Induction Programme

A ONE-WEEK INDUCTION PROGRAMME FOR 1ST YEAR B. Tech. STUDENTS 26th NOVEMBER - TO – 4th DECEMBER 2021

Organized by

TEEGALA KRISHNA REDDY ENGINEERING COLLEGE
(UGC-Autonomous)
Approved by AICTE, Affiliated by JNTUH, Accreditated by NAAC- 'A' Grade
Medbowli, Meerpet, Balapur, Hyderabad, Telangana- 500097
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ABOUT THE PROGRAMME

The Induction Program is designed to make the newly joined students feel comfortable, sensitize them towards exploring their academic interests and activities, making them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and building of character. The Universal Human Values component, which acts as an anchor, develops awareness and sensitivity, feeling of equality, compassion and oneness, draw attention to society and nature, and character to follow through. It also makes them reflect on their relationship with their families and extended family in the college (with hostel staff and others). It also connects students with each other and with teachers so that they can share any difficulty they might be facing and seek help.

When new students enter an institution, they come with diverse thoughts, backgrounds and preparations. I is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose. Precious little is done by most of the institutions, except for an orientation program lasting a couple of days. We propose a week long induction program for the UG students entering the institution, right at the start. Normal classes start only after the induction program is over. Its purpose is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self ,people around them, society at large, and nature.

Induction Program me Schedule

S.No	Events	Resource person/ Event organizer/ coordinator	Timings
Day-1 (26.11.2021)			
1	**Orientation Program me:** Academic registration	Departmental Mentors & Coordinators	09.30AM- 10.30AM
2	Address by Chairman and Academicians	Chairman, Principal, Deans & HoD's	10.30AM-02.00PM
3	Lunch Break	- - -	02.00PM - 3.00PM
4	Visit to Departments. and Library	Departmental Coordinators	03.00PM- 4.30PM
Day-2 (27.11.2021)			
1	**Awareness Program on Scholarships**	Sri Chandra Sekhar	10.00AM-11.00PM
2	Creative Arts-Singing, Dance, Skit(for Boys)	Fresher's and Senior Students	11.00AM-1.00PM
	Physical Activity(Sports for Girls)	Ms P. Madhavi	
	Lunch Break	- - -	01.00PM- 2.00PM
3	**Interaction with HOD (IT)**	IT Department HOD & Staff – In AUDITORIUM	02.00PM -4.30PM
Day-3 (29.11.2021)			
1	**Interaction with Staff**	Department of H&S (Mathematics, Physics, English and Chemistry) and Class In charges – In AUDITORIUM	10.00AM-1.00PM
2.	**Interaction with Senior Students**	IV B.TECH ECE and CSE students	
	Lunch Break	- - -	1.00PM- 2.00PM
3	**Motivational Talk**	Smt G. Padmavathi	2.00PM -4.30PM
Day-4 (30.11.2021)			
1	**Creative Arts:-** JAM(Just a Minute) Student interaction	Coordinators	10.00AM-11.00PM
	Interaction with HOD (S&H)	S&H Department HOD – In AUDITORIUM	11.00AM -1.00PM
2.	Lunch Break	- - -	01.00PM- 2.00PM
3.	**Interaction with HOD (CSE)**	CSE Department HOD & Staff – In AUDITORIUM	02.00PM- 4.30PM
Day-5 (01.12.2021)			
1	**Awareness Program me : SHE Team**	Telangana Police Department	10.00AM-1.00PM
	LUNCH BREAK	- - -	01.00PM- 2.00PM
2.	**Motivational Talk**	NSS TEAM	02.00PM- 3.00PM
3.	**Motivational Talk**	Dr V.Madhavi	03.00PM- 4.30PM
Day-6 (02.12.2021)			
1	**Awareness on E-books/Swayam/NPTEL**	Librarian & Staff, TKRCE	10.00AM-11.00AM
2.	**Lecture on Personality Development**	Sri. Partha Saradhi	11.00AM-1.00PM
	Lunch Break	- - -	01.00PM- 2.00PM
3	**Interaction with HOD (EEE)**	EEE Department HOD & Staff – In AUDITORIUM	02.00PM- 4.30PM
Day-7 (03.12.2021)			
1	**Student Counseling**	Dr. V.J.E. Caroline	10.00AM-11.00AM
2.	**Interaction with HOD (ECE)**	ECE Department HOD & Staff – In AUDITORIUM	11.00AM-1.00PM
	Lunch Break	- - -	01.00PM- 2.00PM
3	**Awareness Program me**	Sri T. Shiva Kumar (TPO)	02.00PM- 4.30PM
Day-8 (04.12.2021)			
1	**Physical Activity(Sports for Boys)**	Ms P. Madhavi	10.00AM-1.00PM
2	Lunch Break	- - -	1.00PM- 2.00PM
3	**Motivational Talk**	Sri V. Suryanarayana	2.00PM- 4.30PM
****Program me Summary & Valedictory****			

A. Dhanu 26/11/21
HOD, (H&S)

PRINCIPAL
Teegala Krishna Reddy Engineering College
Meerpet, Hyderabad - 9

Pos Attainment:

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
20MA1BS01 M-1	2.0	1.5	1.0		2.5	2.0		2.0	1.3			2.0
20AP1BS02 APPLIED PHYSICS	2.2	1.3	3		1.	1	2		1			1.6
20CS1ES01 PPS	3	2.8	2.5	1.8		1.8		1				1.5
20ME 1ES02 EG	1.3	1.8	2.5	2	2.8				2.5	2.7		1.0
20AP1BS03 APLAB	2.0	2.0	1.5	1.0	1.3				1.5			2.0
20CS 1ES03 PPS LAB	2.5	1.5	1.5	1.0	2.5				1.0		1.0	1.0
20MA2BS04 M-II	2.0	1.5	1.0		2.5	2.0		2	1.3			2.0
20CH2BS05 CHEMISTRY	2.4	1.8	2.5			1.4	1.5					1.8
20EE2ES05 BEE	3.0	2.0	2.8		2.0							3.0
20ME2ES06 ENGG. WORKSHOP	3.0	1.0	1.0		2.0	2.0	2.0	2.0	3.0			3.0
20EN2HS01 ENGLISH					2.5	2.0			3.0	3.0		3.0
20CH2BS06 CHE LAB	2.4	1.8	2.5		1.4	1.5						1.8
20EN2HS02 ELCS LAB	PO1	PO2	PO3		2.0	2.7			2.8	3.0		2.8
20EE2ES07 BEE LAB	3.0	2.0	2.8		2.0							3.0

Pos Attainment Level:

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Direct Attainment	2.4	1.75	2.05	1.45	2.07	1.82	1.83	1.75	1.93	2.9	1.0	2.11
CO Attainment	2.4	1.75	2.05	1.45	2.07	1.82	1.83	1.75	1.93	2.9	1.0	2.11

PSOs Attainment:

Course	PSO1	PSO2
20CS1ES01 PPS	1.3	1
20CS1ES03 PPS LAB	1.8	2.5
20EE2ES05 BEE	1.8	1.6
20EE2ES07 BEE LAB	1.8	1.7

PSO Attainment Level

Course	PSO1	PSO2
Direct Attainment	1.68	1.7

Faculty Feedback on Teaching and Learning Practices

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College Code: R9

Faculty Feedback Analysis

Feedback of the faculty is collected from the students twice a semester of particular semester based on the performance of the faculty toward the students.

- The analysis is done at the time of the internal examinations of a particular semester.
- The analysis of feedback is collected in the following aspects.

  - Knowledge of the subject.
  - Teaching ability
  - Clarification of doubts
  - Efficiency in communication.
  - Syllabus coverage
  - Standard of Question paper/Evaluation of answer scripts.
  - Maintenance of Discipline in the Class/Lab
  - Motivation and Encouragement.
  - Rapport with students.
  - Regularity in taking Class/Lab.

- The score of the feedback points is calculated as per the following:

  Inadequate - 4
  Satisfactory - 6
  Good - 8
  Very Good – 10

The faculty feedback score should not be less than 9.0, if in case the necessary actions will be performed as,

- Faculty get counseled by the Head of the Department.
- Practice by delivering more seminars by particular faculty.
- Faculty get referred to NPTEL videos.
- Faculty are advised to attend FDPs and Certification Courses to improve subject Knowledge.

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FEEDBACK ANALYSIS REPORT

A.Y: (2022-23)

SEMESTER-I

S. No	Name of the Faculty	Dept	Subject	%
1	K Kavitha	H & S	MC	88.55
2	Aithagoni Shekar	H & S	AP Lab	84.13
3	Reshaboina Nagaraju	H & S	ESE	83.83
4	Mr. P. Surender	CE	EW	83.41
5	Reshaboina Nagaraju	H & S	ELCS Lab	82.42
6	Aithagoni Shekar	H & S	AP	80.67
7	Sukanya Cherukuri	CSE	ECSE	75.72
8	B Rajani	CSE	PPS Lab	75.41
9	B Rajani	CSE	PPS	75.05

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College Code: R9

FEEDBACK ANALYSIS REPORT

A.Y: (2022-23)

SEMESTER-II

S. No	Name of the Faculty	Dept	Subject	%
1	R Srinivas Reddy	H & S	EC	86.89
2	R Srinivas Reddy	H & S	EC Lab	85.57
3	Ramesh Bonigala	EEE	BEE	85.30
4	Anil Kumar	CE	CAEG	84.19
5	K Kavitha	H & S	ODEVC	83.01
6	Ramesh Bonigala	EEE	BEE Lab	82.97
7	Akkala Mounika	AIM	PP Lab	80.75
8	Mounika Sankurushetti	AIM	ITWS	80.42
9	Vadla Amulya	ECE	EDC	68.77

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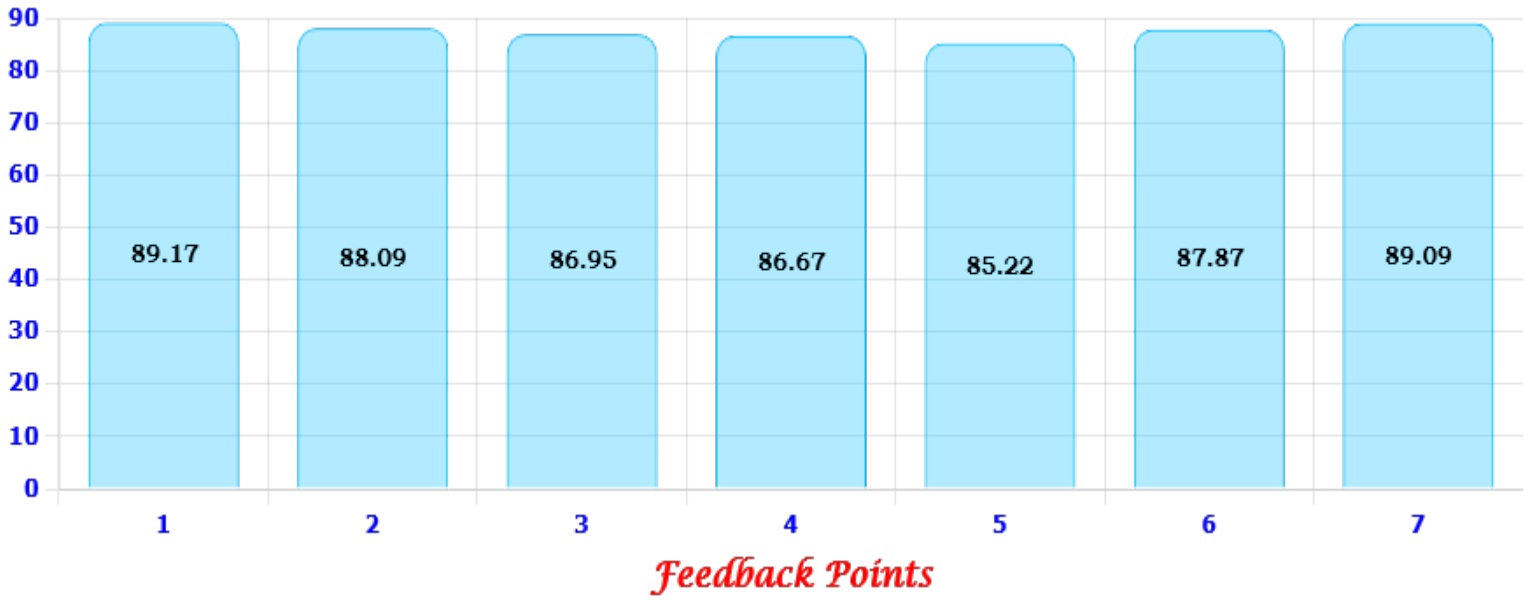
Feed Back Report

Subject	Electronic Device And Circuits
Staff	Bandaru Nireesha (ECE)
Section	I CSE II D
Course	B.Tech
A Year	2022-23

1	2	3	4	5	6	7	Over All %	Students
87.48	87.48	87.48	87.48	87.48	87.48	87.48	**87.47 %**	**48 / 60**



S. No	Description
1	Has the Teacher covered entire Syllabus as prescribed by University / College / Board?
2	Has the Teacher covered relevant topics beyond syllabus
3	Effectiveness of Teacher in terms of:
4	Pace on which contents were covered
5	Motivation and inspiration for students to learn
6	Practical demonstration
7	Clarity of expectations of students Progress

HOD **Principal**

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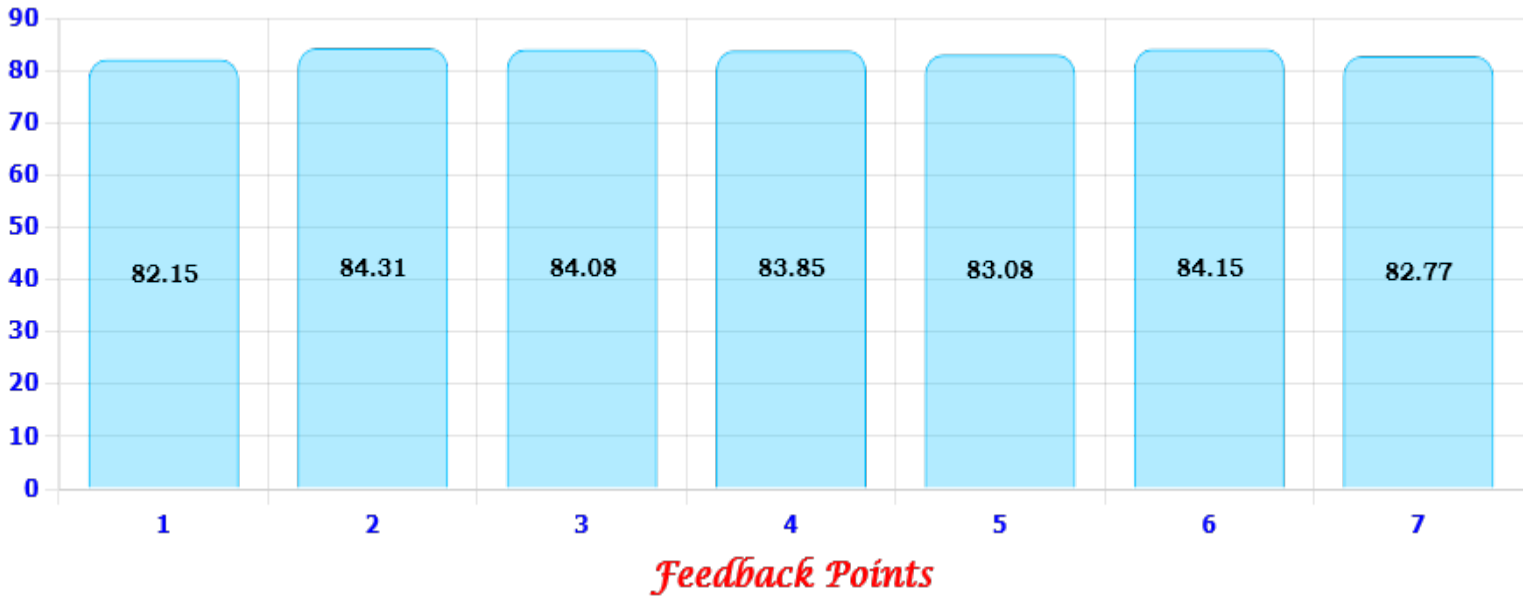
Feed Back Report

Subject	English
Staff	G Padmavathi (H & S)
Section	I CSE I C
Course	B.Tech
A Year	2021-22

1	2	3	4	5	6	7	Over All %	Students
83.72	83.72	83.72	83.72	83.72	83.72	83.72	**83.60 %**	**65 / 65**



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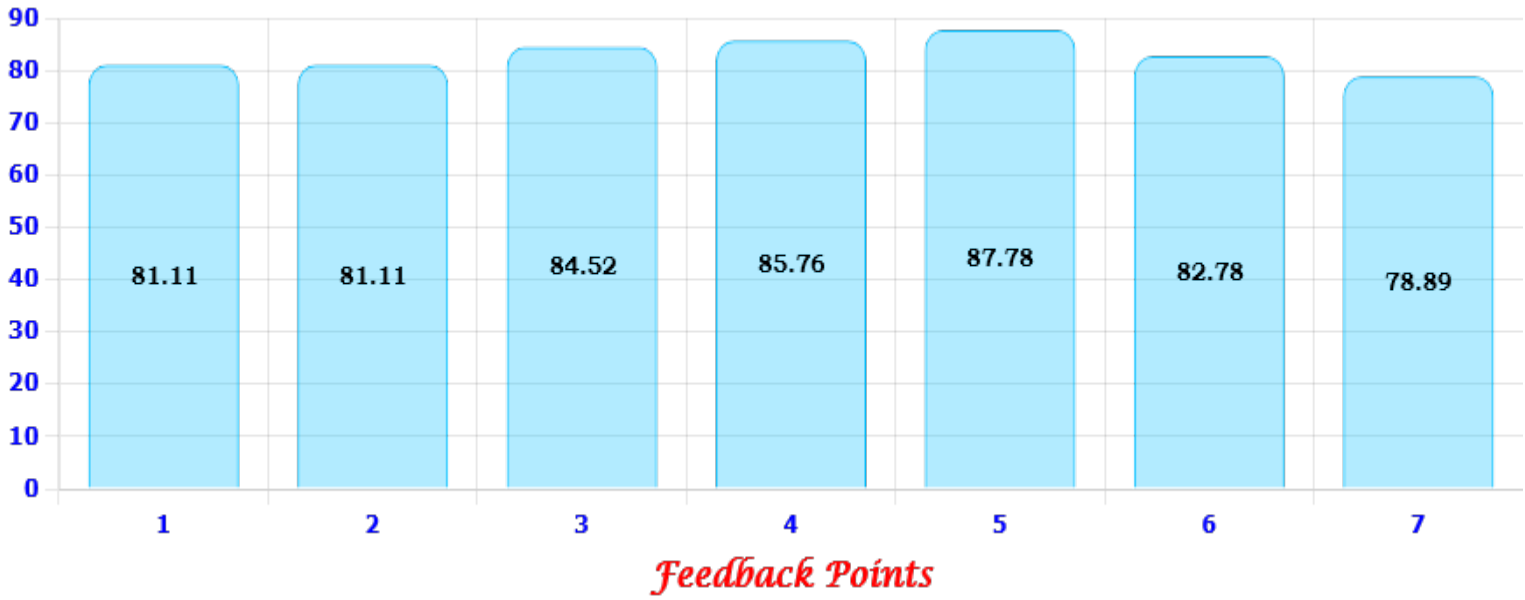
Feed Back Report

Subject	Applied Physics
Staff	B. Gayathri (H & S)
Section	I CSG II A
Course	B.Tech
A Year	2021-22

1	2	3	4	5	6	7	Over All %	Students
83.92	83.92	83.92	83.92	83.92	83.92	83.92	**83.67 %**	**41 / 41**



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2	Has the Teacher covered relevant topics beyond syllabus
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HOD **Principal**

ABSTRACT

Our project aim is to demonstrate real time stock monitor that uses the popular ESP8266 wi-fi module controlled by ARDUINO.

From today world of automation the field of biomedical is no longer aloof. Application of engineering and technology has proved its significance in the field of biomedical. It not only made doctor more efficient but also helped them in improving total process of medication.

Amid the rising number of COVID-19 cases in India, citizens are scrambling for medical oxygen, hospital beds, antiviral drugs and other supplies. Many have even put out desperate pleas on social media platforms to find COVID-related resources for their loved ones.

