

NAME:..... DATE:.....

PTES 9618 Computer Science Worksheet

VON NEUMANN ARCHITECTURE

Source: 9618_w24_qp_33.pdf (Page 3)

2 Reduced Instruction Set Computers (RISC) is a type of processor.

Identify **four** features of a RISC processor.

1

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2

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3

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4

.....

[4]

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8 Complex Instruction Set Computer (CISC) is a type of processor.

Identify **four** features of a CISC processor.

1

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2

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3

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[4]

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11 Reduced Instruction Set Computers (RISC) and Complex Instruction Set Computers (CISC) are two types of processor.

(a) State **two** features of RISC processors.

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..... [2]

(b) Outline the process of interrupt handling as it could be applied to RISC or CISC processors.

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..... [3]

(c) Explain how pipelining affects interrupt handling for RISC processors.

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..... [3]

- 5 There are four basic categories of computer architecture. Single Instruction Single Data (SISD) is one architecture.

Identify the **three other** categories of computer architecture.

Describe each category that you identify.

Architecture 1

Description

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Architecture 2

Description

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Architecture 3

Description

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[6]

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- 4 (a) Describe the characteristics of massively parallel computers.

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..... [3]

- (b) State **one** difference and **one** similarity between the SIMD and MISD computer architectures.

difference

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.....

similarity

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..... [2]

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- 10 Describe the features of the SIMD and MISD computer architectures.

SIMD

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MISD

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..... [4]

(i) Describe the role of the registers in the Fetch-Execute (F-E) cycle.

[5]

Detected

Handled

[5]

[5]

(a) Describe the purpose of the Status Register (SR).

..... [2]

[2]

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- (b) Identify **two** differences between general purpose registers and special purpose registers.

1

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2

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[2]

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- 5 The Central Processing Unit (CPU) of the basic Von Neumann model for a computer system contains several special purpose registers.

- (a) The Memory Data Register (MDR), Index Register (IX) and the Accumulator (ACC) are examples of special purpose registers.

Identify **two other** special purpose registers **and** state their role in the CPU.

Special purpose register 1

Role

.....

.....

Special purpose register 2

Role

.....

.....

[4]

- (b) Describe what is meant by the **Immediate Access Store (IAS)** in a computer system.

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..... [2]

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- 5 (a) State what is meant by the **stored program concept** in the Von Neumann model of a computer system.

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 [1]

- (b) A Central Processing Unit (CPU) contains several special purpose registers and other components.

- (i) State the role of the following registers.

Program Counter (PC)

Index Register (IX)

Status Register (SR)

[3]

- (ii) Tick (✓) **one** box in each row to identify the system bus used by each CPU component.

CPU component	Data bus	Address bus	Control bus
System clock			
Memory Address Register (MAR)			

[1]

- (iii) Describe the purpose of the Control Unit (CU) in a CPU.

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 [2]