J277/01 Computer Systems – Component 1 exam

	☺	😐	☹	Revision materials created	Exam questions answered
1.1 Architecture of the CPU					
I can explain The purpose of the CPU ○ The Fetch-execute cycle					
I can explain the Common CPU components andtheir features. ○ ALU (Arithmetic Logic Unit) ○ CU (Control Unit) ○ Cache ○ Registers.					
I can explain Von Neumann architecture ○ MAR (Memory Address Register) ○ MDR (Memory Data Register) ○ Program Counter ○ Accumulator					
1.2.1 Primary storage (Memory)					
I can explain:					
The need for primary storage					
The difference between RAM and ROM					
The purpose of ROM in a computer system					
The purpose of RAM in a computer system					
How Virtual memory is used and why					
1.2.2 Secondary storage					
I can explain:					
The need for secondary storage					
Common types of storage: ○ Optical ○ Magnetic ○ Solid state					
Suitable storage devices and storage media for a given application					
The advantages and disadvantages of different storage devicesand storage media relating to these characteristics: ○ Capacity ○ Speed ○ Portability ○ Durability ○ Reliability ○ Cost					
1.2.3 Units					
I can explain the different units of data storage: ○ Bit ○ Nibble (4 bits) ○ Byte (8 bits) ○ Kilobyte (1,000 bytes or 1 KB) ○ Megabyte (1,000 KB) ○ Gigabyte (1,000 MB) ○ Terabyte (1,000 GB) ○ Petabyte (1,000 TB)					
How data needs to be converted into a binary format to be processed by a computer					
Data capacity and calculation of data capacity requirements					
1.2.4 Data Storage					

How to convert positive denary whole numbers to binary numbers(up to and including 8 bits) and vice versa					
How to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur					
How to convert positive denary whole numbers into 2-digit hexadecimal numbers and vice versa					
How to convert binary integers to their hexadecimal equivalentsand vice versa					
Binary shifts					
The use of binary codes to represent characters					
The term 'character set'					
The relationship between the number of bits per character in acharacter set, and the number of characters which can be represented, e.g.: o ASCII o Unicode					
How an image is represented as a series of pixels, represented in binary					
Explain what Metadata is					
The effect of colour depth and resolution on: o The quality of the image o The size of an image file					
How sound can be sampled and stored in digital form					
The effect of sample rate, duration and bit depth on: o The playback quality o The size of a sound file					
1.2.5 Compression					
The need for compression					
Types of compression: o Lossy o Lossless					
1.3.1 Networks and topologies					
Factors that affect the performance of networks					
The hardware needed to connect stand-alone computers into aLocal Area Network: o Wireless access points o Routers o Switches o NIC (Network Interface Controller/Card) o Transmission media					
The Internet as a worldwide collection of computer networks: o DNS (Domain Name Server) o Hosting o The Cloud o Web servers and clients o Star and Mesh network topologies					
1.3.2 Wired and wireless networks, protocols and layers					
Explain the different connection mode: o Wired • Ethernet o Wireless • Wi-Fi • Bluetooth					
Explain what encryption is and why it is used.					
Explain what IP addressing and MAC addressing is and the difference between them both.					
Explain the different common network protocols: o TCP/IP (Transmission Control Protocol/Internet Protocol)					

○ HTTP (Hyper Text Transfer Protocol) ○ HTTPS (Hyper Text Transfer Protocol Secure) ○ FTP (File Transfer Protocol) ○ POP (Post Office Protocol) ○ IMAP (Internet Message Access Protocol) ○ SMTP (Simple Mail Transfer Protocol)					
1.4.2 Identifying and preventingvulnerabilities					
Explain each of the common network prevention methods are and the advantages and disadvantages of each: ○ Penetration testing ○ Anti-malware software ○ Firewalls ○ User access levels ○ Passwords ○ Encryption ○ Physical security					
1.6.1 Ethical, legal, cultural andenvironmental impact					
Explain the Impacts of digital technology on wider society including: ○ Ethical issues ○ Legal issues ○ Cultural issues ○ Environmental issues ○ Privacy issues					
Summarise the different Legislation relevant to Computer Science: ○ The Data Protection Act 2018 ○ Computer Misuse Act 1990 ○ Copyright Designs and Patents Act 1988 ○ Software licences (i.e. open source and proprietary)					