The goal was driven by a desire to create a ARDUINO system that connects to the internet and can work as a server/client to perform several functions and eventually serve as a central home hub. The system can be easily modified to fetch any kind of data from the internet and display it as long as there is an API for it.

The rationale behind this project was that there exists almost no library or application of the ARDUINO using the ESP8266. Both the chips individually are highly capable, cheap and can be used for even large-scale manufacture. We wanted to create a prototype ARDUINO system that has internet connectivity and can be easily extended to perform a multitude of things. Using protothreads for this makes this system only much more capable since this threading library is lightweight and makes it easy for anyone to use the ARDUINO. In order to use the keyboard without rewriting most of the configuration fie, we had to use the port expander. The alternative was to use the small board and rewrite the keyboard code. A software tradeoff is that using an intermediary python client slows down the communication (through it is more reliable). It would be slightly faster if we used the ESP to send API calls directly

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Chapter 1

Introduction

1.1 Embedded Systems

Embedded systems are designed to do some specific task, rather than be a general- purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reason such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

An embedded system is not always a separate block - very often it is physically built-in to the device it is controlling. The software written for embedded systems is often called firmware, and is stored in read-only memory or flash convector chips rather than a disk drive. It often runs with limited computer hardware resources: small or no keyboard, screen, and little memory.

Wireless communication has become an important feature for commercial products and a popular research topic within the last ten years. There are now more mobile phone subscriptions than wired-line subscriptions.

Lately, one area of commercial interest has been low-cost, low-power, and short-distance wireless communication used for \personal wireless networks." Technology advancements are providing smaller and more cost- effective devices for integrating computational processing, wireless communication, and a host of other functionalities.

It has Real Time Operating system (RTOS) that supervises the application software and provide mechanism to let the processor run a process as per scheduling by following a plan to control the latencies. RTOS defines the way the system works.

Fig 1.1.1 Real time embedded system examples

These embedded communications devices will be integrated into applications ranging from homeland security to industry automation and monitoring. They will also enable custom tailored engineering solutions, creating a revolutionary way of disseminating and processing information. With new technologies and devices come new business activities, and the need for employees in these technological areas. Engineers who have knowledge of embedded systems and wireless communications will be in high demand. Unfortunately, there are few adorable environments available for development and classroom use, so students often do not learn about these technologies during hands-on lab exercises.

1.2 Aim of project

Our project aim is to demonstrate real time oxygen cylinder and bed availability tracking that uses the ESP8266 wi-fi module controlled by ARDUINO.

1.3 Motivation of project

- Today, internet application development demand is very high.

  Basically, IOT is a network in which all physical objects are connected to the internet through network devices or routers and exchange data.
- IOT allows objects to be controlled remotely across existing network infrastructure.

  In our project we are going to explain how this IOT is used in the stock market for getting the information about the required product in our mobile phone.

1.4 The brief history of IOT

The internet of things (IoT) has only recently become ingrained in our everyday life. It surrounds us everywhere we go: connected cars driving on the street, home automation devices located in the house, smart office sensors embedded in the workplace, and fitness trackers worn on our bodies. Altogether, they create a massive ecosystem of 26.66 billion interconnected things, according to Statista, which hold a remarkable influence over societies and economies worldwide.

But the world hasn't always been this way. Until 1999, the term "internet of things" didn't even exist. So, how exactly did the internet of things evolve so fast and become such a regular buzzword, and what milestones marked internet of things development globally. The best way to answer these questions, let's dive into the roots of this incredible technology.

The concept of connected devices itself dates back to 1832 when the first electromagnetic telegraph was designed. The telegraph enabled direct communication between two machines through the transfer of electrical signals. However, the true IoT history started with the invention of the internet—a very essential component—in the late 1960s, which then developed rapidly over the next decades.

Fig 1.4.1 Examples of IOT

This might be hard to believe, but the first connected device was a Coca-Cola vending machine situated at the Carnegie Melon University and operated by local programmers. They integrated micro-switches into the machine and used an early form of the internet to see if the cooling device was keeping the drinks cold enough and if there were available Coke cans. This invention fostered further studies in the field and the development of interconnected machines all over the world.

1.5 Literature Survey

To understand the actual concept of IOT and related work of this seminar I have gone through various websites including Tata Institute of Fundamental Research, Mumbai. I also referred through the University Grants Commission, Department of Science and Technology (DST) and Science and Engineering Research Bord (SERB). Kachris and I. Tomkos.

According to IEEE survey to get a clear picture what currently is considered as an IoT- Service we surveyed more than, SENSEI, RUNES and OASiS and ongoing EU projects and did a comprehensive search through the ACM and IEEE literature databases.

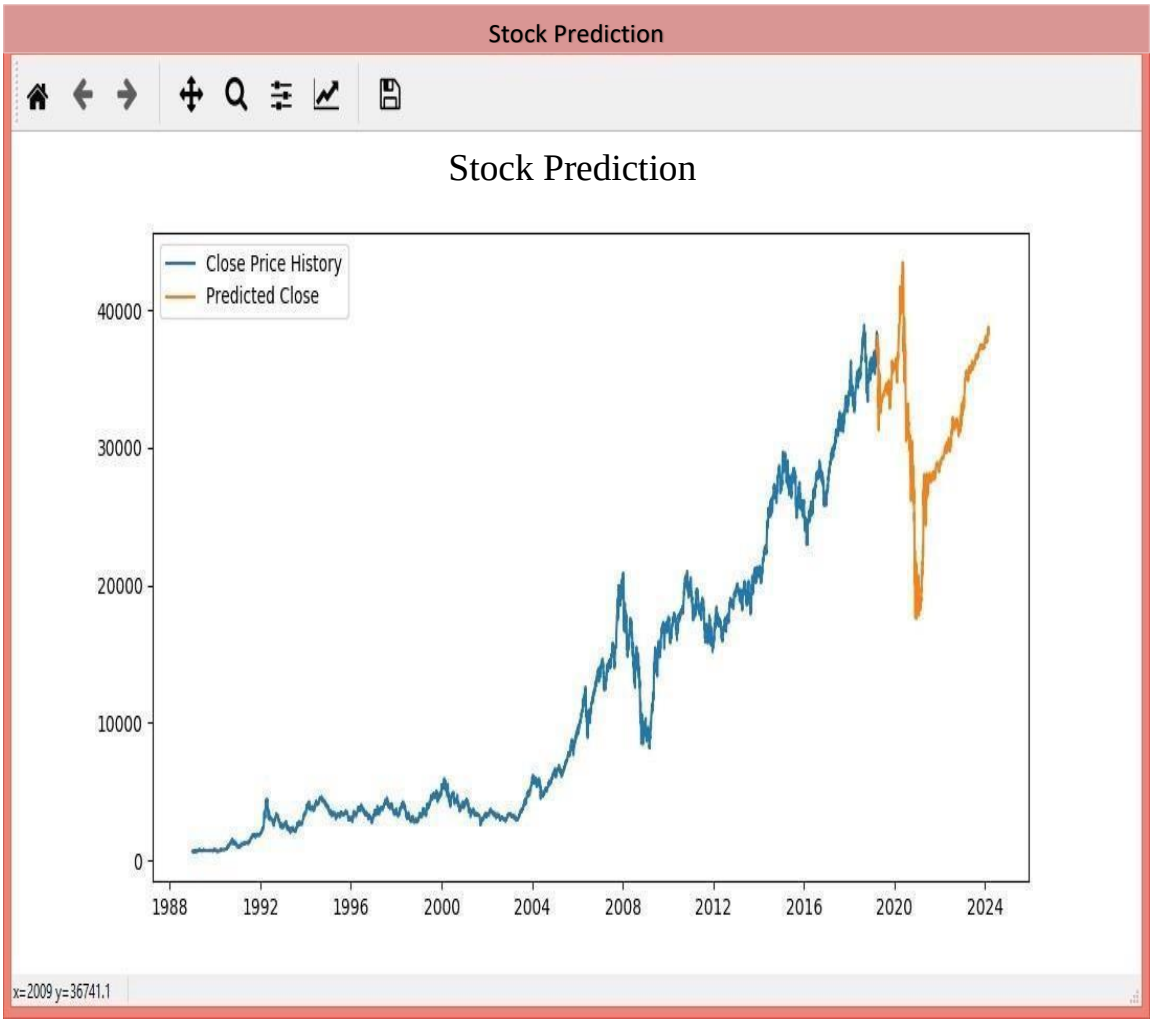


Fig 1.5.1 Oxygen cylinder & Beds monitor using machine learning

The work in by Alsheikh et al. provides a survey of ma- chine learning methods for wireless sensor networks (WSNs) … Compared to some related work in the literature that have … Communications Surveys & Tutorials IEEE COMMUNICATIONS SURVEYS & TUTORIALS.

1.6 Organization of report

The main body of the seminar report is preceded by the detailed contents including list of figures, tables and observations as the follows

Chapter 1: This chapter explains the introduction to embedded systems, aim, motivation and the brief history of IOT and literature survey of the project.

Chapter 2: This chapter describes the ARDUINO and features of the ARDUUINO

Chapter 3: This chapter describes in detail about the hardware components, Internal Sch

Chapter 4: This chapter explains the Software development, Wifi module in IOT technology, Liquid crystal display and switches with their operations.

Chapter 5: This chapter includes the advantages, disadvantages, applications, future scope and the conclusion.

Chapter 6: This chapter contains the bibliography, references and the Appendix of the project.

1.7 Conclusion

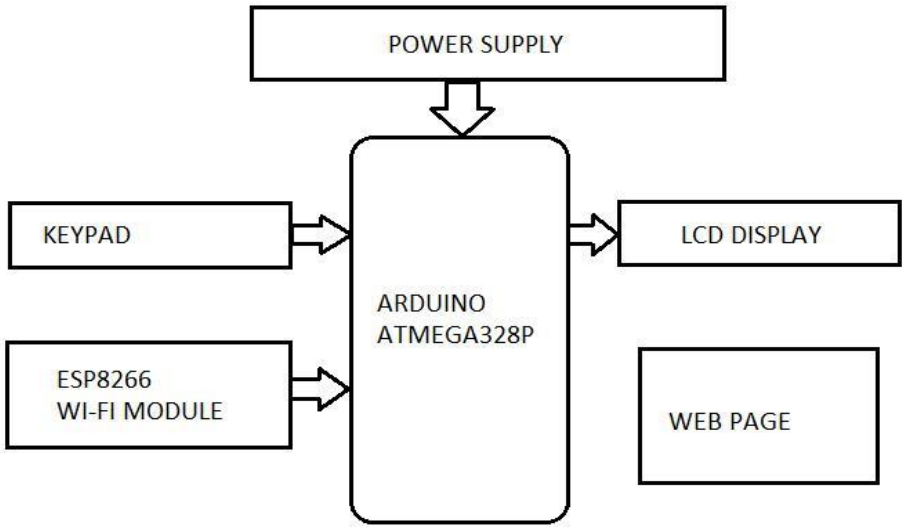
The project “Tracking of Beds and Oxygen cylinders” has been successfully designed and tested. Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC’s and with the help of growing technology the project has been successfully implemented.

Chapter 2

ARDUINO

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P datasheet. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

2.1 Block Diagram



2.1 : Block Diagram

2.1.1 Hardware

- ARDUINO
- LCD
- ESP 8266
- switches

2.1.2 Software

- Embedded C
- Arduino IDE

2.2 ARDUINO UNO

Description of hardware components and its interfacing

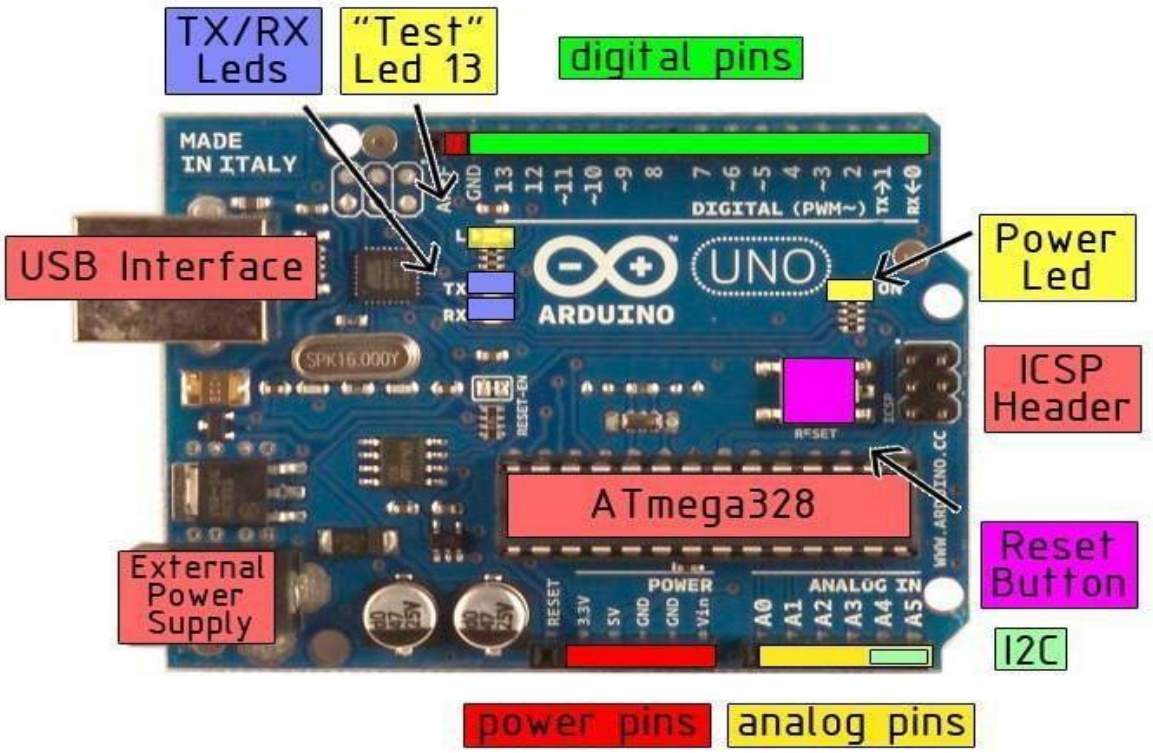


Fig 2.2: Description of Hardware Components

Fig 2.2.1: Arduino Uno

Arduino Uno is a microcontroller board based on the ATmega328P datasheet. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.
You can find here your board warranty information.

You can find in the Getting Started section all the information you need to configure your board, use the Arduino Software (IDE), and start tinker with coding and electronic The Arduino/Genuino Uno can be programmed with the (Arduino Software (IDE)). Select "Arduino/Genuino Uno from the Tools > Board menu (according to the microcontroller on your board). For details, see the reference and tutorials.

The ATmega328 on the Arduino/Genuino Uno comes preprogrammed with a bootloader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files).
You can also bypass the bootloader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header using Arduino ISP or similar; see these instructions for details.
The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available in the Arduino repository.

The ATmega16U2/8U2 is loaded with a DFU bootloader, which can be activated by:

- On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy).
- On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode.

You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an externalprogrammer (overwriting the DFU bootloader). See this user-contributed tutorial for more information.

The Arduino/Genuino Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector.

The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

2.1.1 Features:

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Length	68.6 mm
Width	53.4 mm
Weight	25 g

2.2.2 Comparisons with other boards

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Chapter 3

Hardware components

3.1 Internal Schematic of AT mega328P

The Atmega328P microcontroller is a 8-bit AVR RISC -based microcontroller combines 32 KB ISP flash memory with read-while-write capabilities, 1 KB EEPROM, 2 KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. The device achieves throughput approaching 1 MIPS per MHZ. A common alternative to the ATmega328 is the "picoPower" ATmega328P. A comprehensive list of all other members of the megaAVR series can be found on the Atmel website

- ATmega328
- ATmega328P and ATmega328P-AUTOMOTIVE
- ATmega328PB and ATmega328PB-AUTOMOTIVE (superset of ATmega328P)
  - has more UART, I2C, and SPI peripherals than ATmega328P

As of 2013 the ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed. Perhaps the most common

implementation of this chip is on the popular Arduino development platform, namely the Arduino Uno and Arduino Nano models.

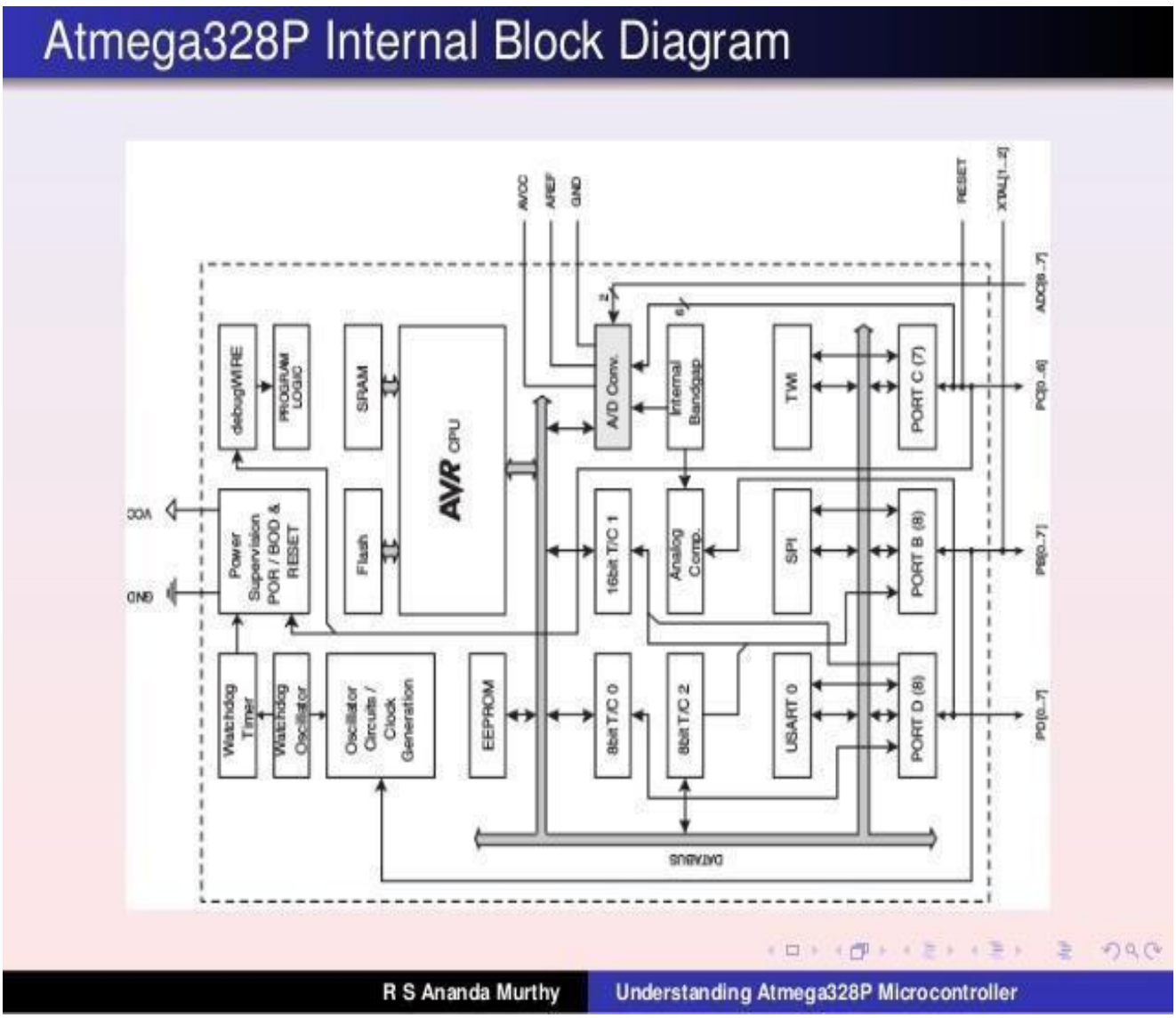


Fig 3.1: Block diagram of ATmega328P Microcontroller

Over the years the Arduino boards have been used to build thousands of projects, from daily objects to compound scientific instruments. An international community of designers, artists, students, programmers, hobbyists, and experts has gotten together around this open source stage, their donations have added up to an unbelievable amount of available knowledge that can be of immense help to beginners and specialists alike.

