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10CS55

Fifth Semester B.E. Degree Examination, December 2012
Computer Networks – I

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. What is protocol? Define the key elements of protocols? **(05 Marks)**

b. Define network topology, explain ring topology with advantages and disadvantages. **(05 Marks)**

c. Explain the different levels of addressing used in an internet with a suitable example for each level of addressing in TCP /IP? **(10 Marks)**

2 a. Explain the following :
i) Bandwidth
ii) Through put
iii) Transmission time
iv) Latency
v) Jitter. **(05 Marks)**

b. Explain with the block diagram, the causes for transmission impairments. **(09 Marks)**

c. Explain with neat waveform any two polar line coding schemes. **(06 Marks)**

3 a. What is multiplexing? Explain with a neat diagram FDM. **(08 Marks)**

b. Explain how time – division – multiplexing differs from FDM, with a neat diagram? **(04 Marks)**

c. What is switching? Differentiate circuit switch network with packet – switched network. **(08 Marks)**

4 a. What is internet checksum? List the steps undertaken by sender and receiver for error detection. **(06 Marks)**

b. Explain with an example of block coding method for error detection and correction? **(10 Marks)**

c. What is the Hamming distance? Find the minimum Hamming distance of the coding scheme shown in the table. **(04 Marks)**

Data word		Code word				
0	0	0	0	0	0	0
0	1	0	1	0	1	1
1	0	1	0	1	0	1
1	1	1	1	1	1	0

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – B

5 a. Calculate the time takes to send 2 million bits of data in a system that uses stop and wait protocols, if the distance between sender and receiver is 2000 kms. Assume packet size is 400 bits and propagation speed is 2×10^8 m. No data or control frame is lost. **(10 Marks)**

b. Explain the frame format and transitional phases of Point – to – point protocols. **(10 Marks)**

6 a. Explain why collision is an issue in a random access protocol but not in controlled access or channelizing protocols? **(04 Marks)**

b. Explain any two popular control access methods, with a neat diagram. **(08 Marks)**

c. Explain 802.3 MAC frame format. **(08 Marks)**

7 a. Explain the services of IEEE 802.11 standards. **(04 Marks)**

b. Write a short notes on :
   i) Blue tooth
   ii) Cellular telephone. **(10 Marks)**

c. Explain the five standard of IMT – 2000 radio – interface of 3G systems? **(06 Marks)**

8 a. Explain briefly the advantages of IPV6. **(06 Marks)**

b. Find out the netid and hostid of the following IP address?
   i) 111.64.2.6
   ii) 131.57.9.3
   iii) 207.64.52.11
   iv) 225.34.2.1 **(08 Marks)**

c. Write short notes on network address translation (NAT). **(06 Marks)**

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06CS55

Fifth Semester B.E. Degree Examination, December 2012
Computer Networks – I

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions atleast TWO questions from each part.***

PART – A

1 a. What are different modes of communication? **(04 Marks)**

b. What are four fundamental characteristics on which the effectiveness of a data communication depends on? **(06 Marks)**

c. What is protocol? What are its key elements? **(02 Marks)**

d. Briefly describe OSI reference model and differentiate with TCP/IP. **(08 Marks)**

2 a. Write a short note on line coding schemes. **(04 Marks)**

b. Explain delta modulation technique used in analog to digital convession. **(06 Marks)**

c. List three causes for transmission impairment. **(02 Marks)**

d. Define Nyguist bit rate and Shannon capacity. What are the propagation time and the transmission time for a 2.5 Kbyte message, if the bandwidth of the network is 1 Gbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s. **(08 Marks)**

3 a. The power of a signal is 10 mw and the power of the noise is 1 μw (microwatts), What are the values of SNR and SNR_{dB}? **(04 Marks)**

b. A network with bandwidth of 10 Mbps can pass only an average of 12,000 frames per minutes with each frame carrying an average of 10,000 bits. What is the through put of this network? **(02 Marks)**

c. What is multiplexing? With neat diagram, explain FDM. **(06 Marks)**

d. What is TDM? A four 1 – Kbps connections are multiplexed together. A unit is 1 bit. Find :
   i) The duration of 1 – bit before multiplexing
   ii) The transmission rate of the link
   iii) The duration of a time slot
   iv) The duration of a frame. **(08 Marks)**

