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**B.E / B.Tech (FULL TIME ) REGULAR EXAMINATIONS, APRIL/MAY 2013**  
**ELECTRICAL AND ELECTRONICS ENGINEERING**  
**IV SEMESTER, REGULATIONS : R-2008**  
**EC 9261 COMMUNICATION ENGINEERING**

**Time : 3 Hours**

**Max. Marks: 100**

**Answer ALL questions**

**Part-A**

**(10x2=20 Marks)**

1. Channel encoding was done using (15,11) code. Find the bit rate at the output of the encoder if the input bit rate is 128 kb/sec.
2. Write about the property of PRBS which is used to reduce the fading effect.
3. Draw the frequency spectrum of NBFM with  $m=1$  and frequency swing of 30 Khz. Assume carrier frequency.
4. Draw the block diagram of QPSK transmitter and receiver.
5. Write any two properties of Entrophy
6. Mention the different type of losses in optical communication.
7. The peak value of modulating and carrier signals are 3V and 5V respectively. Calculate the maximum and minimum voltage levels of AM signal.
8. Jammer's margin is 26.123 dB. Determine the chip rate assuming bit rate is 244b/sec and  $E_b/N_0 = 10$ .
9. What is meant slope overload error in DM and how it can be reduced
10. Distinguish between GEO, LEO and MEO satellites with respect to distance from the earth.

**Part-B**

**(5x16=80 Marks)**

- 11.(i) Explain with block diagram PCM communication transmitter and receiver. **(10)**  
(ii) Describe BFSK communication system. **(6)**

- 12.(a)(i) Define AM with waveforms and derive for total power of AM signal. Also draw the block diagram of AM transmitter and receiver. **(10)**  
(ii) Explain AM demodulator. **(6)**

**OR**

- 12.(b)(i) Derive the expression for FM signal. Draw the block diagram of FM transmitter and receiver. **(10)**  
(ii) Explain FM demodulator. **(6)**

- 13.(a)(i) Perform Huffman Coding for the following source. Determine the code words for every message and coding efficiency. (10)

m0	m1	m2	m3	m4	m5	m6	m7
.064	.096	.096	.144	.096	.144	.144	.216

- (ii) Draw the HDB3 coded signal for the data given. Assume the market bit has negative value. 1 0 1 1 0 0 0 0 1 0 0 0 0 1 (2)
- (iii) Draw the block diagram showing the processing steps involved in bandpass communication of analog signal through digital link. (4)

OR

- 13.(b)(i) Determine all the code words of the code whose coefficient matrix is given as

$$P = \begin{matrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{matrix}$$

- (ii) Demonstrate the detection of error with an example. Also implement the encoder and decoder using combination logic. (8)

- 14.(a) Describe Direct sequence-Spread Spectrum Modulation for Bandpass Communication.

OR

- 14.(b)(i) What is FDMA and write its features. (6)
- (ii) Differentiate between TDMA/TDD, TDMA/FDD, FDMA/FDD and FDMA/TDD. (10)

- 15.(a)(i) Draw the block diagram of optical communication. (2)
- (ii) Write about dispersions in fibre. (4)
- (iii) LED and Laser sources. (10)

OR

- 15.(b)(i) Explain Kepler's laws with respect to satellite communication. (6)
- (ii) Briefly explain the different satellite access assignment techniques. (6)
- (iii) Write the expressions for satellite uplink equation and downlink equation. (4)