higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

DATA COMMUNICATION AND NETWORKING
NQF LEVEL 4

27 February 2020

This marking guideline consists of 7 pages.

Copyright reserved

SECTION A

QUESTION 1

1.1	1.1.1	C		
	1.1.2	C		
	1.1.3	B		
	1.1.4	A		
	1.1.5	A		
	1.1.6	A		
	1.1.7	B		
	1.1.8	A		
	1.1.9	B		
	1.1.10	A		
			(10 × 1)	(10)

1.2	1.2.1	E		
	1.2.2	K		
	1.2.3	A		
	1.2.4	B		
	1.2.5	C		
	1.2.6	D		
	1.2.7	F		
	1.2.8	J		
	1.2.9	G		
	1.2.10	I		
			(10 × 1)	(10)

1.3	1.3.1	plug-and-play		
	1.3.2	modem		
	1.3.3	guest		
	1.3.4	print		
	1.3.5	client/server		
	1.3.6	connectionless		
	1.3.7	session		
	1.3.8	network baseline/baseline		
	1.3.9	data security		
	1.3.10	contingency plan		
			(10 × 1)	(10)

Copyright reserved

1.4 1.4.1 True
1.4.2 False
1.4.3 False
1.4.4 True
1.4.5 True
1.4.6 True
1.4.7 True
1.4.8 False
1.4.9 False
1.4.10 True

(10 × 1) (10)
[40]

TOTAL SECTION A: 40

SECTION B

QUESTION 2

2.1 **(A)** – Token passing
(B) – Star OR bus
(C) – Coaxial OR Twisted-pair OR fibre-optic
(D) – CSMA
(E) – Star OR bus
(F) – Twisted-pair OR fibre-optic
(G) – Token passing
(H) – Ring
(I) – Token passing
(J) – Twisted-pair OR fibre-optic

(10 × 1) (10)

2.2
- Layer 1 – physical
- Layer 2 – data link
- Layer 3 – network
- Layer 4 – transport
- Layer 5 – session
- Layer 6 – presentation
- Layer 7 – application (7 × 1)

ONE mark if listed in the correct order (1 × 1) (8)
[18]

Copyright reserved

QUESTION 3

3.1.1
- FIGURE 1: time division multiplexing
- FIGURE 2: frequency division multiplexing (2)

3.1.2 Time division multiplexing transmits a signal over a single communication channel by dividing the time frame into slots✓ – one slot for each message signal✓ whereas frequency division multiplexing (FDM) allows multiple users to share a single communication channel by allocating a discrete frequency for each data stream✓ and then combing many modulated signals for transmission. ✓ (4)

3.1.3 FDM/frequency division multiplexing✓
FDM signal is inherently an analogue waveform which must be transmitted over an analogue channel like analogue telephone.✓ (2)

3.2 The network layer is responsible for creating channels that carry data packets from one computer to another computer✓. The functions of this layer include:
- Routing, that is, finding the fastest, shortest path to deliver data.✓
- Sending the data packets to the physical media.✓
- Receiving segments or data from the transport layer. ✓
- Addressing the packet, that is giving the correct source✓ and destination✓ addresses.
- Checking and correcting errors✓.
- Sending the data packets in the correct order✓.

(8)
[16]

QUESTION 4

4.1
- Keep users informed of what is happening as far as possible.
- Obtain a diagram of existing cabling.
- Test components as early in the installation as possible.
- Do not continue to the next step in the installation until it is confirmed that the previous step was successful.
- Detailed records of the exact type of cable and connectors, and all network components must be maintained.
- Record where each component is installed, factory settings and current configuration.
- All hardware to be used on the network should be run for an extended time before installation.
- Hardware must be checked very carefully after installation.
- Test application software first on a non-network computer to ensure it works.
- Install applications on the network and test each one carefully.
- Keep a complete list of all application software on the network.
- Back-up all computers before adding them to a network.
- Keep all manufacturer documentation in a safe place.

