

P.R. GOVERNMENT COLLEGE (A), KAKINADA
B.Sc. III Year - Electronics – Semester – VI
w.e.f. 2017-18 ADMITTED BATCH

PAPER – 7 A [Elective - A]
MICRO CONTROLLER AND INTERFACING

3 Hours/Week [Total: 45 hrs]Credits: 3

Course Learning Outcomes

The subject aims:

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

Learning Outcomes:

Students will be able to:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system

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Syllabus

UNIT-I: (6Hrs)

Introduction, comparison of Microprocessor and micro controller, 8-bit and 16-bit Microcontrollers, Harvard and Von-Neumann Architectures, Assembler-Compiler-Simulator/Debugger.

UNIT -II: (12Hrs)

Microcontroller Architecture:

Block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register Register banks and stack, pin diagram of 8051, interrupts.

UNIT-III : (9Hrs)

Addressing modes, instruction set of 8051:

Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Timer/Counter Programming,

Unit -IV: (9Hrs)

Programming:

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V:(9 Hrs)

Data communication:

Serial Communication – basics of serial communication, Half and Full duplex transmission, Asynchronous Serial Communication and framing, Data communication classification.8051 Serial Communication programming. 8051 Interrupts. Interrupt priority in the 8051.

TEXT BOOKS:

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j.Ayalam, Dhananjay V.gadre, cengage publishers
- 2.The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and System Design – Raj kamal.
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J.Ajala**,west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V.Deshmukh

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Elective PAPER – 7 A

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Model Question Paper

Note: - Set the question paper as per the blue print given at the end of this model paper.

TIME: 2 1/2 Hrs

Max Marks: 60

Section	Questions to be given	Questions to be answered	Marks
A	5	3	3 x 10M = 30M
B	9	6	6 x 5 M = 30M
Total	14	9	60M

Blue Print

Chapter Name	Essay Questions 10 marks	Short Questions 5 marks	Programs 5 marks	Marks allotted
Introduction	1	2	---	20
Microcontroller Architecture	1	2	---	20
Addressing modes, instruction set of 8051	1	1	1	20
Programming	1	---	2	20
Data communication	1	1	---	15
Total Marks				95

**PAPER – 7 A [Elective - A]
MICRO CONTROLLER AND INTERFACING
QUESTION BANK**

ESSAY ANSWER TYPE QUESTIONS

UNIT-I: Introduction to 8051

1. Give the differences between microprocessor and micro controller.
2. Write the differences between Harvard and von-Neumann architectures.
3. Write a short notes on assembler, compiler and simulator/debugger in 8051.
4. Explain about 8-bit and 16- bit microcontrollers in detail with 2 examples.

UNIT-II:Microcontroller Architecture

1. Draw and explain the architecture of 8051.
2. Draw the pin diagram of 8051 and explain each pin.
3. Describe in detail about PSW register, register banks and stack in 8051.
4. Draw the block diagram of 8051 and explain each block.
5. Explain program counter and memory organization, data types and directives in 8051.

UNIT-III:Addressing modes, instruction set of 8051

1. Write about addressing modes and accessing memory using various addressing modes in 8051.
2. Explain instruction set and their usage in 8051.
3. Explain in detail about timer/counter programming in 8051.

UNIT-IV:Programming

1. Explain addition, multiplication, subtraction, division each with an example.
2. Write a program on largest of any four 16-bit numbers.
3. Explain in detail about assemble language programming and give some examples.

UNIT-V: Data communication

1. Draw and explain block diagram of serial communication in 8051.
2. Write about half and full duplex transmission, asynchronous serial communication and framing.
3. Explain in detail about 8051 Interrupts. Interrupt priority in the 8051.
4. Write about Data communication classification and Serial Communication programming in 8051.

SHORT ANSWER TYPE QUESTIONS

UNIT-I: Introduction to 8051

1. Explain 8-bit and 16-bit Microcontrollers in 8051.
2. Explain Harvard architecture.
3. Write about von-Neumann architecture.
4. Describe compiler and simulator/debugger in 8051.

UNIT-II: Microcontroller Architecture

1. Draw the Architecture of 8051.
2. Explain Data types and directives.
3. Explain in detail PSW register.
4. Draw the pin diagram of 8051.
5. Explain about interrupts in 8051.

UNIT-III: Addressing modes, instruction set of 8051

1. What are the Addressing modes present in 8051 and explain them.
2. How to access the memory using various addressing modes?
3. Explain the jump, loop and call instructions.
4. What is Counter Programming in 8051?

UNIT-V: Data communication

1. Draw the block diagram of serial communication in 8051.
2. Explain SCON register and mode classification in it.
3. What is Half and Full duplex transmission? Give some examples.
4. Explain Data communication in 8051.
5. How interrupt priority takes place in 8051.

PROGRAMMING:

UNIT-III: Addressing modes, instruction set of 8051

1. Write a program on largest of an array of four 8-bit numbers.
2. Write a program on smallest of an array of four 8-bit numbers.
3. Write a program on subtraction of two 8-bit numbers.
4. Write a program on moving of data between registers using addressing modes of 8051.

UNIT-IV: Programming

1. Write a program on addition of two 16-bit numbers.
2. Write a program on multiplication on two 8-bit numbers.
3. Write a program on arranging four 8-bit numbers in ascending order.
4. Write a program on division of two 8-bit numbers.