



40448

Total No. of Pages: 4

7E1830

Roll No. _____

7E1830

B. Tech. VII - Sem. (Main / Back) Exam., Nov-Dec 2025
Open Elective - I
7EC6-60.1 Principle of Electronic Communication

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL2. NIL**PART - A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 What is the fundamental need for modulation in electronic communication?
- Q.2 Define 'Gain' and 'Attenuation' in the context of a communication system.
- Q.3 Distinguish between PAM and PWM.
- Q.4 List two advantages of Digital Modulation over Analog Modulation.
- Q.5 What is the primary function of a telephone hybrid in a telephone system?
- Q.6 Name two common types of LAN hardware.

- Q.7 ✕ What is the main difference between Geostationary Earth Orbit (GEO) and Low Earth Orbit (LEO) satellites?
- Q.8 ✕ Mention two advantages of using fiber-optic cables over copper cables for communication.
- Q.9 ✕ What is the key principle behind Code Division Multiple Access (CDMA)?
- Q.10 ✕ Briefly explain the purpose of ZigBee technology.

[5x4=20]

PART - B

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 ✕ Describe the process of demodulation for an Amplitude Modulated (AM) signal using a simple envelope detector.
- Q.2 ✕ With a neat diagram, explain the components and working of a Global Positioning System (GPS).
- Q.3 ✕ Compare and contrast Ethernet LANs and Token Ring LANs based on their access methods and topologies.
- Q.4 ✕ Draw a block diagram of a basic Satellite Communication System, labeling its main components.
- Q.5 ✕ Describe the concept of Wavelength Division Multiplexing (WDM) in optical communication and its benefits.
- Q.6 ✕ Explain the "cellular concept" in mobile communication and how it helps in frequency reuse.
- Q.7 ✕ Discuss the key features and applications of Bluetooth technology.

PART – C**(Descriptive/Analytical/Problem Solving/Design Questions)****Attempt any three questions**

- Q.1 (a) Explain the generation and demodulation process of Frequency Modulation (FM) using suitable block diagrams.
- (b) A signal has a power of 50 mW at the input of an amplifier. If the amplifier has a gain of 20 dB, what is the output power in Watts?
- Q.2 (a) Describe the process of Pulse Code Modulation (PCM). Clearly explain the three main steps involved: sampling, quantization and encoding.
- (b) Compare ASK, FSK and PSK digital modulation techniques based on their bandwidth efficiency, noise immunity and complexity.
- Q.3 (a) Discuss the fundamental principles of the Internet and its evolution as a telecommunication system.
- (b) Explain the different layers involved in a typical Local Area Network (LAN) architecture and their respective functions.
- Q.4 (a) Compare and contrast GSM and CDMA cellular communication systems in terms of their multiple access techniques, security features and typical applications.
- (b) Explain the working principle and applications of RFID (Radio Frequency Identification) communication.
- Q.5 (a) Describe the architecture and working of a Wireless LAN (WLAN) based on the IEEE 802.11 standard.
- (b) Discuss the advantages and disadvantages of Infrared Wireless communication compared to RF-based wireless technologies.