**Question 1**

in binary

,

Representation of A

23 bits

|  |  |  |  |
| --- | --- | --- | --- |
| A= | 0 | 10000010 | 111010…0 |

in binary

,

Representation of B

23 bits

|  |  |  |  |
| --- | --- | --- | --- |
| B= | 0 |  | 000000…0 |

Comparison of exponents:

Difference of exponents:

shift smaller operand by to the right

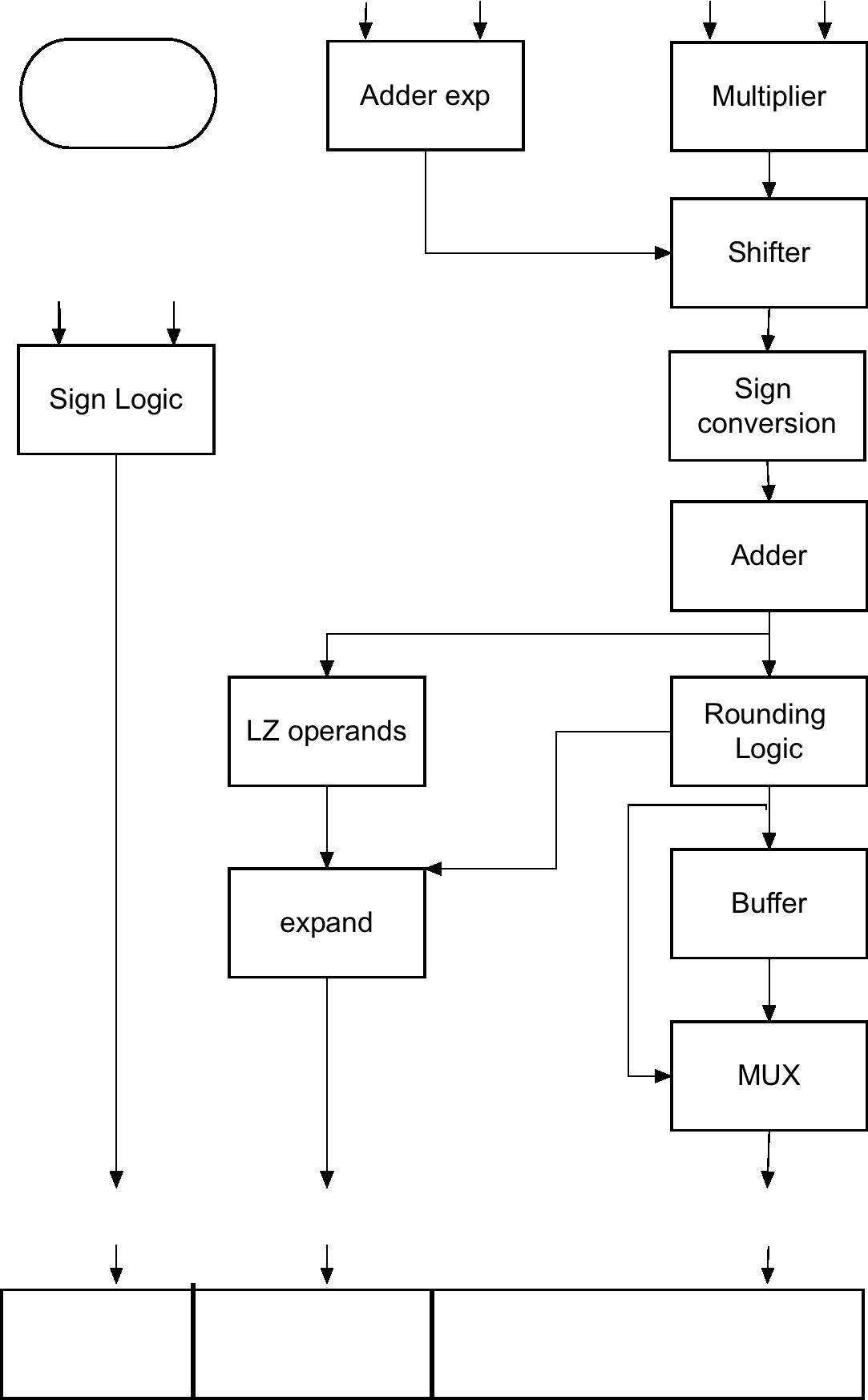
Now A

Normalization not required Subtraction

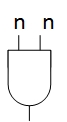
Rounding not required

|  |  |  |
| --- | --- | --- |
| 0 | 10000010 | 11100000…0 |

23 bits



**Question 2**

Use  to produce partial products

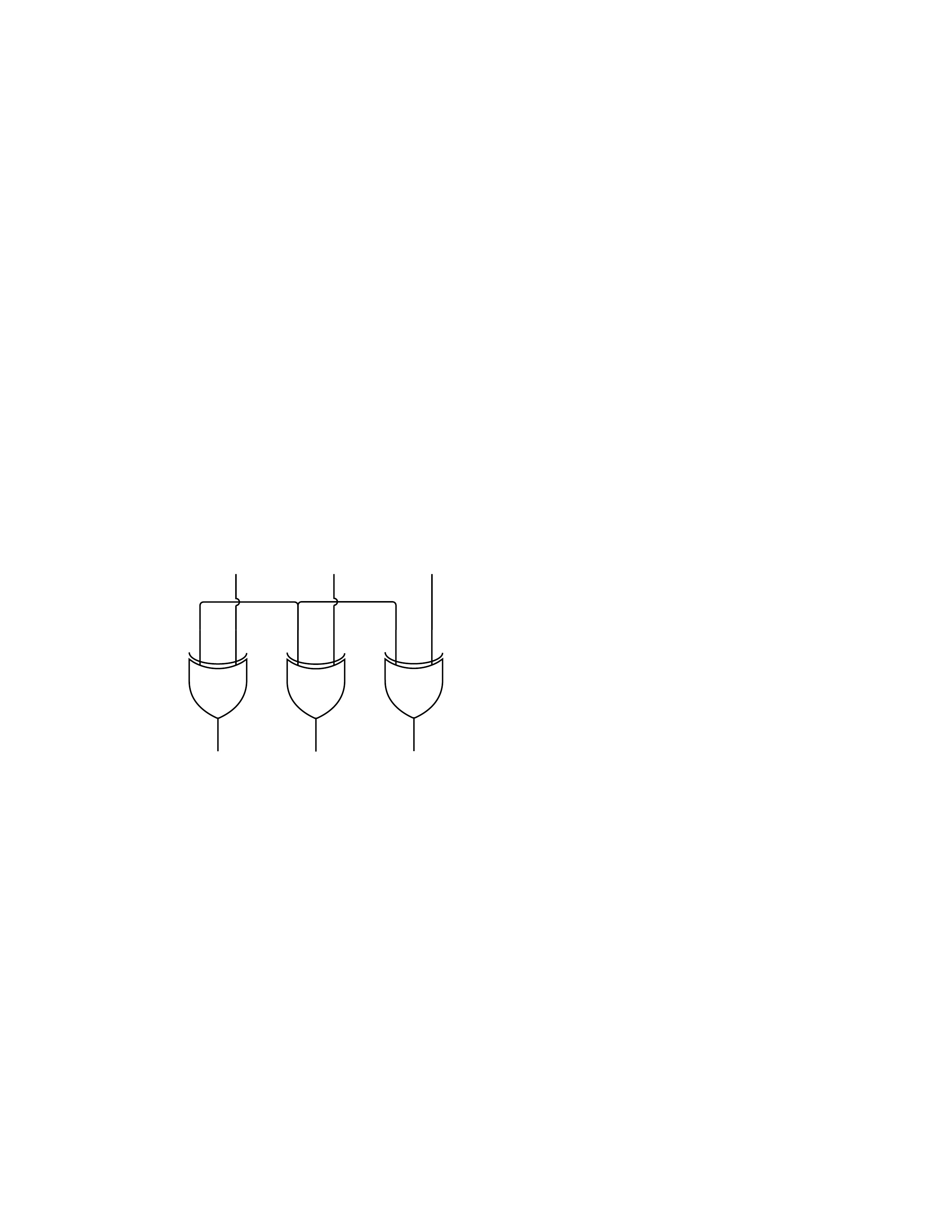
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
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|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | 0 |  |
|  |  |  |  |  |  |  |  |
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| --- | --- | --- | --- |
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| --- | --- | --- | --- |
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if X is a 2’s complement number, than we have to convert the number as follows:



0

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

0

0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
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|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | 0 |  |
|  |  |  |  |  |

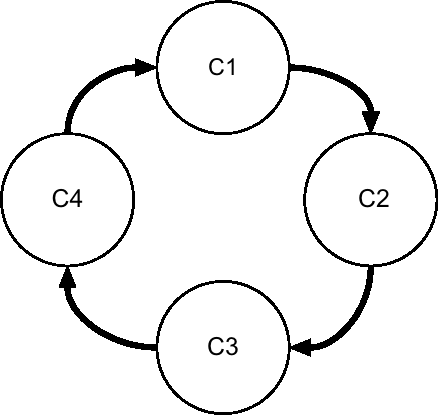
0

0

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

**Question 3**

State diagram:



State table:

|  |  |
| --- | --- |
| Present State | Next State |
|  |  |
|  |  |
|  |  |
|  |  |

State assignment:

, , ,

Excitation table:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |

From table excitation vectors can be read directly:

