

**Subject: DATA COMMUNICATION & NETWORKS**

Time: 3 Hours

**DECEMBER 2010**

Max. Marks: 100

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after half an hour of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

**Q.1 Choose the correct or the best alternative in the following: (2×10)**

a. WAN stands for:

- (A) Wireless Network
- (B) Wideband Networks
- (C) Wide Area Network
- (D) None of the above

b. The key features of a protocol are:

- (A) Syntax and Timing
- (B) Semantics and Timing
- (C) Timing only
- (D) Syntax, Semantics and Timing

c. Physical layer has important characteristics such as:

- (A) Electrical and Mechanical
- (B) Functional and Procedural
- (C) Mechanical and Procedural
- (D) Electrical, Mechanical, Functional & Procedural

d. Name the protocol which facilitates the transfer of a file from one system to another under user command:

- (A) SMTP
- (B) Telnet
- (C) Protocol Interfaces
- (D) FTP

e. A periodic signal is one in which the same signal:

- (A) Doesn't repeat
- (B) Reproduces itself
- (C) Suppressed
- (D) Repeats overtime

f. Guided media consists of:

- (A) Wireless & Coaxial
- (B) Optical fiber & Coaxial
- (C) Twisted pair & Wireless
- (D) Twisted pair, Coaxial, Optical fiber

- g. Modem is a device which performs:
- (A) Modulation (B) Demodulation  
(C) Modulation & Demodulation (D) Multiplexing
- h. Name the process which allows several transmission sources to share a larger transmission capacity:
- (A) Modulation (B) Multiplexing  
(C) Demodulation (D) Mixing
- i. Back end Network connects:
- (A) Mainframes (B) Super computers  
(C) Mass storage device (D) All of the above
- j. The full form of IPv6 is
- (A) Internet protocol-6 (B) Internet address-6  
(C) Internet Domain-6 (D) Internet protocol version 6

**Answer any FIVE Questions out of EIGHT Questions.  
Each question carries 16 marks.**

- Q.2** a. Briefly explain Local Area Network and what are the distinctions between LAN's and WAN's. (8)
- b. Briefly explain OSI model and briefly describe its each layer. (8)
- Q.3** a. Define channel capacity, data rate, bandwidth, noise, error rate, Nyquist bandwidth, Shannon capacity formula, SNR. (8)
- b. Briefly explain optical fiber and list at least its five advantages. (8)
- Q.4** a. Define modulation and briefly explain at least two principal reasons for analog modulation of analog signals (6)
- b. Briefly explain parity check with the help an example. (6)
- c. Describe Full Duplex and Half Duplex transmitter. (4)
- Q.5** a. Describe error control and what are the most common techniques for error control? (8)
- b. What is Multiplexing? Describe Frequency Division Multiplexing. (8)

- Q.6** a. Briefly explain circuit switching network. What are the three phases of establishing communication? (8)
- b. Describe Least Cost Algorithm and briefly explain two common algorithms (8)
- Q.7** a. Briefly describe Back end Network and what are its typical characteristics? (6)
- b. What are the factors leading to the growth of Internet and Internet traffic? (6)
- c. Briefly describe Ad hoc Networks. (4)
- Q.8** a. Describe basic protocol function and list various categories in which they can be grouped. (8)
- b. Briefly explain IP addresses and Network classes. (4)
- c. Briefly explain the enhancements of IPv6 over IPv4. (4)
- Q.9** Write short notes on:
- (i) Multicasting. (4 × 4)
  - (ii) Routing protocols.
  - (iii) TCP.
  - (iv) SMTP.