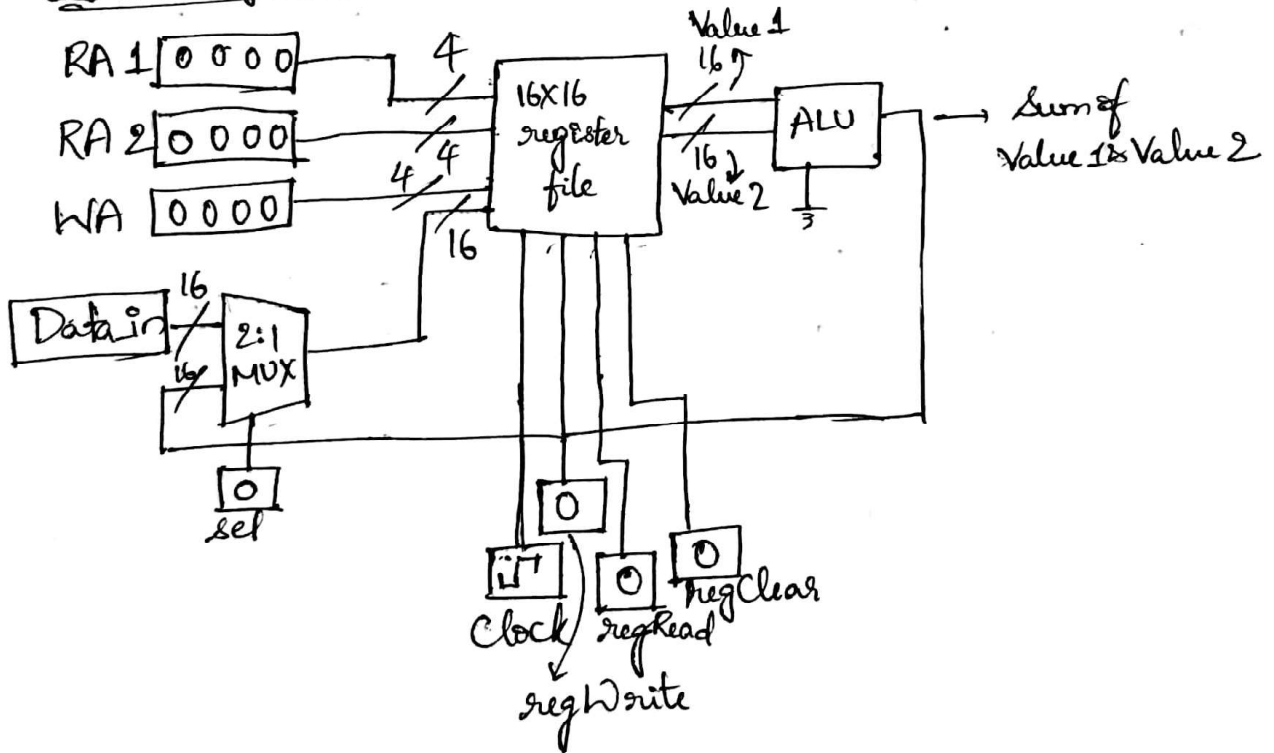
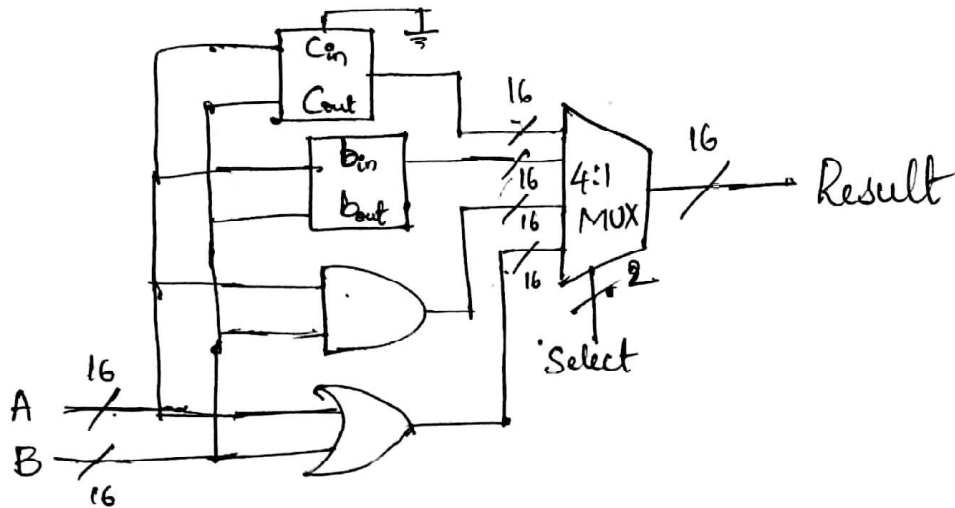


Ans 3

Logic Diagram





RA1, RA2 \rightarrow read addresses

WA is write address

Data-in \rightarrow data to be written

sel \rightarrow select line for 2:1 MUX, decides b/w storing
Data-in or sum of numbers.

Clock is Clock

regWrite \rightarrow enables write mode

regRead \rightarrow enables read mode

regClear \rightarrow when = 1, clears all stored values in
register file

ALU \rightarrow performs Addition, Subtraction, bitwise AND,
bitwise OR over 16-bit inputs

Ques: ① To store 10 numbers in registers 1 to 10

② Compute their sum & write result in another register

Procedure:

Consider the numbers to be stored are:

1, 2, 4, 8, 16,
32, 64, 128, 256, 512

① Set WA to 0001, Data.in to DEC 1.

② Set regWrite to 1. Toggle the Clock.

DEC 1 is stored in register @ address 0001

③ Keep repeating 'step 1 & 2' till all desired numbers are stored

④ Set regWrite to 0.

Now all the numbers are stored.

⑤ Set RA2 to 1011 (from 0001 to 1010, numbers are stored)
Set WA to 1011, sel to 1

⑥ Set regWrite to 1. Set regRead to 0

⑦ Set RA1 to 0001. Toggle the clock

⑧ Repeat step 7 for RA1 from 0010 to 1010.

Finally sum of all numbers is stored at register 1011

⑭