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**2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

## IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS

**DATA COMMUNICATIONS**

(ELECTRICAL&amp;ELECTRONICS ENGINEERING)

NOVEMBER 2005

TIME: 3 HOURS

MAX MARKS: 80

Answer any FIVE Questions  
All Questions carry equal marks  
?????

1. (a) Determine the bandwidth efficiency for 16-QAM modulator with  $f_b = 20$  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

$C = 10$  - 13W;  $f_b =$  input data rate = 30kbps;

$N = 0.06 \times 10$  - 15W;  $B =$  Band width = 60kHz

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](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?

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