



PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE	
QUALIFICATION CODE: 07BACS	LEVEL: 7
COURSE: INTRODUCTION TO COMPUTER NETWORKING	COURSE CODE: ICN511S
DATE: JUNE 2019	SESSION: 1
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS

1. Answer **all questions**.
2. Please, ensure that your writing is **legible, neat and presentable**.
3. When answering questions you should be led by the allocation of marks.
4. Clearly mark rough work as such or cross it out unambiguously in ink.

PERMISSIBLE MATERIALS

1. Calculator

THIS QUESTION PAPER CONSISTS OF 7 PAGES (Including this front page)

Question 1

[Marks:15]

1.1 The first line of HTTP request message is called _____

- A. Request line
- B. Header line
- C. Status line
- D. Entity line

1.2 The binary equivalence of 192.168.3.24 is

- A. 10100000. 00101000.00000011.00011000
- B. 11000000. 10100100. 00000010. 00011000
- C. 01100000. 11101000. 00000010.00011000
- D. 11000000. 10101000. 00000011.00011000

1.3 What happens when a host station receives a frame that contains its own MAC address in the destination field?

- A. The Layer 2 information is removed and the frame is pushed up to Layer 3.
- B. The host station will copy the information to its buffers and send it back out.
- C. The frame originated from the host and will be ignored.
- D. The Layer 3 information is added to the frame.

1.4 FTP server listens for connection on port number

- A. 23
- B. 12
- C. 21
- D. 80

1.5 A communication path way that transfers data from one point to another is called

- A. Medium
- B. Node
- C. Host
- D. Topology

1.6 Bits can be send over guided and unguided media as analog signal by

- A. Digital modulation
- B. Amplitude modulation
- C. Frequency modulation
- D. Phase modulation

1.7. Wireless transmission can be done via

- A. radio waves
- B. microwaves
- C. infrared
- D. all of the above

1.8 The data link layer takes the packets from _____ and encapsulates them into frames for transmission.

- A. network layer
- B. physical layer

- C. transport layer
- D. application layer

1.9 The default subnet mask for 128.128.45.4 is

- A. /18
- B. /17
- C. /16
- D. /20

1.10 Which range of port numbers are reserved for services that are commonly used by applications that run on servers?

- A. 0 to 255
- B. 0 to 1023
- C. 1024 to 49151
- D. 49152 to 65535

1.11 Layer 2 switches process _____ layer protocol data units.

- A. Application
- B. Application and physical
- C. Physical and data link
- D. Application, physical and data link

1.12 Routers may use MAC addresses in addition to IP addresses to route packets

- A. True
- B. False

1.13 Upon typing the URL in the address bar of the PC, the DNS server will resolve the IP address of the destination IP. This is followed by

- A. HTTP sending request messages to the destination
- B. TCP establishing a connection
- C. HTTP sending response messages to the client
- D. All of the above

1.14 PC BDQ is unable to connect to any remote websites, ping its default gateway, or ping a printer that is functioning properly on the local network segment. Which action will verify that the TCP/IP stack is functioning correctly on this PC?

- A. Use the ipconfig /all
- B. Use the ping 127.0.0.1 command at the command prompt.
- C. Use the traceroute command at the command prompt
- D. Use FTP

1.15 The Layer 4 header of TCP/IP protocol stack contains which type of information to aid in the delivery of data?

- A. Process port number
- B. Host logical address
- C. Device physical address
- D. Virtual connection identifier

Question 2

[Marks:25]

2.1 Name two java classes used in creating TCP socket applications.

(2 marks)

2.2 Explain the role of FIN and ACK in the TCP header.

(4 marks)

2.3 In a client server architecture, a single server has the ability to communicate with multiple clients simultaneously over TCP connections as shown in Figure 1 below.

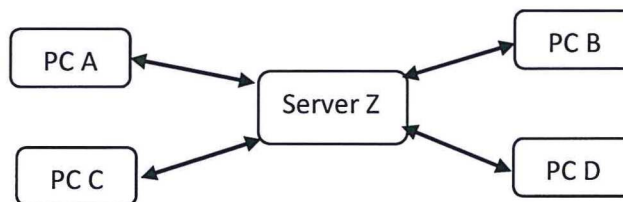


Figure 1

a) Explain how server Z is able to uniquely identify communication among the different clients?

(4 marks)

b) Is it possible for server Z to use the same TCP segments' sequence numbers to communicate to PC B and PC D at the same time? Motivate your answer.

(2 marks)

c) Can PC A decide to terminate the connection with server Z at any time that it prefers?

