

BRAC UNIVERSITY
Department of Computer Science and Engineering

CSE 340: Computer Architecture
Quiz Time: 45 minutes Marks: 15

Name:

ID:

Section:

1. Suppose gaming consoles PS5 and Xbox S use different implementations of AMD's Zen 2 architecture. Suppose, the instructions they support can be divided into three classes according to their CPI (class A, B, C,). [7.5]

Consoles	Clock Rate	CPI of Different Instruction Types		
		A	B	C
PS 5	2.8 GHz	1	2	3
Xbox S	3.0 GHz	5	4	2

Now suppose, a program has an instruction count of 1.5×10^6 and the instructions are divided into classes as follows: 30% class A, 40% class B, 30% class C.
What is the difference between the average CPI of these two consoles in milliseconds?

Answer:

instruction count = 1.5×10^6

A = $1.5 \times 10^6 \times 30\% = 450000$

B = $1.5 \times 10^6 \times 40\% = 600000$

C = $1.5 \times 10^6 \times 30\% = 450000$

Average CPI of PS5 = $(450000 \times 1) + (600000 \times 2) + (450000 \times 3) / 2.8 \times 10^6$
= 0.00107

Average CPI of Xbox = $(450000 \times 5) + (600000 \times 4) + (450000 \times 2) / 3 \times 10^9 = 0.00185$

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Difference between average CPI of PS5 and Xbox = $(0.00185 - 0.00107)$
= 0.00078
(ANS)

2. Draw a PLA circuit for the given expressions.

[7.5]

1. $Y1 = ABC'D + ABCD + AB'C'D'$
2. $Y2 = ABCD + A'B'C'D' + A'B'CD'$

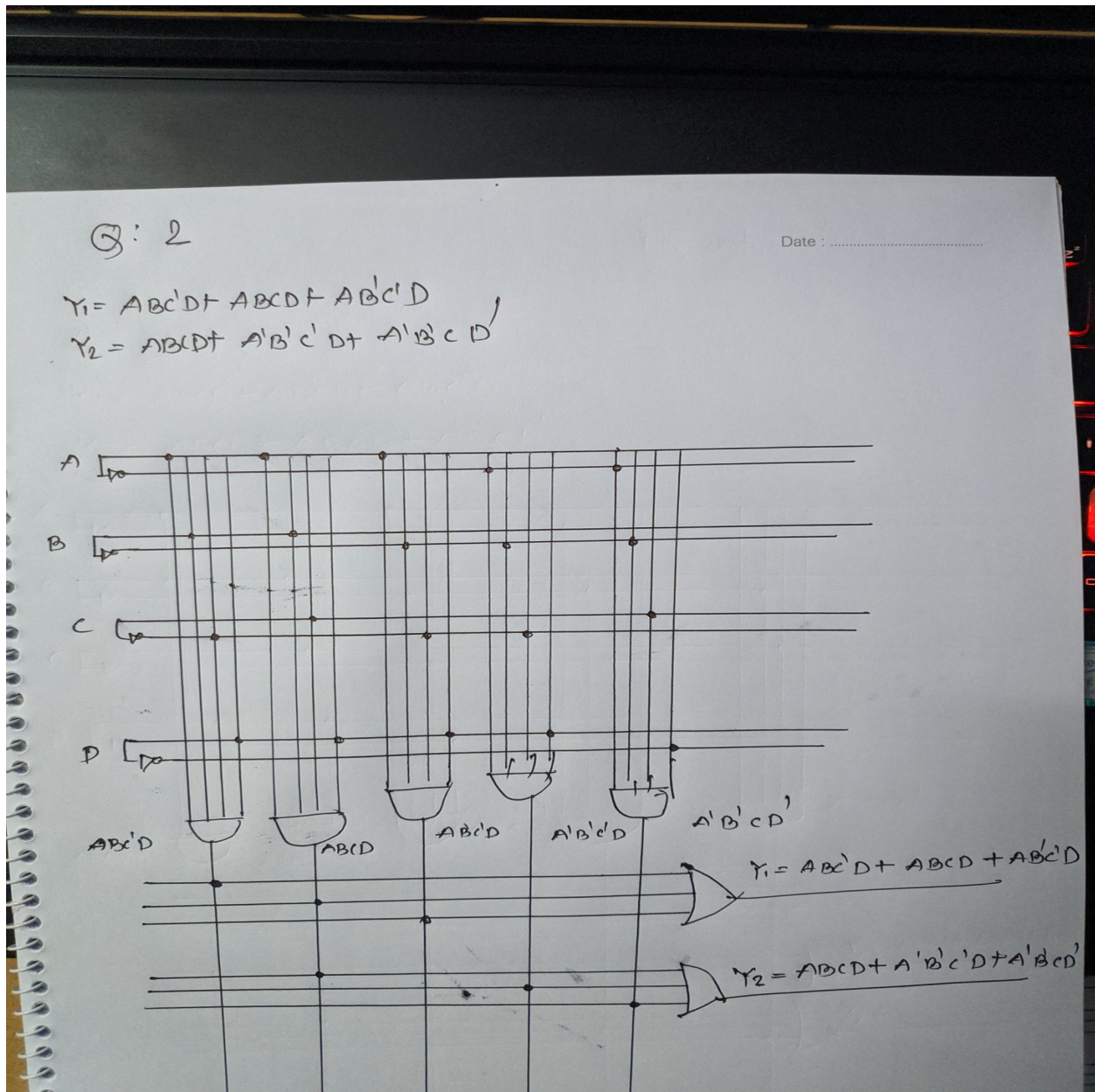
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