

Sixth Semester Examination -2007

COMPUTER NETWORKS

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate full marks for the questions.

- IWL
1. Answer the following questions : 2×10
- (a) How long does it take to transmit x KB over y-Mbps link ? Give your answer as a ratio of x and y.
 - (b) What is the difference between broadcast and multicast ?

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- (c) How does a LAN differ from WAN ?
- (d) What advantages a multipoint connection have over point-to-point connection ?
- (e) Explain the meaning of peer-to-peer process.
- (f) How does a analog signal differs from the digital signal ?
- (g) Distinguish between bit rate and baud rate.
- (h) What is the sampling rate of PCM if the frequency ranges from 1000 to 4000 Hz ?
- (i) Give one example each of guided and unguided media.
- (j) What are the two types of TDM ?
2. (a) Show the **NRZ** and **NRZI** encoding for the bit pattern given below : 5
1001 1111 0001 0001
- (b) Suppose we want to transmit the message 1011 0010 0100 1011 and protect it from errors using the CRC-8 polynomial

$x^8 + x^2 + x^1 + 1$. What is result of the receiver CRC calculation if the leftmost bit of the message is inverted due to the noise on the transmission link ? How does the receiver knows that a error has occurred ? 5

3. (a) Explain the mechanism of stop-and-wait ARQ. 5
- (b) Differentiate between token ring and token bus. 5
4. (a) Explain how a message exchange takes place between to machine A and B using TCP connection. 5
- (b) Encrypt the message $m = 7$ using RSA encryption with the following parameters $p = 13$, $q = 7$, and $e = 5$. 5
5. (a) How do the layer of TCP/IP protocol suite correlate to the layers of the OSI model ? 5
- (b) A periodic signal is decomposed into five sine waves with frequencies of 100, 300,

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500, 700, and 900 Hz. What is the bandwidth of the signal ? Draw the spectrum assuming all components have a maximum amplitude of 10 volts. 5

6. (a) What are the functions of DTE and DCE ? 5

(b) List different methods used to convert digital signal to an analog signal and explain any one of them. 5

7. (a) Differentiate between circuit switching and packet switching. 5

✓ (b) Explain how space division switch differs from time division switch. 5

8. (a) Describe each of the states of PPP connection. 5

(b) Explain why public key encryption requires fewer keys than secret key encryption. 5