

## IV B.Tech I Semester Supplementary Examinations, November 2005

## DATA COMMUNICATIONS

(Electrical &amp; Electronic Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Determine the bandwidth efficiency for 16-QAM modulator with  $f_b = 20 \text{ Mbps}$ . [6]
- (b) For a QPSK system and the given parameters determine [10]
  - i. Carrier power (C) in dBm
  - ii. Noise power (N) in dBm
  - iii. Noise power density ( $N_0$ ) in dBm
  - iv. Energy per bit ( $E_b$ ) in dB
  - v. Carrier to noise power ratio
  - vi.  $E_b/N_0$  ratio

$C = 10 - 13 \text{ dBm}$ ;  $f_b = \text{input data rate} = 30 \text{ kbps}$ ;  
 $N = 0.06 \times 10 - 15 \text{ dBm}$ ;  $B = \text{Band width} = 60 \text{ kHz}$
2. Draw the following networks.
  - (a) i. 7 user star-network topology [10]
  - ii. Seven-node bus network topology
  - iii. Seven-node ring network topology
  - (b) What are the advantages of each topology [6]
3. What is the difference between even parity and odd parity methods Explain. [16M]
4. (a) What are the characteristics of a serial interface. [10M]
- (b) Define Baud rate. Explain [6M]
5. Write short notes on
  - (a) Multi link procedure [5M]
  - (b) information transfer. [5M]
  - (c) balanced asynchronous class. [6M]
6. (a) Define Multiplexing & describe Time Division Multiplexing with Block Diagram. [6M]
- (b) A PCM-TDM system multiplexes 24 voice band channels. Each sample is encoded into 7 bits and a framing bit is added to each frame. The sampling rate is 9000 samples / second. BPRZAMI encoding format is used. Determine [10M]

- i. Line speed in BPS
  - ii. Min Nyquist Band Width.
7. Differentiate between DUV, DAV, DAVID, and DIV clearly? [16M]
8. What are the problems in exchanging message blocks between computers? How are they solved? [16M]

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