University of Sargodha
BS 3ʳᵈ Term Examination 2017.
Subject: I. T   **Paper: Computer Communication & Network (CMP: 2540)**

Time Allowed: 2:30 Hours

Maximum Marks: 8

Note: Objective part is compulsory. Attempt any four questions from subjective parts.

Objective Part

Q1. Write short answers of the following questions in 2-3 lines only   (16*2=32)

   i.   What is signaling rate?
   ii. Define protocol with example
   iii. List two cellular network protocols
   iv. What is connection oriented protocol also list the name of that protocol?
   v.   What is time domain analysis for signal?
   vi. What is error detection?
   vii. Differentiate between ARP and RARP and which is layer is responsible for these.
   viii. Explain block coding with suitable example.
   ix. Indicate some significant differences between broadcast radio and microwave.
   x.   What function does a modem perform?
   xi. What is a parity bit?
   xii. What is attenuation?
   xiii. How twists in per unit length reduce the noise in twisted pair cable?
   xiv. Explain the term data network.
   xv. Explain asynchronous communication.
   xvi. What is CDMA?

Subjective Part   (12*4=48)

Q2. Write a note on guided media? Also elaborate its various types.

Q3. Discuss the working of virtual circuit switching with appropriate example.

Q4. Describe various LAN topologies with appropriate examples.

Q.5. Write a short note on the followings

   • Encoding Schemes
   • Network Layer
   • Noise

Q.6. Explain Cellular Wireless Networks in detail.

Q.7. Discuss asynchronous transmission and synchronous transmission with examples

Objective Part   Compulsory

Q.No.1: Attempt all parts and each require answer 2 – 3 lines   **(16*2=32)**

1- What is signaling rate?

The rate at which data is transmitted through a given point along a transmission line or communications circuit. It can be bit, byte, KB or Gb per seconds.

2- Define Protocol with example?

Network protocols were created to allow computers to communicate in an organized manner without any room for misinterpretation. These rules determine things like packet format, type and size. They also determine what happens when an error occurs, and which part of the network is supposed to handle the error and how. For example FTP is File Transfer Protocol takes care of transferring files over network.

3- List two cellular network protocols.

GSM: The Global System for Mobile Communication (GSM) is a European standard that was developed to provide a common second-generation technology for all Europe.
GPRS:

4- What is connection oriented protocol also list the name of that protocols?

In telecommunications, connection-oriented describes a means of transmitting data in which the devices at the end points use a preliminary protocol to establish an end-to-end connection before any data is sent. Connection-oriented protocol service is sometimes called a "reliable" network service, because it guarantees that data will arrive in the proper sequence. Transmission Control Protocol (TCP) is a connection-oriented protocol.

5- What is the time domain analysis for signal?

6- What is error detection?

In networking, error detection refers to the techniques used to detect noise or other impairments introduced into data while it is transmitted from source to destination. In error detection, we are only looking to see if any error has occurred. The answer is a simple yes or no. We are not even interested in the number of corrupted bits. A single-bit error is the same for us as a burst error.

7- Differentiate between ARP and RARP and which is layer responsible for these?

Address Resolution Protocol is a communication protocol used for discovering physical address associated with given network address. Typically, ARP is a network layer to data link layer mapping process, which is used to discover MAC address for given Internet Protocol Address.

RARP (Reverse Address Resolution Protocol) is also a network layer protocol. RARP is a TCP/IP protocol that allows any host to obtain its IP address from the server. RARP is adapted from the ARP protocol and it is just reverse of ARP. It retrieves the logical address for a computer from the server.

8- Explain Block Coding with suitable example.

Block coding helps in error detection and re-transmission of the signal. It is normally referred to as mB/nB coding as it replaces each m-bit data group with an n-bit data group (where n>m). Thus, its adds extra bits

(redundancy bits) which helps in synchronization at receiver's and sender's end and also providing some kind of error detecting capability.

9- Indicate some significant differences between broadcast radio and microwave.

✓ Microwaves are a sub-class of radio waves.

✓ The frequency of radio waves can take values from 300 GHz to 3 kHz, but microwaves are defined to have frequencies ranging from 300 GHz to only 300 MHz.

✓ Radio waves in general have long distance communication capabilities, but microwaves do not have these abilities.

✓ Radio waves are mostly used in the communication field whereas microwaves are used in industries and astronomy.

10- What function does a modem perform?

Modem is actually a Modulator and Demodulator. It converts the digital data to analog signals (modulation) to send on transmission media. It can also receive analog signals and converts it to digital (De Modulation) data at receiver side.

11- What is parity bit?

A parity bit, or check bit, is a bit added to a string of binary code to ensure that the total number of 1-bits in the string is even or odd. Parity bits are used as the simplest form of error detecting code. There are two variants of parity bits: even parity bit and odd parity bit.

12- What is attenuation?

Attenuation means a loss of energy. When a signal, simple or composite, travels through a medium, it loses some of its energy in overcoming the resistance of the medium. That is why a wire carrying electric signals gets warm, if not hot, after a while. Some of the electrical energy in the signal is converted to heat. To compensate for this loss, amplifiers are used to amplify the signal.

13- How twists in per unit length reduce the noise in twisted pair cable?

If the two wires are parallel, then the electromagnetic interference from the devices such as motor can create a noise or interference on the wire that is closer to the source of noise. This results in high voltage level in one wire than the other.

If two wires are twisted, then the cumulative effect of the interference on both the wires is equal. In such a way, each wire is closer to the noise source for half of the time and farther away for the other half i.e. in one twist one wire is closer to the noise source and the other is farther; in next twist the reverse is true. In this way, there will be no difference at the receiver side as unwanted signals are cancelled out.

14- Explain term Data Network.

A data network is a system that transfers data between network access points (nodes). Data networks are primarily designed to transfer data from one point to one or more points (multipoint). Data networks may be composed of a variety of communication systems including circuit switches, leased lines and packet switching networks. There are predominately two types of data networks, point-to-point and multipoint.

15- Explain Asynchronous Communication.

Asynchronous transmission, we send 1 start bit (0) at the beginning and 1 or more stop bits (1s) at the end of each byte. There may be a gap between bytes. The strategy with this scheme is to avoid the timing problem by not sending long, uninterrupted streams of bits. Instead, data are transmitted one character at a time, where each character is 5 to 8 bits in length.

16- What is CDMA?

CDMA Stands for Code Division Multiple Access. Code division multiple access (CDMA) is a digital cellular network standard that utilizes spread-spectrum technology. CDMA (Code-Division Multiple Access) refers to any of several protocols used in second-generation (2G) and third-generation (3G) wireless communications. As the term implies, CDMA is a form of multiplexing, which allows numerous signals to occupy a single transmission channel, optimizing the use of available bandwidth. The technology is used in ultra-high-frequency (UHF) cellular telephone systems in the 800-MHz and 1.9-GHz bands

Subjective Part

Q2. Write a note on guided media? Also elaborates its types.

> Page 187 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

Q3.Describe the working of virtual circuit switching with appropriate example.

> Page 216 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

Q4. Describe various LAN Topologies with appropriate examples.

> Page 9 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

Q5. Write a short note on following:

1- **Encoding Schemes**   Page 95,135 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition
2- **Network Layer**   Page 39 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition
3- **Noise**   Page 79 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

Q6. Explain cellular wireless network in details

> Page 470 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

Q7. Discuss asynchronous transmission in details.

> Page 127 on "Data Communication & Network" by Forouzan, Behrouz 5th Edition

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