KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Marks Scored:

Level : B.E.
Year : III

Course : ETEG 301
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date 05 AUG 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

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

1. Inventing the electric telegraph is credited to_____
   a. Guglielmo Marconi
   b. Samuel Morse
   c. Nikola Tesla
   d. Thomas Edison

2. In Nepal, distribution of telephone line to general public started from_____
   a. 2007 BS
   b. 2008 BS
   c. 2012 BS
   d. 2019 BS

3. In communication channel, external noise_____
   a. Can be minimized and eliminated
   b. Can be minimized but cannot be eliminated
   c. Cannot be minimized but can be eliminated
   d. Cannot be minimized and eliminated

4. The main disadvantage of using wireless communication for long-distance transmission is it's _____
   a. High Cost
   b. Difficult installation process
   c. Limited bandwidth
   d. Low footprint

5. The best suited propagation mode for short-range communication within a city is _____
   a. Ground wave
   b. Sky wave
   c. LOS
   d. Guided wave

6. If the digital bits are represented by digital pulse sequences, it's called_____
   a. Digital modulation
   b. Line coding
   c. Encryption
   d. Quantization

7. In the T568A wiring standard, _____ color pair is connected to the pins 1 and 2 of an RJ45.
   a. Blue / White & Blue
   b. Green / White & Green
   c. Orange / White & Orange
   d. Brown / White & Brown

8. Among the following, _____ is the main disadvantage of Amplitude Modulation (AM).
   a. High complexity
   b. Inefficient use of bandwidth
   c. Limited range
   d. Prone to interference

9. In Frequency Modulation (FM), the amount of frequency deviation depends on the _____
   a. Amplitude of the modulating signal
   b. Frequency of the modulating signal
   c. Amplitude of the carrier signal
   d. Frequency of the carrier signal

10. QAM combines the method of _____
a. ASK & FSK b. ASK & PSK c. FSK & PSK d. PSK & QPSK

11. The main purpose of frequency reuse in cellular communication is to_____
a. Increase the cell size
b. Maximize the use of bandwidth
c. Reduce the power consumption of mobile devices
d. Improve the call quality

12. In OSI model, _____ layer is responsible to translate different data formats.
a. Data link layer b. Transport layer c. Presentation layer d. Application layer

13. 1000 Base T is also called _____
a. Standard Ethernet b. Fast Ethernet
c. Gigabit Ethernet d. 10 Gig Ethernet

14. Among the following, _____ resolution is considered as minimum requirement for standard HDTV.
a. 480 p b. 720 p c. 1080 p d. 1920 p

15. Continuous wave radar is basically used to measure _____
a. Object distance b. Object size c. Object velocity d. Object features

16. _____ satellite orbit is commonly used for GPS satellite.
a. Low Earth Orbit b. Medium Earth Orbit
c. Geostationary Orbit d. Highly Elliptical Orbit

17. The European navigation system equivalent of GPS is called _____
a. GLONASS b. BeiDou c. Galileo d. IRNSS

18. In optical fiber, the primary function of the cladding is _____
a. To provide physical protection b. To reflect light back into the core
c. To act as insulator d. To enhance the signal strength

19. The role of a coupler in PLC system is to _____
a. Regulate power distribution
b. Modulate data signals onto the power line
c. Convert electrical signals to electromagnetic signals
d. Amplify data signals

20. The key feature of Z-wave technology is _____
a. Low power consumption
b. Point-to-Point communication
c. Mesh networking capabilities
d. Long range communication

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Semester : II
F. M. : 40

SECTION "B"
[8 Q. × 5 = 40 marks]

Attempt *ALL* questions.

1. a. Describe the concept of bandwidth in communication system. [3]
   b. In twisted pair, considering the structural difference between UTP and STP, discuss how do these differences affect their performance? [2]

2. a. In case of AM, compare the bandwidth requirements of VSB, DSB-SC and SSB-SC modulation techniques. [3]
   b. If the modulating signal is 01101010, draw modulated signal waveforms for ASK and FSK. [2]

3. a. What is the primary purpose of handoff in cellular mobile communication networks? [3]
   b. Compare and contrast monopole towers with guyed towers and self-supporting towers in the context of cellular mobile communication infrastructure. [2]

4. a. Discuss the role of internet layer in the TCP/IP model. [3]
   b. Draw simple dual ring architecture of FDDI model and discuss how does this architecture enhance the reliability of the network in comparison to simple ring topology only? [2]

5. a. Write any three pros of OTT system in comparison to SMS system. [3]
   b. Discuss how the features such as Digital Video Recording (DVR) and Video-On-Demand (VOD) of set-top box have enhanced the flexibility and convenience of TV viewers these days? [2]

6. a. Explain the concept of signal travel and its significance in GPS positioning. [3]
   b. Define LiDAR and explain its operating principles. [2]

7. a. In power transmission network, discuss how OPGW can enhance communication capabilities, monitoring, and maintenance of electrical grids? [3]
   b. Compare and contrast geostationary satellites with low earth orbit satellites in satellite communication networks. [2]

8. a. What are the key advantages and disadvantages of using power lines for communication compared to other transmission mediums like twisted pair and co-axial cable? [3]
   b. What is Z-Wave? List any two key features of Z-Wave that makes it suitable for automating home environments. [2]