

Mid Term Exam 18 November 2018

Student Name _____ Code _____

Q-No.	Score	Grade
1	5	
2	4	
3	4	
4	4	
5	5	

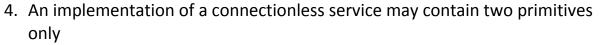


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Question One: [5 marks] Choose All the Correct Answers

- 1. Design issues for a Network include:
 - a. Reliability
 - b. Security
 - c. Allocation of resources
 - d. one of the above
- 2. A layer talks to its peer using a service
 - a. True
 - b. False
- 3. Acknowledged datagram is regarded as a connectionless service
 - a. True
 - b. False



- a. True
- b. False
- 5. Consider the hybrid 5-layer network model. Which of the following layers may offer the "reliable service"?
 - a. The physical layer
 - b. The datalink layer
 - c. The network layer
 - d. The transport layer
 - e. None of the above
- 6. Consider the OSI reference model. Suppose the unit of data exchanged at the data link level is called a frame and the unit of data exchanged at the network level is called a packet. Which of the following (is) are (an) accurate descriptions of the relation between a packet and a frame?
 - a. A packet encapsulates a frame
 - b. A frame encapsulates a packet
 - c. A packet has error detection and/or correction field in its header or trailer but a frame does not.
 - d. A frame has error detection and/or correction field in its header or trailer but a packet does not
 - e. None of the above
- 7. Which of the following layer of OSI model also called end-to-end layer?



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- a. Presentation layer
- b. Network layer
- c. Session layer
- d. Transport layer
- 8. It is possible to calculate 5 redundant bits to correct all single bit errors in a message of size 10 bits
 - a. True
 - b. False
- 9. In simplex stop and wait protocol, what can possibly happen if we removed this line "to_physical_layer(&s)" from the receiver code?
 - e. ACK drop at the sender side
 - f. Packet drop at the receiver side
 - g. Both (a) and (b)
 - h. None of the above
- 10.In simplex protocol for a noisy channel, if the channel is assumed to be error free (i.e. no possibility of packet loss or corruption).
 - i. No timeout will be needed
 - j. No sequence numbers will be needed
 - k. No acknowledgements from the receiver will be needed
 - I. None of the above.



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Question Two: [4 marks] Answer the following:

The following character encoding is used to send the following character sequence

"HELLO": [H: 01101101, E: 01000101, L: 01001100, O: 01001111]

Knowing that the data link layer uses <u>character count</u> as a framing method, and that maximum frame size to be sent in bytes is <u>Four</u> bytes, and assuming in order delivery of frames.

- a. Show in binary the bit sequence transmitted, mark the beginning of the frame, and separate bytes from each other's.
- b. State one disadvantage of using the character count as framing method, and give one example to it.



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Question Three: [4 marks] Answer the following:

The following message **11001101** is transmitted using a data link that applies the hamming coding technique with **odd parity** check.

- a. What is the hamming distance of the transmitted code words?
- b. How many error bits can this technique correct?
- c. What is the number of parity bits needed to transmit this message?
- d. Show the transmitted bit stream for this message, showing the **steps** of your work and the **bits positions**.



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Question Four: [4 marks] Answer the following:

a. Given a 7-bit message $\underline{1101001}$ and the generator polynomial $G(x) = x^2 + 1$. Show the full steps to get the transmitted message.



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Qu	uestion Five: [5 marks] Answer the following:	
<u>In </u>	Stop & wait protocol:	
a.	. Why is it enough to have one bit sequence numl	ber (numbers 0 and 1)?
b.	. Can packets that are delayed for a long time cau	ise problems?
c.	. Why is it necessary to add numbers also to ackn	owledgement frames? Justify.
d.	Assuming a digital data transmission system be (signal round trip delay about 35 ms) using a frame size of 512 Bytes. The overhead can be in throughput using a stop and wait ARQ protocol?	T1-line (1536 kbps), and a neglected. What is the total



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