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∗106 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\*10^6 \* 30% = 450000  
B= 1.5\*10^6 \* 40% = 600000

C= 1.5\*10^6 \* 30% = 450000

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

= 0.00107

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

Difference between average CPI of PS5 and Xbox = (0.00185 – 0.00107)

= 0.00078

(ANS)

1. **Draw a PLA circuit for the given expressions. [7.5]**
2. Y1 = ABC’D + ABCD + AB’C’D’
3. Y2 = ABCD + A’B’C’D’ + A’B’CD’

