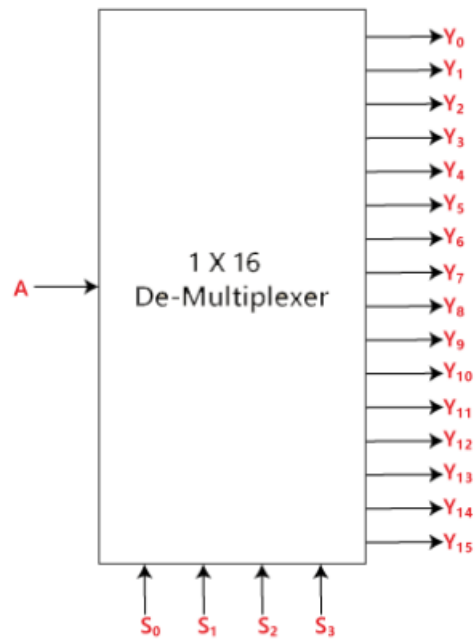


**Draw a block diagram, truth table and logic circuit of 1\*16 Demultiplexer and explain its working principle.**

Solution:

1 to 16 demultiplexer has one output data, four select lines A, B, C and D and 16 output lines Y0 to Y15. This is implemented using AND and NOT gate.

1 to 16 demultiplexer can be implemented using 1 to 8 demultiplexer, 1 to 4 demultiplexer and 1 to 2 demultiplexer



The below **truth table** shows the operation of 1 to 16 demultiplexer:



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

Logical circuit of the above expressions is given below:

