



Final term Exam May. 2021

Department: Mathematics  
Code number: (206C)  
Mark: 90  
Time: 2 hours

Major: 2<sup>nd</sup> Grade –  
Computer Science & Physics  
and Computer Science

Course Title:  
Computer Networks

Date: 12 June 2021

**Answer the following questions: (Note!!!: exam is in 3 pages)**

**Question 1:**

**Choose the correct answer (1.5 mark for each)**

**[45 marks]**

1- ..... data is continuous and take continuous values.

- a) ☒ Analog      b) Digital      c) Both analog and digital      d) None of the choices

2- In ..... transmission mode, both stations can transmit and receive at the same time.

- a) simplex      b) half duplex      c) ☒ full duplex      d) B and C

3- In a ..... communication, the media needs to be shared between devices.

- a) point-to-point      b) ☒ multipoint      c) mesh      d) None of the choices

4- In a ..... communication, the media is dedicated.

- a) ☒ point-to-point      b) multipoint      c) mesh      d) None of the choices

5- In a fully connected mesh topology with six computers, we need ..... links.

- a) 6      b) 36      c) ☒ 15      d) None of the choices

6- Data can flow only in one direction all of the times in a ..... mode.

- a) ☒ simplex      b) half duplex      c) full duplex      d) None of the choices

7- Which topology requires a central controller or hub?

- a) ☒ Star      b) Mesh      c) Bus      d) Ring

8- Which of the following is not a computer LAN topology?

- a) bus      b) ☒ band      c) star      d) ring

9- A walkie-talkie operates in ..... transmission.

- a) simplex      b) ☒ half duplex      c) full duplex      d) semi-duplex

10- There are ..... links in a fully connected mesh topology with seven computers.

- a) 1      b) ☒ 21      c) 42      d) None of the choices

11- Which topology requires a multipoint connection?

- a) Star      b) Mesh      c) ☒ Bus      d) Ring

12- A link-layer switch is involved in.... layers of the TCP/IP protocol suite.

- a) ☒ 2      b) 3      c) 4      d) 5

13- Transport layer of OSI model lies between network layer and ..... layer.

- a) application      b) data link      c) ☒ session      d) presentation

14- TCP/IP consists of ..... layers developed ..... the OSI model.

- a) seven; before      b) ☒ five; before      c) six; before      d) five; after

15- In the TCP/IP protocol suite, which of the following is an application layer protocol?

- a) UDP      b) IP      c) TCP      d) ☒ FTP





## Question 2:

[23 marks]

- A. List three reasons for planning and documenting IPv4 addresses. [5 marks]  
 B. Identify the five components of a data communications system. [6 marks]  
 C. Categorize the four basic topologies in terms of line configuration. [6 marks]  
 D. Match each function to the corresponding layer in the TCP/IP protocol suite [6 marks]

Layer	Function
1- Application	a- Responsible for the delivery of a message from one process to another process.
2- Data-link	b- Responsible for host-to-host communication and routing the packet through possible routes.
3- Network	c- Serves as the window for users
4- Transport	d- Moving bits from one node to another.
5- Physical	e- Responsible for moving frames from one hop (node) to the next.

## Question 3:

[22 marks]

- A. Given the IP address 193.103.20.0 /24, create 3 subnets. [6 marks]  
 Then determine the following:  
 a) How many networks?  
 b) How many hosts per network?  
 c) Write the network address, hosts range, and broadcast address for all subnets.
- B. The loss in a cable is usually defined in decibels per kilometer (dB/km). Assume a signal travel in a cable with loss  $-0.3 \text{ dB/km}$ , if the power of the signal at the beginning is  $2 \text{ mW}$ , what is the power of the signal at 5 km? [6 marks]
- C. Assume that the distance between the sender and the receiver is 12,000 km and that light travels at  $2.4 \times 10^8 \text{ m/s}$ . What are the propagation time and the transmission time for a 2.5 KB message (an e-mail) if the bandwidth of the network is 1 Gbps? [6 marks]
- D. What is the network address for a host with IP address 9.141.136.61 and subnet mask 255.255.0.0? [4 marks]

The end

With my Best Wishes

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