(2 marks)

2.4 Name three (3) roles of TCP on the client side?

(3 marks)

2.5 Name the location where packets get stored upon arriving from server Z to PC B. (2 marks)

2.6 State the event that will take place in each of the following scenarios

a) Retransmission timer has expired at PC A without receiving an ACK from server Z. (2 marks)

b) segment delivered with errors at server Z. (2 marks)

2.7 Certain network applications prefer UDP over TCP due to its fast speed. Name two characteristics of UDP which contributes to its fast speed. (2 marks)

Question 3

[Marks:25]

3.1 State the appropriate signal type carried by the following media: (2 marks)

Media	Signal type
Fibre optic cable	a)
Copper cable	b)

3.2 Identify the network component where the following scenarios take place:

a) Congestion (1 mark)

b) Propagation delay (1 mark)

c) Queueing delay (1 mark)

3.3 Discuss the role of sockets in accessing your emails from www.gmail.com. (6 marks)

3.4 Mention two symptoms/signs of congestion in the network. What is the impact of congestion on the packets in transit? (4 marks)

3.5 Is it possible to design a delay free network? motivate your answer. (2 marks)

3.6 For each Microsoft Window Operating Systems command below, discuss the instances in which you will find them beneficial to use. Also, demonstrate through using one example showing how the commands will be typed at your command prompt to give you meaningful results.

a) arp (2 marks)

b) netstat (2 marks)

c) traceroute (2 marks)

d) ipconfig (2 marks)

Question 4

[Marks:20]

4.1 Complete the table below with the names of any three internetworking devices. For each device, state the role it plays in communication networks as well as the TCP/IP layer it belongs to. (6 marks)

Name of network device	Function of device	TCP/IP layer
i)		
ii)		
iii)		

4.2 State two differences between IEEE 802.3 LAN standard and IEEE 802.11 Wireless LAN standard. (4 marks)

4.3 Name the application layer protocol that can be used to achieve the following?

- a) Remotely log onto your office router from home (1 mark)
- b) Upload content to the FTP server (1 mark)
- c) Secure transmission between your client and server (1 mark)

4.4 Differentiate between encapsulation and de-encapsulation. (3 marks)

4.5 Identify the two techniques used to assign IP addresses to end user devices. Which method will you use to assign IP addresses to 700 devices in a LAN and why? (4 marks)

Question 5

[Marks:15]

Consider Figure 2 below to answer the questions:

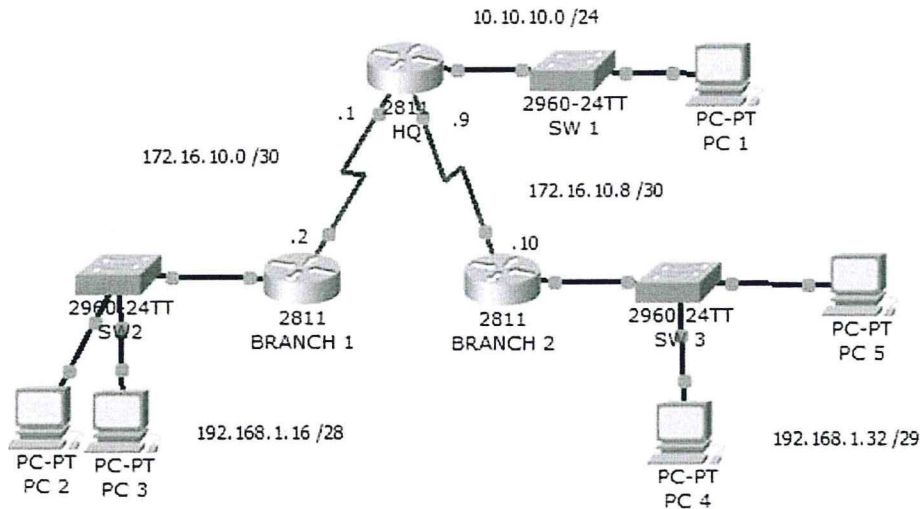


Figure 2

5.1 Determine the IP address, subnet mask and default gateway for PC 3 and PC 4. (6 marks)

Device	IP Address	Subnet Mask	Default gateway
PC 3	i)		
PC 4	ii)		

- PC 4 would like to communicate to PC 1. How does PC 4 get PC 1's IP address? (2 marks)
- Determine the source MAC and destination MAC addresses for the communication in a). (2 marks)
- State the role played by MAC addresses in delivering the packets? (2 marks)
- Mention any three types of ethernet cables used in a LAN. (3 marks)

GOODLUCK!