(Any relevant 10 × 1) (10)

Copyright reserved

4.2
- Power off the DSL modem or unplug the cable from the Internet service provider before connecting any equipment.
- Plug an Ethernet cable into the router's WAN port and then plug the other end into the modem.
- Plug one end of another Ethernet cable into the router's LAN port and the other end into the laptop's Ethernet port.
- Power up the modem, router and computer.
- Go to the management webpage of the router. Open a browser and type in the IP address of the router. Add WPA2 security.
- Change the wireless network name (SSID) to make it easy to identify your network.
- Save the configuration settings on the router and if need be, unplug the cable connecting the computer to the router. Plug in a wireless adapter card on both the PC and laptop if they are not installed with one already.
- Find the new network you set up.
- Connect the PC and the laptop to the new wireless network. (Any 8 × 1) (8)

[18]

QUESTION 5

5.1
- Load testing✓ – checks the application's ability to perform under anticipated user loads.✓
- Stress testing✓ – involves testing an application under extreme workloads to see how it handles high traffic or data processing.✓
- Endurance testing✓ – done to make sure the software can handle the expected load over a long period of time.✓
- Spike testing✓ – tests the software's reaction to sudden large spikes in the load generated by users.✓
- Volume testing✓ – large number of data is populated in database and the overall software system's behavior is monitored.✓
- Scalability testing✓ – testing to determine the software application's effectiveness in 'scaling up' to support an increase in user load.✓

(Any 4× 2) (8)

5.2 A stand-alone application helps the user to perform a specific task.✓ It requests services from the operating system✓ so that it can perform the task and it is installed on a single computer for the use of a single user.✓ A networked application runs on a network.✓ It uses the network resources✓ and can be used by many users at their own computers.✓ (6)

5.3 Many organisations now have employees working in remote locations thereby increasing the number of mobile devices accessing their networks resulting in increased security risks.✓ It is important to have tools that provide access control and security. A NAC system provides security and access to a company's network.✓ (2)
[16]

QUESTION 6

6.1 6.1.1 Backing up of data✓ and restoring the PC.✓ (2)

6.1.2
- This will open a series of pages. The first page is 'Select where you want to save your backup'.✓ This is where you'll tell the computer where to send copies of all your files and programs/applications. You're given a number of choices, depending on which back-up method you have set up, that is DVD in the DVD drive; or external hard drive. Click on the option that suits you and then click Next.✓
- Here you are able to choose what Windows recommends or only those items you want to copy.✓ Choose an option and then click Next.✓
- You can now set up a schedule for regular back-ups.✓ You are able to set your own time frames for these backups.✓ (6)

6.2
- Network documentation policy
- Network topology diagram
- Server names, roles and IP addresses
- Changing log for each server
- Software versions and proof of licenses
- Hardware components
- Active directory
- Backup procedures
- Labels of everything
- Evaluation of documentation (Any 2 × 1) (2)

6.3
- Configuration errors
- Server hardware problems
- Problems with other network devices
- Media problems
- User errors
- Network congestion (6)
[16]

QUESTION 7

7.1
- Save all information.
- Close all applications.
- Shutdown all workstations using the operating system shutdown procedure.
- Switch off all workstations.
- Switch off all network printers.
- Save information in the applications that are running on the servers.
- Close the applications that are running on the server.
- Shut down all servers.
- Switch off all servers. (9)

7.2
- Network maintenance
- Monitoring
- Installation of applications
- Security
- Updating network software
- Hardware maintenance
- Troubleshooting
- Supporting users (Any 5 × 1) (5)

7.3
- Class A: 0.0.0.0 to 127.255.255.255
- Class B: 128.0.0.0 to 191.255.255.255
- Class C: 192.0.0.0 to 223.255.255.255
- Class D: 224.0.0.0 to 239.255.255.255
- Class E: 240.0.0.0 to 255.255.255.255

1 mark for any IP address in the correct range (10)

7.4 This indicates the number of network devices✓ on a route between a sending and a receiving router.✓ (2)
[26]

TOTAL SECTION B: 110
GRAND TOTAL: 150

Copyright reserved