

OCR J277 EXAM PAPER 1				Video Links	Notes
Topic					
1.1.1 Architecture of the CPU	the purpose of the CPU	x	x	x	<a href="https://www.youtube.com/watch?v=7Up7DIPkTzo&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa">https://www.youtube.com/watch?v=7Up7DIPkTzo&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa</a>
	o the fetch-execute cycle				
	common CPU components and their function:				<a href="https://www.youtube.com/watch?v=hk9LPXzYeT0&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=2">https://www.youtube.com/watch?v=hk9LPXzYeT0&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=2</a>
	o ALU (Arithmetic Logic Unit)				
	o CU (Control Unit)				
	o Cache				
	o Registers				
	Von Neumann architecture:				<a href="https://www.youtube.com/watch?v=KBmogwVt4Qg&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=3">https://www.youtube.com/watch?v=KBmogwVt4Qg&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=3</a>
	o MAR (Memory Address Register)				
o MDR (Memory Data Register)					
o Program Counter					
o Accumulator					
1.1.2 CPU Performance	How common characteristics of CPUs affect their performance				<a href="https://www.youtube.com/watch?v=pZs_ifoxNLA&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=4">https://www.youtube.com/watch?v=pZs_ifoxNLA&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=4</a>
	o clock speed hz, mhz, ghz				
	o cache				
	o number of cores				
1.1.3 Embeded Systems	o The purpose and characteristics of embedded systems				<a href="https://www.youtube.com/watch?v=WR242Rfnsl0&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=5">https://www.youtube.com/watch?v=WR242Rfnsl0&amp;list=PLCIXwirraUCvYFmgaS_gQ4eKe1GJqJJa&amp;index=5</a>
	o Examples of embedded systems				
1.2.1 Primary storage (Memory)	The need for primary storage				<a href="https://www.youtube.com/watch?v=dhQOkkZxu5w&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM">https://www.youtube.com/watch?v=dhQOkkZxu5w&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM</a>
	The difference between RAM and ROM				
	The purpose of ROM in a computer system				<a href="https://www.youtube.com/watch?v=Q2pzT6oYPWg">https://www.youtube.com/watch?v=Q2pzT6oYPWg</a>
	The purpose of RAM in a computer system				<a href="https://www.youtube.com/watch?v=Q2pzT6oYPWg">https://www.youtube.com/watch?v=Q2pzT6oYPWg</a>
	Virtual Memory				<a href="https://www.youtube.com/watch?v=M31SS70Od08&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=3">https://www.youtube.com/watch?v=M31SS70Od08&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=3</a>
1.2.2 Secondary storage	The need for secondary storage				<a href="https://www.youtube.com/watch?v=FNwA-h_tfp0">https://www.youtube.com/watch?v=FNwA-h_tfp0</a>
	Common types of storage:				<a href="https://www.youtube.com/watch?v=qly_wgo03Oo">https://www.youtube.com/watch?v=qly_wgo03Oo</a>
	o Optical				
	o Magnetic				
	o Solid state				
	Suitable storage devices and storage media for a given application				<a href="https://www.youtube.com/watch?v=xFDwcdap5LA&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=6">https://www.youtube.com/watch?v=xFDwcdap5LA&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=6</a>
	The advantages and disadvantages of different storage devices and storage media relating to these characteristics:				
	o Capacity				<a href="https://www.youtube.com/watch?v=KzgbVfnj7I4&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=7">https://www.youtube.com/watch?v=KzgbVfnj7I4&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=7</a>
	o Speed				
o Portability					
o Durability					
o Reliability					
o Cost					
1.2.3 Units	The units of data storage:				<a href="https://www.youtube.com/watch?v=jBXWZbHPLWI&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=8">https://www.youtube.com/watch?v=jBXWZbHPLWI&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=8</a>
	o Bit				
	o Nibble (4 bits)				
	o Byte (8 bits)				
	o Kilobyte (1000 bytes or 1 KB)				
	o Megabyte (1,000 KB)				
	o Gigabyte (1,000 MB)				
	o Terabyte (1,000 GB)				
o Petabyte (1,000 TB)					
How data needs to be converted into a binary format to be processed by a computer				<a href="https://www.youtube.com/watch?v=T5gliz0Veyl&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=9">https://www.youtube.com/watch?v=T5gliz0Veyl&amp;list=PLCIXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=9</a>	
Data capacity and calculation of data capacity requirements					
<b>Numbers</b>					

1.2.4 Data storage	How to convert positive denary whole numbers to binary numbers (up to and including 8 bits) and vice versa			<a href="https://www.youtube.com/watch?v=pCIUh20mNIA&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=10">https://www.youtube.com/watch?v=pCIUh20mNIA&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=10</a>	
	How to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur			<a href="https://www.youtube.com/watch?v=3K_Nw_pDzUO&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=12">https://www.youtube.com/watch?v=3K_Nw_pDzUO&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=12</a>	
	How to convert positive denary whole numbers into 2-digit hexadecimal numbers and vice versa			<a href="https://www.youtube.com/watch?v=nubr7GxN6TA&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=11">https://www.youtube.com/watch?v=nubr7GxN6TA&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=11</a>	
	How to convert from binary to hexadecimal equivalents and vice versa				
	Binary shifts			<a href="https://www.youtube.com/watch?v=B_3W5C7ppF4&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=13">https://www.youtube.com/watch?v=B_3W5C7ppF4&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=13</a>	
	<b>Characters</b>				
	The use of binary codes to represent characters			<a href="https://www.youtube.com/watch?v=9oYV4JvSsok&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=14">https://www.youtube.com/watch?v=9oYV4JvSsok&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=14</a>	
	The term 'character-set'				
	The relationship between the number of bits per character in a character set, and the number of characters which can be represented, e.g.:				
	o ASCII - 8 Bits (256 characters)				
	o Unicode				
	<b>Images</b>				
	How an image is represented as a series of pixels, represented in binary			<a href="https://www.youtube.com/watch?v=6EfxuAOKZKc&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=15">https://www.youtube.com/watch?v=6EfxuAOKZKc&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=15</a>	
	Metadata				
	The effect of colour depth and resolution on:				
	o The quality of the image				
	o The size of an image file				
<b>Sound</b>					
How sound can be sampled and stored in digital form			<a href="https://www.youtube.com/watch?v=Ed7AFazB8PM&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=16">https://www.youtube.com/watch?v=Ed7AFazB8PM&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=16</a>		
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			<a href="https://www.youtube.com/watch?v=kOFA8FPL5kE&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=17">https://www.youtube.com/watch?v=kOFA8FPL5kE&amp;list=PLCIOXwirraUCaJP5LxCsFXWgX1_S-lIGM&amp;index=17</a>	
	Types of compression:				
	o Lossy				
	o Lossless				
1.3.1 Networks & Topologies	Types of Network			<a href="https://www.youtube.com/watch?v=KeN3H8_Jhbc&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-">https://www.youtube.com/watch?v=KeN3H8_Jhbc&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-</a>	
	Lan (Local Area Network)				
	Wan (Wide Area Network)				
	Factors that affect the performance of networks			<a href="https://www.youtube.com/watch?v=E_9mlCpmnuk&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=3">https://www.youtube.com/watch?v=E_9mlCpmnuk&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=3</a>	
	The hardware needed to connect stand-alone computers into a Local 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:			<a href="https://www.youtube.com/watch?v=u0uPibv0J0w&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=4">https://www.youtube.com/watch?v=u0uPibv0J0w&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=4</a>	
o DNS (Domain Name Server)					
o Hosting					
o The Cloud					
o Webservers and Clients					
Star and Mesh network topologies			<a href="https://www.youtube.com/watch?v=PR51lu3DC88&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=5">https://www.youtube.com/watch?v=PR51lu3DC88&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=5</a>		
	Modes of connection:			<a href="https://www.youtube.com/watch?v=MeKlIP5f-R8&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=6">https://www.youtube.com/watch?v=MeKlIP5f-R8&amp;list=PLCIOXwirraUBnOLZCixrLTSulfvYeWj-&amp;index=6</a>	
	o Wired				
	• Ethernet				
	o Wireless				
	• Wi-Fi				
• Bluetooth					

1.3.2 Wired and wireless networks, protocols and layers	Encryption				<a href="https://www.youtube.com/watch?v=pe6WbfI9qt4&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=7">https://www.youtube.com/watch?v=pe6WbfI9qt4&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=7</a>	
	IP addressing and MAC addressing				<a href="https://www.youtube.com/watch?v=p9D0Ca3VNpM&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=8">https://www.youtube.com/watch?v=p9D0Ca3VNpM&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=8</a>	
	Standards				<a href="https://www.youtube.com/watch?v=xwKbxDs7aY&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=9">https://www.youtube.com/watch?v=xwKbxDs7aY&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=9</a>	
	Common protocols including:				<a href="https://www.youtube.com/watch?v=ncGIs1Wnxn8&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=10">https://www.youtube.com/watch?v=ncGIs1Wnxn8&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=10</a>	
	o TCP/IP (Transmission Control Protocol/Internet Protocol)					
	o HTTP (Hyper Text Transfer Protocol)					
	o HTTPS (Hyper Text Transfer Protocol Secure)					
	o FTP (File Transfer Protocol)					
	o POP (Post Office Protocol)					
	o IMAP (Internet Message Access Protocol)					
o SMTP (Simple Mail Transfer Protocol)						
					<a href="https://www.youtube.com/watch?v=S6Kwx5ZJpxg&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=11">https://www.youtube.com/watch?v=S6Kwx5ZJpxg&amp;list=PLCIOXwirraUBnOLZCixrLTSulfgvYeWj-&amp;index=11</a>	
1.4.1 Threats to computer systems and networks	Forms of attack				<a href="https://www.youtube.com/watch?v=4f05t8ppJfk&amp;list=PLCIOXwirraUC2Af_tINOVMbc35YcrudcP&amp;index=2">https://www.youtube.com/watch?v=4f05t8ppJfk&amp;list=PLCIOXwirraUC2Af_tINOVMbc35YcrudcP&amp;index=2</a>	
	o Malware					
	o Social engineering, e.g. phishing, people as the 'weak point'					
	o Brute-force attacks					
	o Denial of service attacks					
	o Data interception and theft					
1.4.2 Identifying and preventing vulnerabilities	Common prevention methods:				<a href="https://www.youtube.com/watch?v=XJEJQN-CEDk&amp;list=PLCIOXwirraUC2Af_tINOVMbc35YcrudcP&amp;index=3">https://www.youtube.com/watch?v=XJEJQN-CEDk&amp;list=PLCIOXwirraUC2Af_tINOVMbc35YcrudcP&amp;index=3</a>	
	o Penetration Testing					
	o Anti-malware software					
	o Firewalls					
	o User access levels					
	o Passwords					
	o Encryption					
o Physical Security						