

Assignment 1

Note:

1. Write all the assignments in A4 sheet or any other sheet.
2. Take the snapshots of all assignment and **upload a single file** in Google drive.
3. Share the link of Google drive in a Google form, which will be shared with you soon.
4. It is compulsory for all the students to submit the assignments in stipulated time frame.

Last Date of submission: 31 August 2020

Q1: - The content of AC in the basic computer is hexadecimal A937 and the initial value of E flip flop is 1. Determine the contents of accumulator (AC), E, Program Counter (PC), address register (AR) and instruction register (IR) in hexadecimal after the execution of the **CLA** instruction. The initial value of PC is hexadecimal 021.

Initial conditions:

AC = A937h

E = 1

PC = 021h

Q2: - What is the difference between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register?

Q3: - A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers, and an address part.

- a) How many bits are there in the operation code, the register code part, and the address part?
- b) Draw the instruction word format and indicate the number of bits in each part.
- c) How many bits are there in the data and address inputs of the memory.

Q4: - The content of PC in the basic computer is 3AF (all numbers are in hexadecimal). The content of accumulator (AC) is 7EC3. The content of memory at address 3AF is 932E. The content of memory at address 32E is 09AC. The content of memory at address 9AC is 8B9F.

- a) What is the instruction that will be fetched and executed next?
- b) Show the binary operation that will be performed in the AC when the instruction is executed
- c) Give the contents of registers PC, AR, DR, AC and IR in hexadecimal and the values of E, I and the sequence counter SC in binary at the end of the instruction cycle.

Q5: - Explain, what is a subroutine in assembly language.