

Year 12 Summer work

Computer Science



HAZELEY 6TH FORM

CHARACTER, CONFIDENCE & CREATIVITY

Deadline: Friday 11th
September 2020
Hazeley Academy

Computer Science

OCR AS Year 12 Computer Science (H046)

Component 1, Section 1: The characteristics of contemporary processors, input, output and storage devices.

Objectives:

- Develop an understanding of the structure and functions of the processor
- Identify the differences between different types of processors
- Discuss the features of input, output and storage devices
- Develop a basic understanding of the Eclipse IDE

Tasks:

Produce a technical presentation that covers the specification points outlined below. Support notes (a script) must be developed to support the information on each slide; this should prevent too much information appearing on each slide. The script must be written in the speaker notes at the bottom of the PowerPoint. The notes must not be longer than a paragraph of 4 to 5 sentences for each slide. Use appropriate diagrams where possible to assist explanations. Your presentation must cover the following:

1.1 The characteristics of contemporary processors, input, output and storage devices	
Components of a computer and their uses	
1.1.1 Structure and function of the processor	<p>(a) The Arithmetic and Logic Unit; ALU, Control Unit and Registers (Program Counter; PC, Accumulator; ACC, Memory Address Register; MAR, Memory Data Register; MDR, Current Instruction Register; CIR). Buses: data, address and control: how this relates to assembly language programs.</p> <p>(b) The fetch-decode-execute cycle, including its effect on registers.</p> <p>(c) The factors affecting the performance of the CPU, clock speed, number of cores, cache.</p> <p>(d) Von Neumann, Harvard and contemporary processor architecture.</p>
1.1.2 Types of processor	<p>(a) The differences between and uses of CISC and RISC processors.</p> <p>(b) Multicore and Parallel systems.</p>
1.1.3 Input, output and storage	<p>(a) How different input, output and storage devices can be applied to the solution of different problems.</p> <p>(b) The uses of magnetic, flash and optical storage devices.</p> <p>(c) RAM and ROM.</p> <p>(d) Virtual storage.</p>

1.1.4 Eclipse IDE (2 hours)

- Install Eclipse on home computer and gain basic understanding
- Install Pydev module inside Eclipse
- Develop a basic Python Module inside Eclipse

It is expected that these activities should take approximately 7 hours to complete the technical presentation using the resources provided. Section 1 covers 20% of the theory requirements for component 1, equivalent to 10% of the total AS qualification and forms an essential part of understanding core hardware principles.

3b. Assessment objectives (AO)

There are three assessment objectives for OCR's AS Level in Computer Science and these are detailed in the table below.

Learners are expected to demonstrate their ability to:

	Assessment Objective
AO1	Demonstrate knowledge and understanding of the principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
AO2	Apply knowledge and understanding of the principles and concepts of computer science, including to analyse problems in computational terms.
AO3	Design, program and evaluate computer systems that solve problems, making reasoned judgements about these and presenting conclusions.

AO weightings in AS Level in Computer Science

The relationship between the assessment objectives and the components are shown in the following table:

Component	% of AS Level Computer Science (H046)			
	AO1	AO2	AO3	Total
Computing principles (H046/01)	19*	16*	15*	50
Algorithms and problem solving (H046/02)	17*	19*	14*	50
Total	36*	35*	29*	100

* values rounded to nearest whole %.

Summer Homework - Assessment criteria:

The summer homework will be based on the presentation completed and delivered to the class and the answers given to questions arising from members of the audience.

The summer homework will contribute towards your PR1. The marks for this PowerPoint will awarded as follows:

Criteria	D or Below (0 – 2)	C (3 – 5)	B (6 – 8)	A – A* (9 – 10)
1.1.1 Structure and function of the processor	Basic explanation provided of specification points on the PowerPoint slides. 1.1.1 - (a, b, c & d) Very limited or no explanation in the script. Impacting delivery of the presentation.	Secure explanation provided of specification points on the PowerPoint slides. However, with some inaccuracies. 1.1.1 - (a, b, c & d) Some explanation in the script.	In depth explanation provided of specification points on the PowerPoint slides. With relevant examples. With very few mistakes. 1.1.1 - (a, b, c & d) Good explanation in the script.	An accurate an in-depth explanation provided of specification points on the PowerPoint slides. With relevant examples using diagrams and annotation of key components. With very limited or no mistakes. 1.1.1 - (a, b, c & d) Concise explanation in the script. Also, a very confident delivery of the presentation.
Score for 1.1.1				

Criteria	D or Below (0 – 2)	C (3 – 5)	B (6 – 8)	A – A* (9 – 10)
1.1.2 Types of processor	Basic explanation provided of specification points on the PowerPoint slides. 1.1.2 – (a & b) Very limited or no explanation in the script. Impacting delivery of the presentation.	Secure explanation provided of specification points on the PowerPoint slides. However, with some inaccuracies. 1.1.2 – (a & b) Some explanation in the script.	In depth explanation provided of specification points on the PowerPoint slides. With relevant examples. With very few mistakes. 1.1.2 – (a & b) Good explanation in the script.	An accurate an in-depth explanation provided of specification points on the PowerPoint slides. With relevant examples using diagrams and annotation of key components. With very limited or no mistakes. 1.1.2 - (a & b) Concise explanation in the script. Also, a very confident delivery of the presentation.
Score for 1.1.2				
Criteria	D or Below (0 – 2)	C (3 – 5)	B (6 – 8)	A – A* (9 – 10)
1.1.3 Input, output and storage	Basic explanation provided of specification points on the PowerPoint slides. 1.1.3 – (a, b, c & d) Very limited or no explanation in the script. Impacting delivery of the presentation.	Secure explanation provided of specification points on the PowerPoint slides. However, with some inaccuracies. 1.1.3 – (a, b, c & d) Some explanation in the script.	In depth explanation provided of specification points on the PowerPoint slides. With relevant examples. With very few mistakes. 1.1.3 – (a, b, c & d) Good explanation in the script.	An accurate an in-depth explanation provided of specification points on the PowerPoint slides. With relevant examples using diagrams and annotation of key components. With very limited or no mistakes. 1.1.3 - (a, b, c & d) Concise explanation in the script. Also, a very confident delivery of the presentation.
Score for 1.1.3				
			1.1.1	
			1.1.2	
			1.1.3	
			Total score	/ 30

Grade Boundaries:




%	Mark	Grade
90% and above	27	A*
80%	24	A
70%	21	B
60%	18	C
50%	15	D
40%	12	E
Below 40%	11 and below	U

PLC:

The tasks set are directly link to Component 1 Section 1: The characteristics of contemporary processors, input, output and storage devices PLC. You should use this alongside the development of the presentation.

OCR GCE Computer Science

Component 01 – Computing Principles

Aims				My SMART target to improve my knowledge is.....
Section 1 – The characteristics of contemporary processors, input, output and storage devices				
1.1.1 Structure and function of the processor				
The Arithmetic and Logic Unit (ALU), Control Unit and registers: Program Counter (PC), Accumulator (ACC), Memory Address Register (MAR), Memory Data Register (MDR), Current Instruction Register (CIR).				
Buses: data, address and control: How this relates to assembly language programs.				
The fetch-decode- execute cycle, including its effect on registers.				
The factors affecting the performance of the CPU, clock speed, number of cores, cache.				
Von Neumann, Harvard and contemporary processor architecture.				

Resources/Research:

Develop coding skills in Language of your choice: <https://www.codecademy.com/>

Develop Python coding skills using: <https://snakify.org/en/>

Wider Reading:

OCR AS Specification: <http://www.ocr.org.uk/Images/170845-specification-accredited-as-level-gce-computer-science-h046.pdf>

Algorithms: http://www.asiplease.net/computing/alevel/extended_reading.html

Computer Science Unplugged: <http://csunplugged.org/activities/>

Isaac Computer Science Portal: <https://isaacomputerscience.org/>

Please read theory notes on Teach ICT – <http://teach-ict.com/>

An extensive website has been constructed to support your learning without the need to purchase the exam board official textbook: <https://sites.google.com/a/thehazeleyacademy.com/ict-computer-science/>

Copy and pasting is not permitted, you need to demonstrate your own understanding. This will only be accessible for returning students as you MAY require a Hazeley Login.

Online courses:

<https://www.futurelearn.com/courses/an-introduction-to-physical-computing>

<https://www.futurelearn.com/courses/artificial-intelligence-technology-application>

Submission Date: All work must be submitted by Friday 11th September 2020.