

Date: 28.08.2006

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

4th Year 2nd Semester Final Examinations, Fall 2006

Department of Electrical & Electronics Engineering

Course No.: CSE 327 Course Title: Computer Networks

Full Marks: 70

Time: 3 Hours

The figures in the margin indicate full marks
There are SEVEN questions. Answer any FIVE.

1. a) Write down the algorithm for 1 bit sliding window protocol. Show using an example that there will be unnecessary retransmissions when both sides' data link layer starts transmitting the initial frame simultaneously even though there are no transmission errors. [3+4]
- b) Describe the function of the five service primitives when implementing a simple connection oriented service. Define Soft handoff. [6+1]
2. a) Draw the OSI reference model and explain how all its layers work. [7]
- b) Define pipelining. If the channel capacity is 10000 bits/sec, the frame size is 100 bits and the round trip propagation delay is 100 msec, then what is the channel utilization? [1+3]
- c) Draw a typical Bluetooth data frame and explain each of the fields briefly. [3]
3. a) Write down the design issues for layering. Describe any three briefly. [4]
- b) Describe the function of the three GSM control channels briefly. [4]
- c) Draw the typical ADSL arrangement and explain briefly how each component functions. [6]
4. a) Write down the algorithm of the simplex protocol for a noisy channel. [4]
- b) Compare packet switching with circuit switching. [4]
- c) Construct the Hamming code for the data frame 110111011010. [6]
5. a) Draw the architecture of the LMDS system and briefly explain how it works. [3]
- b) Compare the OSI reference model with the TCP/IP model. [4]
- c) Draw an 8x8 Batcher Banyan switch. Write down the rules of cell transition for both Batcher and Banyan switch: Cells are present on input line 2, 3, 4 and 5 which are headed for output lines 6, 5, 1 and 4, respectively. Please show how these cells will move from the input lines to the output lines. [7]
6. a) Write down the channel assignment of AMPS. Describe how incoming calls are managed in AMPS. [2+3]
- b) Draw the control field portion of a supervisory HDLC frame. Describe the type fields that distinguish them. [4]
- c) Draw the IEEE 802.11 generic data frame and briefly describe each of its fields. [5]

7. a) Define piggybacking. Draw the PPP full frame format for unnumbered mode of operation and briefly describe each of its fields. [1+4]
- b) Draw a Space division switch with $N=24$, $n=6$ and $k=3$ and calculate the total number of crosspoint. Draw the diagram of DQDB and write down its features. [3+2]
[1 x 4]
- c) Define:
- I. Head-of-line blocking
 - II. Hard Handoff
 - III. DWDM
 - IV. Store and forward subnet

Date: 19.03.2008

Ahsanullah University of Science and Technology
Department of Electrical & Electronic Engineering
 4th Year, 2nd Semester Final Examination, Fall-2007

