Tutorial Letter 204/2/2018

Computer Networks

COS2626

Semester 2

School of Computing

This tutorial letter contains the solution to Assignment 04 for semester 2

BARCODE

CONTENTS

Page

1 INTRODUCTION.....3

2 SOLUTION TO ASSIGNMENT 04: SEMESTER 2.....4

To be admitted to the examination, you must submit at least **ONE** assignment before the due date. The due dates for the assignments are as follows:

Assignment 01	**10th August 2018**
Assignment 02	**31st August 2018**
Assignment 03	**21st September 2018**

1 INTRODUCTION

Dear Student,

This tutorial letter, designated COS2626/**204**/2/2018, contains the solution to Assignment 04 for Semester 2.

You should have at this stage received the following study material:

- COS2626/**101**/3/2018 (Start-up letter - Available under Official Study Material on *my*UNISA)
- COS2626/**201**/2/2018 (Solution to Assignment 01 - Available under Additional Resources on *my*UNISA)
- COS2626/**202**/2/2018 (Solution to Assignment 02 - Available under Additional Resources on *my*UNISA)
- Assignment 03 does not contain a solution as this was a community engagement project.
- COS2626/**204**/2/2018 (Solution to Assignment 04 - Available under Additional Resources on *my*UNISA)

BEST WISHES FOR A SUCCESSFUL YEAR OF STUDY
THE LECTURERS
COS2626

2 SOLUTION TO ASSIGNMENT 04: SEMESTER 2

Question 1 **[5]**

State whether the following questions pertaining to LANS, MANs and WANs are TRUE or FALSE. If FALSE, correct the statement.

1.1	A LAN is a network of computers and other devices that is confined to a relatively small space, such as one building or even one office.	[1]
True✓		
Pages: 11-12, Chapter 1		
1.2	A group of connected LANs in the same geographical area is known as a WAN.	[2]
False✓, A group of connected LANs in the same geographical area is known as a **MAN✓**.		
Page: 17, Chapter 1		
1.3	The largest network is a PAN.	[2]
False✓, the largest network is a **WAN**.✓		
Page: 17, Chapter 1		

Question 2 **[4]**

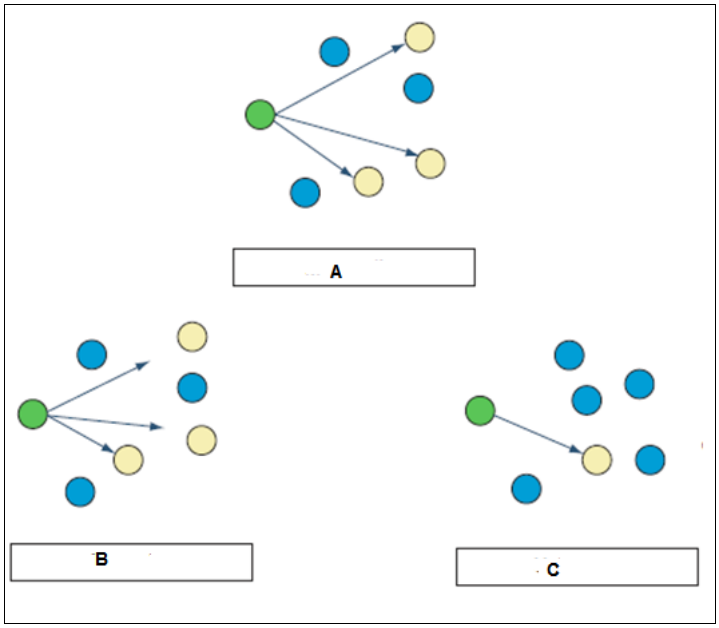
Name the layers of the OSI responsible for the functions, labelled A to D respectively in the following table.

A	Describes how data between applications is synced and recovered if messages don't arrive intact at the receiving application.	[1]
B	Responsible for sending bits via s wired or wireless transmission.	[1]
C	Responsible for reformatting, compression and/or encrypting data in a way that the application on the receiving end can read.	[1]
D	Responsible for transporting Application layer payloads from one application to another.	[1]

A	**Session✓**
B	**Physical✓**
C	**Presentation✓**
D	**Transport✓**
Pages: 21-23, Chapter 1	

Question 3 **[3]**

IPv6 supports THREE types of IP addresses as depicted in the diagram below. Identify 'A', 'B' and 'C' respectively.



