASER
10. The input modulated signal of the Mixer stage in AM receiver is centered at 950 KHz. What is the image frequency.

Part – B (5 x 16 = 80 marks)

11. i) Define FM with waveforms and derive the expression for FM. (6)
ii) Define AM with waveform and derive the expressions for AM (6)
iii) An AM signal has a power of 10 KW at 80% modulation. Find the efficiency of transmission. (4)
12. a) Explain PCM communication system with block diagram.

(OR)

- b) i) Explain BPSK communication system. (8)
 ii) Draw the transmitter and receiver block diagram of QPSK and also draw the signal phase and signal space diagram (8)

13) a) Explain in detail FDMA, TDMA and CDMA

(OR)

- b) i) Explain Direct Sequence SSS for Base band Communication systems with relevant diagrams. (8)
 ii) How will you generate seven bit code sequence to be used in spread spectrum modulation. (4)
 iii) Calculate the signal to noise in dB at the output of Spread spectrum Communication receiver while the S/N at input is 30, Bit rate is 244.2 b/sec and chip rate is 1 Mb/sec. (4)

14. a) i) Derive signal to interference noise ratio of co channel interference in cellular communication (8).

- ii) For the AMPS system the required SINR is 22 dB, find the cluster size N. Given $\alpha = 4$. (4)
 iii) For a cellular system with 105 voice call channels and cluster size $N = 7$, $M = 20$. Find the capacity of a system with and without frequency reuse. (4)

(OR)

- b) i) Explain Different types of Dispersion. (6)
 ii) What are the features of Step Index Single Mode Fibre, Step Index Multi mode Fibre and Graded Index Fibre (6)
 iii) Explain the function of Avalanche Photo Diode. (4)

15. a) i) Perform Shannon Fanno Coding for source given and find the Entropy H(s), code words of all messages and efficiency (6)

m0	m1	m2	m3	m4	m5	m6	m7	m8
.0625	.0625	.125	.0625	.0625	.125	.125	0.125	0.25

- ii) Construct a convolution encoder for (2,1,3) code and find the output sequence when the input sequence is 1011101. The generator $g_1^1 = 1011$ and $g_1^2 = 1101$. (6)
 iii) Explain Manchester coding. (4)

(OR)

b) i) Write all the code words of (7,4) Block code using $P = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$ Also Find Hamming Weight. (6)

- ii) Demonstrate the error correcting capability when the received code word with error is 1010100. Find the information sequence transmitted. (4)
 iii) Implement the encoder and decoder with Combination Logic. (6)