Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

FIFTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER EXAMINATIONS, NOV - 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.	Explain three AM receiver parameters.	**3**
1C.	An AM transmitter has antenna current of 2 A with modulation index of 60 percent. What will be the total antenna current if one more identical antenna is connected in parallel with the previous one, keeping the transmitter output same? Will it affect modulation index?	**2**
2A.	Explain tuned radio frequency AM receiver with necessary diagram and list its drawbacks.	**4**
2B.	Describe varactor diode FM modulator with necessary diagram.	**3**
2C.	Compare the advantages and disadvantages of angle modulation and amplitude modulation.	**3**
3A.	Describe Crosby direct FM transmitter with block diagram.	**3**
3B.	In FM system, when the audio frequency is 500 Hz and modulating voltage 4.2V, the deviation produced is 6 kHz. If the modulating voltage is now increased to 5.7 V, calculate the new value of frequency deviation produced. If the audio frequency voltage is raised to 7.4 V while the modulating frequency is dropped to 250 Hz, what is the frequency deviation? Calculate the modulation index in each case.	**3**
3C.	With neat sketch, explain DPCM transmitter and receiver.	**4**
4A.	With the help of block diagram, phasor diagram and constellation diagram, explain BPSK modulator and demodulator.	**5**
4B.	What is Companding? Compare μ-law and A-law compander with their characteristics.	**3**
4C.	What are the different types of quantization errors usually encountered in delta modulation?	**2**
5A.	Write a short note on i) Frequency Hop Spread spectrum ii) TDMA and FDMA techniques	**5**

5B. With neat sketch, explain the operation of QPSK transmitter. **3**

5C. Determine the upper and lower side frequencies, minimum Nyquist rate of a BPSK modulator for a carrier frequency of 70MHz with a bit rate of 10Mbps. **2**

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