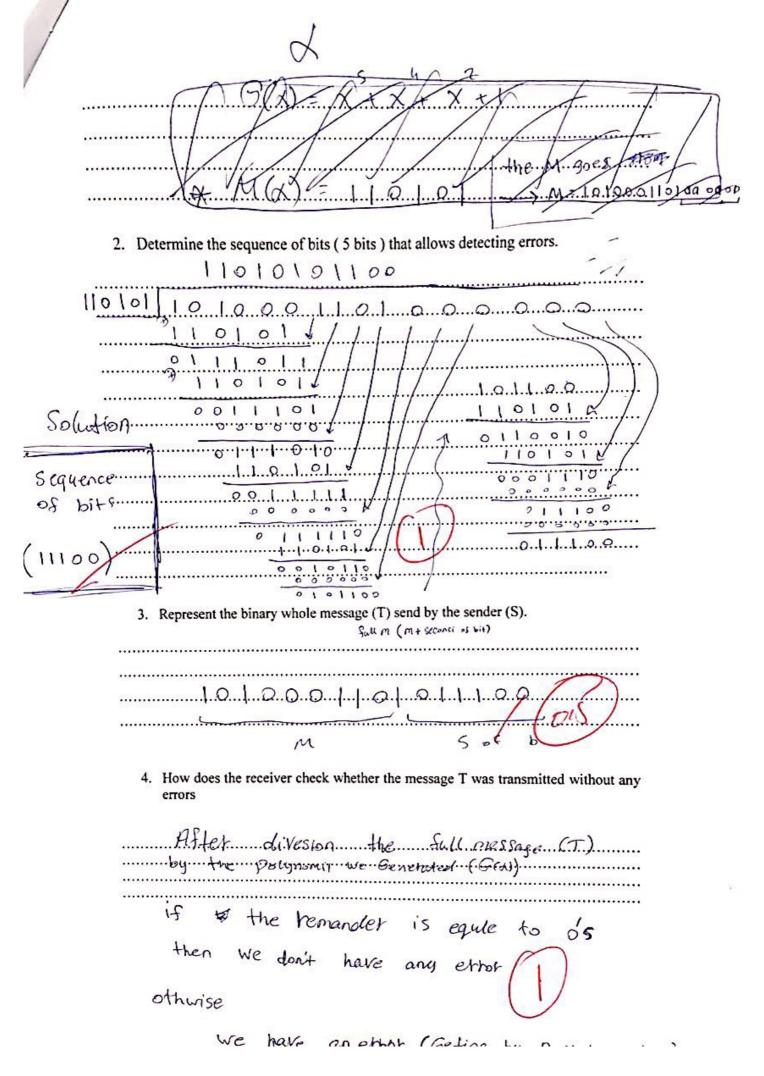
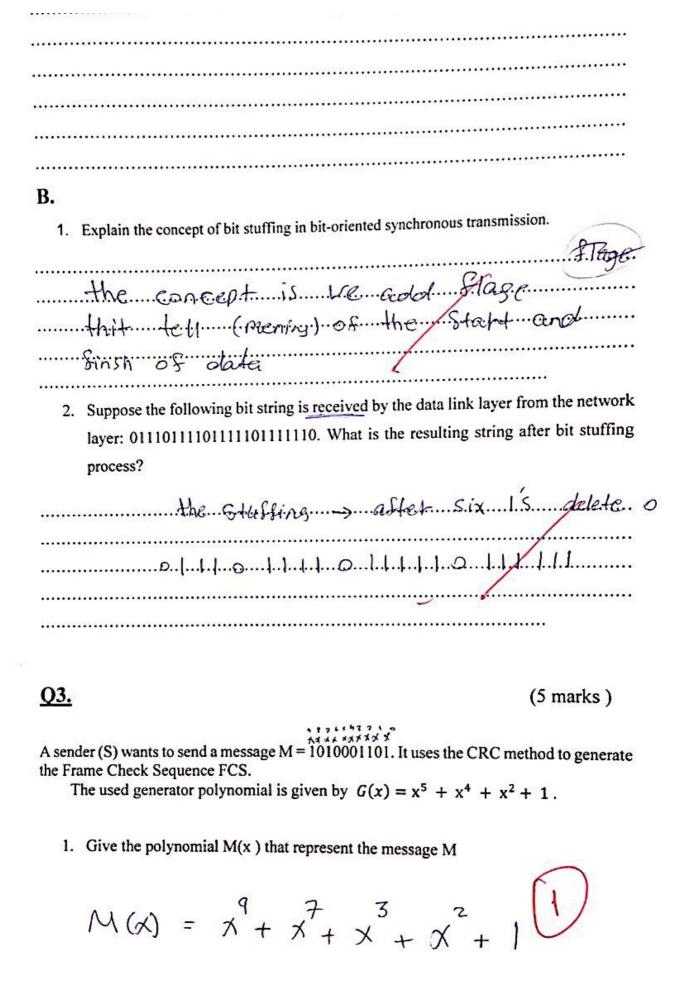
	Q1.1. Define the concept of layer in communication architecture.	(5 marks)
	The Sender and resiver has a layer using the tasks because	take
	that comenction between layer	to to
	inteface between them (interactive)	
	3. Name the seven layers defined in the ISO OSI Reference Model and stoff the lowest three layers.	tate the functions 3
	-1) Phay sicol 1 layer the layer contective to	
vo add the to delect ther		
	3) Network layer: the layer conticiclive moving data 4) Thansport layer	Packt by Yackt)
	5) Seissaion layer	
	6) lhesintion layet	
	7) Applection layer	