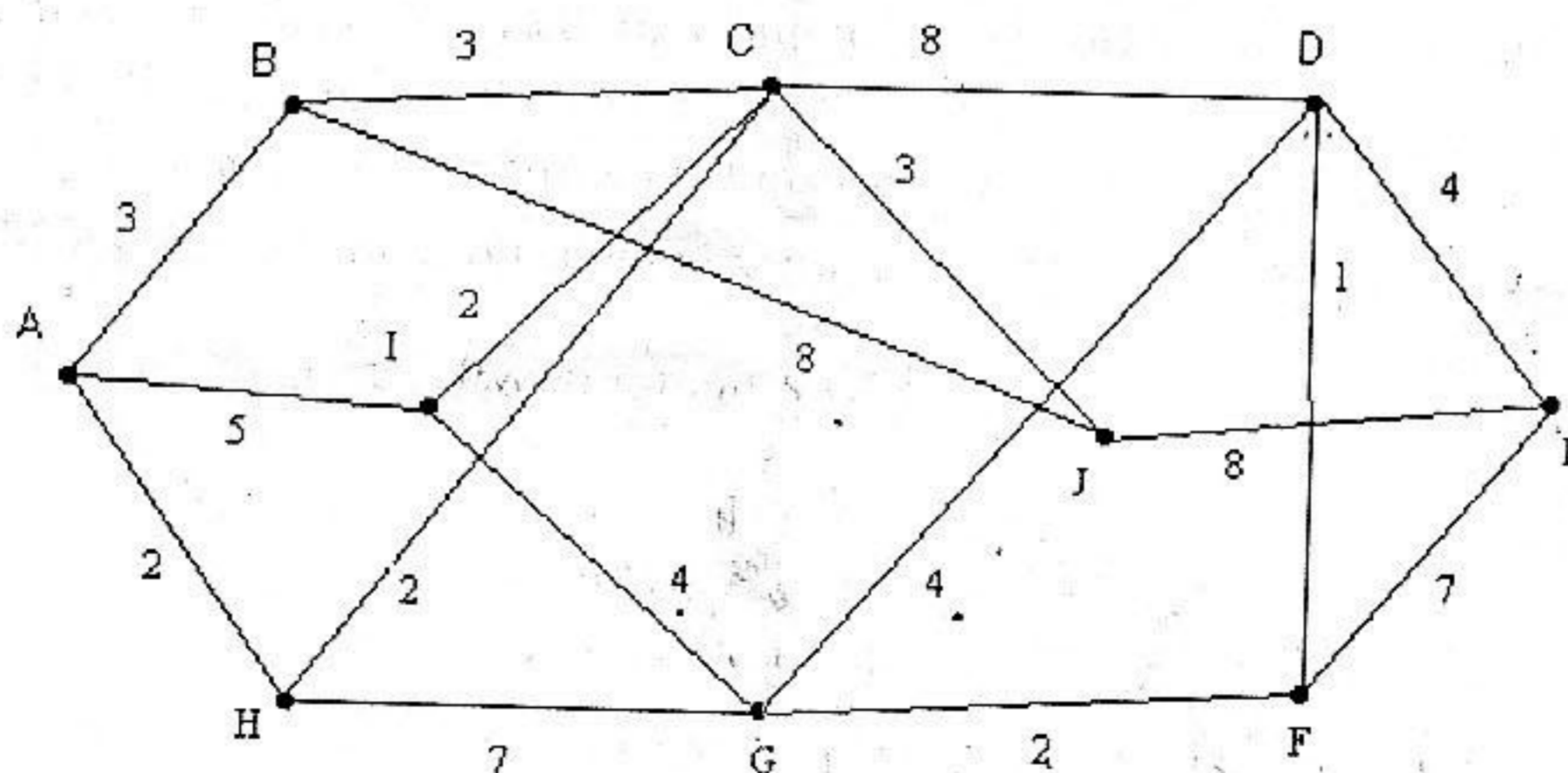
Course No.: EEE-327 Course Title: Computer Networks

Full Marks: 210

Time: 3 Hours

There are 8(eight) questions. Answer any 6(six) questions.
Questions are of equal value/marks allotted are indicated in the margin.

1. (a) Why reference models are used in Computer Networks? With diagram briefly describe functions of different layers of OSI reference model. 15
- (b) Describe the properties of electromagnetic spectrum. 5
- (c) Define three transmission modes with example. 15
2. (a) What are the differences between circuit switch connection and virtual circuit connection? 7
- (b) What is the framing? What is the difficulty of framing? With example describe how it can be overcome by (i) Character count and (ii) Starting and ending flags, with bit stuffing. 15
- (c) Describe CRC error detection method with example. 13
3. (a) With diagram describe how selective repeat protocol is used for acknowledgement techniques. 15
- (b) Explain how Carrier Sense Multiple Access with Collision Detection (CSMA/CD) can be used to overcome the problems of ALOHA in media access control. 10
- (c) Describe the variation of binary countdown protocol provided by MOK and WARD. 10
4. (a) What are the differences between OSI and TCP/IP reference model? 13
- (b) What is the purpose of Hamming code? Discuss the method to find the positions of error bits in Hamming code. 12
- (c) Compare connection-less service and connection oriented service. 10
5. (a) With diagram explain how connectionless service can be provided to the user by network layer. 10
- (b) Write down the principle of shortest path routing? Write the algorithm of Dijkstra Shortest path and find the shortest path from A to E for the following network.



- ~~6~~ (c) With diagram describe count-to-infinity problem in distance vector routing. 8
- ~~6~~ (a) With examples narrate different properties of an IP address. Write down the formats of different classes of IP addressing. 13
- (b) AUST has a router for internet connectivity of its 5 departments. BTTB has assigned 135.10.252.0/24 IP address to AUST. Show how AUST assign the IP address to all departments. Also find
- (i) Network address of each department.
 - (ii) Number of hosts at each department, and
 - (iii) Subnet Mask. 12
- (c) Write down different message types of internet Control Message Protocol (ICMP) 10
- ~~7~~ (a) What are the disadvantages of leaky bucket algorithm? How some problems can be removed by using byte counting leaky bucket. 10
- (b) What are the average rate, peak rate and burst size in token bucket algorithm? Explain the token bucket algorithm and derive the equation of time for maximum speed of output.
- (c) What are the different transport service primitives in Berkly Socket? Explain how they work? 12
- ~~8~~ (a) What are the advantages of IPv6 over IPv4? 10
- (b) Discuss the TCP header field by field. 15
- (c) With diagrams explain the encryption model for a symmetric-key cipher that is used in cryptography. 10

