NATIONAL OPEN UNIVERSITY OF NIGERIA

UNIVERSITY VILLAGE, 91 CADASTRAL ZONE, NNAMDI AZIKWE EXPRESSWAY, JABI, ABUJA
FACULTY OF SCIENCE
APRIL, 2019 EXAMINATION

Course Code: CIT 852
Course Title: Data Communication and Networks
Credit Unit: 3
Time: 2½ hrs
Instruction: Answer Question 1 and any other four (4) questions.

1a) List the different framing methods. ***(2 marks)***
b) Why is bit stuffing advantageous over character stuffing? ***(1 mark)***
c) In the context of digital-to-digital modulation, which type of encoding is most effective at removing the DC component in the signal and why? ***(3 marks)***
d) Enumerate four of the basic goals that a Computer network should satisfy. ***(4 marks)***
e) Depending on the transmission technology (i.e., whether the network contains switching elements or not), we have two types of networks. List them. ***(1 mark)***
f) List the different approaches to open loop control ***(1½ marks)***
g) List the important multiplexing mechanism at the Transport Layer and explain how they are different from each other. ***(3 marks)***
h) Enumerate the types of routers OSPF identifies and the purpose of each ***(4 marks)***
i) List the types of encoding used for digital-to-digital encoding. ***(1½ marks)***
j) What is Traffic shaping? ***(1 mark)***

2a) Write short notes on Virtual Private Network (VPN) ***(5 marks)***
b) Compare leaky bucket traffic shaper and token bucket traffic shaper? (Present your answer using tables). ***(4 marks)***
c). State the key functions of each sub layer of the Data-Link layer? ***(3 marks)***

3a) In a tabular form, list the core protocols of the Internet layer of the Open System Interconnect (OSI) reference model stating the responsibility of each. ***(6 marks)***
b) State any two factors responsible for the rapid growth of Internet ***(2 marks)***
c) With the aid of illustrative diagram, describe block ciphers ***(3 marks)***
d) List two of the important functions of the network layer ***(1 mark)***

4a) State the three kinds of connections and networks OSPF supports. ***(1½ marks)***
b) Write short notes on the following :
i) Unipolar Encoding ***(6½ marks)***
ii) Bipolar Encoding ***(4 marks)***
(Use diagram for better illustration where necessary)

5a) In asynchronous communications, a typical frame for transmitting character data has four components. Enumerate them. ***(6 marks)***
b) State two advantages and two disadvantages of Asynchronous Communication. ***(4 marks)***
c) State any two disadvantages of Synchronous Communication. ***(2 marks)***

6a) In a tabular form, compare Virtual Circuit and Datagram Subnets based on the following issues: ***(7 marks)***

i) Addressing machine
ii) Referencing of circuit setup
iii) State information by a router
iv) Routing procedure
v) Effect of router failures
vi) Quality of service

b) Briefly describe MACA? ***(3 marks)***
c) List the features with which MACA W extends MACA ***(2 marks)***