

KATHMANDU UNIVERSITY  
End Semester Examination  
February, 2025

Marks Scored:

Level : B.E.

Year : III

Exam Roll No. :

Time: 30 mins.

Registration No.:

Course : ETEG 301

Semester : II

F. M. : 10

Date : 18 FEB 2025

SECTION "A"

[20 Q. × 0.5 = 10 marks]

**Choose and encircle the most appropriate option from each set of choices**

1. The revolutionary communication device telegraph used \_\_\_\_\_ signal for establishing communication.  
a. Sound                      b. Light                      c. Radio                      d. Electrical
2. In Sky Wave Propagation, because of \_\_\_\_\_ in atmosphere, radio waves reflect back to the earth.  
a. High concentrations of ozone                      b. Electrically charged particles  
c. Dense clouds                      d. Vacuum space
3. Analog signals are often more susceptible to noise because \_\_\_\_\_  
a. Any variation in signal is interpreted as information  
b. They use a smaller range of values  
c. They are always transmitted wirelessly  
d. They are easier to be compressed
4. Pulse Code Modulation (PCM) is a technique used for \_\_\_\_\_  
a. Transmitting analog signals using antenna  
b. Converting analog signals to digital signals  
c. Converting digital signals to analog signals  
d. Generating pulse in the code
5. Increasing the Signal-to-Noise ratio in a communication channel \_\_\_\_\_  
a. Decreases the channel capacity  
b. Increases the channel capacity  
c. Have no effect on the channel capacity  
d. Increases until saturation and then gradually decreases
6. In twisted pair, cross talk refers to \_\_\_\_\_  
a. Signal reflection  
b. Signal loss over distance  
c. External electromagnetic noise  
d. Interference between adjacent wires or circuits
7. In FM, the frequency deviation is proportional to the \_\_\_\_\_  
a. Carrier frequency  
b. Modulating frequency  
c. Amplitude of modulating signal  
d. Bandwidth of the modulated signal



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8 FEB 2025

Course : ETEG 301  
Semester : II  
F. M. : 40

SECTION "B"

*Attempt ALL questions. Each question carries 5 marks. Marks are indicated inside brackets.*

1.
  - a. What does VSAT stand for and what is its primary use in a country like Nepal? [3]
  - b. What is digital communication and why digital communication is often preferred in modern communication system? [2]
  
2.
  - a. Briefly define unicast, multicast, and broadcast communication highlighting the key difference in how data is transmitted to recipients. [3]
  - b. In what situations would you choose to use STP cable over UTP cable? [2]
  
3.
  - a. Compare AM and FM in terms of susceptibility to noise, bandwidth, and types of applications they are used for. [3]
  - b. Show with the help of sketch how the amplitude of carrier signal is varied in ASK and FSK. [2]
  
4.
  - a. What is frequency reuse in cellular mobile communication? [2]
  - b. Briefly describe the key characteristics of each of the following network topology: Bus, Star, and Mesh. [3]
  
5.
  - a. Compare SMS to OTT in terms of accessibility and reliability. [2]
  - b. Describe the path a signal takes from the broadcast center to your TV in a DTH system. [3]
  
6.
  - a. Explain how radar measures the distance to object and determine the speed of a moving object. [3]
  - b. Write the functions of satellite control center. [2]
  
7.
  - a. Draw a block diagram of optical fiber communication system and explain the role of photo detector? [3]
  - b. How does OPGW differ from traditional ground wire used in power lines? [2]
  
8.
  - a. What is Power Line Communication? List down two application areas where this technology can be adapted. [3]
  - b. What is IoT and in your opinion what are the primary applications of it in the field of electrical engineering? [2]