



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikwe Express Way, Jabi – Abuja

Faculty of Sciences
October/November Examination 2016

Course Code: CIT 852

Course Title: Data Communication and Networks

Credit Unit: 3

Time Allowed: 3 Hours

Instruction: Attempt any Five (5) questions

Questions

1.
 - a. Briefly explain the key features of the following:
 - i. Circuit-switched networks (2.5 marks)
 - ii. Packaged-switched networks (2.5 marks)
 - b. State 3 advantages and 2 disadvantages of each of the following network topologies:
 - i. Bus (2.5 marks)
 - ii. Star (2.5 marks)
 - iii. Ring (2.5 marks)
 - c. List 3 types of broadcast networks (1.5 marks)
2.
 - a. Complete the following table(3.5 marks):

Layer	Data Package Name
Application	
Presentation	
Session	
Transport	
Network	
Data-link	
Physical	

- b. With the aid of a table ONLY, outline 5 differences between the OSI reference model and the TCP/IP model. (5 marks)
 - c. Define the following terms:
 - i. Baud (1 mark)
 - ii. Noise (1 mark)
 - iii. Propagation delay (1 mark)
 - iv. Attenuation (1 mark)
 - d. For a constant rate transmission, if it takes 100 seconds to complete 1 transmission cycle, what is the frequency of the transmission?
3.
 - a. State 3 drawbacks each of the TCP/IP reference model and the OSI reference model. (6 marks)
 - b. State 2 approaches to broadcast infrared networking.(2 marks)
 - c. State 3 characteristics of a connection-oriented service (3 marks)
 - d. List and explain very briefly 3 strategies to manage congestion in a network (3 marks)
4.
 - a. State the 3 steps required for connection establishment in connection oriented services (3 marks).
 - b. Briefly explain the following concepts:
 - i. Flooding (3.5 marks)
 - ii. Link state routing (4.5 marks)
 - c. State 3 reasons for congestion on a network (3 marks)
5.
 - a. List the steps of the Dijkstra routing algorithm (5 marks)
 - b. Using a table only, highlight 2 differences between congestion control and flow control. (4 marks)
 - c. For each class of IP address, specify the following with the aid of a table containing the following columns: (5 marks)
 - i. IP address class
 - ii. Higher order bit
 - iii. Format
6.
 - a. List the 4 types of routers identified by OSPF and state the function of each router (4 marks).
 - b. When an application invokes TCP, state and explain briefly what services it receives from TCP (6 marks).
 - c. State 3 important features of UDP (3 marks)
 - d. State 2 applications that use UDP exclusively (1 mark).

7.

- a.** Explain the following terms:
 - i.** Hierarchical address (1 mark)
 - ii.** Flat address (1 mark)
 - iii.** Static Address assignment (1.5 marks)
 - iv.** Dynamic address assignment (1.5 marks)
 - v.** Adaptive routing (1.5 marks)
 - vi.** Non-adaptive routing (1.5 marks)
- b.** When routers receive packets faster than they can forward them, state the 2 possibilities that could occur in the case of congestion. (2 marks)
- c.** State 4 features of a token bucket traffic shaper. (4 marks)