

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

FIFTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER EXAMINATIONS, DEC - 2017

SUBJECT: COMMUNICATION SYSTEMS [ICE 3103]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Explain square law modulator and demodulator.	5
1B.	Describe AM envelope detector.	3
1C.	Compare AM and FM with suitable examples.	2
2A.	Explain low level and high level AM transmitters with necessary diagrams.	4
2B.	Explain the process of FM demodulation using slope detector with necessary diagrams.	3
2C.	A carrier $A_c \cos \omega_c t$ is frequency modulated by a signal $E_m \cos \omega_m t$. The modulation index is m_f . Find the expression for the modulation index and frequency deviation from the resulting FM signal.	3
3A.	Describe Armstrong indirect FM transmitter with block diagram and phasor diagram.	4
3B.	Explain adaptive delta modulation with necessary diagrams.	3
3C.	What is uniform quantization? Explain the types of uniform quantization with relevant figures.	3
4A.	Explain DPCM with block diagram (transmitter and receiver) and necessary equations.	5
4 B .	With a block diagram explain Differential phase shift keying transmitter and determine the output for the following input sequence :00110011010101(Assume reference bit=1)	3
4C.	Explain clock recovery with necessary diagrams.	2
5A.	Write a short note on	5
	i) Frequency Hop Spread spectrum ii) TDMA and FDMA techniques	
5B.	With neat sketch, explain the operation of QPSK receiver.	3
5C.	With the help of block diagram explain the components of a cellular telephone system.	2