Reg. No.



MANIPAL INSTITUTE OF TECHNOLOGY

FIFTH SEMESTER B. TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2018

SUBJECT: COMMUNICATION SYSTEMS [ICE 3103]

TIME: 3 HOURS MAX. MARKS Instructions to candidates: (i) Answer ALL questions. (ii) Missing data may be suitably assumed.		ARKS: 50	
1A.	The output current of 70% modulated AM generator is 1.5 A. To what value will this current rise if the generator is modulated additionally by another audio wave whose modulation index is 0.7?	(2)	
1 B .	With a neat circuit diagram explain the working of balanced slope detector.	(3)	
1C.	Explain the operation of AM superheterodyne receiver with block diagram.	(5)	
2A.	Discuss indirect FM transmitter with suitable block diagram.	(5)	
2B.	Determine (a) the peak frequency deviation, (b) the carrier swing, and (c) the modulation index for an FM modulator with deviation sensitivity $K_1 = 4 \text{ kHz/V}$ and a modulating signal $V_m(t) = 10 \sin(2\pi 2000t)$. What is the peak frequency deviation produced if the modulating signal were to double in amplitude?	(2)	
2C.	Discuss the significance of companding with relevant illustrations.	(3)	
3A.	For the given binary sequence 10101110 draw the digital waveform corresponding to: NRZ polar, NRZ bipolar, NRZ Manchester, and RZ unipolar.	(2)	
3B.	Describe the errors in delta modulation scheme and explain briefly the adaptive delta modulation technique to overcome these errors.	(5)	
3C.	Compare coherent and non-coherent FSK demodulator with examples.	(3)	
4A.	With block diagrams, describe the working principle of QPSK transmitter and receiver. Also draw truth table, phasor, and constellation diagrams.	(5)	
4B.	How to achieve carrier recovery using squaring loop and costas loop? Explain.	(5)	
5A.	What is M-ary encoding? With appropriate waveform explain its significance.	(2)	
5B.	Mention any 2 application of spread spectrum communication. Write the scheme to generate pseudo noise sequences with an example.	(3)	
5C.	Write a short note on		
	i) Code Division Multiple Access ii) Global System for Mobile Communications	(5)	