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Q2. (5 marks)
(5 marks)
A. 1. Give the Shannon's Theorem that describes the data rate of a physical medium with respect to signal to noise ratio.
A. 1. Give the Shannon's Theorem that describes the data rate of a physical medium with
1. Give the Shannon's Theorem that describes the data rate of a physical medium with respect to signal to noise ratio. Late Rate 22 & Bandwith & Late (LASNR) 1. Lee have a Signal that have a naisy in the Phaycest medium we this change. 2. Calculate the theoretical highest bit rate of a regular telephone line that has a bandwidth of 3000 hz. The signal-to-noise ratio is 3162.



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<u>Q4.</u>	(5 marks)
1	. Briefly explain the difference between transmission time and propagation time.
 	The Hansnissian time is the time we need to the data than prove from the first Medie (Sender Phayar layer to the last Medie (Kesivea). The 12 topagation time is the time to constrict the data in Applection Sender to prove to the Medie (Phayeal ly Assume that two hosts, A and B are connected by a single link with rate R bps (bits per second). A and B are separated by m meters and the propagation speed along the link connecting them is s meters/second. Host A is sending a packet of L bits to host B. Ignoring processing and queuing time, obtain an expression for the end-to-end delay.
	Propagation Speed Propagation Speed We consider the sliding window protocol Figure 2. Does this figure indicate that Go-Back-N is being used or Selective Repeat is being used? We use Selective Repeat



7. Suppose the following bit string is received by the data link layer from the network layer:
01110111101111101111110. What is the resulting string after bit stuffing process?

-011101111011111111111010

8. A sender (S) wants to send a message M = 1010001101. It uses the CRC method to generate the frame check sequence FCS.

The used generator polynomial is given by G(x) = X' + X' + X' + 1.

1. Give the polynomial M(x) that represent the message M.

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$$M(x) = X^{\circ} + X^{7} + X^{3} + X^{2} + 1$$

2. Determine the sequence of bits (5 bits) that allows detecting errors.

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- 3. Represent the binary whole message (T) send by the sender (S).
- 4. How does the receiver check whether the message T was transmitted without any errors?
- 9. Briefly explain the difference between transmission time and propagation time.
 - Transmission time: time to put M-bit message "on the wire".
 - Transmission time = M (bit) / rate (bit/sec) = M/R seconds
 - Propagation time: time for bits to propagate across