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3	Dr. S. Sarojini Mary	-	Determination of Switching Angle from Inductance Profile of Converter Fed Switched Reluctance Generator in Wind Energy Conversion System.	First International Conference on Circuits, Signals, Systems and Securities	2020	-	21
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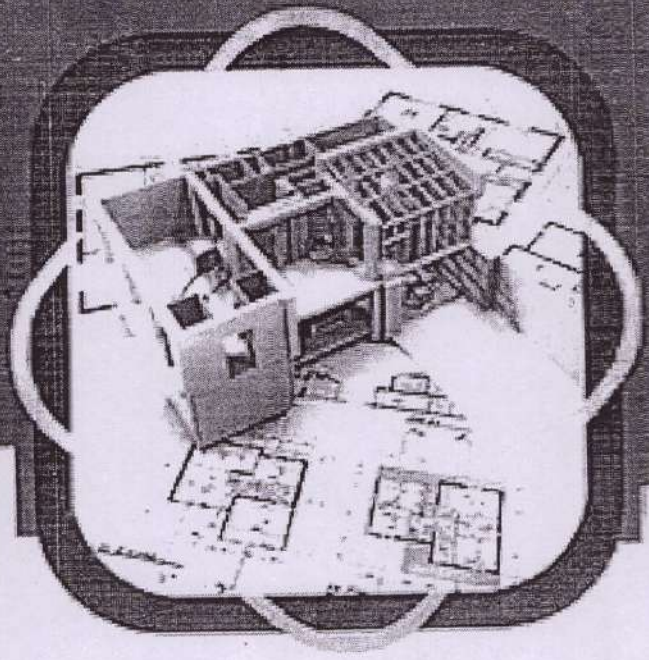

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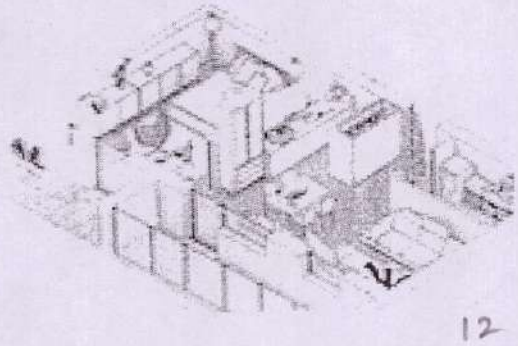

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Proceeding of CISC 2019

Springer

Decision Support System for Determining Academic Advisor Using Simple Additive Weighting

M. Sivaram, S. Shanmugapriya, D. Yuvaraj, V. Porkodi, Ahmad Akbari, Wahidah Hashim, Andino Maseleno and Miftachul Huda

Abstract In every college there is always an Academic Advisor. Every student studying in a tertiary institution must have an Academic Advisor. Higher education is also a continuation of secondary education which is organized to prepare students to become members of the community who have the ability, not only in the academic field but also in all fields where students or student forms a form of agent of change, agent of control, and iron stock. The problem that occurs in determining the Academic Advisor is the need for Academic Advisors for students or students at STMIK Pringsewu Lampung. Where the parties concerned are still confused in determining the Academic Advisor, who is eligible to be an Academic Advisor? This problem can be solved by the method of saw in determining criteria and decision-making. This method will give an alternative weighting where the biggest weight is the alternative choice who will be determined to be Academic Supervisor in STMIK Pringsewu Lampung College.

