

CETPA INFOTECH PVT. LTD.

CURRICULUM OF ROBOTICS

INTRODUCTION TO ROBOTICS

- Present and future scope of robotics
- Types of robots
- Application of robotics

BASIC ELECTRONICS

- Resistors
- Capacitors
- Diodes
- Transistor

TYPES OF MOTORS

- Introduction to Motors
- AC motor
- DC motor
- Stepper motor
- Servo motor
- DC geared motor

TYPES OF SENSORS

- Introduction to Sensing Devices
- IR sensor
- Light searching sensor
- Temperature sensor
- Touch sensor
- Motion sensor

MOTOR CONTROLLING CIRCUITS

- Motor controlling using driver ICs **IC's**
- LM358(dual op- amp)
- LM35(Temperature sensor)
- L293D(dual H-bridge IC)
- 7805(Voltage regulator)

INTRODUCTION TO EMBEDDED SYSTEM

- History & need of Embedded System
- Basic components of Embedded System

- Type of Microcontroller
- Memory Classification

PIN DESCRIPTION & ARCHITECTURE OF AVR MICROCONTROLLER

MEMORY ARCHITECTURE OF ATMEGA16

BRIEF INTRODUCTION TO COMPUTER ARCHITECTURE

- Classification of Von-Neumann and Harvard Architecture
- Difference between RISC and CISC
- Memory Classification (Primary & Secondary)

COMPUTER LANGUAGES

- Low Level Languages
- Middle Level Language
- High Level Language
- Interaction of language with Compilers

EMBEDDED DEVELOPMENT TOOLS

- Assembler
- Interpreter
- Compiler
- Simulator
- Emulator
- Debugger

INTRODUCTION OF EMBEDDED C

- Why C
- Benefits of C over Assembly
- Constants, Variables & Data Types
 - Keywords & Identifiers
 - Data type & its memory representation

LED INTERFACING

SEVEN SEGMENT INTERFACING

- Non-Multiplex
- Multiplex

LCD INTERFACING

- To move data on LCD in 8-bit
- To move data on LCD in 4-bit
- To display data on both rows in 4 and 8-bit Mode
- Scrolling message display on LCD in 4 and 8 bits Mode.

SWITCH & KEYPAD INTERFACING

- Introduction to Switches & Keyboard Matrix
- Interfacing Circuit of Switches & Keyboard Matrix
- Programming of Keyboard Matrix & Switches
- Controlling of LED's by using Switches
- Key board Matrix & LCD Interfacing Program

TIMER

- Timer0/Timer1/Timer2 Programming
- PWM using Timers

INTERRUPT

- Timer Interrupts Programming
- External Hardware Interrupts Programming
- Interrupt Priority

- Hardware Classification of Embedded System
- Programming Language Classification of Embedded System
- Advantage & Disadvantage of Low level & High level programming language of Embedded System

CLASSIFICATION OF MICROPROCESSOR & MICROCONTROLLER

- Difference between Microprocessor & Microcontroller
- Classification based on architecture
- Classification based on Instruction Set

- User Defined Data type (structure)
- Array
- Pointers

• **Operators**

- Arithmetical Operator
- Logical Operator
- Bitwise Operators

• **Control Statement and Loops**

- If
- Switch
- For
- While
- Do While

- Introduction to Preprocessor Directives
- Assembly within C (Inline Assembly)

RS232 INTERFACING

- Interfacing with PC using UART/RS232
- Interfacing with PC using UART/RS232 with Interrupts

ADC INTERFACING

- To display digital data on LED
- To display digital data on LCD

SENSOR INTERFACING

- IR Sensor Interfacing
- Temperature Sensor Interfacing

OTHER COMMUNICATION

PROTOCOLS

- I2C protocol
- SPI Protocol

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