

Topic 2: Sample Questions

- Q1. (a) Explain the functions of the following registers found in a typical 8-bit Microprocessors:
- (i) Program counter
 - (ii) Status Register
 - (iii) Memory Address Register
 - (iv) Instruction Register
 - (v) Accumulator
- (b) Suppose the 8085 CPU performs the following arithmetic operations, list the state of each flag in the flag register
- (i) $45_{(16)} + E2_{(16)}$
 - (ii) $8A_{(16)} + 96_{(16)}$
 - (iii) $01000101_{(2)} + 11100010_{(2)}$
- (c) A microprocessor system has 16-bit data bus, and 20-bit address bus. Determine the maximum amount of data in megabytes that can be accessed by this system from its main memory.
- Q2 (a) A microprocessor based system uses 8-bit data bus and 16-bit address bus. What is the maximum memory capacity in kilobytes that can be accessed by this microprocessor system?
- (b) The 8085 CPU is to execute an instruction which transfers data from memory location with address 3000H to the accumulator. Name all the registers involved in the execution of this instruction.
- (c) Explain why Stack Pointer and Program counter registers are 16-bit registers, while most other register in the 8085CPU are 8-bits.

- Q3 (a) Define
- i. Machine cycle
 - ii. Instruction cycle
- (b) With the aid of a flow diagram, describe the fetch-execute cycle of the CPU.
- (c) The Original IBM PC/XT computer has a 20-bit address bus and 8-bit data bus. Determine:
- i. Number of hexadecimal digits needed to specify an address;
 - ii. Maximum memory addressable , in megabytes
 - iii. Amount of memory reserved for the system's use, if 640K bytes are available for user programs.
- Q4. (a) With the aid of a diagram, explain the operation of a tri-state device and state why they are essential in a bus-oriented system.
- (b) Explain why data buffers are disabled when not in use.
- (c) With the aid of a diagram, explain why two-way data buffers must be used on data bus lines
- Q5. (a) Write the advantages/disadvantages of having more number of general purpose registers in a microprocessor.
- (b) Describe the purpose of incrementer/decrementer address latch register.
- (c) Discuss the status of \overline{WR} and \overline{RD} signals of 8085 at any given instant of time.
- (d) Explain the function of the two DMA signals HOLD and HLDA.