Not Part

GHANA COMMUNICATION TECHNOLOGY UNIVERSITY

FACULTY OF COMPUTING AND INFORMATION SYSTEMS
Bsc COMPUTER SCIENCE (LEVEL 200, WEEKDAY)
END-OF-SEMESTER EXAMINATIONS, APRIL/MAY 2023

CSNS 241: DATA COMMUNICATIONS

Student ID :

Venue:

Sign:

Date :5th MAY 2023

Duration: 2hrs 15mins

Instructions:

All pages MUST contain ID number of student, Name of Lecturer, Campus, signature of student.

Answer all questions(100marks)

---

1. What is the difference between *Data Communications* and *Networking*? [2marks]

2. Briefly describe 3 types of data communication networks. [6marks]

3. Explain the different types of *Data Flow* in Data Communications with typical examples. [6marks]

4. Explain the following and describe the advantage of each over the other: [6ma
   a) Packet Switched network
   b) Circuit Switched network

7. List all the protocols in OSI and TCP/IP models by layers. [10marks]

8. Compare TCP/IP and OSI models layer by layer.

[10marks]

[10marks]

9. What is the difference between:
   a) Switch and Router
   b) Analog and Digital signal
   c) Periodic and Aperiodic signal

15. Draw Time-domain and Frequency-domain representations of 3 sine waves with frequencies 0, 8, 16. [6marks]

16. A digital signal has sixteen levels. How many bits are needed per level? [4marks]

10. What is the relationship between the following: [6marks]
    a) Frequency and Period
    b) Wavelength and Frequency
    c) Bandwidth and Frequency

11. Answer True or False with brief explanation to the following: (-2 for wrong answer) [10marks]
    a) In Data Communications, we commonly use periodic analog signal (True/False)
    b) If a signal does not change at all, its frequency is zero. (True/False)
    c) If a signal changes instantaneously, its frequency is one. (True/False)
    d) A single-frequency sine wave is not useful in Data Communications. (True/False)
    e) If the composite is non-periodic, the decomposition gives a combination of sine waves with continuous frequencies. (True/False)

12. The period of a signal is 900ms. What is its frequency in megahertz? [4marks]

5. a) What is the function of *twisting* in *Twisted-Pair Cable* [2marks]

b) What is the purpose of *Cladding* in an *optical fiber* [2marks]

c) explain 2 advantages of *optical fiber* over *twisted-pair cable* [2marks]

6. **Explain the terms:** *Protocol Layering, Encapsulation, Frame, Packet.* [4marks]