All boards are entirely open-source, allowing users to build them separately and finally adapt them to their exact needs. Over the years the Arduino boards have been used to build thousands of projects, from daily objects to compound scientific instruments.An international community of designers, artists, students, programmers, hobbyists, and experts has gotten together around this open source stage, their donations have added up

to an unbelievable amount of available knowledge that can be of immense help to beginners and specialists alike.

3.2 Communication:

Arduino/Genuino Uno has a number of facilities for communicating with a computer, another Arduino/Genuino board, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The 16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a.inf file is required.

The Arduino Software (IDE) includes a serial monitor which allows simple textual data to be sent to and from the board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1).

A Software Serial library allows serial communication on any of the Uno's digital pins.The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino Software (IDE) includes a Wire library to simplify use of the I2C bus; see the documentation for details. For SPI communication, use the SPI library.

3.3 Automatic (Software) Reset:

Rather than requiring a physical press of the reset button before an upload, the Arduino/Genuino Uno board is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 nanofarad capacitor.

When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino Software (IDE) uses this capability to allow you to upload code by simply pressing the upload button in the interface toolbar. This means that the bootloader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload.

This setup has other implications. When the Uno is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half-second or so, the bootloader is running on the Uno.
While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened. If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data.
The Uno board contains a trace that can be cut to disable the auto-reset. The pads on either side of the trace can be soldered together to re-enable it. It's labeled "RESET-EN". You may also be able to disable the auto-reset by connecting a 110 ohm resistor from 5V to the reset line; for details. get a regulated positive supply from the mains supply.

3.4 Power Supply:

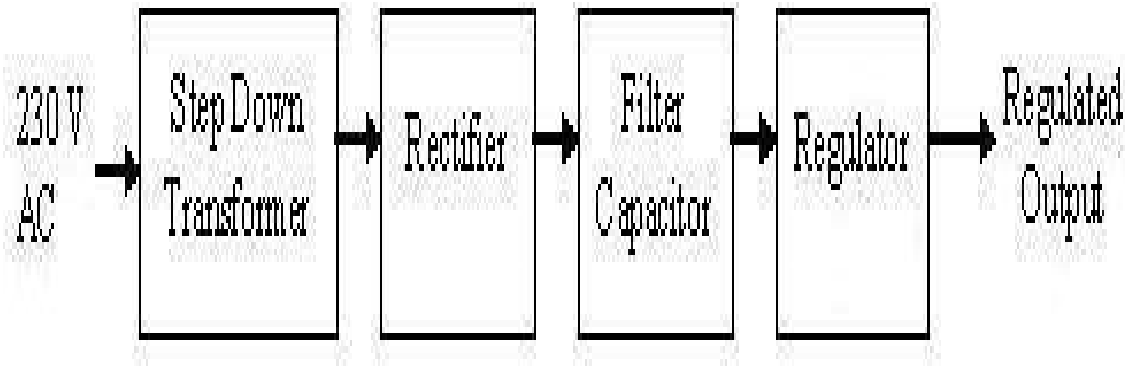


Fig 3.5.1: Basic block diagram of a fixed regulated power supply.

Let us go through each block.

- Transformer

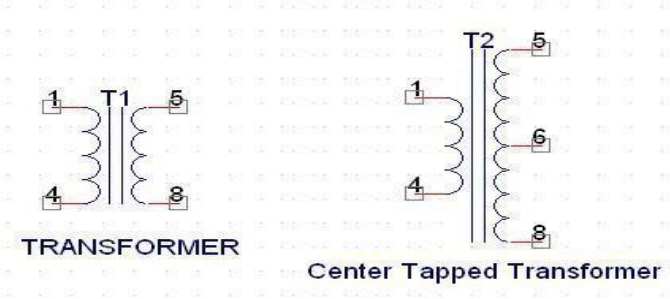


Fig 3.5.2: Transformer

A transformer consists of two coils also called as “WINDINGS” namely PRIMARY & SECONDARY. They are linked together through inductively coupled electrical conductors also called as CORE. A changing current in the primary causes a change in the Magnetic Field in the core & this in turn induces an alternating voltage in the secondary coil. If load is applied to the secondary then an alternating current will flow through the load. If we consider an ideal condition

then all the energy from the primary circuit will be transferred to the secondary circuit through the magnetic field.

So

$$I_p V_p = I_s V_s$$

The secondary voltage of the transformer depends on the number of turns in the Primary as well as in the secondary.

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

- Rectifier

A rectifier is a device that converts an AC signal into DC signal. For rectification purpose we use a diode, a diode is a device that allows current to pass only in one direction i.e. as when the anode of the diode is positive with respect to the cathode also called as forward biased condition & blocks current in the reversed biased condition.

Rectifier can be classified as follows

1) Half Wave rectifier

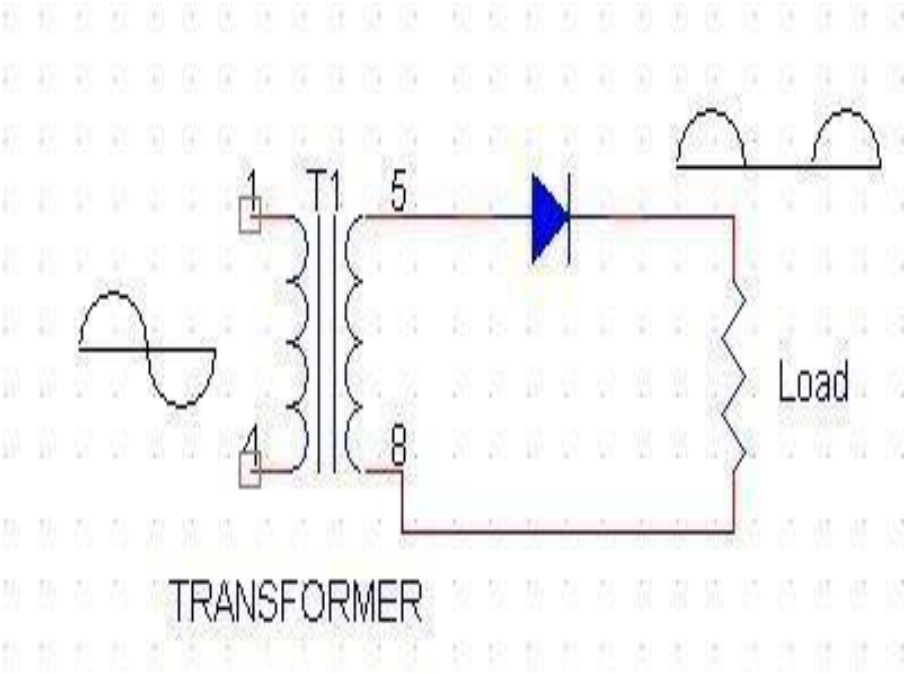


Fig 3.5.3: Half Wave Rectifier

This is the simplest type of rectifier as you can see in the diagram a half wave rectifier consists of only one diode. When an AC signal is applied to it during the positive half cycle the diode is forward biased & current flows through it. But during the negative half cycle diode is reverse biased & no current flows through it. Since only one half of the input reaches the output, it is very inefficient to be used in power supplies.

2) **Full wave rectifier**:

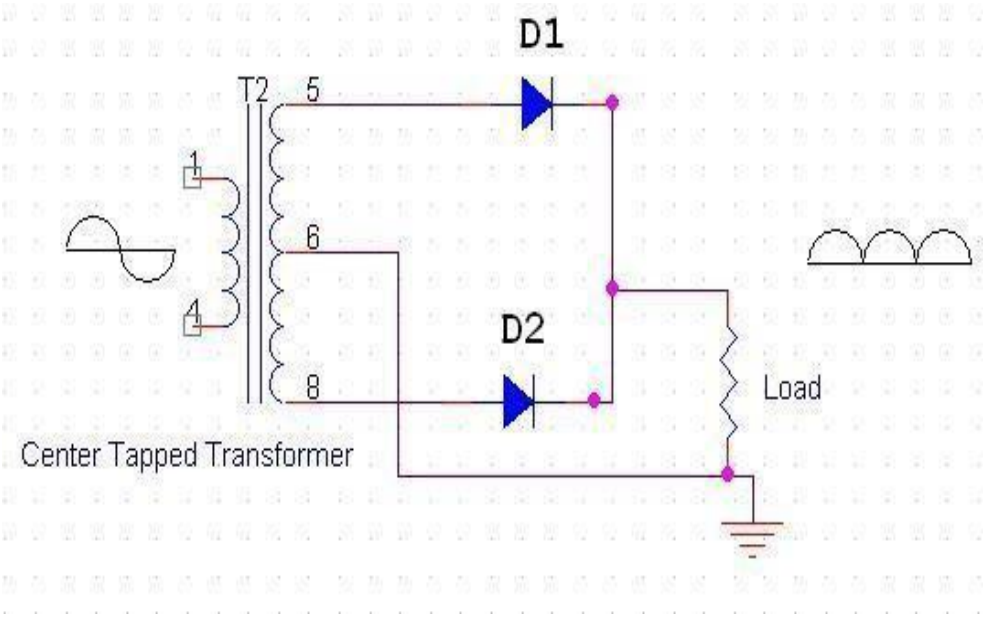


Fig 3.5.4: Full Wave Rectifier

Half wave rectifier is quite simple but it is very inefficient, for greater efficiency we would like to use both the half cycles of the AC signal. This can be achieved by using a center tapped transformer i.e. we would have to double the size of secondary winding & provide connection to the center. So during the positive half cycle diode D1 conducts & D2 is in reverse biased condition. During the negative half cycle diode D2 conducts & D1 is reverse biased. Thus we get both the half cycles One of the disadvantages of Full Wave Rectifier design is the necessity of using a center tapped transformer, thus increasing the size & cost of the circuit. This can be avoided by using the Full Wave Bridge Rectifier.

across the load.

3) **Bridge Rectifier**:

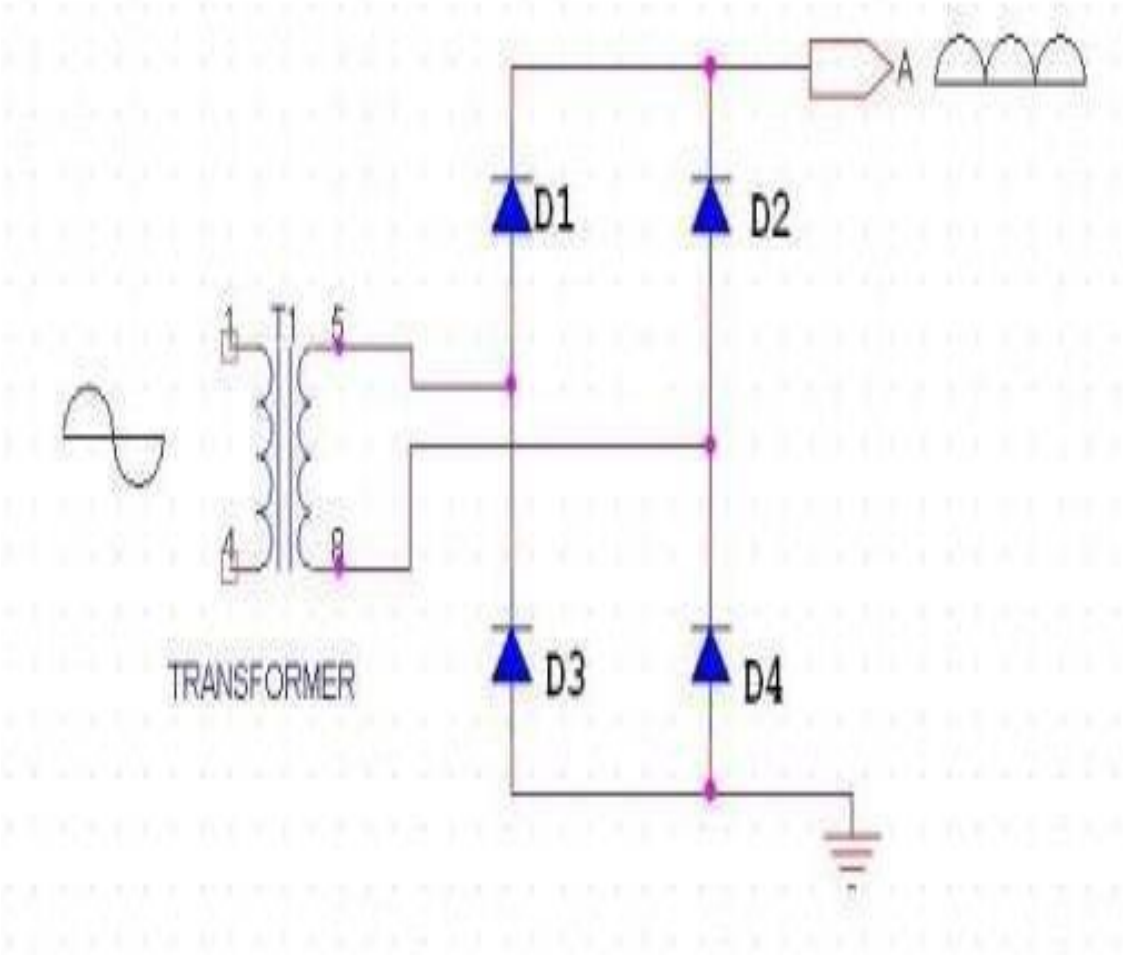


Fig 3.5.5: Bridge Rectifier

As the name suggests it converts the full wave i.e. both the positive & the negative half cycle into DC thus it is much more efficient than Half Wave Rectifier & that too without using a center tapped transformer thus much more cost effective than Full Wave Rectifier.

Full Bridge Wave Rectifier consists of four diodes namely D1, D2, D3 and D4. During the positive half cycle diodes D1 & D4 conduct whereas in the negative half cycle diodes D2 & D3 conduct thus the diodes keep switching the transformer connections so we get positive half cycles in the output.

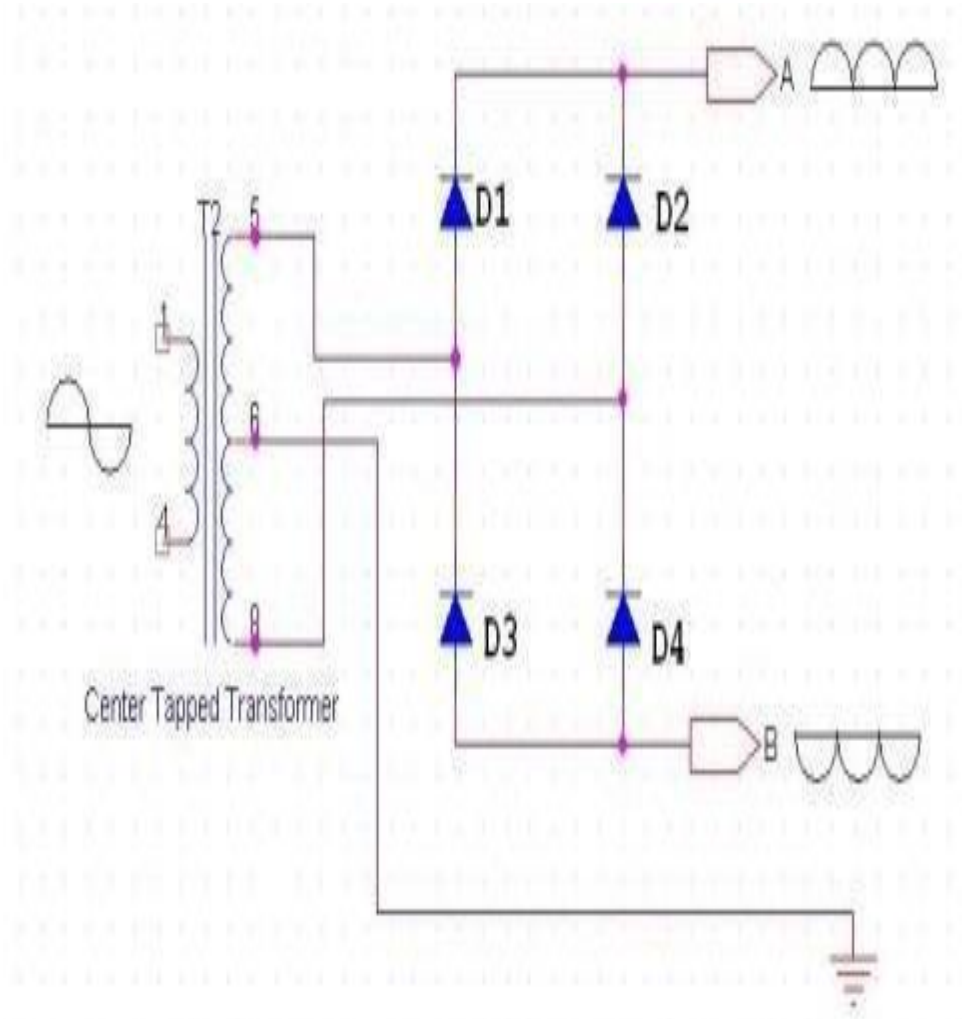


Fig 3.5.6: Bridge Rectifier with Center Trapped Transformer

If we use a center tapped transformer for a bridge rectifier we can get both positive & negative half cycles which can thus be used for generating fixed positive & fixed negative voltages.

Filter capacitor

Even though half wave & full wave rectifier give DC output, none of them provides a constant output voltage. For this we require to smoothen the waveform received from the rectifier. This can be done by using a capacitor at the output of the rectifier this capacitor is also called as "FILTER CAPACITOR" or "SMOOTHING CAPACITOR" or "RESERVOIR CAPACITOR". Even after using this capacitor a small amount of ripple will remain.
We place the Filter Capacitor at the output of the rectifier the capacitor will charge.
peak voltage during each half cycle then will discharge its stored energy slowly through the load while the rectified voltage drops to zero, thus trying to keep the voltage as constant as possible.

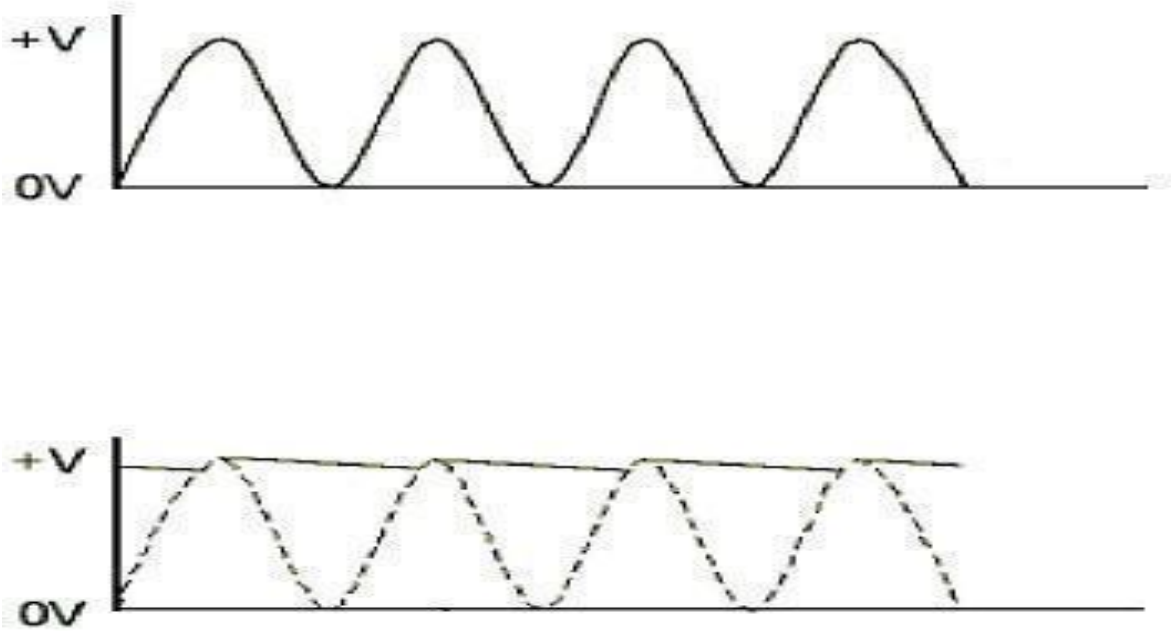


Fig 3.5.7: Output of Filter Capacitor

If we go on increasing the value of the filter capacitor then the Ripple will decrease. But then the costing will increase. The value of the Filter capacitor depends on the current consumed by the circuit, the frequency of the waveform & the accepted ripple.

$$C = \frac{V_r F}{I}$$

Where,

Vr= accepted ripple voltage.(should not be more than 10% of the voltage) I= current consumed by the circuit in Amperes.