Keywords Decision support system · Simple additive weighting · Academic advisor

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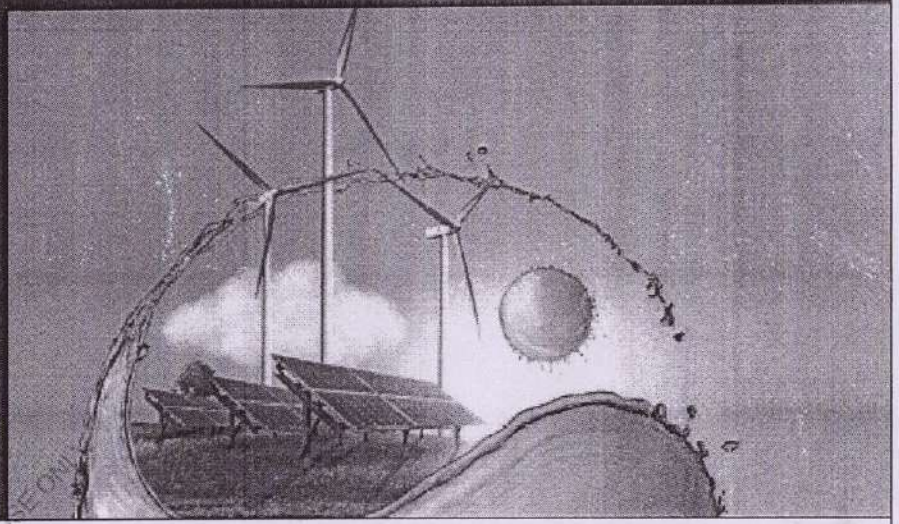
Developing renewable energy technologies that exploit the sun, the wind, and geothermal energy is critical to addressing concerns about climate change and some environmental issues. However, using renewable energy sources will not eliminate all environmental concerns. Although renewable energy sources produce relatively low levels of Green House gas emissions and conventional air pollution, manufacturing and transporting them will produce some emissions and pollutants. The production of some photovoltaic (PV) cells, for instance, generates toxic substances that may contaminate water resources. Renewable energy installations can also disrupt land use and wildlife habitat, and some technologies consume significant quantities of water.To develop sound policies Policy makers must understand the relative environmental impacts of alternative energy sources, including how the impacts of renewable energy technologies compare to those of fossil-fuel technologies and to opportunities for improvements in energy efficiency. Understanding the potential environmental impacts of renewable energy technologies is also essential for identifying and pursuing design, manufacturing



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1. S. N. Bhadra, D.Kastha, S.Banerjee, "Wind Electrical Systems", Oxford University Press, 2005.
2. B.H.Khan Non-conventional Energy sources Tata McGraw-hill Publishing Company, New Delhi,2009.

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An preliminary course on analog and digital communications is basic to the under- graduate program in electrical engineering. This course is typically obtainable at the low-grade level. Classically, it is understood that the student has the environment in the coal, electronics, signals and systems, and perhaps prospect theory, the preliminary manner in brain scenery of this path, a textbook optional for the course must be easy to read precise, and hold an profusion of perceptive examples, problems and computer experiments. These objectives of the book are wanted to speed up the rudiments of knowledge or communication systems at preliminary level and in an effectual way. This book has been written with all of these objectives in mind. Given the mathematical nature of communication theory, it is quite easy for the reader to misplace view of the practical side of communication systems. Right through the book, we have made a particular effort not to fall into this ensnare. We have done this by touching through the conduct of the subject in an methodical method, always irritating to keep the mathematical behavior at an effortless-to-seize level and also pointing out practicals

I am Dr. U.Sureshkumar working as a Professor/HOD in EEE/MIET,Tiruchi-07,TN,India.BE in Electrical and Electronics in Thiyagarajar College of Engineering , Applied ME in Electronics in Madurai Kamarajar University and completed his Ph.D. In Thiyagarajar College of Engineering , I have more than 2 decade of experience as Teaching /industries

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Dr. Umaiyadoss Sureshkumar

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from
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1

UNIT

FUNDAMENTALS AND LINK LAYER

1.1. OVERVIEW OF DATA COMMUNICATIONS

A network is a set of devices (also referred to as nodes) connected by communication links. A node can be a computer, printer or any other device capable of sending data and receiving data generated by other nodes on the network.

Data communication is the exchange of data between two devices via some form of transmission medium. The effectiveness of a data communication system depends on;

(i) ***Delivery:*** Data must be delivered to the correct destination. Data must be received by the intended device or user and only by that device or user.

(ii) ***Accuracy:*** The system must deliver the data without any change. Data that have been altered in transmission and left uncorrected are unusable.

(iii) ***Timeliness:*** The system must deliver the data in time. The system must deliver the audio or video data as they are produced, in the same order that they are produced, and without significant delay. This kind of delivery is called real-time transmission.

(iv) ***Jitter:*** Jitter refers to the variation in the packet arrival time. It is the uneven delay in the delivery of audio or video packets.

