

PAPUR ARHOLIAD / EXAMINATION PAPER

LLEOLIAD / LOCATION:	ABERTAWE / SWANSEA
CYFNOD ARHOLIADAU / EXAMINATION PERIOD:	MAI / MAY
LEFEL / LEVEL:	4

MODIWL / MODULE: ACCA4022 COMPUTER ARCHITECTURE (MOCK EXAM)

AMSER / TIME:	2 HOURS
CYFARWYDDIADAU / INSTRUCTIONS:	ANSWER <u>ALL</u> QUESTIONS

Adnoddau neu ddefnyddiau sydd eu hangen / Equipment or materials required:
Dewiswch o'r canlynol os gwelwch yn dda / Please select from the following:

Cyfrifiannell / Calculator ☒

Llyfr Agored / Open Book ☐

Llyfr Fformiwla / Formula Book ☐

Arall nodwch os gwelwch yn dda / Other please specify

Show all your calculations in your exam book

Marks add up to 100

The assessment constitutes 50% of the overall module and all the Comp. Arch. aspect

Office Use Only:			
Author:		Semester:	
Internal Verifier:		R Y/N?	Yes / No (Please delete as applicable)
Contribution to Overall Module Assessment (%):			

ANSWER ALL QUESTIONS

1. Question One (35 marks)

Attempt all the following. You must show all working clearly. Marks will be awarded for the method as well as final answer. **Basic calculators** may be used.

- a) Convert the following decimal numbers to Binary: (3 marks each = 6 marks)

- i. 189
- ii. 720

- b) Convert the following binary numbers to base 10 (3 marks each = 6 marks)

- i. 11011010
- ii. 101101001

- c) Convert the following binary numbers to Hex numbers (3 marks each = 6 marks)

- i. 101111010101
- ii. 110010111001

- d) Convert the following hexadecimal numbers to binary: (2 marks each = 4 marks)

- i. A9
- ii. 3F

- e) Convert the following Hex numbers to decimal (3 marks each = 6 marks)

- i. B4
- ii. 7A

- f) How many different/unique values can be represented by a 6-bit number? (3 marks)

- g) A 50 MB file is downloaded using a 100 Mb/s connection. Calculate the approximate download time. (4 marks)

2. Question TWO (25 Marks)

- a) Draw and clearly label ONE of the following architectures:
Von Neumann Architecture
OR
Harvard Architecture.
Ensure all relevant components are properly identified. (12 marks)
- b) In the context of a CPU, explain what is meant by cache memory and registers. Briefly describe how cache and registers support and enhance CPU operation. (13 marks)

3. Question Three (25 Marks)

- a) Define primary memory and distinguish between RAM and ROM (2 differences). (5 marks)
- b) For RAID 0, RAID 1, and RAID 10, state two key characteristics of each (6 marks)
- c) With diagrams, describe how data is organised in: (8 marks)
- RAID 0
 - RAID 1
 - RAID 10
- d) For each RAID level, state: (6 marks)
- one advantage
 - one disadvantage.

Question Four (15 Marks)

- (a) Draw a clearly labelled Fetch–Execute Cycle diagram. (6 marks)
- (b) Describe the stages of the instruction cycle and explain the role of :(9 marks)
- Program Counter (PC)
 - Memory Address Register (MAR)
 - Memory Data Register (MDR)
 - Instruction Register (IR)

Diwedd / End