A	**Multicasting✓**	[1]
B	**Anycasting✓**	[1]
C	**Unicasting✓**	[1]
Page: 75, Figure 2-18, Chapter 2		

Question 4 **[4]**

The following questions are based on routers.		
4.1	Routers rely on _____to identify which router is the next hop to reach a particular destination host.	[1]
routing table✓		
Page: 125, Chapter 3		
4.2	_____routing is a technique in which a network administrator configures a routing table to direct messages along specific paths between networks.	[1]
Static✓		
Page: 126, Chapter 3		
4.3	_____ routing automatically calculates the best path between two networks and accumulates this information in the routing table.	[1]
Dynamic✓		
Page: 126, Chapter 3		
4.4	The _____command allows you to view a host's routing table.	[1]
route✓		
Page: 126, Chapter 3		

Question 5 **[4]**

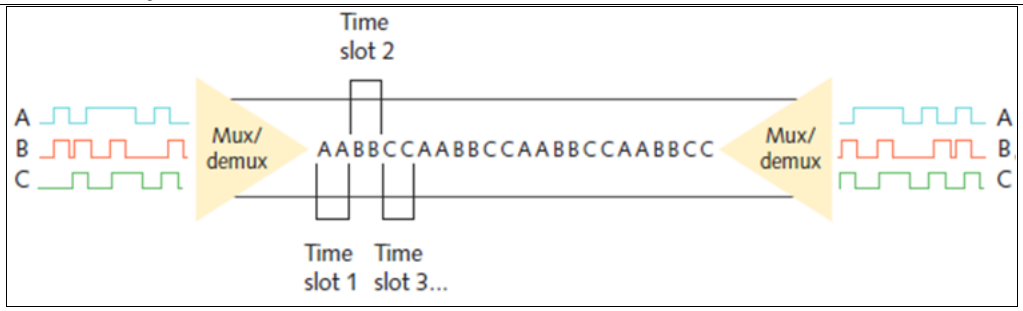
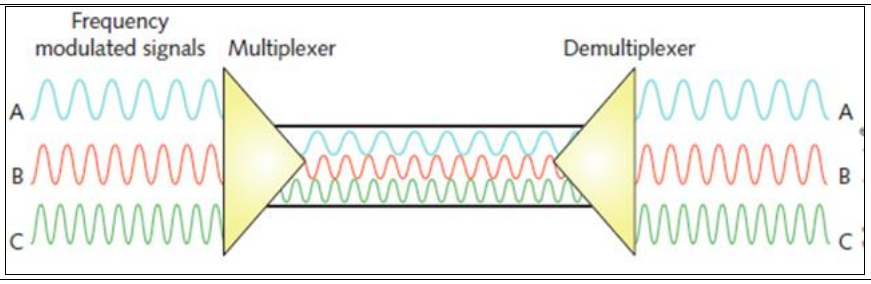
Name the power flaws labelled A to D respectively in the following table.

A	A fluctuation in voltage level caused by other devices on the network or electromagnetic interference.	[1]
B	A momentary increase in voltage due to lightning strikes, solar flares or electrical problems.	[1]
C	A complete power loss.	[1]
D	A momentary decrease in voltage; also known as sag.	[1]

A	**Noise✓**
B	**Surge✓**
C	**Blackout✓**
D	**Brownout✓**
Page: 176, Chapter 4	

Question 6 **[4]**

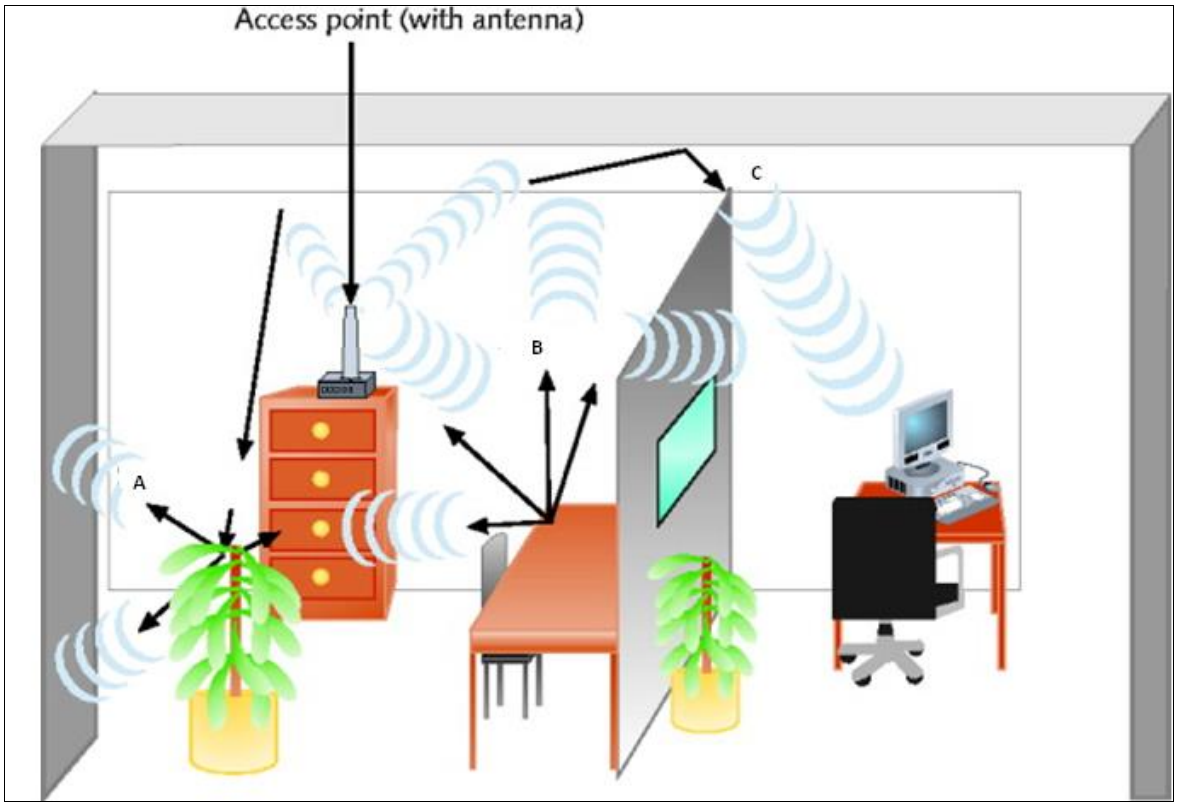
Identify the CORRECT form of multiplexing in the following table by studying the descriptions and figures of the different types of multiplexing.

