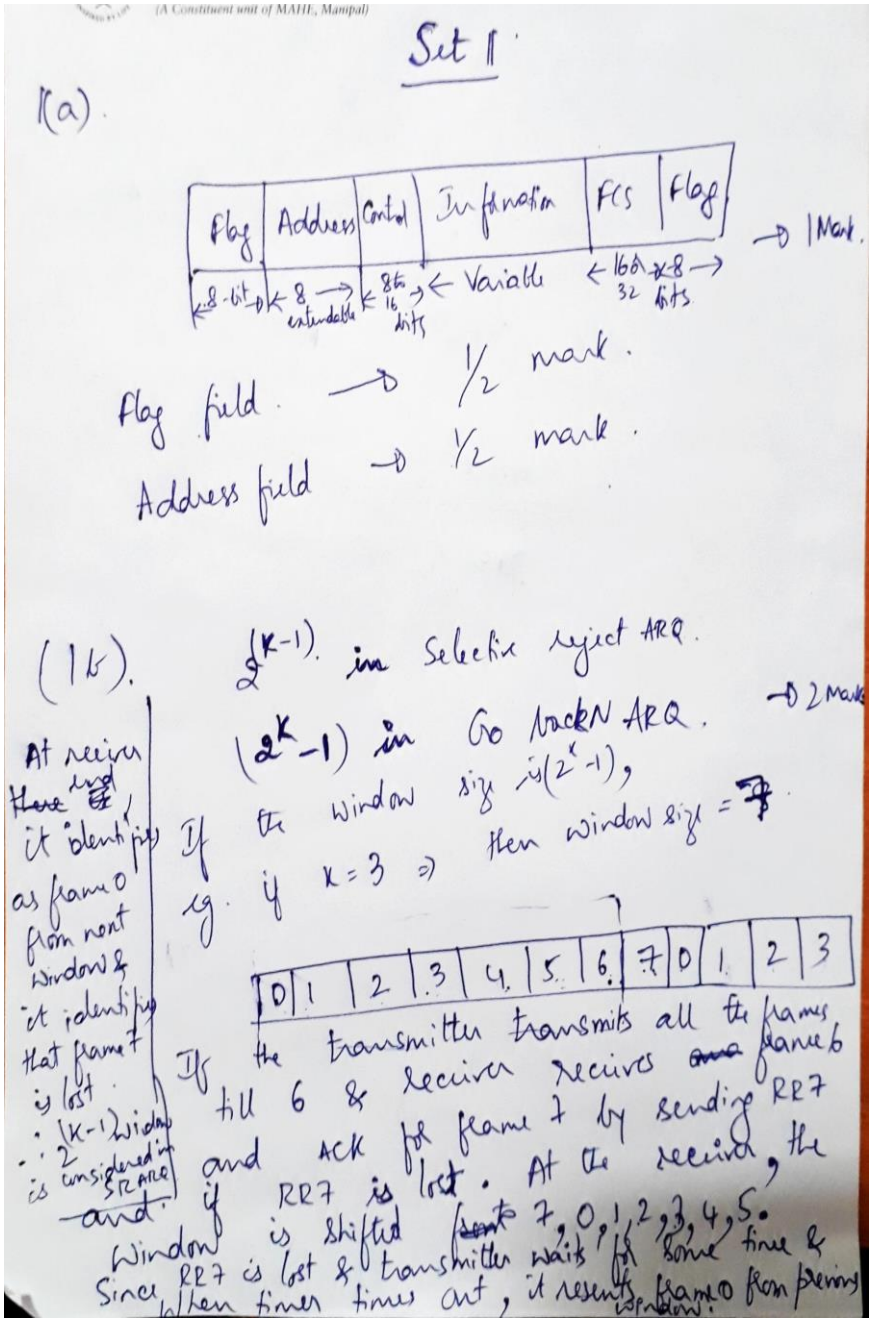
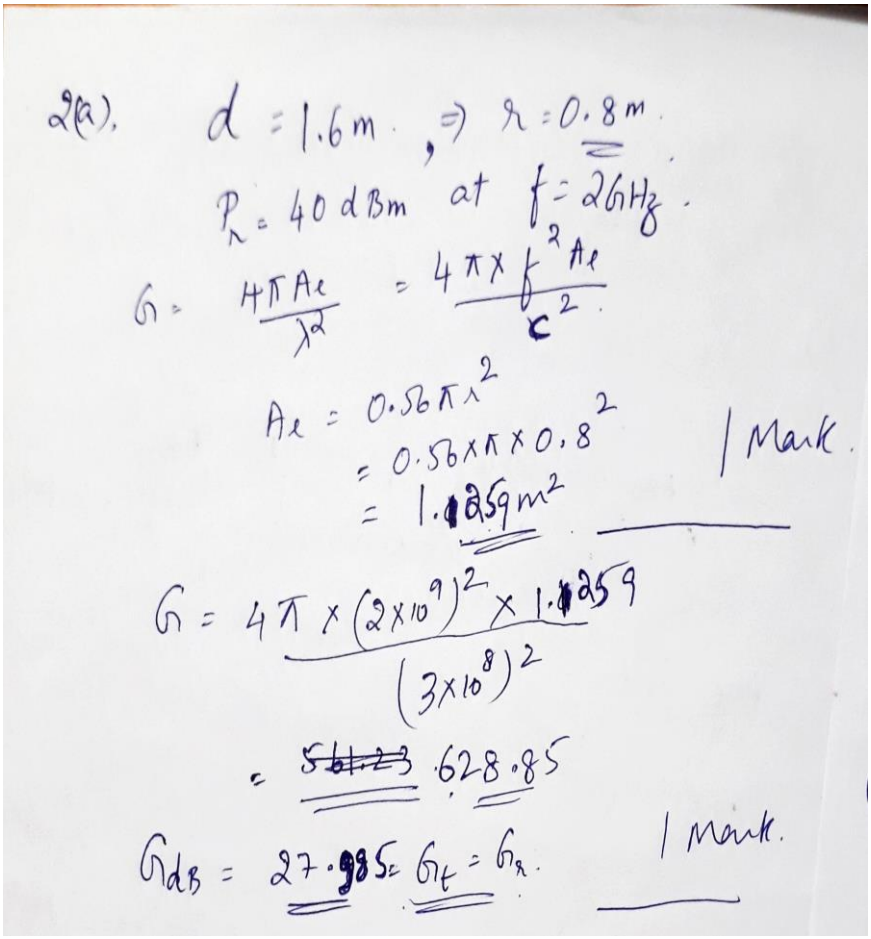
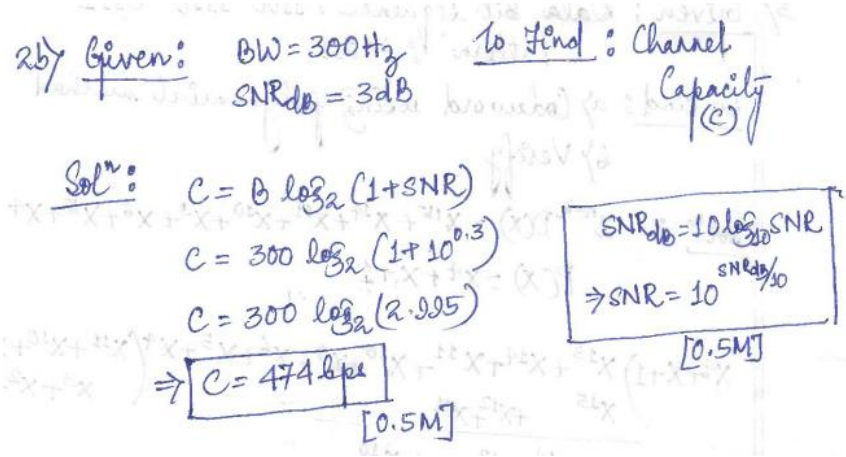
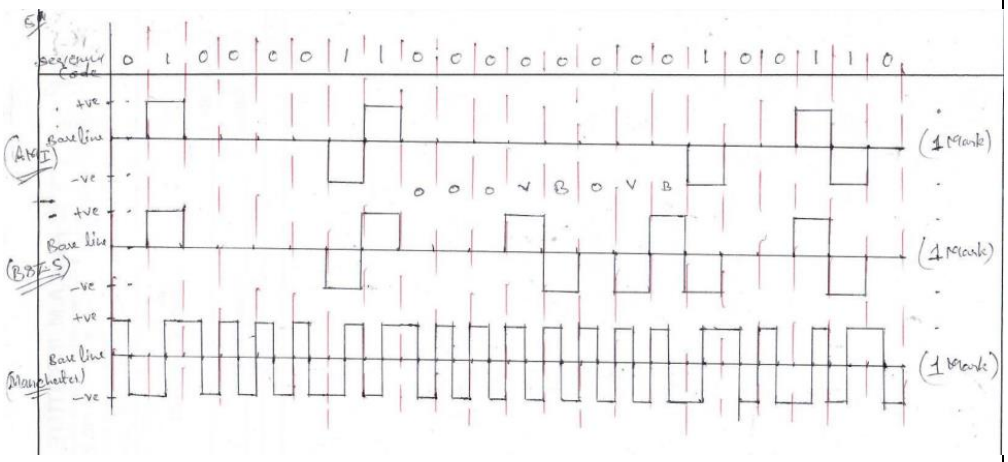
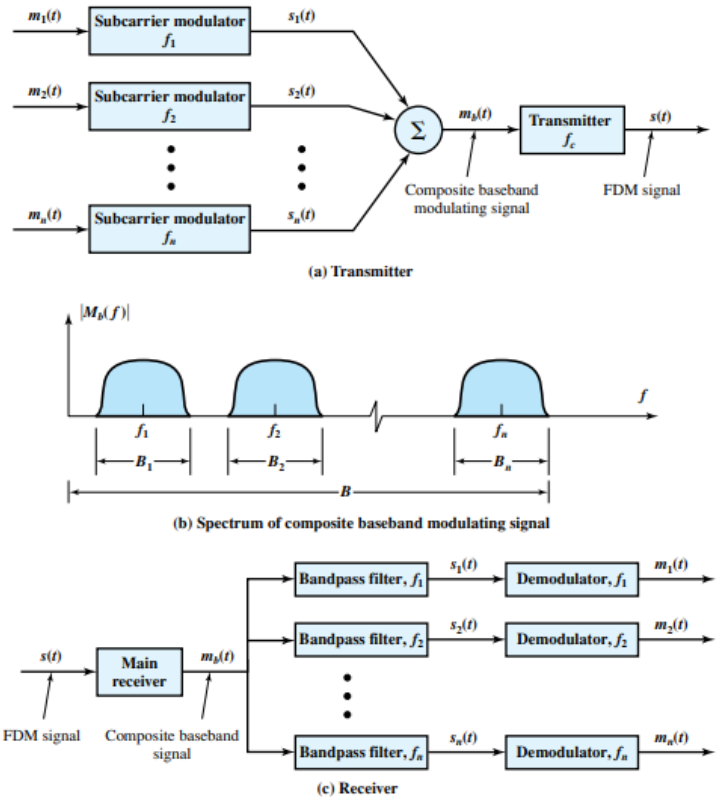
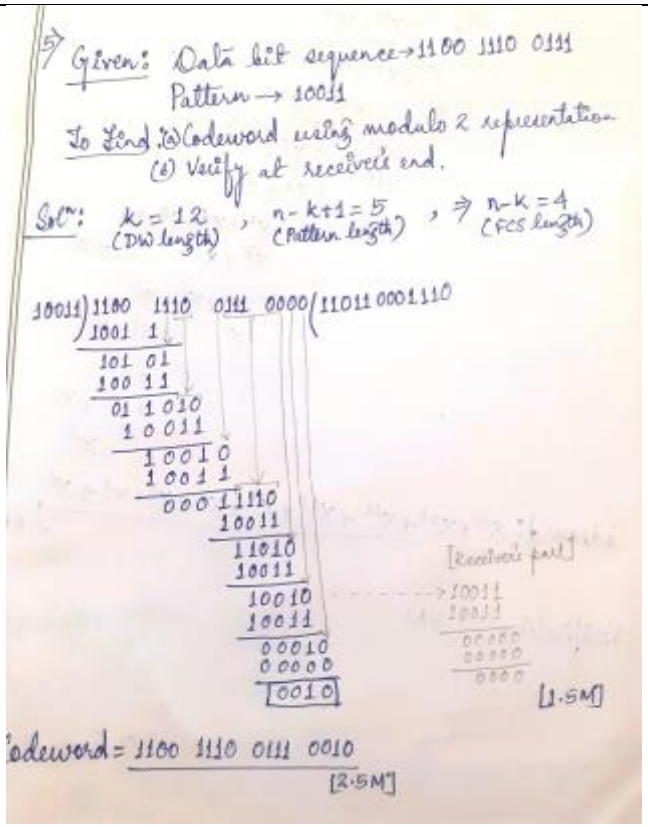
III SEMESTER B.TECH.
(INFORMATION TECHNOLOGY/COMPUTER & COMMUNICATION ENGINEERING)
IN-SEMESTER EXAMINATIONS, DECEMBER 2021
SUBJECT: PRINCIPLES OF DATA COMMUNICATION [ICT 2156]
SCHEME OF EVALUATION
TOTAL MARKS: 20 M
SET-1

