Reg. No.



V SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE-UP EXAMINATIONS, MAY 2018

SUBJECT: COMMUNICATION SYSTEMS [ELE 3103]

REVISED CREDIT SYSTEM

Time: 3 Hours Date: 09 May 2018		Max. Marks: 50	
Instructions to Candidates:			
	 Answer ALL the questions. 		
	 Missing data may be suitably as 	sumed.	
	 Draw diagrams wherever neces 	sary	
1A.	Explain the characteristics of w ideal low pass filtered white no bandwidth 2B.(Consider both p	hite noise. Find the autocorrelation functi ise spectra, where the midband frequency positive and negative frequencies)	on of the r is fc and (04)
1B.	Consider a carrier signal $c(t)$ message signal $m(t) = 5sin(50)$	= $50 \cos(2\pi \cdot 10^8 t)$ frequency modulat $00t$).Let the modulation index be 10.	ed by a
	a) Obtain the pow b) Obtain the max	er in the modulated signal imum frequency deviation of the modulat	ed signal
	c) What is transm	ission bandwidth of the modulated signa	l? (03)
1C.	Explain AM Super heterodyne i	eceiver with the help of a neat block diag	ram (03)
2A.	Derive the expression for singl terms of bessel function also dr	e tone modulation of an angle modulated raw the spectrum.	wave in (05)
2B.	Derive the interpolation forn measure used to prevent aliasi	nula. Explain aliasing and suggest a cong	orrective (05)
3A.	What is meant by indirect FM g using indirect method	eneration? Discuss about the generation o	of WBFM (05)
3B.	Assume an analog message sigr quantization level is 8 -17.5,-12.5,-7.5,-2.5, 2.5, 7.5, 12	nal is limited to the range from -20V to +2 and corresponding codes are loca .5, 17.5 volts. Find the quantized sequenc	0V. If the ated at ce. (03)
3C.	In digital communication syste carrier frequency is 100 MF bandwidth requirement of the	m, the bit rate of NRZ data stream is 1 M Iz. Find the symbol rate of transmiss channel if the following techniques are us	Ibps and sion and sed.
	a) QPSK system		
	b) BFSK system		(02)

- **4A.** Explain QPSK transmitter and receiver with the help of block diagram. Draw the signal space representations of each symbol. (05)
- **4B.** With neat block diagram and expressions, explain the transmission and reception of symbols using differential phase shift keying technique. **(05)**
- **5A.** For a (7, 4) systematic cyclic code with $g(x) = 1 + x^2 + x^3$. Determine the code word if the message sequence is [1110] (03)
- **5B.** For a (6, 3) linear block code the parity bits are b 0 = m 0 + m 1; b 1 = m 1 + m 2; b 2 = m 0 + m 2.
 - a) Find the code vector for message sequence [1 1 0]
 - b) If the received sequence is [1 1 1 0 1 0] then evaluate the syndrome vector. If the received sequence is erroneous then find the location of the error. (04)
- 5C. The trellis diagram of a rate-1/2, constraint length-3 is shown in fig Q5C. The all-zero sequence is transmitted, and the received sequence is 10001000. Using the Viterbi algorithm, compute the decoded sequence.



Fig Q5C