

Code No: N0421/R07

Set No. 1

IV B.Tech I Semester Regular Examinations, November 2012
COMPUTER NETWORKS
(Common to Electronics & Communication Engineering, Electronics &
Instrumentation Engineering, Bio-Medical Engineering, Mechatronics and
Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) "Although wireless networking and mobile computing are often related, they are not identical". Justify the statement.
(b) With suitable examples compare point-to-point channels and broadcast channels? [8+8]
2. (a) Television channels are 6MHz wide. How many bits/sec can be sent if four level digital signals are used? Assume a noiseless channel
(b) How does a virtual circuit differ from a physical circuit? What advantages would a virtual circuit provide? [8+8]
3. (a) Discuss the error control technique which is commonly used in data network. What value of N is used in go-back-N ARQ technique used in ARPANET and why?
(b) Imagine that you are writing the data link software for a line used to send data to you, but not from you. The other end uses HDLC, with a 3-bit sequence number and a window size of seven frames. You would like to buffer as many out of sequence frames as possible to enhance efficiency, but you are not allowed to modify the software on the sending side. Is it possible to have a receiver window greater than one, and still guarantee that the protocol will never fail? If so, what is the largest window that can be safely used? [8+8]
4. (a) What is the prime difference between a token bus and a token ring?
(b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in the units of 40 msec.
 - i. What is the chance of success on the first attempt?
 - ii. What is the probability of exactly k collisions and then a success?
 - iii. What is the expected number of transmission attempts needed? [4+12]
5. Define Adaptive and Non-Adaptive routing. Classify the routing algorithms in to adaptive and non adaptive type with suitable justifications. [16]
6. (a) Explain Load shedding for congestion control.
(b) What is Jitter? Why it is important to control jitter for Audio and Video applications? How Jitter is controlled? [6+10]

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7. (a) What are the different flags in TCP segment? Explain each of them.
(b) How TCP uses sliding window to achieve flow control? [10+6]
8. (a) How POP works? What are the advantages of IMAP over POP?
(b) What is the role played by message transfer agent? Explain. [6+10]

FirstRanker

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1. (a) Define the following terms:
 - i. Computer Network
 - ii. Peer process
 - iii. Protocol
 - iv. Interface.(b) Discuss various network applications and goals in detail. [8+8]
2. (a) How much bandwidth is there in 0.1 micron of spectrum at a wavelength of 1 micron?
(b) Give the format of ATM cell? Why ATM uses cell switching? [8+8]
3. (a) A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50 percent?
(b) Discuss about the various types of frames in HDLC protocol? [8+8]
4. (a) What is the prime difference between a token bus and a token ring?
(b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in the units of 40 msec.
 - i. What is the chance of success on the first attempt?
 - ii. What is the probability of exactly k collisions and then a success?
 - iii. What is the expected number of transmission attempts needed? [4+12]
5. (a) Network layer can provide either connection oriented service or connection less service. Which one you prefer. Justify your answer.
(b) Define Virtual circuit and Datagram. Compare Virtual circuit subnet with Datagram Subnet.
(c) Is Virtual circuit same as Physical connection. Comment. [5+8+3]
6. Explain in detail
 - (a) OSPF and
 - (b) BGP. [8+8]

Code No: N0421/R07

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7. (a) Assume Audio or Video being played On-line. In such situations retransmitted packet is equivalent to packet lost. Which transport protocols is suitable for such situations. Justify your selection.
- (b) For File transfer which transport protocol is preferred & why?
- (c) Why TCP uses cumulative acknowledgement policy? [6+5+5]
8. (a) Why DNS uses distributed data bases?
- (b) How do you make web pages dynamic?
- (c) What is the functionality that is supported by user agent? [5+6+5]

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Code No: N0421/R07

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1. (a) Make a technical comparison between OSI & TCP/IP reference model.
(b) "Novell Netware looks more like TCP/IP than like OSI". Justify. [8+8]
2. (a) Discuss various channels supported by ISDN bit pipe?
(b) Differentiate between virtual circuits and circuit switching? [8+8]
3. (a) Discuss about point-to-point protocol?
(b) Discuss about various framing techniques? Mention their advantages and disadvantages? [8+8]
4. (a) Explain in detail binary count down collision free protocol?
(b) Give the detailed description of 802.3 frame format? [8+8]
5. What are the limitations of using Distance vector routing in mobile networks. Suggest ways of adapting Distance vector routing to mobile networks. [16]
6. What is fragmentation? Why fragmentation is required? What are the two strategies for recombining the fragments? Compare them. [16]
7. (a)) To get around the problem of sequence numbers wrapping around while old packets still exist, one could use 64-bit sequence numbers. However, theoretically, an optical fiber can run at 75 Tb/s. What maximum packet lifetime is required to make sure that future 75 Tb/s networks do not have wraparound problems even with 64-bit sequence numbers? Assume that each byte has its own sequence number, as TCP does.
(b) For a 1-Gbps network operating over 4000 km, the delay is the limiting factor, not the bandwidth. Consider a MAN with the average source and destination 20 km apart. At what data rate does the round-trip delay due to the speed of light equal the transmission delay for a 1-KB packet? [8+8]
8. (a) Why DNS uses distributed data bases?
(b) How do you make web pages dynamic?
(c) What is the functionality that is supported by user agent? [5+6+5]

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Set No. 4

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1. (a) Compare point-to-point channels with broadcast channels along with suitable examples?
(b) A collection of five routers is to be collected in a point-to-point subnet. Between each pair of routers, the designers may put a high speed line, a medium-speed line, a low-speed line, or no line. If it takes 100ms of computer time to generate and inspect each topology, how long will it take to inspect all of them to find the one that best matches the expected load? [8+8]
2. (a) What is the need for analog amplifiers in broad band system? What is the problem with analog amplifiers? How to overcome that problem in broad band systems?
(b) Differentiate between input queuing and output queuing at an ATM switch? [8+8]
3. (a) Explain one-bit sliding window protocol. Give the advantages and disadvantages of one-bit sliding window protocol?
(b) Discuss the services provided by the data link layer to the network layer? [8+8]
4. (a) Compare the five different types of cabling (Ethernet)
(b) A 1-km long, 10-Mbps CSMA/CD LAN (not 802.3) has a propagation speed of 200 m/ μ sec. Data frames are 256 bits long, including 32 bits of header, checksum, and other overhead. The first bit slot after a successful transmission is reserved for the receiver to capture the channel to send a 32-bit acknowledgment frame. What is the effective data rate, excluding overhead, assuming that there are no collisions? [8+8]
5. What are the services provided by Network layer to Transport layer. Explain. [16]
6. Explain routing in mobile hosts. [16]
7. (a) Explain the transport primitives.
(b) Imagine that a two-way handshake rather than a three-way handshake were used to set up connections. In other words, the third message was not required. Are deadlocks now possible? Give an example or show that none exist. [8+8]

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8. (a) With the help of diagram explain the encryption model.
(b) What is the role of key secrecy and algorithm secrecy in security?
(c) What are the approaches for cryptanalysis? [8+4+4]

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