6.1	In _____multiplexing, the transmitter assigns slots according to priority and need.	[1]
6.2	_____multiplexing is a technology used with fiber-optic cable, which enables one fiber-optic connection to carry multiple light signals simultaneously.	[1]
6.3		[1]
6.4		[1]

6.1.	**Statistical ✓**
6.2	**wavelength division ✓**
6.3	**TDM (Time Division Multiplexing) ✓**
6.4	**FDM (Frequency Division Multiplexing) ✓**
Pages: 216-218, Figures 5-6 – 5-8, Chapter 5	

Question 7 **[3]**

Identify the multipath signal phenomena denoted by the letters 'A', 'B' and 'C' in the following diagram.



A	**scattering ✓**	[1]
B	**diffraction ✓**	[1]
C	**reflection ✓**	[1]
Page: 280, Figures 5-6 – 5-8, Chapter 5		

Question 8 **[9]**

Match each term regarding wireless networking (Column 1) with the correct description from Column 2. Fill in the correct option in the grid provided. Provide only the alphabet, e.g.:

8.1	**e**

	COLUMN 1		**COLUMN 2**	
8.1	Wireless spectrum	a.	Assesses client requirements, facility characteristics, and coverage areas to determine an access point arrangement that will ensure reliable wireless connectivity within a given area.	[1]
8.2	Directional antenna	b.	A software tool that can assess the quality of the wireless signal.	[1]
8.3	NFC (Near-Field Communication)	c.	Software than can evaluate Wi-Fi network availability as well as help optimize Wi-Fi signal settings or help identify Wi-Fi security threats.	[1]
8.4	AP	d.	The process of configuring clients for wireless access to the network	[1]
8.5	roaming	e.	The term applied to a station moving from one BSS to another without losing connectivity.	[1]
8.6	On-boarding	f.	A device that accepts wireless signals from multiple nodes and transmits them to the rest of the network.	[1]
8.7	Wireless analyzer	g.	A form of radio communication that transfers data wirelessly over very short distances.	[1]
8.8	Spectrum analyzer	h.	Issues wireless signals along a single direction.	[1]
8.9	Site survey	i.	A continuum of the electromagnetic waves used for data and voice communication.	[1]

8.1	**i**✓	Page 277, Chapter 6
8.2	**h**✓	Page 279, Chapter 6
8.3	**g**✓	Page 284, Chapter 6
8.4	**f**✓	Page 287, Chapter 6
8.5	**e**✓	Page 295, Chapter 6
8.6	**d**✓	Page 307, Chapter 6
8.7	**c**✓	Page 313, Chapter 6
8.8	**b**✓	Page 313, Chapter 6
8.9	**a**✓	Page 303, Chapter 6

Question 9 **[4]**

Identify the CORRECT wireless standards.

Standard	Frequency band	Max, theoretical throughput	Effective throughput	Geographic range
9.1	2.4 GHz	11 Mbps	5 Mbps	100 m
9.2	5 GHz	54 MBps	11-18 Mbps	20 m
9.3	2.4 GHz	54 Mbps	20-25 Mbps	100 m
9.4	2.4 GHz or 5 GHz	65 – 600 MBps	65-500 Mbps	400 m (if MIMO is used)

9.1	**802.11b**✓	[1]
9.2	**802.11a**✓	[1]
9.3	**802.11g**✓	[1]
9.4	**802.11n**✓	[1]
Page: 293, Table 6-3, Chapter 6		