Experiment No: 1

Title: 8051 – Study of different types of arithmetic and logical instructions & Programs

Class: T.E. **Year:** **Semester: Five**

Roll No.: **Name:**

Date of performance: **Date of Submission:**

Signature:

AIM: Study of different types of arithmetic and logical instructions.

1. WAP to add and subtract two 8-bit numbers.
2. WAP to multiply and divide two 8-bit numbers.
3. WAP to add and subtract two 16-bit numbers.
4. WAP to add two BCD numbers.

S/W AND H/W TOOLS: 8051 IDE

ALGORITHMS

1) Addition and subtraction of two 8-bit numbers

i. Move first 8-bit number to Accumulator

ii. Move second 8-bit number to B Register

iii. Add numbers in A and B register and store the result in A.

iv. Copy the result in R1 register.

i. Move first 8-bit number to Accumulator

ii. Move second 8-bit number to B Register

iii. Subtract the numbers in A and B register and store the result in A.

iv. Copy the result in R2 register.

2) Multiplication and division of two 8-bit numbers.

i. Move first 8-bit number to Accumulator

ii. Move second 8-bit number to B Register

iii. Using MUL instruction multiply contents in A and B

iv. Store the result in register R3.

i. Move the Dividend to Accumulator

ii. Move the Divisor to B Register

iii. Using DIV instruction divide contents in A by B

iv. Store the Quotient in register R1 and Remainder in R2

3) Addition and subtraction of two 16-bit numbers

i. Move LSB byte of first 16-bit number to Accumulator
ii. Move LSB byte of second 16-bit number to R1 Register
iii. Perform addition using ADD instruction. Monitor the PSW (flag register)
iv. Store the added result in some temporary register.
v. Move MSB byte of first 16-bit number to Accumulator
vi. Move MSB byte of second 16-bit number to R2 Register
vii. Perform addition using ADDC instruction.
viii. Store the result in any temporary register.

i. Clear the contents of Carry flag
ii. Move LSB byte of first 16-bit number to Accumulator
iii. Move LSB byte of second 16-bit number to R1 Register
iv. Perform subtraction using SUBB instruction. Monitor the PSW (flag register)
v. Store the result in some temporary register.
vi. Move MSB byte of first 16-bit number to Accumulator
vii. Move MSB byte of second 16-bit number to R2 Register
viii. Perform subtraction using SUBB instruction
ix. Store the result in any temporary register.

4) Addition of two BCD numbers

i. Move first 8-bit number to Accumulator

ii. Move second 8-bit number to B Register

iii. Add numbers in A and B register.

iv. Decimal adjust using DA A instruction

v. Store the result in any temporary register

PROGRAMS

Attach 1-6 programs with output wherever possible.

CONCLUSIONS: