

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(ETE) (2011 Onwards) (Sem.-7,8)**  
**ADVANCED COMMUNICATION SYSTEMS**  
Subject Code : BTECT-701

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.

**SECTION-A**

**1. Answer briefly :**

- a) A CDMA mobile measures the signal strength from the base as  $-100$  dBm. What should the mobile transmitter power be set to as a first approximation?
- b) How does GSM handle handoff requests from base to mobile?
- c) What do you mean by single carrier per channel?
- d) Describe frequency hopping.
- e) How many satellite transponders are required to interlink five earth stations with FDM/FM modulation?
- f) How is the control channel divided into logical channel in the TDMA system?
- g) Discuss about the structures of fiber.
- h) What is the meaning of the term modem? Name the three most common types of digital communication.
- i) Write the difference between bit rate and baud rate.
- j) What factors limit the maximum data rate for a channel?

### SECTION-B

2. Define the term quantizing noise? For a PCM signal, describe the effects of increasing the sampling rate and increasing the number of bits per sample.
3. Explain the Architecture of optical transport network.
4. Describe what a Satellite link budget is and how it is used?
5. An earth station receiving system consist of a 20dB gain antenna with  $T_{AR} = 80$  K, an RF amplifier  $G_a = 40$ dB and  $T_e = 30$  K, and a down converter with  $T_e = 15,000$  K. What is the overall *dc* effective input noise temperature of the receiving system?
6. What is meant by a logical channel and how is the control channel divided into logical channels in TDMA system?

### SECTION-C

7. For a QPSK system the given parameters are  $C = 10^{-12}W$ ,  $f_b = 60$  kbps,  $N = 1.2 \times 10^{-14}W$ ,  $B = 120$  kHz, determine :
  - a) Carrier power in dBm
  - b) Noise power in dBm
  - c) Noise power density in dBm,
  - d) Energy per bit in dBJ
  - e) Carrier to Noise power ratio in dB
  - f)  $\frac{E_b}{N_o}$  ratio
8. Why is it necessary to use multiple satellites for real time coverage with LEO and MEO System? How can the use of multiple satellites be avoided for data communication with MEO and LEO satellites?
9. Write a note on following :
  - a) SNET
  - b) VSAT

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**