F= frequency of the waveform. A half wave rectifier has only one peak in one cycle so F=25hz

Whereas a full wave rectifier has Two peaks in one cycle so F=100hz.

Voltage Regulator

A voltage regulator is a device which converts varying input voltage into a constant regulated output voltage. Voltage regulator can be of two types

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Voltage Regulator

A voltage regulator is a device which converts varying input voltage into a constant regulated output voltage. Voltage regulator can be of two types Linear Voltage Regulator:

Also called as Resistive Voltage regulator because they dissipate the excessive voltage resistively as heat.

1) Switching Regulators:

They regulate the output voltage by switching the Current ON/OFF very rapidly. Since their output is either ON or OFF it dissipates very low power thus achieving higher efficiency as compared to linear voltage regulators. But they are more complex & generate high noise due to their switching action. For low level of output power switching regulators tend to be costly but for higher output wattage they are much cheaper than linear regulators.

The most commonly available Linear Positive Voltage Regulators are the 78XX series where the XX indicates the output voltage. And 79XX series is for Negative Voltage Regulators.

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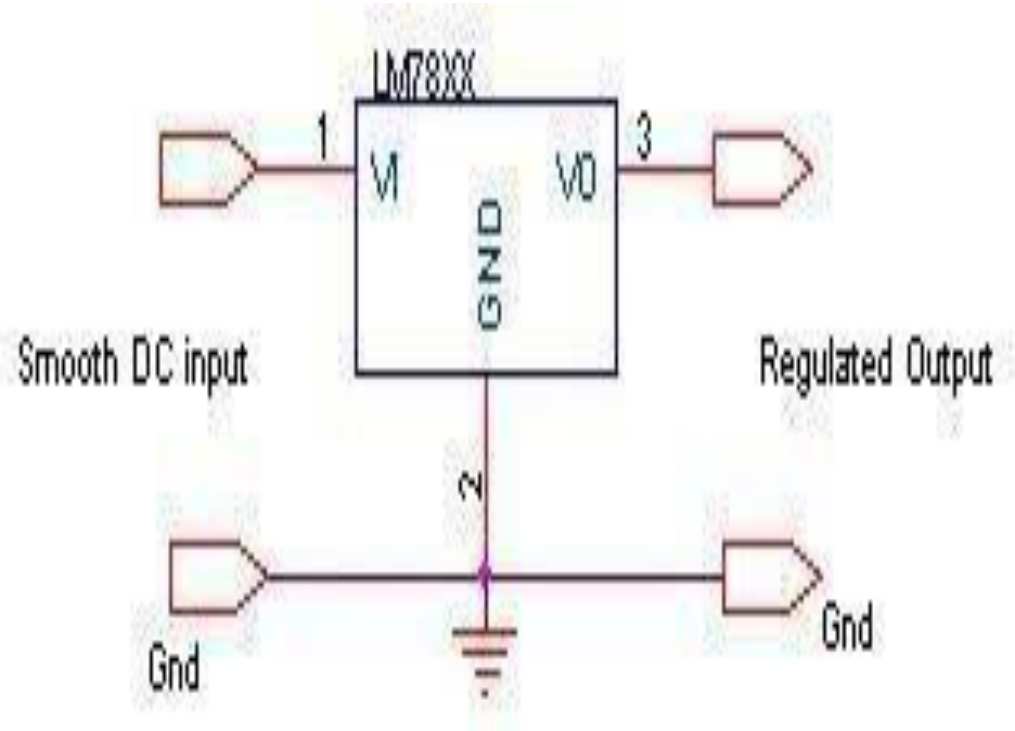


Fig 3.5.8: Switching Regulator

After filtering the rectifier output the signal is given to a voltage regulator. The maximum input voltage that can be applied at the input is 35V.Normally there is a 2-3 Volts drop across the regulator so the input voltage should be at least 2-3 Volts higher than the output voltage. If the input voltage gets below the Vmin of the regulator due to the ripple voltage or due to any other reason the voltage regulator will not be able to produce the correct regulated voltage.

Switching regulators convert one voltage to another by temporarily storing energy and then releasing that stored energy to the output at a different voltage. The terms DC to DC converter, switched mode power supply (SMPS), switching regulator, and switching converter all refer to the same thing. These operate by controlling a solid state device, like a transistor or diode, that acts like a switch. The switch interrupts the flow of current to an energy storage component, such as a capacitor or an inductor, in order to transform one voltage to another. There are many types of switching regulator topologies including the three most common ones:

- Buck (Step-Down) Switching Regulator

Characteristics

Line Regulation

Line regulation refers to fluctuations of the output voltage relative to the variation of the input DC voltage. This may be expressed in percentage points or a specific fluctuation in a given input range, such as 12 mV. For power supply ICs, and in particular for linear regulators, in most cases they have the same name specification. In terms of semantics, it is identical. Input voltage conditions for line regulation of a power supply are based on a presumed input voltage range of the power supply. In the case of line regulation, the property to be addressed means static output voltage fluctuations, that is, non-transient fluctuations.

Although newer power supply ICs provide excellent its line regulation performance, in terms of circuitry as a power supply, we need to look beyond IC capabilities, but also we must study the capability of input capacitor to be used to ensure sufficient line regulation.

Load Regulation

Load Regulation refers to fluctuations in the output voltage relative to the variation in load current. Similar to line Regulation, the load regulation is expressed in terms of percentage points and fluctuations between a given set of load variations. As in the case of line regulation, load

regulation specifications apply to the IC itself. However, when the IC is viewed as a power supply, we need to focus on the fact that voltage levels differ between power supply outlet and load input as the voltage declines, due to the resistive components of the output wires. At the outlet for power output, when the load current fluctuates, changes occur in a manner dependent upon the load regulation of the power circuit itself. At the load inlet, however, there is an additional decrease in voltage due to the resistance component of the interconnect. For this reason, many situations can arise where the voltages at the power supply pins for the load requiring large currents decline unexpectedly. A more detailed discussion on this topic will be presented in the section on “Evaluating the Switching Regulator”.

One of the load fluctuations is a transient fluctuation. As in the case of line regulation, however, load regulation is not a property on transient phenomena. To address load transients, we invoke a separate concept of transient response.

Efficiency

Efficiency is defined as the ratio (%) of the output power to the input power. In simple terms, efficiency is a value that can be arrived at by measuring the power (current x voltage) pulled in at the input end and the power extracted from the output end.

While the importance of efficiency is obvious, remember that minimizing losses directly translates to reducing heat generation. Heat generation represents a critical evaluation item because not only it limits the amount of output power that can be utilized, but it also requires the space and devices for heat dissipation and cooling, and can even be a factor that reduces the reliability of power supply circuits and of add-on circuits.

Input/Output Ripple Voltage

Ripple Voltage, which refers to pulsation, occurs on both the input and output ends. On the output end, since the device of interest is a switching regulator, there always exists a ripple voltage stemming from switching operations. Although the term Switching Noise may also be used to describe Ripple Voltage, the former generally encompasses both harmonics and spikes.

In terms of ripples, the ripple voltage, which is the height of a pulse, and the frequency, need to be evaluated. In cases where a low power supply voltage, such as 1V or less, is used, as in the case of an FPGA, situations may arise where the required power supply voltage accuracy cannot be satisfied due to the ripple voltage. In addition, ripples, including harmonics and spikes, tend to reduce the system S/N.

Although output ripples can be reduced by means of an output filter, in situations where the frequency fluctuates, such as in PFM, methods for reducing the output ripple requires a careful analysis.

Input ripples arise when the switching transistor pulls in a large current by switching operations. Because spikes can occur by the switching (on/off) of the current and by the parasitic inductance of the input, elimination of spikes requires a careful circuit layout design. In concrete terms, the input capacitor should be connected right next to the input pins for the IC to eliminate parasitic inductance.

Transient Response

The transient response characteristic describes the rate of response from the time the output load current changes suddenly until the output voltage returns to the set value. Critical factors affecting the transient response characteristic include the response performance of the IC itself, in addition to the output capacitor and the equivalent serial resistance (ESR).

In the current-mode power supply IC, the transient response characteristic can be optimized by adjusting the phase characteristics. Also, hysteresis (ripple) control provides highly favorable transient response characteristics.

Allowable Dissipation

Allowable dissipation refers to the extent of direct loss that can be tolerated by the devices (ICs and transistors) used in a power supply circuit. Specifically, it means the quantity of allowable power loss that can be calculated from Tjmax (the maximum junction temperature rating) and the package thermal resistance. In the case of power elements (switching transistors), the term refers

to the allowable loss, and for built-in power devices, the term refers to the allowable loss inherent in the IC itself. In terms of circuits, because newer power devices are surface-mounted on a circuit board, in most cases the PCB can be used as a heat sink (it goes without saying that in the case of large-power circuits a separate heat sink is provided); consequently, pattern layout is an important consideration. At any rate, since thermal dissipation and allowable dissipation must be evaluated carefully, sound heat calculations are an important step.

3.5 Proposed Hardware:

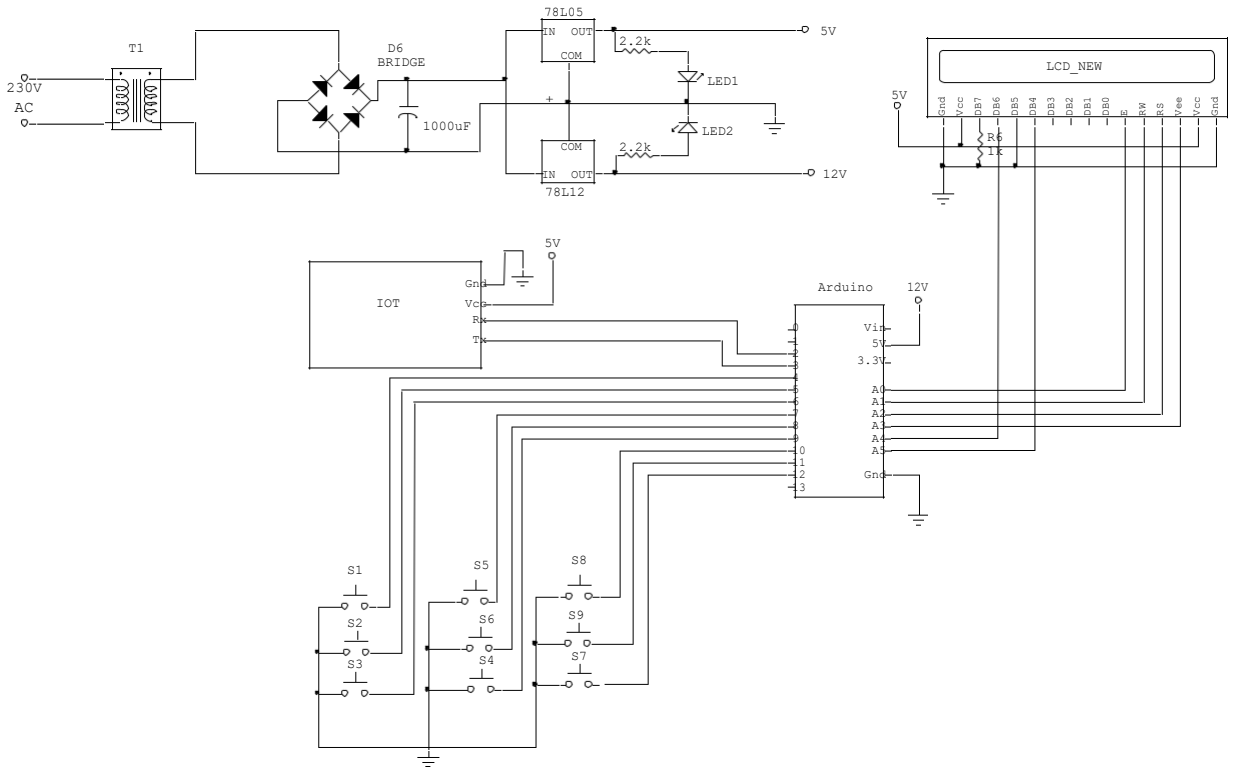


Fig 3.5.1: Proposed Hardware

7805 is an integrated three-terminal positive fixed linear voltage regulator. It supports an input voltage of 10 volts to 35 volts and output voltage of 5 volts. It has a current rating of 1 amp although lower current models are available. Its output voltage is fixed at 5.0V. The 7805 also has a built-in current limiter as a safety feature. 7805 is manufactured by many companies, including National Semiconductors and Fairchild Semiconductors.

The 7805 will automatically reduce output current if it gets too hot. The last two digits represent the voltage; for instance, the 7812 is a 12-volt regulator. The 78xx series of regulators is designed

to work in complement with the 79xx series of negative voltage regulators in systems that provide both positive and negative regulated voltages, since the 78xx series can't regulate negative voltages in such a system.

The 7805 & 78 is one of the most common and well-known of the 78xx series regulators, as it's small component count and medium-power regulated 5V make it useful for powering devices.

SPECIFICATIONS	**IC 7805**
V_{out}	5V
V_{ein} - V_{out} Difference	5V - 20V
Operation Ambient Temp	0 - 125°C
Output I_{max}	1A

Table 3.5.2: Specifications of IC7805

Fig 3.5.3 MAX 232

Fig 3.6.4: TTL/CMOS Serial Logic Waveform

The diagram above shows the expected waveform from the UART when using thecommon 8N1 format. 8N1 signifies 8 Data bits, No Parity and 1 Stop Bit. The RS-232 line, when idle is in the Mark State (Logic 1

The diagram above shows the expected waveform from the UART when using the common 8N1 format. 8N1 signifies 8 Data bits, No Parity and 1 Stop Bit. The RS-232 line, when idle is in the Mark State (Logic 1). A transmission starts with a start bit which is (Logic 0). Then each bit is sent down the line, one at a time. The LSB (Least Significant Bit) is sent first. A Stop Bit (Logic 1) is then appended to the signal to make up the transmission. The data sent using this method, is said to be framed. That is the data is framed between a Start and Stop Bit.

- RS-232 Voltage levels
  - +3 to +25 volts to signify a "Space" (Logic 0)
  - -3 to -25 volts for a "Mark" (logic 1).
  - Any voltage in between these regions (i.e. between +3 and -3 Volts) is undefined. The data byte is always transmitted least-significant-bit first.

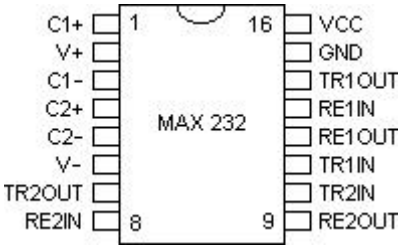
The bits are transmitted at specific time intervals determined by the baud rate of the serial signal. This is the signal present on the RS-232 Port of your computer, shown below.

Fig 3.5.5: RS-232 Logic Waveform

- RS-232 Level Converter: Standard serial interfacing of microcontroller (TTL) with PC or any RS232C Standard device , requires TTL to RS232 Level converter . A MAX232 is used for this purpose. It provides 2-channel RS232C port and requires external 10uF capacitors. The driver requires a single supply of

  +5V.

The standard specifies a maximum open-circuit voltage of 25 volts: signal levels of ±5 V, ±10 V, ±12 V, and ±15 V are all commonly seen depending on the voltages available to the line driver circuit. Some RS-232 driver chips have inbuilt circuitry to produce the required voltages from a 3 or 5 volt supply.



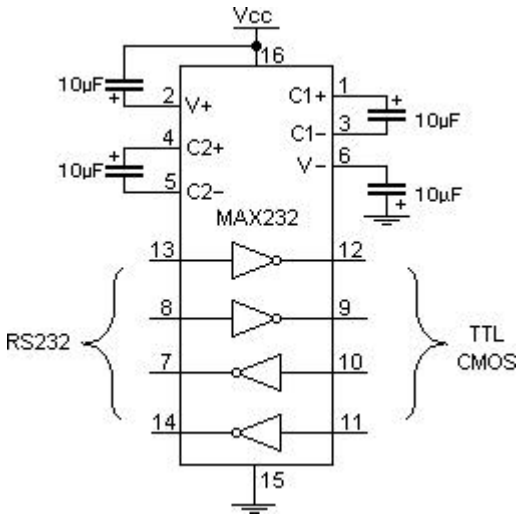


Fig 3.5.6: MAX 232 Pin description

3.6 Serial communication

When a processor communicates with the outside world, it provides data in byte sized chunks. Computers transfer data in two ways: parallel and serial. In parallel data transfers, often more lines are used to transfer data to a device and 8 bit data path is expensive. The serial communication transfer uses only a single data line instead of the 8 bit data line of parallel communication which makes the data transfer not only cheaper but also makes it possible for two computers located in two different cities to communicate over telephone.

Serial data communication uses two methods, asynchronous and synchronous. The synchronous method transfers data at a time while the asynchronous transfers a single byte at a time. There are some special IC chips made by many manufacturers for data communications. These chips are commonly referred to as UART (universal asynchronous receiver-transmitter) and USART (universal synchronous asynchronous receiver transmitter). The AT89C51 chip has a built in UART.

In asynchronous method, each character is placed between start and stop bits. This is called framing. In data framing of asynchronous communications, the data, such as ASCII characters, are packed in between a start and stop bit. We have a total of 10 bits for a character: 8 bits for the ASCII code and 1 bit each for the start and stop bits. The rate of serial data transfer communication is stated in bps or it can be called as baud rate. To allow the compatibility among data communication equipment made by various manufacturers, and interfacing standard called RS232 was set by the Electronics industries Association in 1960.

Today RS232 is the most widely used I/O interfacing standard. This standard is used in PCs and numerous types of equipment. However, since the standard was set long before the advent of the TTL logic family, its input and output voltage levels are not TTL compatible.

In RS232, a 1 bit is represented by -3 to -25V, while a 0 bit is represented +3 to +25 V, making -3 to +3 undefined. For this reason, to connect any RS232 to a microcontroller system we must use voltage converters such as MAX232 to connect the TTL logic levels to RS232 voltage levels and vice versa. MAX232 ICs are commonly referred to as line drivers.

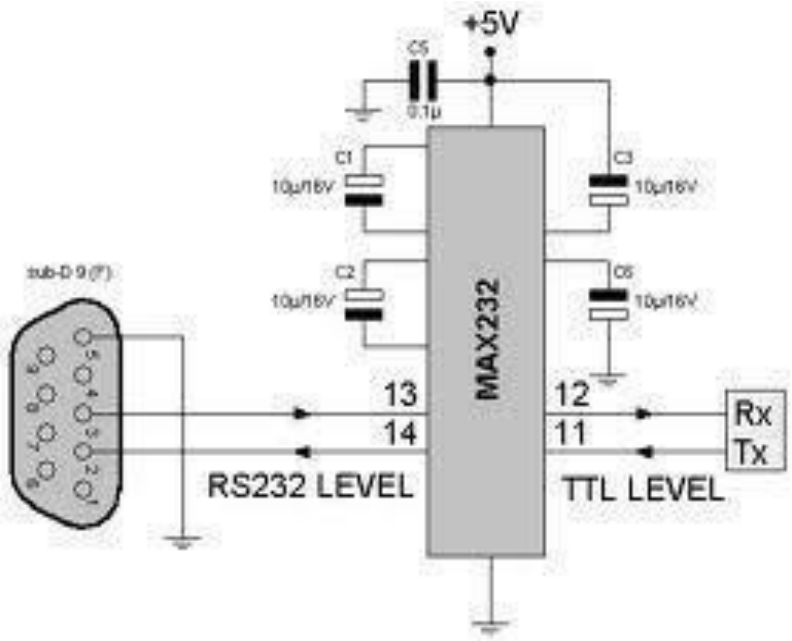


Fig 3.6.1 serial communication circuit

The RS232 cables are generally referred to as DB-9 connector. In labeling, DB-9P refers to the plug connector (male) and DB-9S is for the socket connector (female). The simplest connection between a PC and microcontroller requires a minimum of three pin,

TXD, RXD, and ground. Many of the pins of the RS232 connector are used for handshaking signals. They are bypassed since they are not supported by the UART chip.

Fig 3.6.2: DB9 Connector

IBM PC/ compatible computers based on x86(8086, 80286, 386, 486 and Pentium) microprocessors normally have two COM ports. Both COM ports have RS232 type connectors. Many PCs use one each of the DB-25 and DB-9 RS232 connectors.