4 a. Describe the physical and transmission characteristic of the following :
   i) Coaxial cable
   ii) Fiber optic cable, with neat diagram. **(08 Marks)**

b. Define hamming distance and CRC. **(02 Marks)**

c. Distinguish between radio waves and infrared waves. **(04 Marks)**

d. What is CRC? Explain with suitable example. **(06 Marks)**

PART – B

5 a. Explain salient features of
   i) Stop -and - wait protocol
   ii) Go – back – N ARQ. **(08 Marks)**

b. Explain briefly point – to – point protocol. **(06 Marks)**

c. Differentiate between character oriented and bit oriented format for framing. **(06 Marks)**

6 a. What is channelization? Explain CDMA. **(06 Marks)**

b. What is random access? Explain following random access protocols.

i) Slotted ALOHA

ii) CSMA/ CD. **(08 Marks)**

c. Describe the MAC layers in IEEE 802.11 standard. **(06 Marks)**

7 a. Explain the hidden and exposed station problem in IEEE 802.11. **(08 Marks)**

b. Describe frame format for IEEE 802.3 MAC frame format. **(06 Marks)**

c. In brief explain Bluetooth layers. **(06 Marks)**

8 a. With neat diagram, describe cellular telephony network. **(06 Marks)**

b. Explain briefly SONET/ SDH protocol. **(06 Marks)**

c. What is ATM and its design goals. Explain ATM architecture, with neat diagram. **(08 Marks)**

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06CS55

Fifth Semester B.E. Degree Examination, June 2012
Computer Networks – I

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What is data communication? What are the four important fundamental characteristics? **(06 Marks)**

b. What is a protocol? Briefly explain its key elements. **(05 Marks)**

c. Explain the responsibilities of transport layer in OSI reference model. **(09 Marks)**

2 a. Define bandwidth. A periodic signal has bandwidth of 20Hz. The highest frequency is 60Hz. What is the lowest frequency? Draw the spectrum if the signal contains all frequencies of the same amplitude. **(04 Marks)**

b. Calculate the Shanon channel capacity in the following cases :
i) Bandwidth = 20 kHz $SNR_{dB} = 40$; ii) Bandwidth = 200 kHz $SNR_{dB} = 6$. **(06 Marks)**

c. Define line coding. Describe unipolar NR2, polar NR2–L, bipolar AMI and Manchester encoding by applying on the information sequence 101011100. **(10 Marks)**

3 a. An analog signal has a bit rate of 8000 bps and a band rate of 1000 band. How many data elements are carried by each signal element? How many signal elements do we need? **(05 Marks)**

b. Explain phase modulation with a neat diagram. **(05 Marks)**

c. What is time division multiplexing? Explain how statistical TDM overcomes the disadvantages of synchronous TDM. **(10 Marks)**

4 a. Briefly explain the coaxial cable and optical fiber with their applications. **(08 Marks)**

b. Find the codeword, using CRC given data word "1001" and generator "1011". **(06 Marks)**

c. What is internet checksum? With an example list the steps undertaken by the sender and receiver for error detection. **(06 Marks)**

PART – B

5 a. Explain selection repeat ARQ with neat diagrams. **(08 Marks)**

b. What is piggybacking? List its usefulness. **(04 Marks)**

c. Explain the frame format and transitional phases of point-to-point protocol. **(08 Marks)**

6 a. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughout if the system produces 1000 frames per second. **(06 Marks)**

b. With a neat diagram explain CSMA/CD protocol. **(08 Marks)**

c. Explain the MAC sublayer of gigabit Ethernet **(06 Marks)**

7 a. Explain the architecture of IEEE 802.11. **(08 Marks)**

b. Differentiate between repeater and amplifier. **(02 Marks)**

c. How does a VLAN reducer network traffic? **(04 Marks)**

d. Differentiate between bus backbone and star backbone. **(06 Marks)**

8 a. Explain in detail, the architecture of a SONET system. **(10 Marks)**

b. Give the architecture of ATM. Show how VPs and VCs are established. **(06 Marks)**

c. Write a short note on AMPS. **(04 Marks)**

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