

KATHMANDU UNIVERSITY  
End Semester Examination  
June/July, 2023

Marks Scored:

Level : B.E.

Year : III

Exam Roll No. :

Time: 30 mins.

Course : ETEG 301

Semester : II

F. M. : 10

Registration No.:

Date : 03 JUL 2023

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Encircle the most appropriate answer.

1. Development of the code using a combination of dots and dashes which is used for telegraphic communication is credited to.....
  - a. Guglielmo Marconi
  - b. Thomas Edison
  - c. Samuel Morse
  - d. Alexander Graham Bell
  
2. In communication system, the term "bandwidth" refers to the .....
  - a. Range of frequencies
  - b. Data rate
  - c. Number of connected devices
  - d. Connection capability
  
3. Among the following, which channel is most susceptible to EM interference?
  - a. Twisted pair
  - b. Coaxial cable
  - c. Fiber optic cable
  - d. Radio waves
  
4. Which of the following is a disadvantage of using twisted pair cable for long-distance transmission?
  - a. High Cost
  - b. Difficult installation process
  - c. Limited Bandwidth
  - d. Susceptible to crosstalk
  
5. The frequency deviation in frequency modulation technique is directly proportional to .....
  - a. Modulating signal amplitude
  - b. Modulating signal frequency
  - c. Carrier frequency
  - d. Modulation index
  
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 OSI model, as a data packet moves from the lower to the upper layers, headers are .....
  - a. Added
  - b. Removed
  - c. Rearranged
  - d. Replicated
  
8. In packet switching, data packets are .....
  - a. Transmitted in a sequential order
  - b. Transmitted simultaneously to multiple destinations
  - c. Buffered at the sender before transmission
  - d. Routed independently through the network

9. The size of IP address in IPv6 is.....
  - a. 48 bits
  - b. 96 bits
  - c. 128 bits
  - d. 256 bits
10. Typically IMEI number is of .....in length.
  - a. 10 digits
  - b. 13 digits
  - c. 15 digits
  - d. 17 digits
11. The transfer of a call from one base station to another base station is called.....
  - a. Call forward
  - b. Call transfer
  - c. Roaming
  - d. Handover
12. The protocol that enables access to the internet from a mobile device is.....
  - a. HTTP
  - b. WAP
  - c. ISD
  - d. TCP
13. Aspect ratio of standard television system until the HDTV was.....
  - a. 3:2
  - b. 4:3
  - c. 16:9
  - d. 21:9
14. In DTH broadcasting, the component responsible for down-converting and demodulating the received signal is.....
  - a. Set-top-box
  - b. Satellite dish
  - c. Television receiver
  - d. Transponder
15. Continuous wave radar is basically used to measure.....
  - a. Object distance
  - b. Object size
  - c. Object velocity
  - d. Object features
16. Geostationary satellites are located at an altitude of approximately.....
  - a. 500-1500 KMs
  - b. 5000-10000 KMs
  - c. 30000 KMs
  - d. 36000 KMs
17. The civilian GPS signal, known as L1 signal, operates at a frequency of approximately .....
  - a. 1 GHz
  - b. 1.5 GHz
  - c. 2.4 GHz
  - d. 3.7 GHz
18. A type of fiber optic cable that is installed by being attached to a host conductor along overhead power lines is called.....
  - a. Optical ground wire
  - b. All dielectric self-supporting
  - c. Optical attached cable
  - d. Optical phase conductor
19. In PLC, the device acting like high pass filter dividing communication signal and electrical signal is called .....
  - a. Splitter
  - b. Duplexer
  - c. Coupling
  - d. PLC Modem
20. Z-Wave uses .....topology to form a network.
  - a. Mesh
  - b. Bus
  - c. Star
  - d. Hybrid

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Time : 2 hrs. 30 mins.

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Semester : II  
F. M. : 40

SECTION "B"  
[8Q × 5 = 40 marks]

Attempt *ALL* questions.

1. a. What is channel? What are the two significant factors that determine the channel capacity of any communication channel? [3]  
b. What is the main purpose of having a twist in a twisted-pair cable? [2]
2. a. What is VSB in AM? Do you think it is wise to compromise the bandwidth in VSB in comparison to SSB? If yes, why? If not, why, not? [3]  
b. If the modulating signal is 010110, draw modulated signal waveforms for ASK and FSK, respectively. [2]
3. a. What is the purpose of physical layer, data link layer and network layer in OSI model? [3]  
b. Draw a simple client server network model and peer to peer network model assuming the types and number of connected nodes on your own. [2]
4. a. It is said that capacity of cellular system is directly proportional to the number of times a cluster is replicated. Now, define, what is cluster and also discuss how the capacity of cellular system is directly proportional to the number of times a cluster is replicated? [3]  
b. What do you mean by Handoff in cellular mobile communication? [2]
5. a. Write any three pros and cons of SMS system. [3]  
b. Draw a simple DTH architecture and show how it works. [2]
6. a. How is positioning done in GPS. What is the minimum number of satellites required to determine one's position using GPS and why is that so? [3]  
b. What is radar and explain how it determines the distance to the target during its operation? [2]
7. a. What are the advantages of optical fiber communication? [2]  
b. How OPGW, OPAC and OPPC are placed in transmission line networks? [3]
8. a. What are the opportunities, challenges and risks associated with PLC? [3]  
b. In your opinion, what role could IoT play in order to convert traditional grid into a smart grid? [2]