The COM ports are designated as COM1 and COM2. We can connect the serial port to the COM 2 port of a PC for serial communication experiments. We use a DB9 connector in our arrangement.

3.7 Wi-fi module

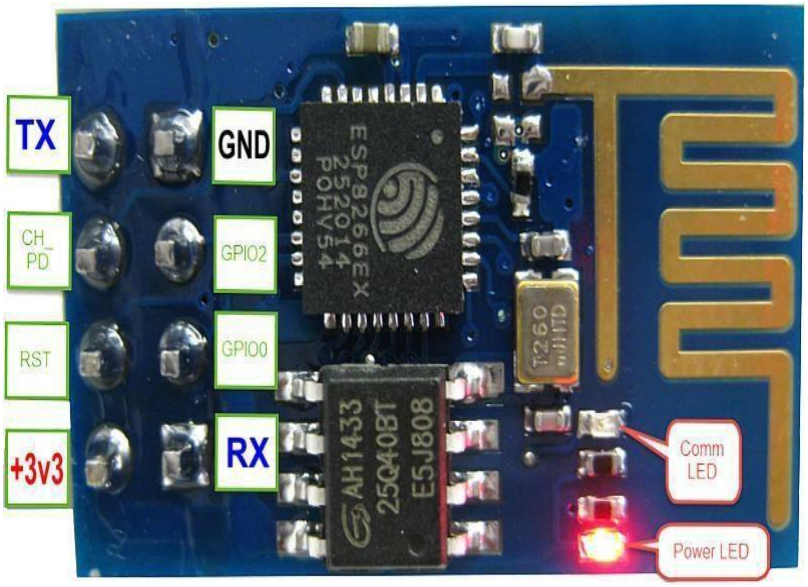


Fig 3.7.1 Wi-fi Module

3.8 Wi-fi module Features

- 802.11 b/g/n protocol
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLL, regulators, and power management units
  - +19.5dBm output power in 802.11b mode
- Integrated temperature sensor
- Supports antenna diversity
- Power down leakage current of < 10uA
- Integrated low power 32-bit CPU could be used as application processor

- SDIO 2.0, SPI, UART
- STBC, 1×1 MIMO, 2×1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4µs guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

The ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and MCU (Micro Controller Unit) capability produced by Shanghai-based Chinese manufacturer, The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer, AI-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands.

However, at the time there was almost no English- language documentation on the chip and the commands it accepted. The very low price and the fact that there were very few external components on the module which suggests that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.

The **ESP8285** is an ESP8266 with 1 MB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi. The successor to these module(s) is ESP32.This is the series of ESP8266-based modules made by Express if.

The reason for the popularity of many of these boards over the earlier ESP-xx modules is the inclusion of an on-board USB-to-UART bridge (like the Silicon Labs' CP2102 or the WCH CH340G) and a Micro-USB connector, coupled with a 3.3-volt regulator to provide both power to the board and connectivity to the host (software development) computer – commonly referred to as the console, making it an easy development platform.

With earlier ESP-xx modules, these two items (the USB-to-serial adapter and the regulator) had to be purchased separately and be wired into the ESP-xx circuit. Modern ESP8266 boards like the NodeMCU are easier to work with and offer more GPIO pins.

Most of the boards listed here are based on the ESP-12E module, but new modules are being introduced seemingly every few months.components on the module which suggests that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.

The **ESP8285** is an ESP8266 with 1 MB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi. The successor to these module(s) is ESP32.This is the series of ESP8266-based modules made by Express if.

“Active pins" include the GPIO and ADC pins with which you can attach external devices to the ESP8266 MCU. The "Pitch" is the space between pins on the ESP8266 module, which is important to know if you are going to breadboard the device.

The "Form factor" also describes the module packaging as "2 x 9 DIL", meaning two rows of 9 pins arranged "Dual In Line", like the pins of DIP ICs. Many ESP-xx modules include a small on-board LED which can be programmed to blink and thereby indicate activity.

There are several antenna options for ESP-xx boards including a trace antenna, an on- board ceramic antenna, and an external connector which allows you to attach an external Wi-Fi antenna. Since Wi-Fi communications generates a lot of RFI (Radio Frequency Interference), governmental bodies like the FCC like shielded electronics to minimize interference with other devices. Some of the ESP-xx modules come housed within a metal box with an FCC seal of approval stamped on it. First and second world markets will likely demand FCC approval and shielded Wi-Fi devices.

3.9 AI-Thinker modules

Fig 3.9.1: ESP-01 module

These are the first series of modules made with the ESP8266 by the third-party manufacturer AI-Thinker and remain the most widely available. They are collectively referred to as "ESP-xx modules".

To form a workable development system they require additional components, especially a serial TTL-to-USB adapter (sometimes called aUSB-to-UART bridge) and an external 3.3 Volt power supply. Novice ESP-8266 developers are encouraged to consider larger ESP8266 Wi-Fi development boards like the Node MCU which includes the USB-to-UART bridge and a Micro-USB connector coupled with a 3.3 Volt power regulator already built into the board.

When project development is complete, you may not need these components and can consider using these cheaper ESP-xx modules as a lower power, smaller footprint option for yourproduction runs.

ESP8266 offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor.

When ESP8266 hosts the application, and when it is the only application processor in the device, it is able to boot up directly from an external flash. It has integrated cache to improve the performance of the system in such applications, and to minimize the memory requirements.

Alternately, serving as a Wi-Fi adapter, wireless internet access can be added to any microcontroller-based design with simple connectivity through UART interface or the CPU AHB bridge interface.

The popularity of many of these "other boards" over the earlier ESP-xx modules is the inclusion of an on-board USB-to-UART bridge (like the Silicon Labs' CP2102 or the WCH CH340G) and a Micro-USB connector coupled with a 3.3 Volt regulator to provide both power to the board and connectivity to the host (software development) computer commonly referred to as the console.

With earlier ESP-xx modules, these two items (the USB-to-Serial adaptor and a 3.3 Volt regulator) had to be purchased separately and be wired into the ESP-xx circuit. Modern ESP8266 boards like the Node MCU boards are a lot less painful and offer more GPIO pins to play with. Most of these "other boards" are based on the ESP-12E module, but new modules are being introduced seemingly every few months.

3.10 Liquid Crystal Display

To display interactive messages we are using LCD Module. We examine an intelligent LCD display of two lines,16 characters per line that is interfaced to the controllers. The protocol (handshaking) for the display is as shown.

Whereas D0 to D7th bit is the Data lines, RS, RW and EN pins are the control pins and remaining pins are +5V, -5V and GND to provide supply. Where RS is the Register Select, RW is the Read Write and EN is the Enable pin.

The display contains two internal byte-wide registers, one for commands (RS=0) and the second for characters to be displayed (RS=1). It also contains a user-programmed RAM area (the character RAM) that can be programmed to generate any desired character that can be formed using a dot matrix.

To distinguish between these two data areas, the hex command byte 80 will be used to signify that the display RAM address 00h will be chosen. Port 1 is used to furnish the command or data type, and ports 3.2 to 3.4 furnish register select and read/write levels.

The display takes varying amounts of time to accomplish the functions as listed. LCD bit 7 is monitored for logic high (busy) to ensure the display is overwritten.Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose.

The display takes varying amounts of time to accomplish the functions as listed. LCD bit 7 is monitored for logic high (busy) to ensure the display is overwritten.

Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most common type of LCD controller is HITACHI 44780 which provides a simple interface between the controller & an LCD. These LCD's are very simple to interface with the controller as well as are cost effective.

Fig 3.10.1: 4x20 Line Alphanumeric LCD Display

The most commonly used ALPHANUMERIC displays are 1x16 (Single Line & 16 characters), 2x16 (Double Line & 16 character per line) & 4x20 (four lines & Twenty characters per line). The LCD requires 3 control lines (RS, R/W & EN) & 8 (or 4) data lines. The number on data lines depends on the mode of operation. If operated in 8-bit mode then 8 data lines + 3 control lines i.e. total 11 lines are required. And if operated in 4-bit mode then 4 data lines + 3 control lines i.e. 7 lines are required. How do we decide which mode to use? It’s simple if you have sufficient data lines you can go for 8 bit mode & if there is a time constrain i.e. display should be faster then we

have to use 8-bit mode because basically 4-bit mode takes twice as more time as compared to 8-bit mode.

Pin	Symbol	Function
1	Vss	Ground
2	Vdd	Supply Voltage
3	Vo	Contrast Setting
4	RS	Register Select
5	R/W	Read/Write Select
6	En	Chip Enable Signal
7-14	DB0-DB7	Data Lines
15	A/Vee	Gnd for the backlight
16	K	Vcc for backlight

Table 3.10.2: Pin description of LCD

When RS is low (0), the data is to be treated as a command. When RS is high (1), the data being sent is considered as text data which should be displayed on the screen.

When R/W is low (0), the information on the data bus is being written to the LCD. When RW is high (1), the program is effectively reading from the LCD. Most of the times there is no need to read from the LCD so this line can directly be connected to ground thus saving one controller line.

The ENABLE pin is used to latch the data present on the data pins. A HIGH - LOW signal is

required to latch the data. The LCD interprets and executes our command at the instant the EN line is brought low. If you never bring EN low, your instruction will never be executed.

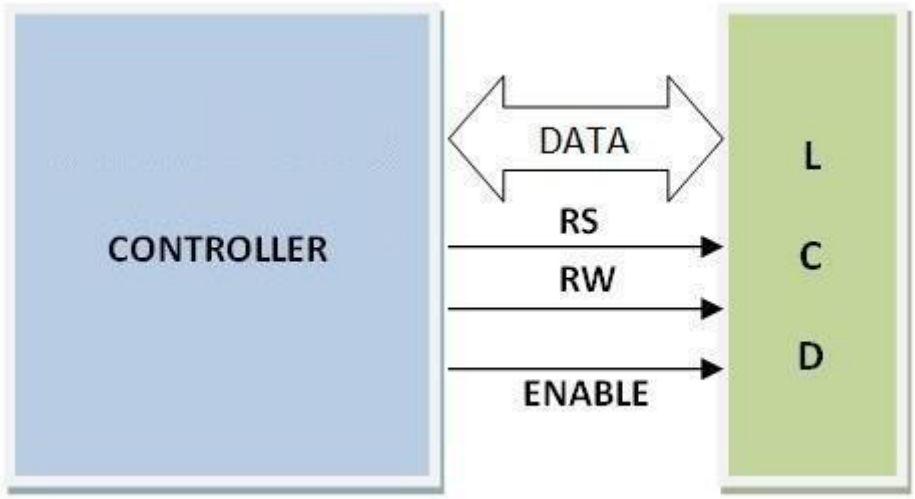


Fig: 3.10.3 latching the data

3.11 FEATURES of LCD 20*4

- These are some features of 20 x 4 LCD modules that are described here with the detailed.
- The most important feature of this module is that it can display 80 characters at a time
- The cursor of this module has 5x8 (40) dots.
- On this module already assembled the controller of RW1063.
- This module operates on the plus five volts input supply and can also work on the plus three volts.
- The plus three volts pinout can also be used for the negative supply.
- The duty cycle of this module is one by sixteen (1/16).

- The light-emitting diode of this module can get supply from the pinout one, pinout two, pinout fifteen, pinout sixteen, or pinout A and K.

Parameters	Symbol	Conditions
Input Voltage	It denoted as VDD	The value of VDD is plus five volts.
Supply Current	It denoted as IDD	Its value is ten milliamperes.
LC Driving Voltage for Normal Temperature Version Module	Its symbol is VDD to V0.	Its value is 5.2 volts
LED Forward Voltage	It is denoted as VF.	Its value is 4.3V
LED Forward Current	It denoted as IF.	Its value is 4.6V.
EL Supply Current	This pinout denoted as EL	VEL = 110 VAC, and four hundred frequency

Advantages

- These are some advantages of this module that are described with the detailed.
- It is less expensive, lightweight as compared to the cathode ray tube display.
- It uses less power according to the brightness resolution.

Switches interfaces input/output devices are critical of an embedded system. It allows to human to input binary information into the computer. Typically we define the asserted state, or logic true when the switch is pressed. Contact switches can also be used in machines to get mechanical contact.

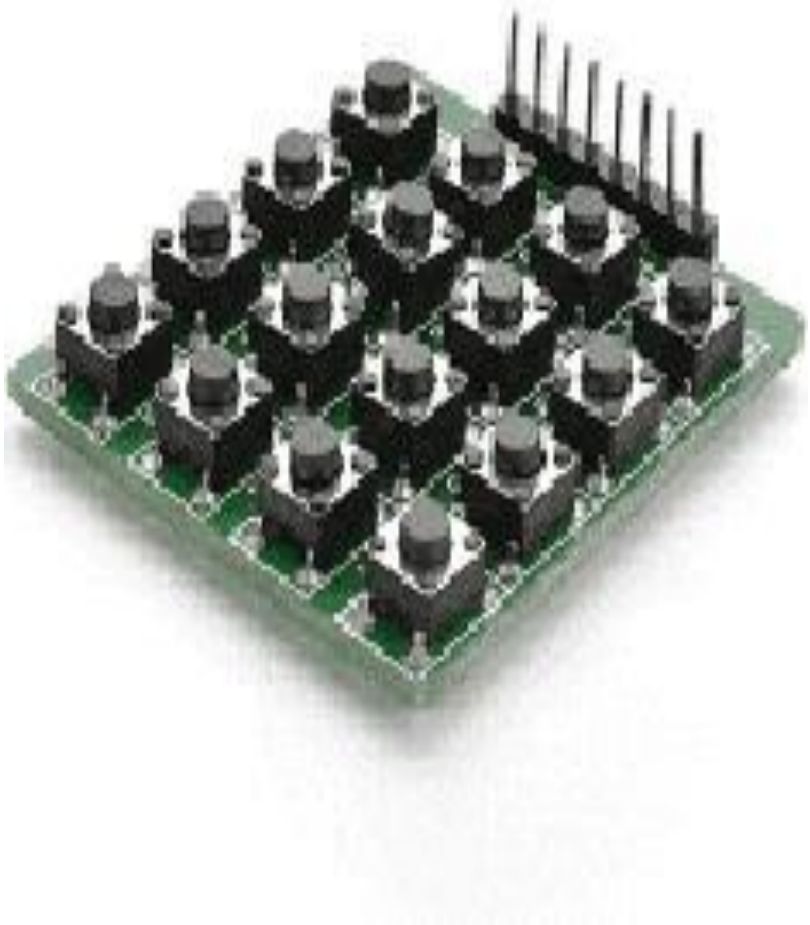


Fig 3.11.1 Switch

Chapter 4

Software Development

4.1 Software installation:

Fig 4.1.1: Software installation

4.2 Software Requirements:

- A computer (Windows, Mac, or Linux)
- An Arduino-compatible microcontroller (anything from this guide should work)
- A USB A-to-B cable, or another appropriate way to connect your Arduino- compatible microcontroller to your computer .

Fig 4.2.1: An A-to-B USB Cable

4.3 An Arduino:

If you're ready to get started, click on the link in the column on the left that matches up with your operating system, or you can jump to your operating system here.

- Windows
- Mac

Linux

Windows:

This page will show you how to install and test the Arduino software with a Windows operating system (Windows 8, Windows 7, Vista, and XP).

4.4 Windows 8, 7, Vista, and XP:

Go to the Arduino download page and download the latest version of the Arduino software for Windows.

When the download is finished, un-zip it and open up the Arduino folder to confirm that yes, there are indeed some files and sub-folders inside. The file structure is important so don't be moving any files around unless you really know what you're doing.

- Power up your Arduino by connecting your Arduino board to your computer with a USB cable (or FTDI connector if you're using an Arduino pro). You should see the an LED labelled 'ON' light up. (this diagram shows the placement of the power LED on the UNO).
- If you're running Windows 8, you'll need to disable driver signing, so go see the Windows 8 section. If you're running Windows 7, Vista, or XP, you'll need to install some drivers, so head to the Windows 7, Vista, and XP section down be

4.5 Windows 8:

Windows 8 comes with a nice little security 'feature' that 'protects' you from unsigned driver installation. Some older versions of Arduino Uno come with unsigned drivers, so in order to use your Uno, you'll have to tell Windows to disable driver signing. This issue has been addressed in newer releases of the Arduino IDE, but if you run into issues, you can try this fix first.

For a nice, step-by-step tutorial with pictures click here, otherwise the steps are outlined below.

To temporarily disable driver signing:

- From the Metro Start Screen, open Settings (move your mouse to the bottom- right-corner of the screen and wait for the pop-out bar to appear, then click the Gear icon)
- Click 'More PC Settings'
- Click 'General'
- Scroll down, and click 'Restart now' under 'Advanced startup'.
- Wait a bit.
- Click 'Troubleshoot'.
- Click 'Advanced Options'
- Click 'Windows Startup Settings'

When your computer restarts, select 'Disable driver signature enforcement' from the list.

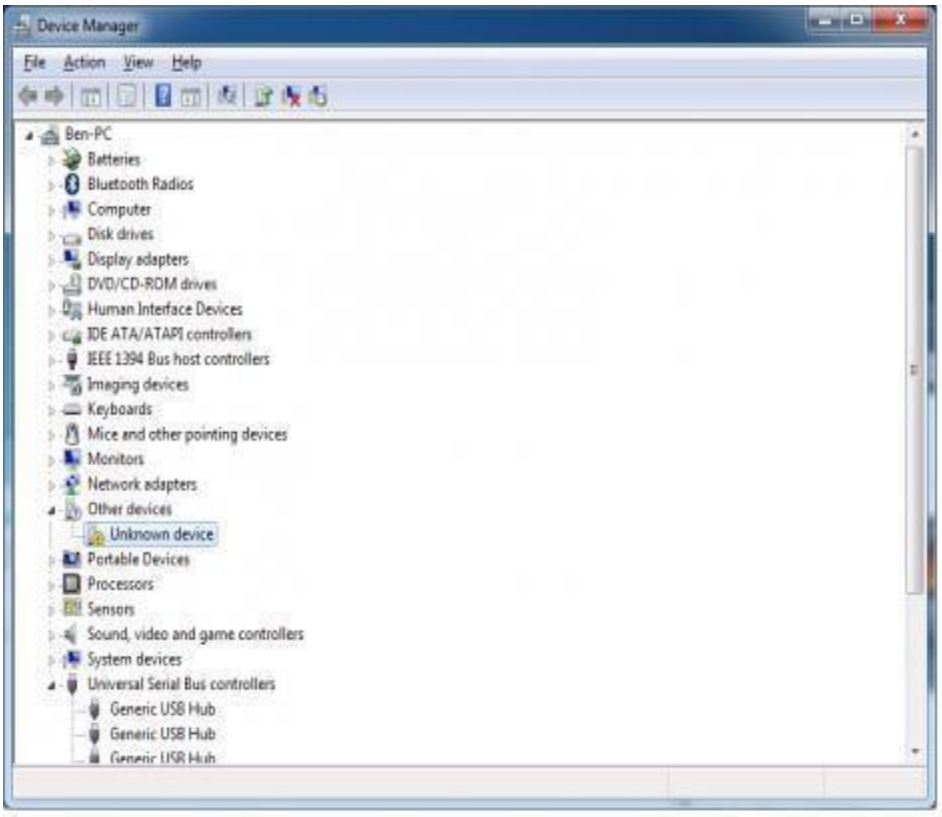
To permanently disable driver signing (recommended, but has some minor security implications):

- Go to the metro start screen
  Type in "cmd"
- Right click "Command Prompt" and select "Run as Administrator" from the buttons on the bottom of your screen
- Type/paste in the following commands: bcded-set loadoptions DISABLE_INTEGRITY_CHECKS bcdedit -set TESTSIGNING ON
- Reboot!

