Paper 1 Computer Systems (J277/01)				
1.1 Systems Architecture		🟥	🟨	🟩
1.1.1 Architecture of the CPU	Understand the purpose of the CPU, including the fetch-execute cycle and key components (ALU, CU, cache)			
	Key components: ALU, CU, Cache, Registers			
	Von Neumann architecture: MAR, MDR, Program Counter, Accumulator			
1.1.2 CPU Performance	Explain how CPU performance is affected by clock speed, cache size, and the number of cores			
1.1.3 Embedded Systems	Understand the purpose and characteristics of embedded systems and give examples			
1.2 Memory and Storage		🟥	🟨	🟩
1.2.1 Primary Storage (Memory)	Explain the differences between RAM, ROM			
	Purpose of RAM and ROM			
	Purpose of virtual memory			
1.2.2 Secondary Storage	Compare types of secondary storage (optical, magnetic, solid-state) and assess their advantages/disadvantages			
	Types of storage: Optical, Magnetic, Solid state			
	Suitable storage devices for given situation			
	Advantages/disadvantages of storage devices: Capacity, Speed, Portability, Durability, Reliability, Cost			
1.2.3 Units	Understand units of data storage (bit, byte, KB, MB, GB, etc.) and calculate storage capacity			
1.2.4 Data Storage	Convert between binary, denary, and hexadecimal			
	Binary shifts, Binary addition			
	Use of binary to represent characters			
	ASCII, UNICODE, Character set			
	How images are represented as pixels			
	Effect of colour depth and resolution on file size, image quality			
	How sound is sampled and stored in digital format			
1.2.5 Compression	Why compression is needed and compare lossy vs lossless compression			
1.3 Computer Networks, Connections and Protocols		🟥	🟨	🟩
1.3.1 Networks and Topologies	Explain types of networks (LAN, WAN), and topologies (star, mesh)			

	Factors affecting performance of networks			
	LAN hardware: Wireless access points, routers, switches, Network Interface Cards			
1.3.2 Wired and Wireless Networks	Compare wired (Ethernet) vs wireless (Wi-Fi, Bluetooth) connections, and understand encryption			
1.3.3 Network Protocols and Layers	Explain common protocols (TCP/IP, HTTP, HTTPS, FTP) and the concept of layers			
	Modes of connection: Wired (Ethernet), Wireless (Wi-Fi, Bluetooth)			
	Encryption, IP and Mac addressing			
1.4 Network Security		 	 	
1.4.1 Threats to Computer Systems and Networks	Identify common threats (malware, phishing, brute-force, DoS attacks, SQL injection)			
1.4.2 Identifying and Preventing Vulnerabilities	Explain prevention methods (penetration testing, anti-malware, firewalls, encryption, physical security)			
1.5 Systems Software		 	 	
1.5.1 Operating Systems	Understand the functions of operating systems (memory management, multitasking, user interface, peripheral management & drivers, User and File management.)			
1.5.2 Utility Software	Explain the purpose of utility software (encryption, defragmentation, data compression)			
1.6 Ethical, Legal, Cultural and Environmental Impacts of Digital Technology		 	 	
1.6.1 Ethical, Legal, Cultural and Environmental Issues	Discuss the impact of digital technology on ethical, legal, cultural, environmental, and privacy issues			
	Legislation: Data Protection Act, Computer Misuse Act, Copyright Designs and Patents Act, Software Licences (open source and proprietary)			