AMIETE – ET/CS/IT (NEW SCHEME)   -   Code: AE71/AC67/AT67

Subject: DATA COMMUNICATION & COMPUTER 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. The wavelength of red light ($f = 4\times10^{14}$):

  (A) 0.5µm   (B) 1µm
  (C) 0.7µm   (D) 0.25µm

b. A periodic signal has band width of 20 Hz. The highest frequency is 60 Hz. What is lowest frequency?

  (A) 20Hz   (B) 80Hz
  (C) 10Hz   (D) 40Hz

c. The absolute bandwidth of a signal is the:

  (A) Width of signal   (B) Width of spectrum
  (C) Beam width   (D) none of the above

d. The decibel gain is defined as:

  (A) $10 \log_{10} P_{out}/P_{in}$ (B) $10 \log_{10} V_{out} / V_{in}$
  (C) $\log_2 P_{out} / P_{in}$ (D) P_{out} / P_{in}

e. The most significant impairments are:

  (A) Attenuation   (B) Delay distortion
  (C) Noise   (D) All of the above

f. To detect and correct errors:

  (A) Send redundant bits   (B) Send one bit
  (C) Apply correction codes   (D) Retransmit data

g. In CDMA, the station uses:

  (A) Same codes   (B) Different codes
  (C) Differential codes   (D) Orthogonal codes

h. VLAN is configured by:
   (**A**) Hard ware   (**B**) Special technique
   (**C**)Microprocessor   (**D**) Software

i. An IPv6 datagram is composed of:

   (**A**) Smaller unit   (**B**) Base header and pay load
   (**C**)Header and pay load   (**D**) Extension header and pay load

j. Name the standard protocol for transferring mail between hosts in the TCP/
   IP suite:

   (**A**) FTP   (**B**) SMTP
   (**C**) Telnet   (**D**) none of the above

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

Q.2 a. Define Data Communication. What are its basic components?   **(6)**

     b. Explain TCP/IP protocol architecture. Explain any three applications that
        can operate on top of TCP.   **(6+4)**

Q.3 a. Briefly explain three types of transmission impairments?   **(6)**

     b. Calculate channel capacity of a telephone line having a bandwidth of
        3KHz assigned for Data communication. The signal to noise ratio is 3162. **(4)**

     c. Differentiate between guided and unguided media. Briefly explain guided
        media.   **(6)**

Q.4 a. Define biphase encoding and describe two biphase encoding schemes.   **(6)**

     b. Describe Asynchronous and Synchronous transmission. Explain Cyclic
        Redundancy Check (CRC) with the help of an example.   **(4+6)**

Q.5 a. Briefly explain Flow Control and Sliding Window control?   **(8)**

     b. What do you understand by Multiplexing? Briefly explain FDM with the
        help of spectrum in frequency and time domain.   **(8)**

Q.6 a. What is Packet Switching? Briefly explain two popular approaches of
        Packet Switching.   **(6)**

     b. List the various control mechanism for congestion control in Packet
        Switching Networks. Explain Frame Relay congestion control techniques
        in detail.   **(10)**

Q.7 a. Explain IEEE 802.11 architecture and services.   **(8)**

b. Write a short note on high speed LANs. **(8)**

Q.8 a. Describe the requirement for an Internetworking facility. **(8)**

b. Describe IPv6 addresses and briefly explain three types of IPv6 addresses?
(8)

Q.9 a. Briefly explain the Router? **(4)**

b. What do you understand by TCP implementation policy options? **(4)**

c. Write short note on:
   (i) SMTP
   (ii) DNS **(2×4 = 8)**