4.6 Windows 7, Vista, and XP:

Installing the Drivers for the Arduino Uno (from Arduino.cc)

- Plug in your board and wait for Windows to begin it's driver installation process
- After a few moments, the process will fail, despite its best efforts
- Click on the Start Menu, and open up the Control Panel
- While in the Control Panel, navigate to System and Security. Next, click on System
- Once the System window is up, open the Device Manager
  - Look under Ports (COM & LPT). You should see an open port named "Arduino UNO (COMxx)". If there is no COM & LPT section, look under 'Other Devices' for 'Unknown Device'



- Right click on the "Arduino UNO (COMxx)" or "Unknown Device" port and choose the "Update Driver Software" option
- Next, choose the "Browse my computer for Driver software" option

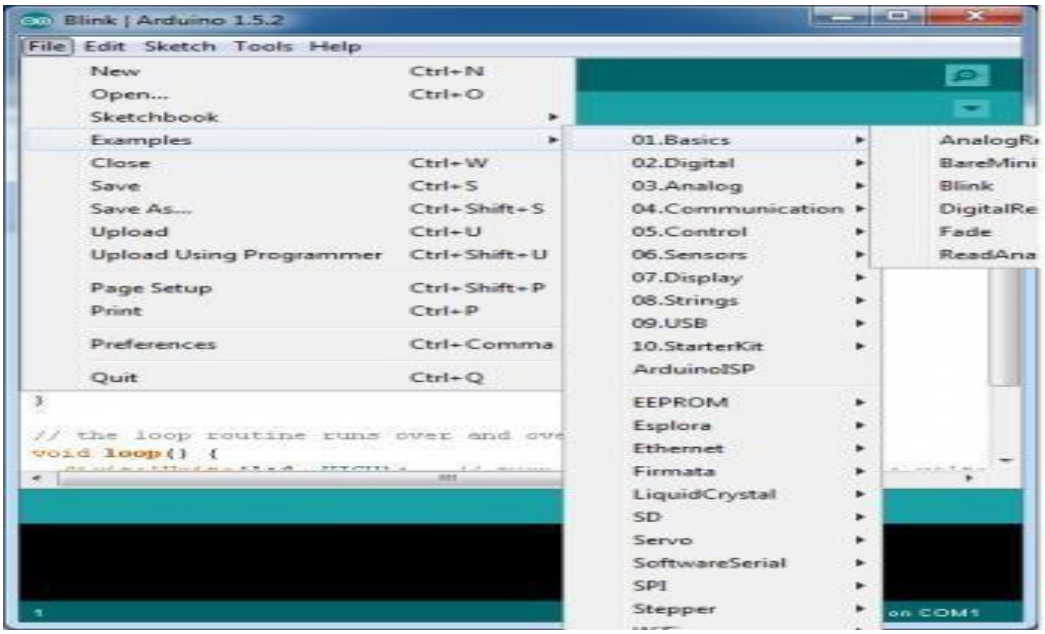
- Finally, navigate to and select the Uno's driver file, named "ArduinoUNO.inf", located in the "Drivers" folder of the Arduino Software download (not the "FTDI USB Drivers" sub-directory). If you cannot see the .inf file, it is probably just hidden. You can select the 'drivers' folder with the 'search sub-folders' option selected instead.
- Windows will finish up the driver installation from there

For earlier versions of the Arduino boards (e.g.Arduino Duemilanove, Nano, or Diecimila) check out this page for specific directions.

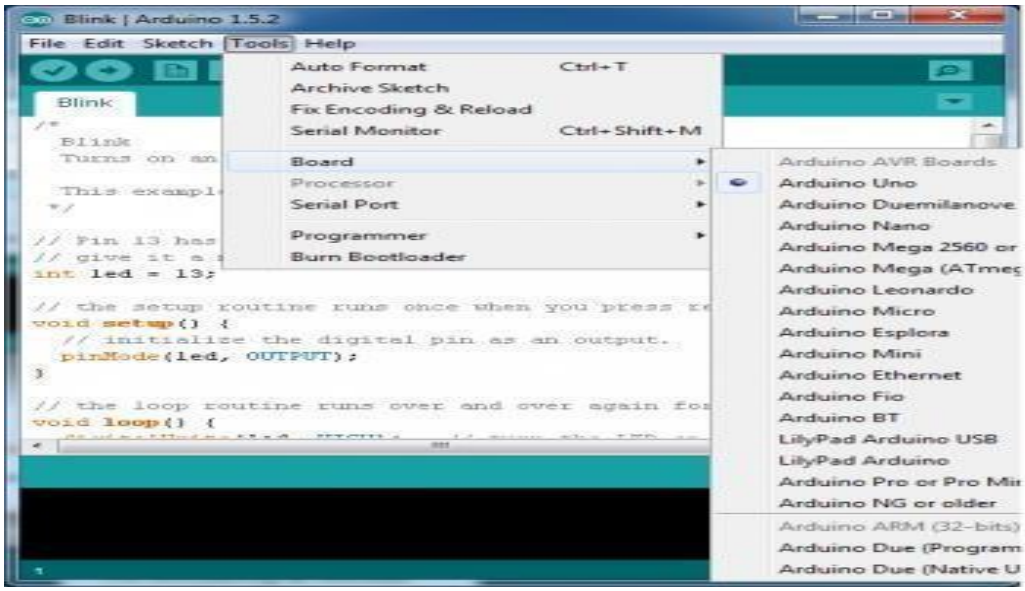
4.7 Launch and Break:

After following the appropriate steps for your software install, we are now ready to test your first program with your Arduino board.

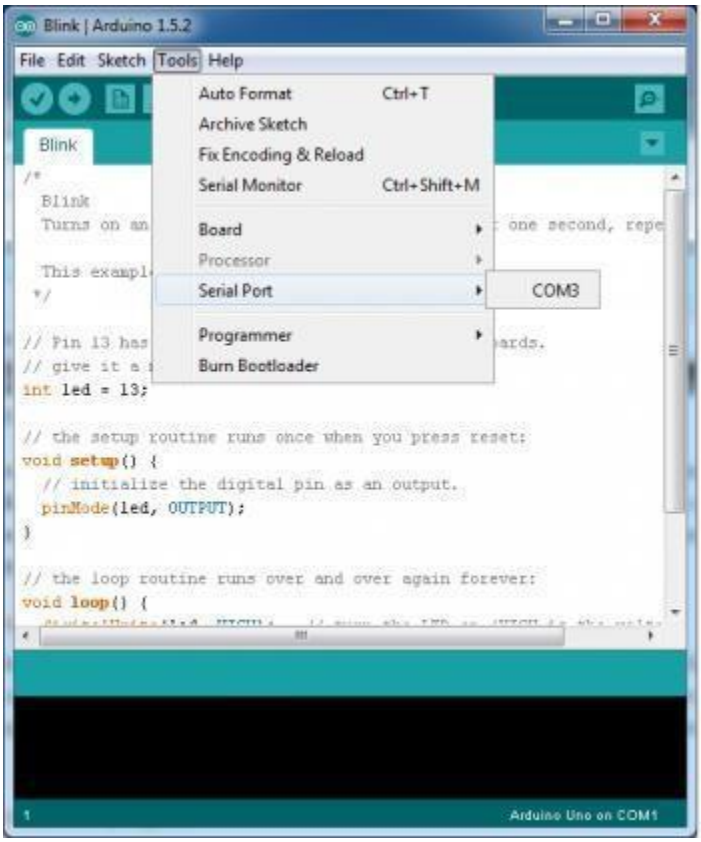
- Launch the Arduino application
- If you disconnected your board, plug it back in
- Open the Blink example sketch by going to: File > Examples > 1.Basics > Blink



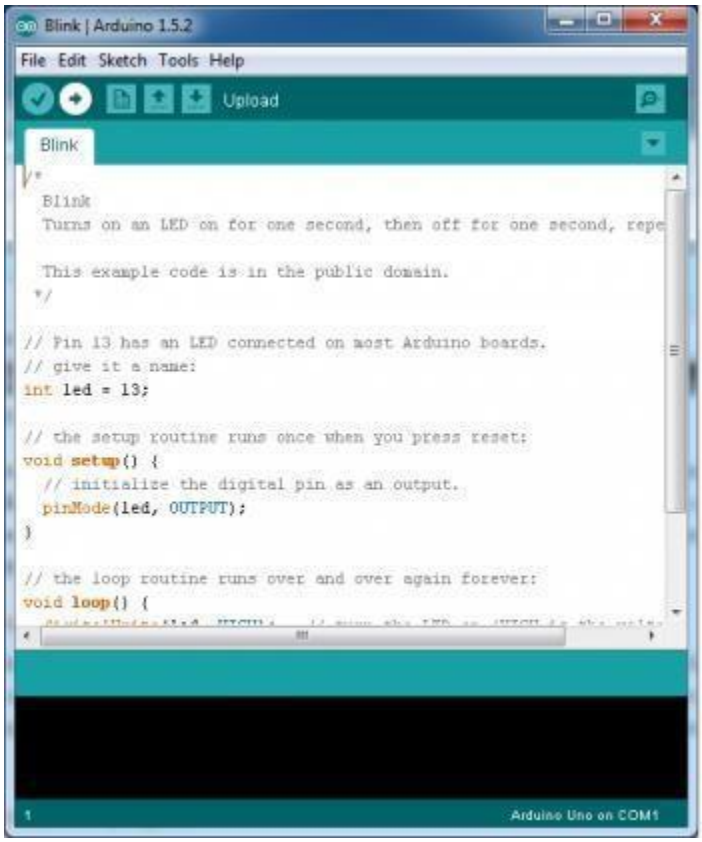
Select the type of Arduino board you're using: Tools > Board > your board type



- Select the serial/COM port that your Arduino is attached to: Tools > Port > COMxx



- If you're not sure which serial device is your Arduino, take a look at the available ports, then unplug your Arduino and look again. The one that disappeared is your Arduino.
- With your Arduino board connected, and the Blink sketch open, press the 'Upload' button.



- After a second, you should see some LEDs flashing on your Arduino, followed by the message ‘Done Uploading’ in the status bar of the Blink sketch.
- If everything worked, the onboard LED on your Arduino should now be blinking! You just programmed your first Arduino.

Troubleshooting

This guide from Arduino has some more details and troubleshooting tips if you get stuck.

Chapter 5

Advantages, Disadvantages, Applications, Result

5.1 Advantages:

- Predictive maintenance, rather than waiting for a machine to fail.
- Reduces the cost and complexity of operation sustain in business.
- Accessing information is easy, you can control a device that is miles apart in real time.

Fig 5.1.1 Advantages of IOT

5.2 Disadvantages:

- Lack of security on privacy
- Yields unemployment
- Today's lifestyle is technology driven, we depend on technology for the tiniest of tasks.

Fig 5.2.1 Disadvantages of IOT

5.3 Applications:

- It is used in the library to search for the required book and the count of it from the library's web page. It can be accessed by anyone from their home itself.

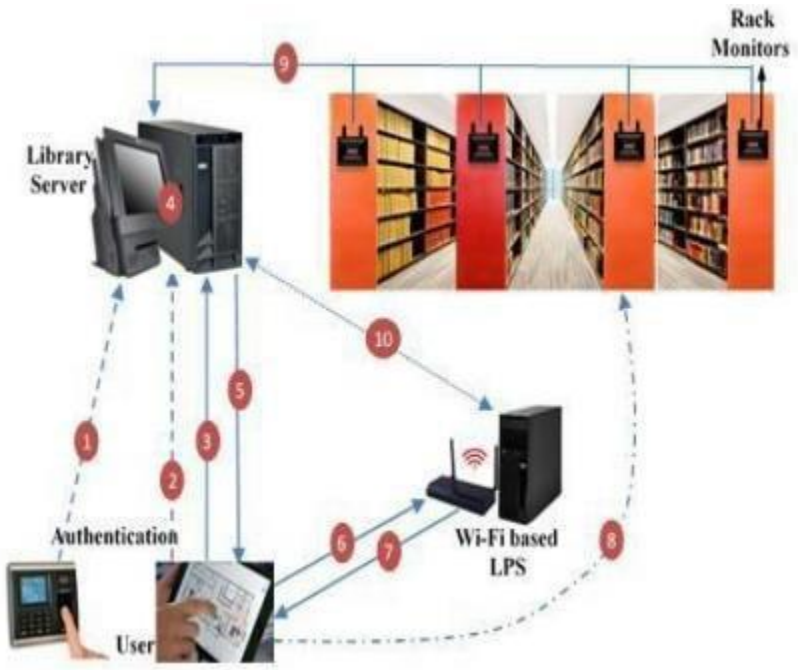


Fig 5.3.1 Application of IOT

- Similarly, we can also use this for any stock market applications such as gold shop too. Here we can verify the availability of the quantity of the gold required.
- We can apply this in the shopping malls for the required product or any accessories, in the medical shop and also in the super markets for the desired items.
- In this way, it is applied in various sectors of the stock market.

5.4 Result:

Web page gives the information about the required items list from the stock market. We can also check the count of the required gold, silver and bronze material through the LCD display as follows:

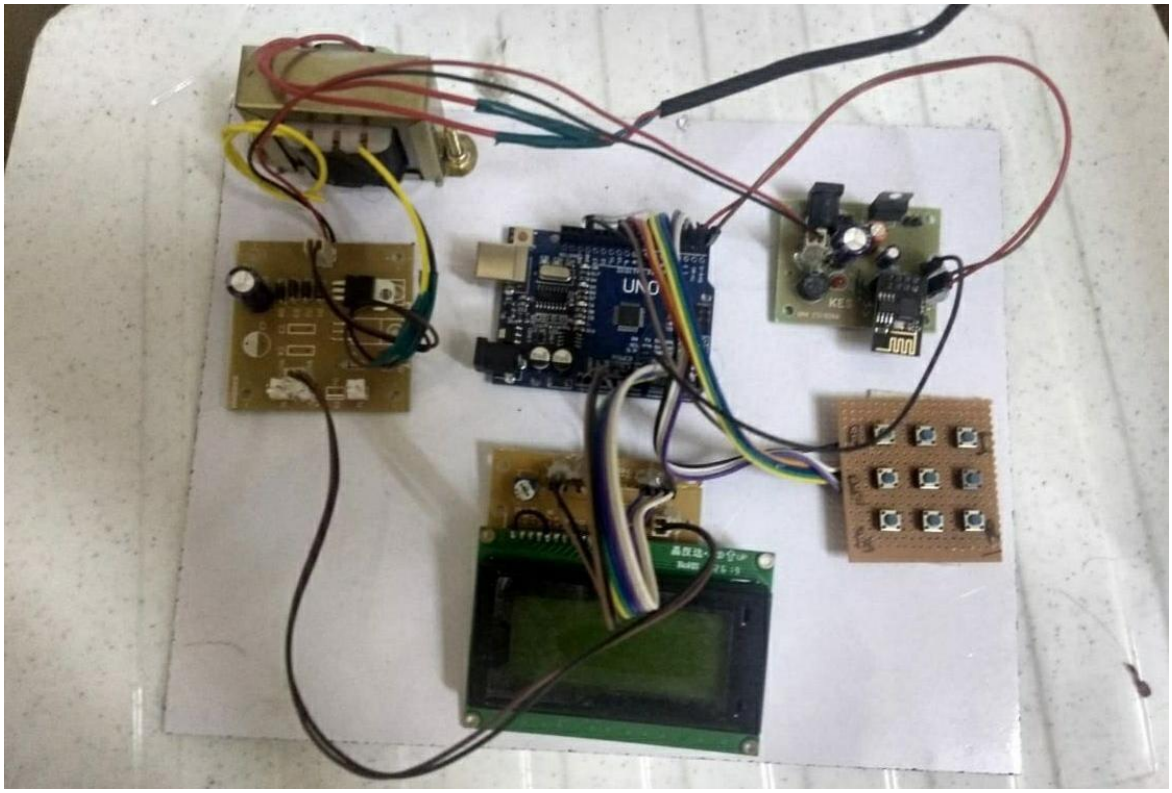


Fig 5.5.1 Final hardware components connection

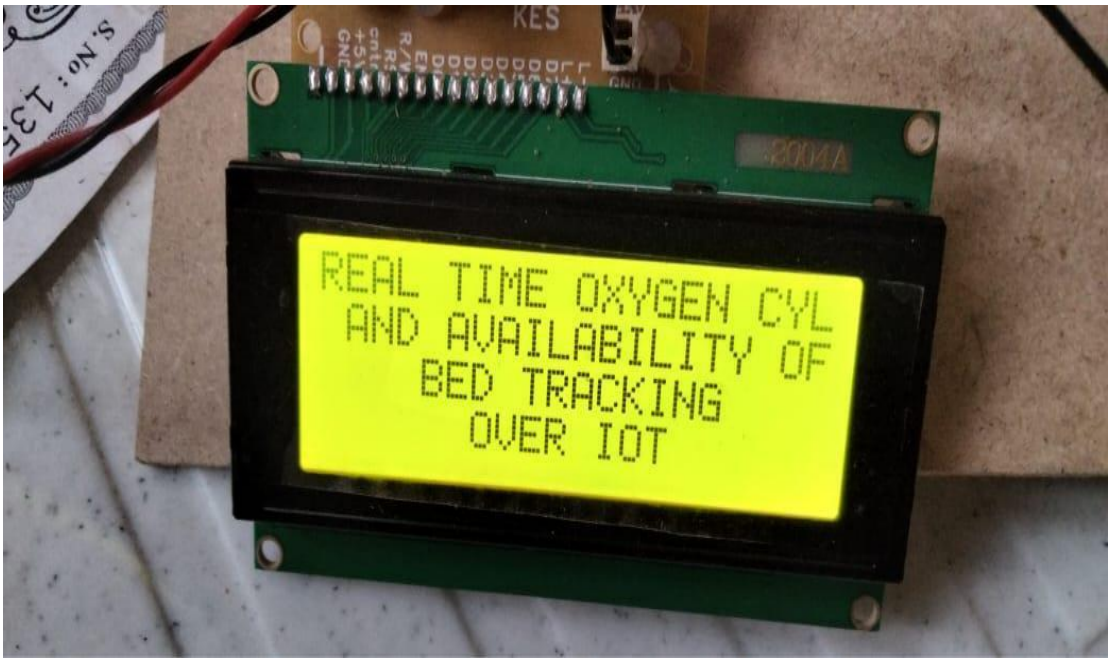


Fig : REAL TIME OXYGEN CYLINDER AND AVAILABILITY OF BEDS TRACKING OVER IOT

Fig 5.5.2 From the above picture it is clear that the availability of beds and oxygen cylinder Tablets are shown total availability as beds are 1000 , oxygen cylinders are 2000 And tablets are 5000.

Fig 5.5.2 From the above picture it is clear that the availability of beds and oxygen cylinder Tablets are shown total availability has been decreased in oxygen cylinders as 2 where taken from 2000 it displays remaining 1998 oxygen cylinders.

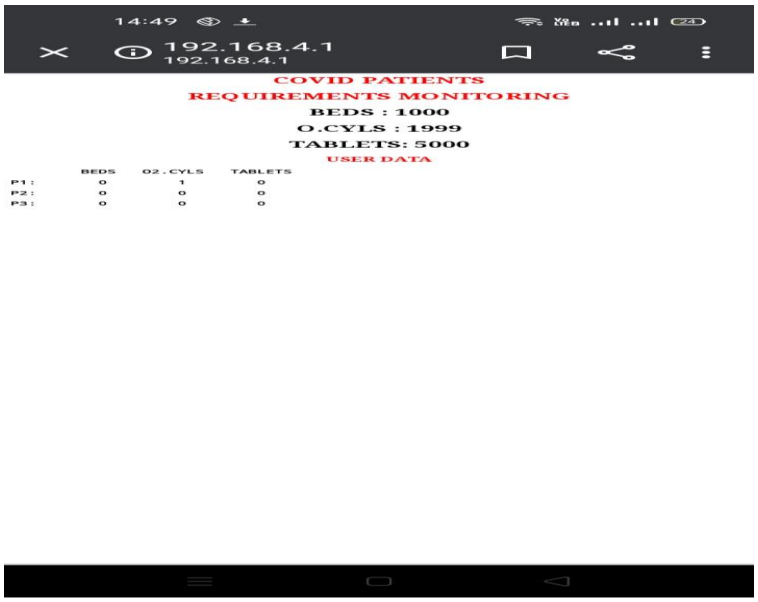


Figure displays the availability after the oxygen cylinders were taken it shows the remaining availability as there is a decrease in oxygen cylinders

Chapter 6

6.1 Conclusion:

Computers and smartphones aren't the only devices connecting to the internet. Everyday objects such as light bulbs, TVs, major appliances, and even doorbells are increasingly featuring internet connectivity. The Internet of Things (IoT) comprises all these devices and objects, all communicating with each other and with data centers over the internet.

