

**JYOTI NIVAS COLLEGE AUTONOMOUS
SYLLABUS FOR 2018 BATCH AND THEREAFTER**

Programme: B.Sc.

Semester: V

**ELECTRONICS PAPER VI
MICROPROCESSOR AND 8051 MICROCONTROLLER**

Course Code: 18VEL6

No. of Hours: 45

COURSE OBJECTIVES

- Explain the difference between microprocessor and microcontrollers
- Describe the architecture of 8085 microprocessor
- Describe the architecture of 8051 microcontroller.
- To get familiarize with Interrupts and Memory concepts
- Use the instruction set and addressing modes of microcontroller
- Develop assembly language programming skills
- Interface various memory and I/O devices

LEARNING OUTCOMES

- Differentiate between microprocessor and microcontroller and to understand interrupts and memory concepts
- Develop assembly language programming skills and to interface various I/O devices

UNIT I

INTRODUCTION TO MICROCOMPUTER AND 8085 MICROPROCESSOR

ARCHITECTURE

10 HRS

Microcomputer Organization: Input/output Devices. Data storage (idea of RAM and ROM). Computer memory. (Mention Only)

8085 Microprocessor Architecture: Microprocessor-Introduction-Evolution of Microprocessor, Applications-mention only.

Features of 8085, Block diagram, Pin-out diagram of 8085. Data and address buses. Registers. ALU. Stack memory, Program counter, Memory addressing capacity, operating frequency.

UNIT II

ARCHITECTURE OF 8051 MICROCONTROLLER.

12 HRS

8051 Microcontroller:- Introduction – Comparison with microprocessor & Microcontroller, RISC Vs CISC architecture, Harvard and Von-Neumann CPU Architectures –Features of 8051 Microcontroller. Pin configuration of 8051.

Block Diagram of 8051-Oscillator and clock- CPU Registers (A & B)- Program Counter- Stack and Stack Pointer-Flags and Program Status Word-Special Function Registers (mention only)
Latest trends in Microcontrollers – ATMEL, PIC, ARM and other families, specifications and applications (Mention only).

UNIT III

INTERRUPTS AND MEMORY

04 HRS

Interrupt Structure-Interrupt Enable Register in 8051-Interrupt Priority Register in 8051-Software Generated Interrupts Register (Mention only).

Memory-Internal memory (RAM & ROM Organization)-External Memory.

UNIT IV

INSTRUCTION SET OF 8051 AND PROGRAMMING

12 HRS

Introduction –Addressing Modes

Instructions Sets of 8051- Data transfer group -Arithmetic and Logic group -Control Transfer group- data types and Directives (Simple Programs for all the instruction groups).

Data transfer instructions – internal data move, external data move, code memory read-only data move, Push and Pop and data exchange instructions.

Logical Instructions – byte level logical operations, bit level logical operations, rotate and swap operations.

Arithmetic Instructions – flags, incrementing and decrementing, addition, subtraction, multiplication and division, decimal arithmetic (simple programs in assembly language).

Jump and call instructions – jump and call program range, jumps, calls and subroutines, interrupts and returns, simple example programs in assembly language.

UNIT V

8051 I/O Ports and INTERFACING

07 HRS

Bit Addressable Registers, I/O Ports -Timers and Counters (TCON, TMOD)-Serial Data communication (SCON, SBUF).

Interfacing: Multiplexed Seven Segment Display, Wave form generation using DAC (Sawtooth and Triangular wave form), LED Display Interfacing, and Interfacing Matrix Keyboard.

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with 8085
By Ramesh .S. Gaonker-Wiley Eastern Limited-V Edition-1998.
2. 8051 Micro controller Architecture, Programming and Application by Kenneth .J. Ayala-
Second Edition- PRI.
3. 8051 Micro controller and Embedded System by Muhammad Ali Mazidi and Janice Gillispi
Mazidi – Pearson Education Publication – 2006

REFERENCE BOOKS

1. Fundamentals Of Microprocessors and Microcomputers by B.Ram- Dhanpat Rai
Publications-1995
2. Micro controllers Theory and Applications by Deshmukh-2004-TMH Publications
3. Micro controllers Architecture, Implementation and Programming by Hintz-2005-TMH
Publications.
4. 8051 Micro controller by Dr.D.S Suresh Kumar- S.K Publishers-First Edition –2007.

LIST OF PROGRAMS (Perform any six programs and two interfacing programs)

1. Write an ALP to perform addition and subtraction.
2. Write an ALP to perform Multiplication and Division.
3. Write an ALP to find the 2's complement of number.

4. Write an ALP to access each bit of a given byte.
5. Write an ALP to find if the given no. is a palindrome.
6. Write an ALP to find the LCM of two numbers.
7. Write an ALP to find GCD of 2 nos.
8. Write an ALP to sort the array of numbers in ascending and descending order.
9. Delay program
10. Interfacing seven segment display
11. Interfacing matrix keyboard
12. Interfacing Stepper motor
13. Interfacing DAC.