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| Module Code | DWD 501 | Module Title | DWD 501 Computer Systems and Support - 2 |
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# DWD 501 Computer Systems and Support

**Q1. In your own words, briefly describe the purpose of using an OSI reference model [2 Mark] (50-75 words).**

 The Open Systems Interconnection model, or OSI for short, is a model that provides a way for different computers to communicate with each other. It does this through a process that transfers data over a network from one device to another, sending the data through the seven layers of the OSI model, those being, application, presentation, session, transport, network, datalink, and physical.

**Q2. In your own words, briefly describe 2 of the OSI model layers [2 Mark] (50-75 words).**

 Physical Layer.

The Physical layer includes all the physical equipment involved in the data transfer process, including parts like cables and switches. This layer also convers data into bit stream, which is a string of 1’s and 0’s.

Network layer.

The network layer oversees facilitating the process of data transfer between two different networks. It does this by breaking up segments from the transport layer into packets, then reassembling them on the receiving end. The network layer is also in charge of a process named routing, which is the process of finding the best physical path for the data to take to reach its destination.

**Q3. Which device is made to take data packets destined for places outside the local network and move them from point A to point B? [1 Mark]**

1. Switch
2. Router ✔️
3. Modem
4. A and B

**Q4. Which of the following two  protocols are commonly used in email communication? [1 Mark]**

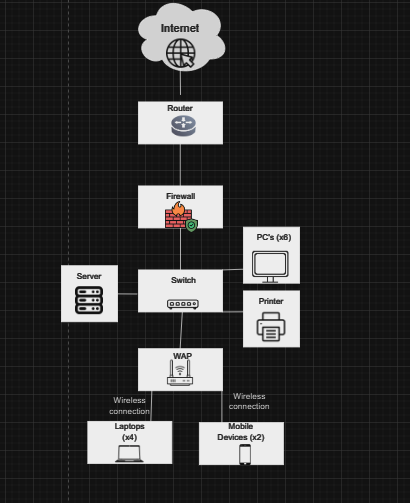
1. FTP
2. POP3  ✔️
3. HTTPS
4. DNS
5. IMAP  ✔️
6. LDAP
7. RIP

**Q5.** Suppose you are a Network Designer, your client a small law firm, ATC Law has requested you to design a local area network, so that every machine can connect with the other computers in the firm locally. They have two departments each with 3 computers, 2 laptops and one mobile device. Both departments share a printer/copier. Your design must include:

1. Inventory List [4 marks]

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| **Hardware** | **Quantity** | **Brief Description of hardware** |
| Devices | 13 total | 3 computers, 2 laptops, 1 mobile device on each department. 1 Printer shared between departments |
| Servers | 1 | CAN (Campus Area network/Corporate Area Network) cover a 1-5km range and allow servers to store and share data between other devices with access. |
| Switches and Routers/Modem | 1 modem, router, and a 6 port switch | Router connects user to the internet, sending packets to the intended user, allowing multiple users to connect to the internet. Switch connects pcs, server, and printer to network. Modem allows allows wireless devices like laptops and mobile devices to connect to the wired network. |
| Cables | N/A | Power cables for the modem router and switch and LAN cables to provide internet. |
| Wireless Access Point | 1 modem, 1 repeater (optional depending on office size) | Modem allows allows wireless devices like laptops and mobile devices to connect to the wired network. Repeater extends internet range if building is large enough that this is needed. |

1. A network diagram, properly connected, that contains all your inventory items. (Use icons to show the components and use captions to label appropriately). You will also need to show how the network connects to the internet. You may use any available drawing tool. [10 marks]



**In your network diagram outline which network architecture and topology, you have used and its advantage? [4 Mark]**

I have used the star topology with the switch as the central hub. I have chosen the star topology because it is reliable, due to the fact that if one cable or device fails, it won’t disrupt and break other devices. It’s also less expensive than other topologies, and easier to install, reducing time and resources in the installation process.

**Section 2 – Hardware and Software troubleshooting** [21 marks]

Suppose you are the Level 1 IT Helpdesk support person for ATC Vision College. You received tickets through IT helpdesk email from staff members complaining about several issues outlined below. State what you think the problem is and what you would do to resolve each problem:

Q6. The person at reception complained that the PC at the reception desk wouldn’t turn on, any indicator lights are not showing and can’t hear any sound such as a cooling fan. [3 marks]

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| First step would be to check the simple things, like if it’s plugged in correctly, if the power switch is on. Then the next step would be to check if all the internal wires are plugged in and working as intended. If all else fails then replacing the power supply would be the next step. |

Q7. The marketing department was given a new PC and they cannot connect to the network. The network has duplicate entries for IP addresses. [3 marks]

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| This issue could be caused by configuration mistakes or router errors. Starting with simple fixes, like resting the router, and the network adapter, would be the first thing to try. If this doesn’t work, checking for corrupt or un updated network drivers may be necessary. Other fixes include manually changing the IP or checking if the device is set to manually be assigned a DHCP (Dynamic Host Configuration Protocol) IP address.  *Reference:* <https://www.netally.com/general/duplicate-ip-address-issue/#:~:text=Here%27s%20how%20you%20can%20resolve,to%20the%20Wi-Fi%20network.> |

Q8. The tutor at the School of Music has an issue with PC a being too slow and running out of memory. [3 marks]

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| The simple option would be to upgrade the PC’s ram, but if this isn’t an option, cutting down on unnecessary background process can help reduce memory use in the short term. |

Q9. The computer at the library encounters a CMOS error. [3marks]

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| A CMOS error is usually caused by information on the CMOS being corrupt, making an error when the computer can’t read information when starting. As with most issues, restarting is the first thing that should be tested. After that updating BIOS update may be the issue, if not this restarting the BIOS should be tested. If all of this fails then the CMOS battery should be replaced, or a professional should be hired.  *Reference:* [https://www.lifewire.com/cmos-checksum-error-what-it-is-and-how-to-fix-it-4689193#:~:text=A%20CMOS%20Checksum%20error%20occurs,can%27t%20store%20information%20anymore.](https://www.lifewire.com/cmos-checksum-error-what-it-is-and-how-to-fix-it-4689193%23:~:text=A%20CMOS%20Checksum%20error%20occurs,can%27t%20store%20information%20anymore.) |

Q10. The Block D users are complaining the internet speed is fluctuating. The campus manager has requested you to recommend one tool/utility to test the connectivity of devices on the network? [3 marks]

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| Many online sources believe ping utility to be the best and most commonly used network testing tool, due to its ability to provide basic connectivity tests between requesting hosts and destination hosts.  Source: <https://hypertecsp.com/knowledge-base/network-troubleshooting-tools-every-it-pro-should-know/> |

Q11. The new tutor at the School of ICT is unable to access the shared printer [3 marks]

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| Starting by checking if the printer is connected to the Wi-Fi, restarting it, checking its cables and restarting is the simple first step that should be taken. If this doesn’t work running the printer troubleshooter should help, otherwise getting professional help may be needed.  Reference <https://www.pcmag.com/how-to/what-to-do-if-windows-cannot-connect-to-the-printer> |

Q12. A new laptop assigned to the CEO was accidentally installed the Microsoft Office 32-bit version instead of a 64-bit version. How would you fix it? [3 marks]

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| The simple fix for this would be to uninstall the incorrect version and install the correct version. If this isn’t an option there is a [tool](https://learn.microsoft.com/en-us/microsoft-365-apps/deploy/change-bitness) online for converting from 32 to 64 bit, however this more complicated then just reinstalling. |