Investing in IoT is tricky because so many companies are involved in its various aspects, including businesses that make or provide.

6.2 Future Scope:

Technology contributing to the future of IoT in healthcare is the introduction of 5G networks which provide 100 times faster speeds for connectivity than traditional 4G networks. IoT devices rely on connectivity to communicate and transfer data between patient and care provider. Faster cellular data transfer provides IoT flexibility in terms of the volumes of data it can exchange and at a much faster rate. With these improvements, new healthcare IoT uses include devices that assist patients with their medication adherence at home; sleep monitoring devices that can track heart rate, oxygen levels and movements for high-risk patients; remote temperature monitoring tools; and continuous glucose monitoring sensors that connect to mobile devices and alert patients and clinicians to changing blood sugar levels.

This new pandemic experience combined with the progress and recent advancements will increase the adoption of IoT and encourage those who might have otherwise ignored the technology in the past to get on board.

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   HTTP://EN.WIKIPEDIA.ORG/WIKI/GLOBAL_POSITIONING_SYSTEM9.PDF
   http://electronics.howstuffworks.com/gadgets/travel/gps.htm
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8. www.8051freeprojectsinfo.com

6.5 Appendix:

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(14, 15, 16, 17, 18,
19); int SelectBook( int x); int
St[3][3]={{0,0,0},
          {0,0,0},
          {0,0,0}};

const int S1 = 2;
const int S2 = 3;
const int S3 = 4;


const int B2 = 5;
const int B3 = 6;
const int B4 = 7;

const int I = 8;
const int S = 9;
const int R = 10;

int beds=1000;
int ocyl=2000;
```

```
int tabs=5000;
int z;
int y;



void setup()
{
Serial.begin(9600); // connect serial
lcd.begin(20, 4);
pinMode(S1, INPUT);
pinMode(S2, INPUT);
pinMode(S3, INPUT);


pinMode(B2, INPUT);
pinMode(B3, INPUT);
pinMode(B4, INPUT);

pinMode(I, INPUT);
pinMode(S, INPUT);
pinMode(R, INPUT);

lcd.print("REAL TIME OXYGEN CYLS");
lcd.setCursor(0, 1);
```

```
lcd.print(" AND AVAILABILITY OF
"); lcd.setCursor(0, 2);
lcd.print("   BED TRACKING    ");
lcd.setCursor(0, 3);
lcd.print("    OVER IOT     ");
delay(5000);

lcd.clear();
      lcd.clear();
      lcd.setCursor(0, 0);
      lcd.print(" BEDS O.CYL TABS");
      lcd.setCursor(0, 1);
      lcd.print("P1:");
      lcd.setCursor(4, 1);
      lcd.print(St[0][0]);
      lcd.setCursor(8, 1);
      lcd.print(St[0][1]);
      lcd.setCursor(13, 1);
      lcd.print(St[0][2]);
      lcd.setCursor(0, 2);
      lcd.print("P2:");
      lcd.setCursor(4, 2);
      lcd.print(St[1][0]);
      lcd.setCursor(8, 2);
      lcd.print(St[1][1]);
```

```
        lcd.setCursor(13, 2);
        lcd.print(St[1][2]);
        lcd.setCursor(0, 3);
        lcd.print("P3:");
        lcd.setCursor(4, 3);
        lcd.print(St[2][0]);
        lcd.setCursor(8, 3);
        lcd.print(St[2][1]);
        lcd.setCursor(13, 3);
        lcd.print(St[2][2]);
        delay(5000);
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("AVAILABLE BEDS/OC/TA");
lcd.setCursor(0, 1);
lcd.print(" BEDS: ");
lcd.print(GOLD);
lcd.setCursor(0, 2);
lcd.print(" O.CYLS: ");
lcd.print(SILVER);
lcd.setCursor(0, 3);
lcd.print("TABLETS: ");
lcd.print(BRONZE);
//lcd.clear();
}
```

```
void loop()
{
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("AVAILABLE BEDS/OC/TABS ");
lcd.setCursor(0, 1);
lcd.print("   BEDS: ");
lcd.print(beds);
lcd.setCursor(0, 2);
lcd.print(" O.CYLS: ");
lcd.print(ocyl);
lcd.setCursor(0, 3);
lcd.print("TABLETS: ");
lcd.print(tabs);

while((digitalRead(S1)==HIGH)&&(digitalRead(S2)==HIGH)&
&(digitalRead(S3)==HIGH))
{
  Serial.print("<h1 style=\"color:red;text-
align:center\">COVID PATIENTS </h1><h1
style=\"color:red;text-align:center\">REQUIREMENTS
MONITORING</h1>");
   Serial.print("<h1 style=\"text-align:center;\">BEDS   :
");Serial.print(beds);Serial.print("<h1>");
   Serial.print("<h1 style=\"text-align:center;\">O.CYLS :
```

```
");Serial.print(ocyl);Serial.print("<h1>");
   Serial.print("<h1 style=\"text-align:center\">TABLETS:
");Serial.print(tabs);Serial.print("<h1>");
    Serial.print("<h2 style=\"color:red;text-align:center;\">
USER DATA</h2>");
   Serial.print("<h2>       BEDS   O2.CYLS
TABLETS</h2>");

    Serial.print("<h2>P1:      ");
    Serial.print(St[0][0]);
    Serial.print("       ");
    Serial.print(St[0][1]);
    Serial.print("       ");
    Serial.print(St[0][2]);
    Serial.print("       ");
    Serial.print("<h2>P2:      ");
    Serial.print(St[1][0]);
    Serial.print("       ");
    Serial.print(St[1][1]);
    Serial.print("       ");
    Serial.print(St[1][2]);
    Serial.print("<h2>P3:      ");
    Serial.print(St[2][0]);
    Serial.print("       ");
    Serial.print(St[2][1]);
```

```
    Serial.print("       ");
    Serial.print(St[2][2]);
}

if(digitalRead(S1)==LOW)
{
 z=0;
 lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print(" P1 SELECTED    ");
 lcd.setCursor(0, 1);
 lcd.print("SELECT ANY REQUIRED");
 Select(0);
}

if(digitalRead(S2)==LOW)
{
 z=1;
 lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print(" P2 SELECTED    ");
 lcd.setCursor(0, 1);
 lcd.print("SELECT ANY REQUIRED");
 Select(1);
}
```

```
if(digitalRead(S3)==LOW)
{
 z=2;
 lcd.clear();
 lcd.setCursor(0, 0);
 lcd.print(" P3 SELECTED ");
 lcd.setCursor(0, 1);
 lcd.print("SELECT ANY REQUIRED");
 Select(2);
}
}
int Select( int x)
{
 if(digitalRead(B2)==0)
 {
  y=0;
 lcd.setCursor(0, 2);
 lcd.print(" BED SELECTED ");
  if(digitalRead(I)==LOW)
  {
     if(beds==0)
     {
     lcd.setCursor(0, 3);
     lcd.print("!!!NOT AVAILABLE!!! ");
     }
```

```
    if(beds>0)
    {
    beds=beds-1;
    lcd.setCursor(0, 3);
    lcd.print("   BED ALLOTTED   ");
    St[x][y]=St[x][y]+1;
    }
  }
    if(digitalRead(R)==LOW)
    {
    beds=beds+1;
    lcd.setCursor(0, 3);
    if( St[x][y]>10)
    {
     St[x][y]=St[x][y]-1;
   lcd.print(" BED CANCELLED    ");
    }
    else
    lcd.print("!!! NO STOCK !!!");
    }
}
if(digitalRead(B3)==0)
{
 y=1;
 lcd.setCursor(0, 2);
```

```
lcd.print("O.CYL SELECTED ");
if(digitalRead(I)==LOW)
{
 if(ocyl==0)
 {
 lcd.setCursor(0, 3);
 lcd.print("!!!NOT AVAILABLE!!!");
 }
 if(ocyl>0)
 {
 ocyl=ocyl-1;
 lcd.setCursor(0, 3);
 lcd.print("O.CYL ALLOTED");
 St[x][y]=St[x][y]+1;
 }
}
 if(digitalRead(R)==LOW)
 {
 ocyl=ocyl+1;
 lcd.setCursor(0, 3);

 if( St[x][y]>1)
 {
  St[x][y]=St[x][y]-1;
  lcd.print("   O.CYL CANCELLED ");
```

```
      }
      else
      lcd.print("!!! NO STOCK !!!");
    }
}
if(digitalRead(B4)==0)
{
  y=2;
  lcd.setCursor(0, 2);
  lcd.print("TABLETS SELECTED");
    if(digitalRead(I)==LOW)
    {
      if(tabs==0)
      {
      lcd.setCursor(0, 3);
      lcd.print("!!!NOT AVAILABLE!!!");
      }
      if(tabs>0)
      {
      tabs=tabs-10;
      lcd.setCursor(0, 3);
      lcd.print("TABLETS ALLOTED ");
      St[x][y]=St[x][y]+10;
      }
    }
```

```
 if(digitalRead(R)==LOW)
 {
 tabss=tabs+10;
 lcd.setCursor(0, 3);
 if( St[x][y]>10)
 {
  St[x][y]=St[x][y]-10;
 lcd.print("TABLETS
 CANCELLED"); }
 else
 lcd.print("!!! NO STOCK !!!");

 }
}
delay(2000);
 lcd.clear();
 lcd.setCursor(0, 0);
  lcd.print("   BEDS O.CYL TABS");
  lcd.setCursor(0, 1);
  lcd.print("P1:");
  lcd.setCursor(4, 1);
  lcd.print(St[0][0]);

  lcd.setCursor(8, 1);
  lcd.print(St[0][1]);
```

```
        lcd.setCursor(13, 1);
        lcd.print(St[0][2]);

        lcd.setCursor(0, 2);
        lcd.print("P2:");
        lcd.setCursor(4, 2);
        lcd.print(St[1][0]);
       lcd.setCursor(8, 2);
        lcd.print(St[1][1]);

