higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

DATA COMMUNICATION AND NETWORKING
NQF LEVEL 4

21 November 2023

This marking guideline consists of 6 pages.

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SECTION A

QUESTION 1

1.1 A
1.2 C
1.3 B
1.4 B
1.5 D
1.6 C
1.7 A
1.8 B
1.9 A
1.10 D

(10 × 1) **[10]**

QUESTION 2

2.1 False
2.2 True
2.3 False
2.4 False
2.5 True

(5 × 1) **[5]**

QUESTION 3

3.1 F
3.2 E
3.3 B
3.4 C
3.5 D

(5 × 1) **[5]**

TOTAL SECTION A: 20

SECTION B

QUESTION 4

4.1 4.1.1 A: Ad-hoc network OR IBSS (independent basic service set)
B: Infrastructure network (2)

4.1.2 An ad-hoc network is also known as an IBSS (independent basic service set) configuration. These WLANs include several PCs/ wireless nodes that communicate directly with one another on a peer-to-peer basis✓ without using an access point (AP)✓ whereas in infrastructure networks, also called an AP topology, wireless devices are connected through an access point (AP).✓ ✓ (2 + 2) (4)

4.2
- Local loops:✓ Local loops are twisted pair cables used to connect a subscriber telephone to the nearest end office or local central office.✓
- Trunks:✓ It is a type of transmission medium used to handle communication between offices. Through multiplexing, trunks can handle hundreds or thousands of connections. Transmission is mainly performed through optical fibres or satellite links.✓
- Switching offices:✓ If there is a permanent physical link between any two subscribers, telephone companies avoids this by using switches that are located in switching offices. A switch is able to connect various loops or trunks and allows a connection between different subscribers.✓

(Any 2 × 2) (4)

4.3 **A – End system (host)**
All layers OR Physical layer to Application layer OR layer 1 to layer 7✓✓

B – Router
Network layer OR layer 3✓✓

C – Hub
Physical layer OR layer 1✓✓

D – Switch
Data link layer OR layer 2 ✓✓ (4 × 2) (8)

4.4 4.4.1 ping
4.4.2 tracert (**NB: DO NOT ACCEPT traceroute**)
4.4.3 ipconfig
(3 × 2) (6)

4.5
- Practice politeness, courtesy and kindness.
- Listen graciously.
- Avoid negativity.
- Talk to people – not about them.
- Do not overcriticise.
- Treat people equally.
- Be emotionally empathetic.
- Value others' opinions. (Any 4 × 1) (4)

[28]

QUESTION 5

5.1
- STEP 1: Use a crimping tool to trim the end of the cable you are terminating to ensure that the ends of the conducting wires are even.✓
- STEP 2: Being careful not to damage the inner conducting wires, strip off approximately one inch of the cable's jacket, using a modular crimping tool or a UTP cable stripper.✓
- STEP 3: Separate the four twisted wire pairs from each other and then unwind each pair so that you end up with eight individual wires. Flatten the wires out as much as possible as they will need to be very straight for proper insertion into the connector.✓
- STEP 4: Holding the cable with the wire ends facing away from you and moving from left to right, arrange the wires in a flat, side-by-side ribbon formation, placing them in the following order: white/orange, solid orange, white/green, solid blue, white/blue, solid green, white/brown, solid brown.✓
- STEP 5: Holding the RJ45 connector so that its pins are facing away from you and the plug-clip side is facing down, carefully insert the flattened, arranged wires into the connector, pushing through until the wire ends emerge from the pins. For strength of connection, also push as much of the cable jacket as possible into the connector.✓
- STEP 6: Check to make sure that the wire ends coming out of the connector's pin side are in the correct order. If not, remove them from the connector, rearrange into proper formation, and reinsert. Remember, once the connector is crimped onto the cable, it is permanent. If you realise that a mistake has been made in wire order after termination, you will have to cut the connector off and start all over again.✓
- STEP 7: Insert the prepared connector/cable assembly into the RJ45 slot in the crimping tool. Firmly squeeze the crimper's handles together until you cannot go any further. Release the handles and repeat this step to ensure a proper crimp.✓

(Correct order of termination✓) (8)

5.2 Connect one end of a straight through cable to the router or modem.✓ Connect the other end to the switch.✓ Connect one end of another cable to a different port on the switch.✓ Connect the other end of this cable to the Ethernet port on the printer.✓ Take another cable and connect to a different port on the switch. Connect the other end of this cable to the Ethernet port on a computer.✓ Repeat until all 10 computers are connected.✓ (6)

5.3
- Check the physical connections:✓ Check that the link light is lit on every computer. Check this light on the computer itself and on the switch or the router the computer is plugged into.✓
- Verify that you can log on:✓ If the physical connections are good, attempt to log on to each of your network computers using a valid domain user account.✓
- Test for connectivity:✓ Use the *ping* command from command prompt to make sure that the computers on the network can communicate with each other.✓ (Any 2 × 2) (4)

5.4
- The application is successfully demonstrated to users.
- The users know how to operate the application.
- The users have documented the instructions on using the application.
- The application is registered with the publisher.
- You have documented the deployment of the application. (5)

5.5
- Think about things that could go wrong when you make network changes
- Predict how the changes will affect users, as well as predict the risks to the organization.
- Determine best time for the changes to happen
- Make sure that users are not making unauthorized changes to the network.
- Monitor and review changes. (Any 3 × 1) (3)

[26]

QUESTION 6

6.1
- It efficiently manages your data and files with proper storage.
- It removes unnecessary files to ensure that you always have storage space for new applications and programs.
- It enhances your system's security by protecting it from malicious virus threats and attacks.
- It easily and quickly locates and accesses your files and folders in the system with the interface customisation feature of utility software.
- It can find your lost files and folders with file recovery software and recover any data loss.
- It enhances your system's performance by creating space and efficiently managing system storage. (Any 4 × 1) (4)

6.2
- Disk defragmentation
- Disk clean-up
- File management
- Compression
- Disk management
- Antivirus
- Firewall (Any 4 × 1) (4)

6.3
- Create virtual local area networks (VLANs):✓ Do this by splitting a physical network into numerous logical networks. This enables a group of devices located on different LAN segments to communicate as if they are on the same segment. This allows the running of multiple networks in one network without rewiring the company.✓
- Provide a different network for guests:✓ Creating guest networks limits the chances of having slow networks and network security risks. This will improve the network performance as office tasks are completed at faster rates without experiencing unnecessary glitches.✓
- Data compression:✓ Compression algorithms can be used to reduce the size of files being transmitted within a network, thereby increasing network speed significantly.✓
- Updates and upgrades:✓ For a network to function optimally, all component software and hardware connected to the network will need to be updated as new updates are rolled out to replace old software with new ones that are compatible with new technologies.✓
- Installing anti-viruses/ security:✓ Viruses can negatively affect the performance of a network; anti-viruses eliminate viruses thereby improving the performance of a network.✓
- Communicate proper network usage:✓ Communicate with users about proper use of the network and which apps/services should not be used on a business network. If there are specific users causing problems, identify them and talk to them directly about their network usage.✓ (Any 4 × 2) (8)

6.4
- Leased line
- Digital subscriber line (DSL)
- Cable Internet OR Cable modem
- Fibre Internet access OR SONET
- Multiprotocol label switching (MPLS)
- Wireless WAN OR 3G/4G/5G OR WiMAX OR Cellular (Any 4 × 1) (4)

6.5
- Proper documentation can save you from time-consuming✓ research to fix recurring problems.✓
- When everything is in place and everybody follows the same processes and procedures,✓ consistency across the network helps to reduce problems and errors.✓
- You will not lose important information✓ when employees leave the company or change departments or positions.✓
- The documentation helps you to quickly troubleshoot your network ✓ and train new employees✓
- It enables knowledge-sharing✓ among employees and there is no single point of failure. ✓ (Any 3 × 2)

(6)
[26]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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