



# AKRG COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved By A.I.C.T.E., New Delhi and Affiliated to JNTUK, KAKINADA)

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## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

III B.Tech – II Semester

Regulation – R13

### MICROPROCESSORS & MICROCONTROLLERS LAB

The students are required to develop the necessary Algorithm, Flowchart and Assembly Language Program Source Code for executing the following functions using MASM/TASM software and to verify the results with necessary Hardware Kits.

#### **PART-I: MICROPROCESSOR 8086**

1. Introduction to MASM/TASM.
2. Arithmetic operation- Multi byte Addition and Subtraction, Multiplication and Division- Signed and unsigned Arithmetic operation, ASCII- Arithmetic operation.
3. Logic operations-Shift and rotate- Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) - Display characters, Strings.

#### **PART-II: INTERFACING WITH MICROPROCESSOR**

1. 8259 – Interrupt Controller-Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display- Write a program to display a string of characters.
3. 8255 – PPI-Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART-Write a program in ALP to establish Communication between two processors.

#### **PART-III: MICROCONTROLLER 8051**

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

#### **PART-IV: INTERFACING WITH MICROCONTROLLER**

1. Simple Calculator using 6 digit seven segment displays and Hex Keyboard interface to 8051.
2. Alphanumeric LCD panel and Hex keypad input interface to 8051.
3. External ADC and Temperature control interface to 8051.
4. Generate different waveforms Sine, Square, Triangular, and Ramp etc. using DAC interface to 8051; change the frequency and Amplitude.