        lcd.setCursor(13, 2);
        lcd.print(St[1][2]);
        lcd.setCursor(0, 3);
        lcd.print("P3:");
        lcd.setCursor(4, 3);
        lcd.print(St[2][0]);
        lcd.setCursor(8, 3);
        lcd.print(St[2][1]);
        lcd.setCursor(13, 3);
        lcd.print(St[2][2]);
        delay(3000);
        lcd.clear();
        return 0;
}
```

LESSON PLAN

TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

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Medbowli, Meerpet, Balapur(M), Hyderabad, Telangana- 500097
Mob: 8498085218. Email: info@tkrec.ac.in, www.tkrec.ac.in

College Code: R9

LESSON PLAN

Year & Branch	**: IV B. Tech. EEE – B**
Academic Year	**: 2019 - 20. I Semester**
Name of the Subject	**: POWER SEMICONDUCTOR DRIVES.**
Department	**: Electrical & Electronics Engineering.**

Text Books:

T – 1 Fundamentals of Electric Drives, G K Dubey Narosa Publications
T – 2 Power Semiconductor Drives, PV Rao, BS Publications

Reference Books:

R – 1 Power Semoconductor Drives, S.B.Dewan, G. R.Slemon, A. Straughen, Wiley Pvt Ltd.
R – 2 Electric Drives N. K. De, P. K. Sen, PHI Learning Private Ltd.
R – 3 Thyristor Control of Electric drives, Vedam Subramanyam Tata McGraw Hill Publications.
R – 4 Electrical machines and drives systems, John Hindmarsh, Alasdair Renfrew, Newnes.

Other Text Books:

O – 1 Power electronics circuits , devices and applications By M.H.Rashid.
O – 2 Power semi conductor drives by J. Gnanavadivel Anuradhe publication.

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Proposed No. of Periods	Proposed Date
			From	To		
I	**Control of DC motors by Single phase and Three phase Converters**				**15**	
1.1	Introduction to Thyristor controlled Drives	T – 1	97	98	01	19-07-19
1.2	Single Phase semi controlled converter connected to d.c separately excited motor with speed – Torque Expressions	T – 1	98	99	01	19-07-19
1.3	Single Phase semi controlled converter connected dc series motor with speed – Torque Expressions	T – 1	98	99	01	20-07-19
1.4	Single Phase fully controlled converter connected to d.c separately excited motor with speed – Torque Expressions	O – 2	2.27	2.30	01	22-07-19
1.5	Single Phase fully controlled converters connected DC series motor with speed – Torque Expressions	O – 2	2.30	2.37	01	22-07-19
1.6	Problems on single phase Converter fed DC motors	T – 1	101	114	03	23-07-19

1.7	Three Phase semi controlled converter connected to d.c separately excited motor with speed – Torque Expressions	O – 2	3.1	3.4	02	24-07-19
1.8	Three Phase semi controlled converter connected dc series motor with speed – Torque Expressions	O – 2	3.8	3.11	01	26-07-19
1.9	Three Phase fully controlled converter connected to d.c separately excited motor with speed – Torque Expressions	T – 1	112	114	01	26-07-19
1.10	Three Phase fully controlled converters connected DC series motor with speed – Torque Expressions	O – 2	3.11	3.13	01	27-07-19
1.11	Problems on Three phase Converter fed DC motors	O – 2	3.14	3.24	02	29-07-19
II	**Four Quadrant Operations of DC Drives**				**12**	
2.1	Introduction to Four quadrant operation - Motoring operations	O – 2	4.1	4.3	02	30-7-19
2.2	Introduction to Electrical braking, and differences between Electrical braking and Mechanical Braking	O – 2	4.3	4.6	01	31-07-19
2.3	Electric Braking – Plugging, Dynamic and Regenerative Braking operations	O – 2	4.6	4.16	02	02-08-19
2.4	Four quadrant operation of D.C motors by single phase dual converters in both CC & NCC modes	O – 2	4.16	4.17	02	02-08-19
2.5	Four quadrant operation of D.C motors by Three phase dual converters in both CC & NCC modes	O – 2	4.17	4.22	02	3-08-19
2.6	Problems on Braking and dual; converters	T – 1	126	131	02	05-08-19
2.7	Closed loop operation of DC motor (Block Diagram Only)	T – 1	131	133	01	06-08-19
	Control of DC Motors By Choppers				**12**	
2.8	Introduction to chopper controlled drives	T – 1	121	122	01	07-08-19
2.9	Operation of Four quadrant chopper drives with an example of hoist as a load.	O – 2	4.1	4.3	02	09-08-19
2.10	Single quadrant chopper fed dc separately excited and series excited motors with speed – Torque Expressions	T – 1	5.2	5.9	02	12-08-19
2.11	Two –quadrant chopper fed dc separately excited and series excited motors with speed – Torque Expressions	O – 2	5.13	5.17	02	13-08-19
2.12	four quadrant chopper fed dc separately excited and series excited motors with speed – Torque Expressions	O – 2	5.17	5.19	02	16-08-19
2.13	Numerical Problems on chopper fed drives	T – 1	126	131	02	17-08-19
2.14	Closed Loop operation (Block Diagram Only)	O – 2	4.23	4.27	01	19-08-19
III	Control of Induction motor Through Stator Voltage and Stator Frequency				**12**	
3.1	Introduction to speed Control of IM conventional methods.	T - 1	140	144	01	21-08-19
3.2	Control of Induction Motor by Ac Voltage Controllers , speed- torque characteristics	T - 1	183	184	02	23-08-19

3.3	Variable frequency control of induction motor by Voltage source inverter	T - 1	186	188	01	24-08-19
3.4	Variable frequency control of induction motor by current source inverter	O – 2	7.34	7.36	01	26-08-19
3.5	Variable frequency control of induction motor by cyclo-converters- PWM control	O - 2	7.27	7.29	01	28-08-19
3.6	Variable frequency control of induction motor by PWM control.	O - 2	7.29	7.31	01	30-08-19
3.7	Comparison of VSI and CSI operations	O – 2	7.39	7.40	01	03-09-19
3.8	Closed loop operation of induction motor drives (Block Diagram Only)	O – 2	7.36	7.39	01	04-09-19
3.9	Numerical problems on induction motor drives	T - 1	199	205	03	06-9-19
IV	Rotor side controlof Induction Motor				07	09-09-19
4.01	Introduction to Static rotor resistance control and Slip power recovery	T - 1	216	218	01	11-09-19
4.02	Static Scherbius drive and its applications	T - 1	219	221	01	17-09-19
4.03	Static Kramer Drive and its applications	T - 1	221	223	01	18-09-19
4.04	Numerical problems on Slip power recovery theory	T - 1	223	227	01	23-09-19
4.05	Revision and Previous Exam Questions Discussion	--	--	--	03	24-09-19
V	**Control of Synchronous Motors**				**11**	
5.1	Separate control of synchronous motor by VSI cycloconverter and speed torque characteristics	T - 1	244	247	02	27-09-19
5.2	self control of synchronous motors by CSI cycloconverter and Waveforms – speed torque characteristics	T - 1	260	265	01	28-09-19
5.3	Separate control of synchronous motor –Load commutated CSI fed Synchronous Motor with speed torque characteristics	O - 1	9.19	9.20	01	30-09-19
5.4	Self control of synchronous motors by Load commutated CSI fed Synchronous Motor and speed torque characteristics	O - 1	9.20	9.22	01	04-10-19
5.5	Applications of Separate control & self control of synchronous motors	O - 1	9.11	9.14	01	05-10-19
5.6	Advantages of Separate control & self control of synchronous motors	O - 1	9.14	9.15	01	14-10-19
5.7	Numerical Problems	O - 1	9.26	9.35	02	15,16-10-19
5.8	Closed Loop control operation of synchronous motor drives (Block Diagram Only) for variable frequency control, Cyclo converter, PWM, VFI, CSI	T - 1	9.25	9.26	02	18,21,23-10-19
	TOTAL				**69**	

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College Code: R9

Year & Branch : **II B. Tech. AIML – A**
Academic Year : **2022 - 23. I Semester**
Name of the Subject : **SOFTWARE ENGINEERING LESSON PLAN**
Department : **AIML**

UNIT NO.	TOPIC NAME	BOOKS REFERENCED	PROPOSED NO. OF PERIODS	PROPOSED DATE	BLOOM'S TAXANOMY LEVEL	TEACHING AID
I						
1.1	**Introduction to Software Engineering:**	**T1,T2,T3, R1**	1	25-09-23	Understand	Chalk and Board
1.2	The evolving role of software changing nature of software		1	26-09-23	Understand	Chalk and Board
1.3	softwaremyths		1	27-09-23	Understand	Chalk and Board
1.4	**A Generic view of process**		1	29-09-23	Remember	Chalk and Board
1.5	Software engineering,		1	30-09-23	Discuss	Chalk and Board

1.6	a layered technology		1	3-10-23	Remember	Chalk and Board
1.7	a process framework		1	4-10-23	Understand	Chalk and Board
1.8	TheCapabilityMaturityModelIntegration(CMMI)		1	5-10-23	Explain	Chalk and Board
1.9	TheCapabilityMaturityModelIntegration(CMMI)		1	6-10-23	Knowledge	Chalk and Board
1.10	TheCapabilityMaturityModelIntegration(CMMI)		1	7-10-23	Explain	Chalk and Board
1.11	processpatterns		1	9-10-23	Discuss	Chalk and Board
1.12	processassessment		1	10-10-23	Explain	Chalk and Board
1.13	personalandteam		1	11-10-23	Understand	Chalk and Board
1.14	processmodels		1	12-10-23	Understand	Chalk and Board
1.15	**Processmodels**		1	13-10-23	Understand	Chalk and Board
1.16	The waterfallmodel		1	14-10-23	Understand	Chalk and Board
1.17	incremental processmodels		1	16-10-23	Understand	Chalk and Board
1.18	evolutionary processmodels		1	17-10-23	Understand	Chalk and Board
1.19	theunifiedprocess		1	19-10-23	Understand	Chalk and

						Board

UNIT NO.	TOPIC NAME	BOOKS REFERENCED	PROPOSED NO. OF PERIODS	PROPOSED DATE	BLOOM'S TAXANOMY LEVEL	TEACHING AID
II						
2.1	Functional and non-functional requirements		1	31-10-23	Remember	Chalk and Board
2.2	user requirements, system requirements		1	3-11-23	Discuss	Chalk and Board
2.3	interface specification, the software requirements document		1	4-11-23	Discuss	Chalk and Board
2.4	**Requirements engineering process**:	**T1,T2,R1**	1	7-11-23	Explain	Chalk and Board
2.5	Feasibilitystudies,requirementselicitation and analysis		1	8-11-23	Explain	Chalk and Board
2.6	Requirementsvalidation,requirements management		1	11-11-23	Explain	Chalk and Board
2.7	**Systemmodels:**Contextmodels		1	14-11-23	Discuss	Chalk and Board
2.8	behavioralmodels,		1	16-11-23	Remember	Chalk and

	datamodels					Board
2.9	Objectmodels,structuredmethods.		1	17-11-23	Understand	Chalk and Board
UNIT NO.	**TOPIC NAME**	**BOOKS REFERENCED**	**PROPOSED NO. OF PERIODS**	**PROPOSED DATE**	**BLOOM'S TAXANOMY LEVEL**	**TEACHING AID**
III		**T1,R1,R2**				
3.1	Design process		1	18-11-23	Remember	PPT
3.2	design quality		1	21-11-23	Understand	PPT
3.3	design concepts, design model.		1	22-11-23	Explain	PPT
3.4	**Creating anarchitectural design**		1	25-11-23	Remember	PPT
3.5	software architecture, data design,		1	26-11-23	Understand	PPT
3.6	architectural styles and patterns, architectural design,		1	4-12-23	Explain	PPT
3.7	conceptualmodelof UML,		1	6-12-23	Discuss	PPT
3.8	basicstructuralmodeling,classdiagrams,		1	8-12-23	Discuss	PPT
3.9	sequencediagrams collaboration diagrams,		1	11-12-23	Discuss	PPT
3.10	usecasediagrams,co		1	13-12-23	Discuss	PPT

	mponentdiagrams.					
UNIT NO.	**TOPIC NAME**	**BOOKS REFERENCED**	**PROPOSED NO. OF PERIODS**	**PROPOSED DATE**	**BLOOM'S TAXANOMY LEVEL**	**TEACHING AID**
IV						
4.1	Astrategicapproachtosoftwaretesting		1	14-12-23	Understand	Chalk and Board
4.2	strategiesforconventionalsoftware testing		2	15,16-12-23	Explain	Chalk and Board
4.3	Black-boxandwhite-boxtesting,validationtesting,systemtesting,theartof debugging.		1	18-12-23	Discuss	Chalk and Board
4.4	**Productmetrics:**Softwarequality	**T1,R2**	2	19,20-12-23	Remember	Chalk and Board
4.5	metricsforanalysismodel,metricsfordesignmodel		1	21-12-23	Understand	Chalk and Board
4.6	metricsforsourcecode,metricsfortesting		2	22,23-12-23	Explain	Chalk and Board
4.7	metricsformaintenance		1	26-12-23	Understand	Chalk and Board
4.8	MetricsforProcessandProducts		1	27-12-23	Remember	Chalk and Board
4.9	Softwaremeasurement		1	28-12-23	Remember	Chalk and Board

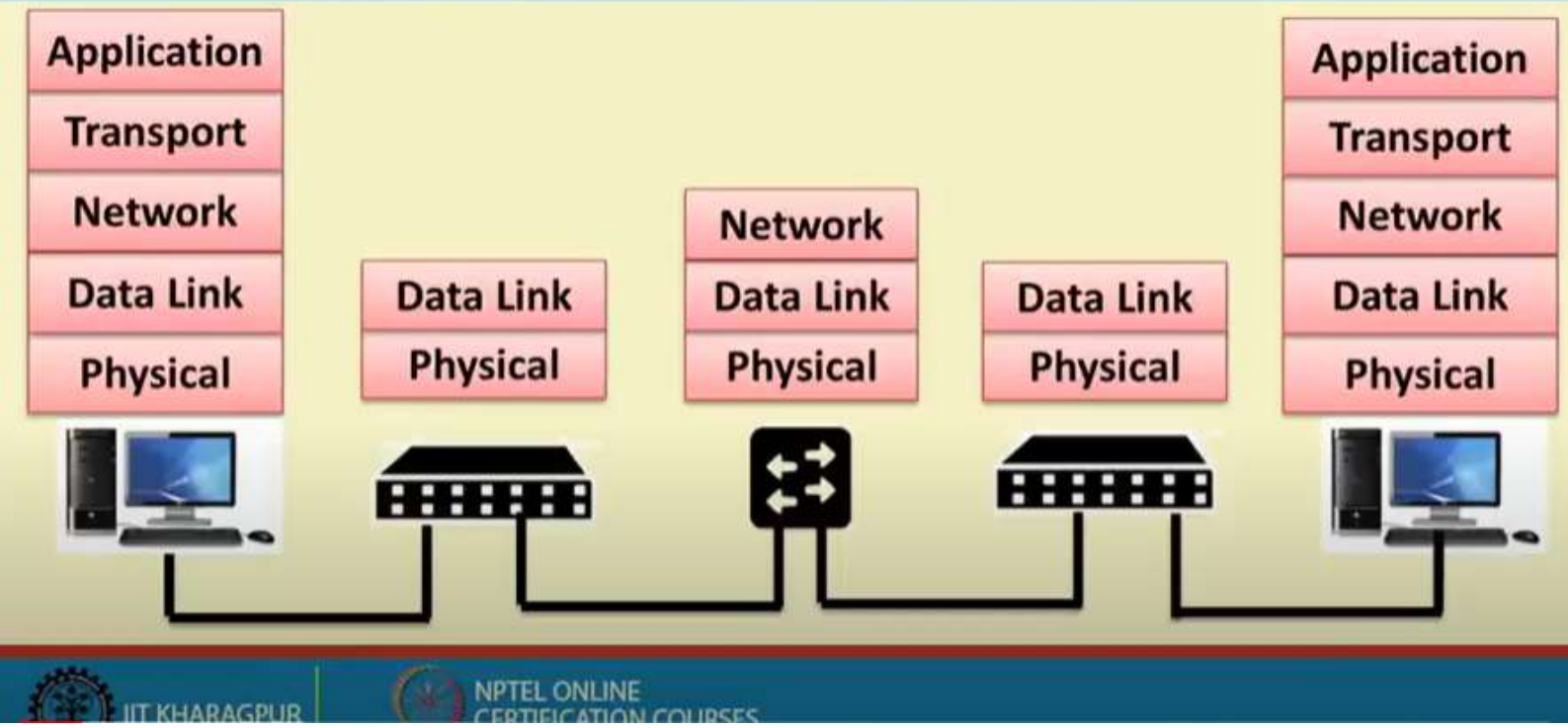
4.10	Metricsforsoftwareq uality.		1	29-12-23	Remember	Chalk and Board
UNIT NO.	**TOPIC NAME**	**BOOKS REFERENCED**	**PROPOSED NO. OF PERIODS**	**PROPOSED DATE**	**BLOOM'S TAXANOMY LEVEL**	**TEACHING AID**
V		**T1,R1,R2**				
5.1	Reactive Vs proactive risk strategies		1	30-12-23	Understand	PPT
5.2	Software risks, risk identification		2	2,3-01-24	Understand	PPT
5.3	Risk projection,risk refinement		1	4-01-24	Understand	PPT
5.4	RMMM, RMMM plan		2	5,6-01-24	Understand	PPT
5.5	**Quality Management:** Quality concepts		1	8-01-24	Examining	PPT
5.6	software quality assurance		1	9-01-24	Examining	PPT
5.7	software reviews, formal technical reviews		1	10-01-24	Remember	PPT
5.8	statistical software quality assurance		2	11,12-01-24	Remember	PPT
5.9	software reliability		1	16-01-24	Remember	PPT
5.10	ISO9000qualitystandards		1	18-01-24	Remember	PPT

NPTL VIDEO LECTURES


COURSE ON
COMPUTER NETWORKS AND
INTERNET PROTOCOL


PROF. SANDIP CHAKRABORTY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Transport Layer - I (Services)



STAKEHOLDERS FEEDBACK

FEEDBACK FROM STAKE HOLDERS

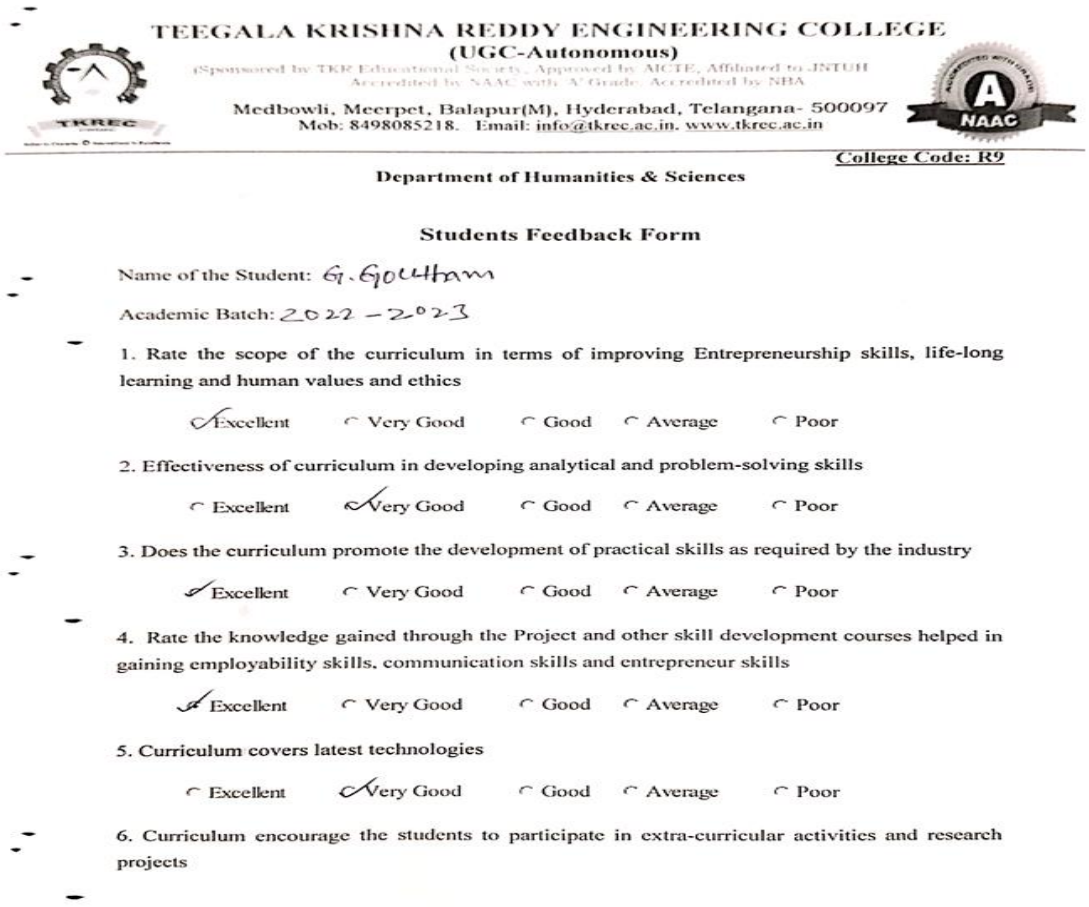
Feedback system for curriculum:

The institution collects feedback from all the stakeholders (Students, Teachers, Parents, Alumni and Employers) at the end of every semester. This Qualitative feedback is one of the significant process in the institution for providing a continuous improvement in the curriculum.

Feedback Form samples:

1. **Student Feedback Form**
2. **Teachers Feedback Form**
3. **Employer Feedback Form**
4. **Alumni Feedback Form**

1) Sample Student Feedback Form:



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College Code: R9

Department of Humanities & Sciences

Students Feedback Form

Name of the Student: G. Goutham

Academic Batch: 2022 – 2023

1. Rate the scope of the curriculum in terms of improving Entrepreneurship skills, life-long learning and human values and ethics

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

2. Effectiveness of curriculum in developing analytical and problem-solving skills

○ Excellent ✓ Very Good ○ Good ○ Average ○ Poor

3. Does the curriculum promote the development of practical skills as required by the industry

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

4. Rate the knowledge gained through the Project and other skill development courses helped in gaining employability skills, communication skills and entrepreneur skills

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

5. Curriculum covers latest technologies

○ Excellent ✓ Very Good ○ Good ○ Average ○ Poor

6. Curriculum encourage the students to participate in extra-curricular activities and research projects

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College Code: R9

Department of Humanities & Sciences

○ Excellent ○ Very Good ✓ Good ○ Average ○ Poor

7. Various platforms and opportunities available by the institution helped you to achieve your goals.

○ Excellent ✓ Very Good ○ Good ○ Average ○ Poor

8. Rate the curriculum's scope in terms of developing the following characteristics, creativity, leadership, innovation, self-motivation, workplace ethics and social responsibility

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

9. Kindly indicate if you have any other additional feedback to offer.

_____

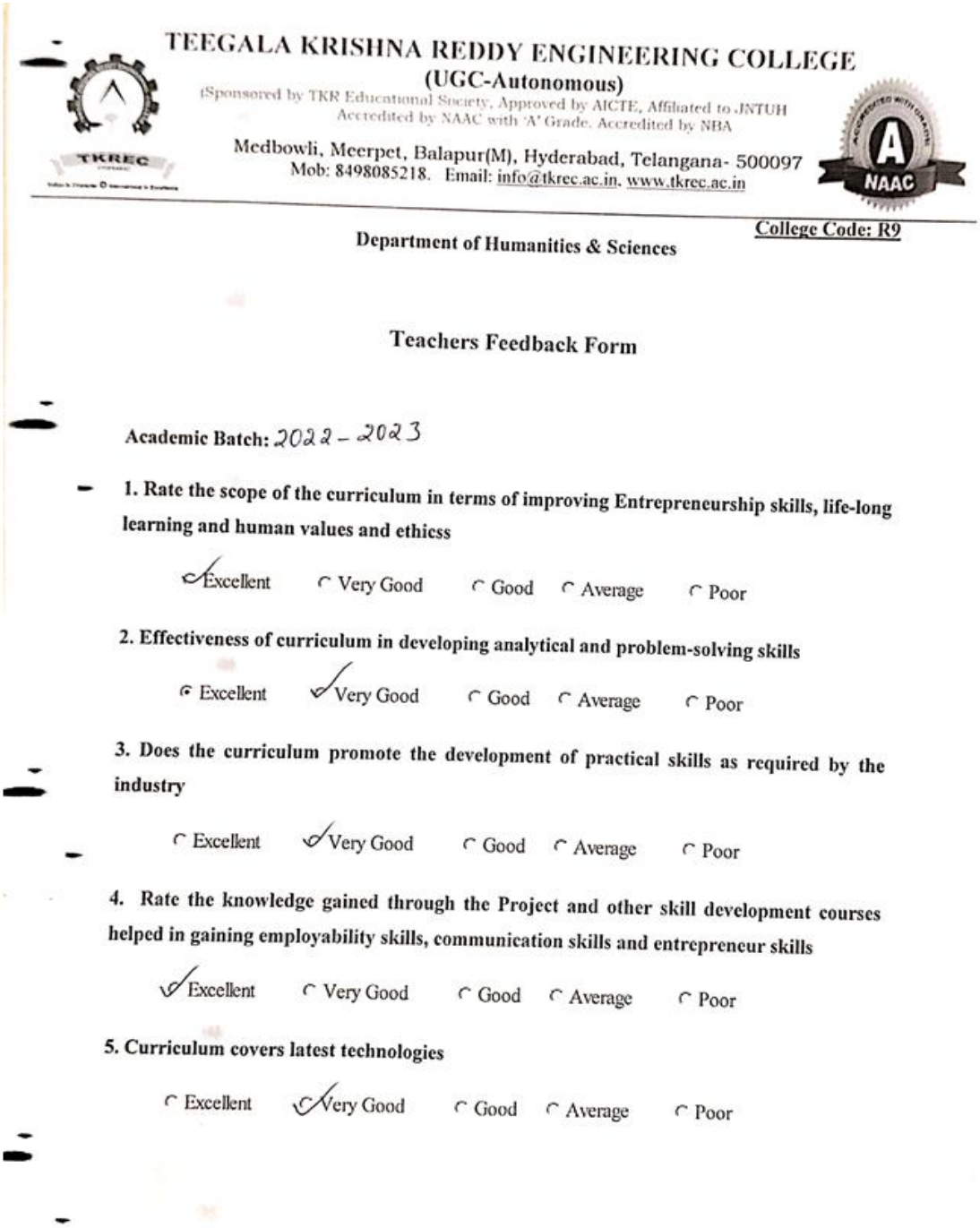
_____

_____

Note:

5- Excellent 4 – Very Good 3- Good 2- Average 1 – Poor

2) Sample Teachers Feedback Form:



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College Code: R9

Department of Humanities & Sciences

Teachers Feedback Form

Academic Batch: 2022 – 2023

1. Rate the scope of the curriculum in terms of improving Entrepreneurship skills, life-long learning and human values and ethicss

✓Excellent ○ Very Good ○ Good ○ Average ○ Poor

2. Effectiveness of curriculum in developing analytical and problem-solving skills

● Excellent ✓Very Good ○ Good ○ Average ○ Poor

3. Does the curriculum promote the development of practical skills as required by the industry

○ Excellent ✓Very Good ○ Good ○ Average ○ Poor

4. Rate the knowledge gained through the Project and other skill development courses helped in gaining employability skills, communication skills and entrepreneur skills

✓Excellent ○ Very Good ○ Good ○ Average ○ Poor

5. Curriculum covers latest technologies

○ Excellent ✓Very Good ○ Good ○ Average ○ Poor

TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

(UGC-Autonomous)

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTUH
Accredited by NAAC with 'A' Grade, Accredited by NBA

Medbowli, Meerpet, Balapur(M), Hyderabad, Telangana- 500097
Mob: 8498085218. Email: info@tkrec.ac.in, www.tkrec.ac.in

College Code: R9

Department of Humanities & Sciences

6. Curriculum encourage the students to participate in extra-curricular activities and research projects

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

7. Various platforms and opportunities available by the institution helped you to achieve your goals.

○ Excellent ✓ Very Good ○ Good ○ Average ○ Poor

8. Rate the curriculum's scope in terms of developing the following characteristics, creativity, leadership, innovation, self-motivation, workplace ethics and social responsibility

✓ Excellent ○ Very Good ○ Good ○ Average ○ Poor

9. Kindly indicate if you have any other additional feedback to offer.

_____

_____

_____

Note:

5- Excellent 4 – Very Good 3- Good 2- Average 1 – Poor

3) Sample Employer Feedback Form:

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Department of Information Technology

EMPLOYER FEEDBACK FORM

Name of the Employee: KATTAM DEEPIKA

Sno	Parametric Index	Excellent	Very Good	Good	Average	Poor
1	How well do you think our graduates demonstrate a solid foundation in engineering principles and practices?	✓				
2	To what extent have you observed our graduates' ability to analyze and solve complex engineering problems?	✓				
3	How has their education contributed to this skill?	✓				
4	To what extent have they demonstrated competence in this area?				✓	
5	Evaluate the proficiency of our graduates in using modern tools and technologies relevant to their field.				✓	
6	How well do they integrate social responsibility into their work?		✓			
7	To what extent do they apply these principles in their work?				✓	
8	Have you observed a strong ethical foundation in their work?					✓
9	How well do they collaborate with colleagues?		✓			
10	How effectively do they convey technical information in a professional setting?		✓			
11	Understanding of project management and financial considerations in engineering projects. To what extent are they prepared in these areas?		✓			
12	Have you noticed a proactive approach to staying updated with industry trends?		✓			

4) Sample Alumni Feedback Form:

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Department of Information Technology

ALUMNI FEEDBACK FORM

Name of the Student: M. Ajay Reddy

Sno	Parametric Index	Excellent	Very Good	Good	Average	Poor
1	To what extent do you feel the program equipped you with a solid foundation in engineering principles and practices?	✓				
2	How well did the program prepare you for analyzing and solving complex engineering problems?		✓			
3	How has the program contributed to this skill?			✓		
4	To what extent did the program support the development of this competency?				✓	
5	How has the program influenced your technological skillset?				✓	
6	How well did the program emphasize social responsibility in engineering?			✓		
7	To what extent did the program integrate these principles into the curriculum?					✓
8	Assess the program's impact on your ethical reasoning and decision-making skills as an engineer.					✓
9	How did the program contribute to your ability to collaborate effectively?	✓				
10	How has the program enhanced your ability to communicate technical information clearly?		✓			
11	To what extent did the program prepare you in these areas?			✓		
12	How has the program instilled a sense of life-long learning?	✓				