COURSE CODE: **CIT 303**

COURSE TITLE: **Principles of Communication Technology**
Time: **3 hrs** *Course Credit Unit*:   **3**
Instruction: **Attempt any five (5) questions. Each question carries 14 marks**
Question 1

    a. Define the term "network topology". (1 mark).

    b. With the aid of diagrams, briefly explain the following network topologies:
        i.   Ring (2 marks)
        ii. Mesh (2 marks)
        iii. Tree (2 marks).

    c. State and briefly explain 3 advantages and 3 disadvantages of using fiber optic cables in networking. (4.5 marks)

    d. State 1 advantage and 2 disadvantages of STP cables in comparison to UTP cables. (2.5 marks)

Question 2

    a. Outline the layers of Open System Interconnection Reference Model (OSI Model), in the right order.(7 marks)

    b. Write briefly on any four Layers.(1.75 marks)

Question 3

    a. Write a brief note on Data Communications.(2marks)

    b. The effectiveness of a data communications system depends on four fundamental characteristics.
        i.   List the four fundamental characteristics.(4 marks)
        ii.   Define these four fundamental characteristics.(1.5 marks each)
    c. What do you understand by the term Communication Protocols? (2 marks)

Question 4

    a. What do understand by the term attenuation (2 marks)

b. The amplification in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with 2 dB/km has a power of 2 mW, what is the power of the signal at 5 km? (3marks).

c. Contrast between Analog and Digital Signal Processing (4 marks)

d. Outline and briefly write on any two guided Media.(2.5 marks each)

Question 5

a. Write briefly on each of the following terms:
iLinear filter   (1 mark)
   ii. Stable filter   (1 mark)
   iii. Unstable filter (1 mark)
   iv. Time-invariant filter (1 mark)
   v. Adaptive filter   (1 mark)
   vi. Linearity (in the context of linear-time invariant (LTI) (2 marks)

b. Outline and write short notes on four (4) basic Network Topologies.(7 marks)

Question 6

i)   Cryptography algorithms (cipher) can be divided into two groups. (7 marks)
   a) List the two groups
   b) Write briefly on the two groups
ii)   A data communications system has five components.(7 marks)
   a) list these components
   b) define these component

Question 7

a)   Outline four (4) basic Network Topologies. (0.5 mark each)

b)   Write a brief on the four network topologies in (a) (1 mark each)

c)   List three guided Media. (1 mark each)

d)   Write briefly on the three guided media (5 mark)