Ahsanullah University of Science and Technology
 Department of Electrical and Electronic Engineering
 4th Year 2nd Semester Final Examination (Spring-2006)
 Course No: CSE- 327, Course Title: Computer Networks

Time: 3 hours

Full Marks: 70

There are 7(seven) questions. Answer any 5(five)

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|----|---|--------------------------|
| 1. | a) Describe the five key assumptions of dynamic channel allocation. | 5 |
| | b) Define CSMA and give the comparisons among 1-persistent CSMA, nonpersistent CSMA and p-persistent CSMA. | 4 |
| | c) Describe the adaptive tree walk protocol and find the optimal level to begin searching the tree in this protocol. | 5 |
| 2. | a) Define hidden station problem and exposed station problem in a wireless LAN. | 4 |
| | b) Describe the frame format of IEEE802.3. Ethernet requires that valid frames must be 63 bytes long – explain with a reason. | 8 |
| | c) List the services of a wireless LAN. | 2 |
| 3. | a) Describe the three different methods of framing. | 6 |
| | b) Let the frame be 11010111011 and the generator be 10011. Calculate the polynomial code checksum and transmitted frame. | 4 |
| | c) Describe simple stop and wait protocol. | 4 |
| 4. | a) Describe sliding window protocol. | 7 |
| | b) Define piggybacking. | 4 |
| | c) Define Automatic Repeat Request. | 3 |
| 5. | a) Define the optimality principle. Define sink tree. | 4 |
| | b) Describe the following terms: | 10 |
| | i. Store and forward packet switching | |
| | ii. Connection oriented service | |
| | iii. Routing algorithm | |
| | iv. Selective flooding | |
| | v. Multicast routing | |
| 6. | a) Describe distance vector routing protocol. | 6 |
| | b) Distance vector routing protocol reacts rapidly to good news, but leisurely to bad news- explain. | 6 |
| | c) List the five steps in link state routing protocol. | 2 |
| 7. | a) Discuss the following terms: | 14 |
| | i. MAN | v. Unicasting |
| | ii. WAN | vi. Protocol Stack |
| | iii. Broadcasting | vii. Datagram service |
| | iv. Multicasting | |

Date of examination: 26/03/07

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

4th Year 2nd Semester, Final Examination, Spring 2007

Department of Electrical and Electronics Engineering

Course No.: CSE327 Course Title: Computer Networks

Full Marks: 70

Time: 3 Hours

The figures in the margin indicate full marks.
There are SEVEN questions. Answer any FIVE.

1. a) What is Hamming Distance? How can it be used to correct maximum 3 bit error? 7
- b) Discuss one bit sliding window protocol with figure having notations (seq, ack, packet number). 7
2. a) Discuss a bitmap protocol. Describe the variation of binary countdown provided by Mok and Ward. 9
- b) Describe the hidden and exposed station problem. 5
3. a) Mention the steps of Link state routing. Discuss with example distribution of link state packets. 8
- b) Discuss Hierarchical routing with its disadvantages. 6
4. Write short notes on: 7×2=14
 - a) NAT
 - b) RARP, BOOTP, DHCP
5. a) Draw the RTP header and discuss its various fields. What are the purposes of RTCP? 8
- b) Compare TCP and UDP. Why urgent data feature is used in RTP? 6
6. a) Show an example how TCP connection is established. What do you know about TCP socket? 7
- b) Name the methods for congestion control in datagram subnets. Discuss choke packets in brief. 7
7. You are the network administrator of an organization. You are given a public IP address 175.30.0.0/16. You have to subnet it such that at most 2000 machines can be accommodated in each subnet. Find: 4+4+6=14
 - a) Subnet mask
 - b) Broadcast address of second usable subnet.
 - c) IP address of 100th usable host of the last usable subnet

