

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

FIFTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: COMMUNICATION SYSTEM [ICE 3103]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.

Describe low level and high level AM transmitters.	5
Derive the expression for total power of AM wave.	3
A standard AM transmission, sinusoidally modulated to depth of 40%, produces sideband frequencies of 6.824 MHz and 6.854 MHz. The amplitude of each sideband frequency is 50V. Determine the amplitude and frequency of the carrier.	2
Explain tuned radio frequency receiver with block diagram and list its disadvantages.	5
Describe varactor diode FM modulator	3
A carrier $E_c \cos \omega_c t$ modulated by a signal $f(t)=2 \cos 2\pi t+6 \cos 10^3 2\pi t+7 \cos 10^3 4\pi t$. Find the bandwidth of FM using Carson's rule. Assume K=10kHz/v, find the deviation ratio.	2
With necessary diagrams explain Armstrong indirect FM transmitter and show that phase deviation depends on amplitude of modulating signal.	5
Explain flat top sampling technique with relevant equations and figures.	3
What is quantization error? Distinguish between uniform and non-uniform quantization.	2
Describe BPSK (Transmitter and Receiver) with the help of block diagrams.	5
What is carrier recovery? With the block diagram explain costas loop carrier recovery.	3
With a block diagram explain frequency division multiplexing.	2
Define spread spectrum modulation. Explain idealized model of baseband spread spectrum system with relevant figures and expressions.	5
List the basic operational steps of transmitting and receiving in a cellular telephone system.	3
What is handoff management? Distinguish between hard hand off and soft hand off	2
	Describe low level and high level AM transmitters. Derive the expression for total power of AM wave. A standard AM transmission, sinusoidally modulated to depth of 40%, produces sideband frequencies of 6.824 MHz and 6.854 MHz. The amplitude of each sideband frequency is 50V. Determine the amplitude and frequency of the carrier. Explain tuned radio frequency receiver with block diagram and list its disadvantages. Describe varactor diode FM modulator A carrier $E_c \cos \omega_c t$ modulated by a signal $f(t)= 2 \cos 2\pi t + 6 \cos 10^3 2\pi t + 7 \cos 10^3 4\pi t$. Find the bandwidth of FM using Carson's rule. Assume K=10kHz/v, find the deviation ratio. With necessary diagrams explain Armstrong indirect FM transmitter and show that phase deviation depends on amplitude of modulating signal. Explain flat top sampling technique with relevant equations and figures. What is quantization error? Distinguish between uniform and non-uniform quantization. Describe BPSK (Transmitter and Receiver) with the help of block diagrams. What is carrier recovery? With the block diagram explain costas loop carrier recovery. With a block diagram explain frequency division multiplexing. Define spread spectrum modulation. Explain idealized model of baseband spread spectrum system with relevant figures and expressions. List the basic operational steps of transmitting and receiving in a cellular telephone system. What is handoff management? Distinguish between hard hand off and soft hand off