

MANIPAL INSTITUTE OF TECHNOLOGY Manipal University

SIXTH SEMESTER B.Tech. (I & C E) DEGREE END SEMESTER EXAMINATION May/June 2016 SUBJECT: ANALOG & DIGITAL COMMUNICATION SYSTEMS (ICE - 320)

TIME: 3 HOURS

MAX.	MARKS :	50
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Instructions to candidates	
• Answer ANY FIVE full questions.	

- Missing data may be suitably assumed.
- 1A. For 100% AM modulation, prove that $P_{SSBSC}=1/2P_{DSBSC}=1/6P_{DSBFC}$ with the help of necessary equations.
- 1B. An arbitrary modulating signal consisting of two modulating frequencies of 1 KHz and 2 KHz modulated by a carrier signal having peak amplitude of 1V and frequency of 1MHz with amplitude index of 0.5 and 0.2 respectively. Write the resultant expression for complex AM signal and sketch its frequency spectrum.
- 1C. Identify the five main components of a data communication system.

(5+3+2)

- 2A. Draw the block diagram for a TRF radio receiver and briefly describe its operation.
- 2B. Superhetrodyne receiver is tuned to a station of 590KHz and intermediate frequency of 455KHz a)Find its image frequencyb)Calculate the image frequency rejection ratio in dB, assuming Q=40
- 2C. List the difference between low level and high level transmitters with block diagram.

(5+3+2)

- 3A. Draw the block Schematic of Armstrong Indirect FM Transmitter and show that phase deviation depends on amplitude of modulating signal
- 3B. Obtain the expression for the capacitance of the RC reactance FET FM modulator with the help of basic circuit.
- 3C. FM modulator has frequency deviation sensitivity of 1.5kHz/V. The carrier signal is modulated by the modulating frequency of 1kHz.Determine the modulation index of a FM signal.

(5+3+2)

- 4A. What is uniform quantization? Derive an expression for signal-to noise ratio in uniform quantization.
- 4B. Describe briefly the functions of each block in a PCM system.
- 4C. What are limitations of Delta modulation and how can these be overcome?

(5+3+2)

- 5A. With truth table, phasor diagram and constellation diagram explain the working 8-QAM transmitter
- 5B. Draw the diagram of differential phase shift keying transmitter and determine the output sequence for the input sequence :00110011010101. Assume reference bit=1.
- 5C. For a tribit input of Q=0,I=0 and C=0,determine the output phase for the 8-PSK modulation.

(5+3+2)

- 6A. With regard to spread-spectrum system, explain coherent binary phase shift keying
- 6B. Compare time division multiple access and frequency division multiple access.
- 6C. Explain the basic operation of transmission in a cellular telephone system.

(5+3+2)