Date: 13/08/08

Ahsanullah University of Science and Technology

Department of Electrical and Electronic Engineering

4th Year 2nd Semester Final Examination

Course No: CSE327

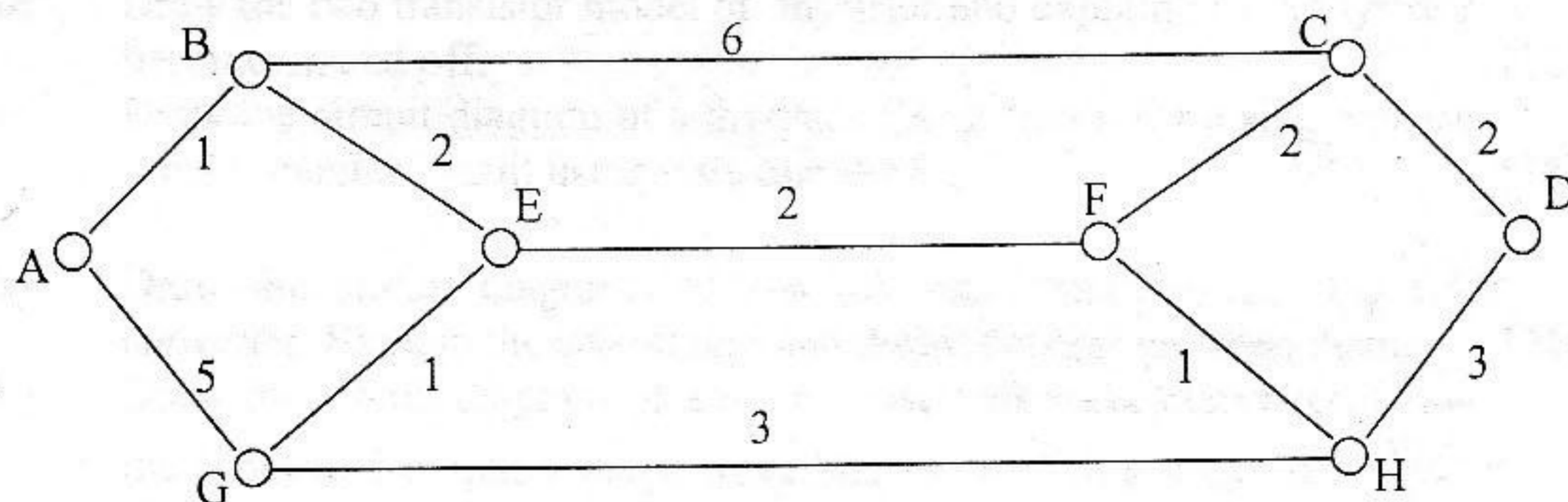
Course Title: Computer Networks.

Time: 3 hrs.

Full Marks: 70

There are 8 (eight) questions answer any 5 (five) questions.
[Marks allotted are indicated in the margin]

1. a) What is computer network? What are the components necessary in computer network? [4]
- b) What is protocol? List the ways in which the OSI model and TCP/IP model are the same as well as differ from each other. [5]
- c) Why are connection oriented communication and connectionless communication used? Which layers in the TCP/IP are responsible for this type of communication? [5]
2. a) Define the hidden station problem and the exposed station problem in a wireless LAN. [5]
- b) Explain how carrier sense multiple access with collision detection (CSMA/CD) can be used to overcome the problems of ALOHA in media access control. [4]
- c) Describe the bitmap protocol with an example. [5]
3. a) Describe the count-to-infinity problem in distance vector routing protocol. How can we solve this problem? [4]
- b) Describe the hierarchical routing protocol. [4]
- c) Mention the steps of link state routing. [3]
- d) For the following graph, show the steps used in computing the shortest path from A to D. [3]



4. a) Compare between the virtual-circuit subnet and datagram subnet. [4]
 b) Explain the differences between packet switching and circuit switching. [6]
 c) What are the problems of using a crossbar switch and how can we solve this problem. [4]
5. a) Discuss the sliding window protocol. [4]
 b) What are the differences between Go-back-N ARQ and Selective-repeat ARQ? [3]
 c) Construct the Hamming code for the bit sequence 1001101. [4]
 d) Describe any one method of framing. [3]
6. a) Assume that you are a network administrator and have a network address of 174.32.0.0. You have to subnet it such that at most 1050 machines can be accommodated in each subnet. Find :
 i) Subnet mask. [4]
 ii) Broadcast address of last usable Subnet. [4]
 iii) IP address of second usable host of the second usable subnet. [3]
 b) What is a subnet mask? Why are they used? [3]
7. a) Write down the difference between symmetric-key cryptography and asymmetric-key cryptography. [3]
 b) Describe **DES** briefly. [4]
 c) Encrypt the message "ATTACK" using **substitute cipher** for $k=3$. [3]
 d) Using **RSA** public key cryptosystem, with $a=1$, $b=2$, $c=3$, etc. If $p=5$, $q=11$ and $d=27$, find e and encrypt "abcdefgh". [4]
8. a) Why does ATM use small, fixed-length cell? Define SVC and PVC. [3+2]
 b) What is the relationship between TPs, VPs, and VCs? [4]
 c) Write down the names of the ATM layers and explain the application adaptation layer1 (AAL1). [2+3]