MODULE A SYSTEMS ARCHITECTURE · A4

The fetch-decode-execute (FDE) cycle

Original practice questions · ~25 minutes · 20 marks · Cambridge 0478 syllabus 3.1.2(b)

Name _____ Date _____

Instructions. Answer all questions in the spaces provided. The marks for each part are shown in brackets [ ]. The total for this worksheet is **20 marks**.

1

Total: 2 marks

(a) State the name of the register that holds the instruction that is currently being decoded and executed. **[1]**

(b) Tick (✓) **one** box to show which bus carries an address from the CPU to memory. **[1]**

Bus	Tick (✓)
Address bus	
Control bus	
Data bus	

2

Total: 6 marks

The paragraph describes the fetch stage of the FDE cycle.

(a) Complete the paragraph using terms from the list. Not all terms are used. **[6]**

accumulator · address bus · ALU · CIR · control bus · data bus · MAR · MDR · program counter (PC) · secondary storage

The address of the next instruction is held in the _____. This address is copied into the _____. The address is sent to RAM along the _____. The instruction stored at that address is sent back to the CPU along the _____ and is stored in the _____. The instruction is then copied into the _____, and the PC is incremented.

3 **Total: 4 marks**

(a) Tick (✓) **one** box in each row to show whether the register stores an **address** or **data / an instruction**. **[4]**

Register	Address	Data / instruction
Program counter (PC)		
Memory address register (MAR)		
Current instruction register (CIR)		
Accumulator (ACC)		

4 **Total: 5 marks**

A ticket barrier at a train station has a CPU that runs a program to check tickets. At the start of a cycle, the program counter (PC) holds 150.

(a) State the value held in the PC after the instruction at address 150 has been fetched. **[1]**

(b) The instruction at address 150 is: *load the value stored at address 300 into the accumulator*. Describe how this instruction is executed. Include the registers and buses that are used. **[4]**

5 **Total: 3 marks**

(a) Explain the role of the control unit (CU) in the FDE cycle. **[3]**

Total for this worksheet: 20 marks