1	a. With respect to the standard HDLC frame format, give the structure of the frame format indicating the individual field size in bits and explain flag and address field. b. With respect to the error control mechanism, why the maximum window size is limited to 2(k-1) in selective reject ARQ when compared to the window size (2k – 1) used in Go Back N ARQ.	1+0.5+0.5 2



2	2a. A microwave communication link exits between two parabolic antennas each with a diameter of 1.6meters. If an isotropic antenna is assumed at the transmitter, it has an output of 40dBm at 2GHz. Calculate the gain of each antenna in decibels.	1+1
		
	b.What is the channel capacity for a teleprinter channel with a 300-Hz bandwidth and a signal-to-noise ratio of 3 dB, where the noise is white thermal noise?	0.5+0.5
		
3	For the bit stream 0100001100000000100110, sketch the waveforms for Manchester, bipolar AMI and B8ZS. Assume that the signal level for the preceding bit for NRZI was high; the most recent preceding 1 bit (AMI) has a negative	1+1+1

	voltage, and the most recent preceding 0 bit (pseudo ternary) has a negative voltage. Each Line code Carries one mark 	
4	With a neat block diagram of transmitter and receiver, explain how synchronous frequency division multiplexing (FDM) works. Block Diagram carries 1.5 marks and detailed Explanation carries 1.5 marks 	1.5 +1.5
5	Using modulo 2 method representation, generate the codeword for the data bit sequence 1100 1110 0111 and verify at the receiver's end using the pattern 10011.	1.5+2.5

		
6	What will be the checksum that Alice sends Bob for the following message? Show the steps of working. Verify at the receiver's end as well. Assume n =8 and the equivalent Hexadecimal value of A = 0x41. Message: MOTIVATION 	2+1