NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
2021_2 EXAMINATION 45678

COURSE CODE: **DAM361**
COURSE TITLE: **BUSINESS COMMUNICATION AND NETWORKS**
CREDIT UNIT: **2**
TIME ALLOWED : 2HRS
INSTRUCTION: **ANSWER QUESTION ONE (1) AND ANY OTHER THREE (3) QEUSTIONS**

1 a. Explain the TCP/IP reference model **(5 marks)**
b. The ultimate outcome of relationship marketing is the building of a unique company asset called a marketing network. What would be the parts of a marketing network for motorcycle producing company and how can internet help in servicing such a network? **(3 marks)**

c. The Internet has given today's companies a new set of capabilities. Among those capabilities is the ability to operate a new information channel. Describe how information can be used by the marketer in this new channel? **(2marks)**
d. Explain the business case behind a migration to Dual Stack configuration where IPv6 & IPv4 are enabled? **(2 marks)**
e. What is the main security concern of dual stack implementations? **(3 marks)**

f. Write the IP address 222.1.1.20 mask 255.255.255.192 and 135.1.1.25 mask 255.255. 248.0 in CIDR notation **(4 marks)**
g. You have been allocated a class A network address of 29.0.0.0. You need to create at least 20 networks and each network will support a maximum of 160 hosts. Explain how the following two-subnet masks- 255.255.0.0 and or 255.255.255.0 would work? **(3marks)**
g. State the features of a partnership business (**3 marks)**

Question 2

a) Explain how data is transmitted along a fiber optic cable **(5 marks)**

b) Identify three physical characteristics of fiber optic cables that make them more suitable for high-speed digital data transmission than copper cables. **(1.5 marks)**

c) Describe what is meant by wave division multiplexing (WDM) and explain how it is used to deliver high-rate data transmission over a fiber optic cable. **(5 marks)**

d) A fiber optic transmission system uses wave division multiplexing with 16 different wavelengths of light. Each of these wavelengths is able to operate at 2.5Gbps.

i. What is the maximum data carrying capacity of this transmission system? **(2 marks)**

ii. If you require 4Mbps to stream one high definition video, determine how many such videos could be

transmitted at the same time using this fiber optic transmission system.

(3.5 marks)

Question 3:

a) The ISO Reference Model defines seven protocol layers, each of which is responsible for a specific range of functions. By considering this model, explain the main functions performed by a protocol operating at:

i. The Physical layer

(3 marks)

ii. The Transport layer (3 marks)

(3 marks)

d) Figure 2 below shows part of a network in which two personal computers A and B, are each connected to a switch (LAN switch 1 and 2) which are themselves interconnected by a router.

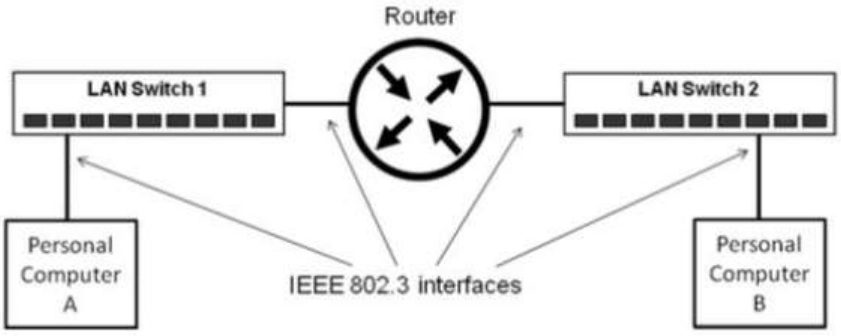

Figure 2

Consider the transmission of data from personal computer A to B and produce a protocol layer diagram that clearly shows how data passes through all of the layers of the ISO Reference model that are used within the PCs, switches and router. **(9 marks)**

Question 4

a) A global organization has offices located in different countries around the world and wishes to connect these together with a network that can transfer data and telephone calls between each

office. Explain how the Internet could be used to provide this network. **(2 marks)**

b) What limitations in terms of the Quality of Service does the Internet have in respect of providing the network described in part (4a)

(3 marks)

c) How does the Quality of Service offered by Multi-protocol label switching (MPLS) differ from that offered by the Internet?

(3 marks)

d) How could the global organization described in part (4a) use Multi-protocol label switching (MPLS) to create its network?

(4 marks)

e) Explain how MPLS would be able to provide a different Quality of Service for the transfer of data and telephone calls.

(3 marks)

Question 5

a. IPv6 introduced the concepts of global unicast and link-local addresses. Provide a brief description of the differences between those addresses **(3 marks)**

b. Explain the reason why IPv6 addresses are represented in hexadecimal while IPv4 in binary **(2 marks)**

c. Write the shortest compressed format of the following IPv6 addresses with explanations:
2001:0DB8:0000:1470:0000:0000:0000:0200
F380:0000:0000:0000:0123:4567:89AB:CDEF **(5 marks)**

d. The dynamic assignation of Global Unicast IPv6 addresses can be done in two different ways: 1) Stateless Address Auto-configuration (SLAAC) and, 2) Dynamic Host Configuration Protocol v6 (DHCPv6). Describe the differences between the two methods. **(5 marks)**