1.1.1 Components

A data communication system consists of five components. They are

(i) ***Message:*** The message is the information or data to be communicated. Some forms of data representations are text, number, images, audio and video.

(ii) ***Sender:*** The sender is a device that sends the message.

(iii) ***Receiver:*** The receiver is a device that receives the message, sent by the sender.

(iv) ***Medium:*** The medium is a physical path through which the message can be passed between the sender and the receiver.

(v) ***Protocol:*** The protocol is a set of rules which governs the data communication. Without the protocol, two systems can be connected but not communicating. The key elements of a protocol are syntax, semantics and timing.

Before getting ahead of ourselves, just what is management, let alone principles of management? A manager's primary challenge is to solve problems creatively, and you should view management as "the art of getting things done through the efforts of other people.The principles of management, then, are the means by which you actually manage, that is, get things done through others—individually, in groups, or in organizations. Formally defined, the principles of management are the activities that "plan, organize, and control the operations of the basic elements of [people], materials, machines, methods, money and markets, providing direction and coordination, and giving leadership to human efforts, so as to achieve the sought object of the enterprise."The fundamental notion of principles of management was developed by French management theorist Henri Fayol (1841–1925). He is credited with the original planning-organizing-leading-controlling framework (P-O-L-C), which, while undergoing very important changes in content, remains the dominant management framework in the world.

Dr. Umaiyadoss Sureshkumar

PRINCIPLES OF MANAGEMENT

INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS, PLANNING, ORGANIZING, DIRECTING, CONTROLLING

I am Dr. Sureshkumar as professor &HOD in EEE at MIET,Tiruchi.I have well experience in POM for the two years in U.G Level especially for engineering background students.

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STUDY OF DURABILITY PROPERTIES ON CONCRETE BY USING INDUSTRIAL WASTE

A.Belin jude[1],G.Sathiya priya[2]

[1] *Assistant professor,Department of civil engineering, M.I.E.T. Engineering College*

[2] *Department of civil engineering,M.I.E.T. Engineering College*

Abstract -This project report the effect of concrete by using copper slag and recycled coarse aggregates are replaced. In this project the recycled coarse aggregates are replaced with 0%, 10%, 20% & 30% to coarse aggregate with the treatment of NaOH-2N for 24 hours and copper slag as fine aggregate replacement in range of 0%, 20%, 40% & 60% by weight of fine aggregate. If the durability and strength is the most important criteria for the design of reinforced concrete structure. In this project work the concrete grade M30 was selected and IS method was used for mix design. The properties of material for cement, fine aggregate, coarse aggregate, recycled coarse aggregate and copper slag were studied for mix design. The various strength concrete like compressive and split tensile strength were studied for various replacements percentages. For the durability studies the test specimens are subjected to sulphate attack, chloride attack and water absorption test on concrete is checked.

Keywords—Cement, copper slag, Recycled coarse aggregate, NaoH-2N, Durability.

I. INTRODUCTION

In the present scenario as a result of continuous growth in population, rapid industrialization, the rate of discharge of pollutants in to the atmosphere has also increased. If the copper slag is one of the industrial waste which is comes out from blast furnace during metal extraction process. However, copper slag can be used in many beneficial ways. It can be used as replacement of fine aggregates in concrete construction, the slag serves as fine, or binding agent which helps to hold large gravel particles within the concrete structures. Concrete is the one of the major construction materials being used worldwide. The aggregate type utilized are either coarse aggregates (with particle size more than 4.75 mm or fine aggregates (with particle size less than 4.74 mm) the aggregate which are used in concrete are obtained either from natural sources or by crushing large size rocks. Coarse aggregates are bound with cement paste during the hydration process to form cement concrete where s fine aggregates are utilized to fill the gaps between the coarse aggregate particles. Coarse aggregate recycling is now a day's popular most of concrete wastes were dumped in low lying lands to increase the level of ground. But when environment is taken into consideration recycled coarse aggregate promotes their reuse and lowers the construction cost.

The main objective of this paper is to be determine the durability properties of concrete the strength parameters of M30grade of concrete when made with replacement of fine aggregate with copper slag and coarse aggregate with recycled coarse aggregates. Compressive strength, split tensile strength and flexural strength of concrete is evaluated with different percentage replacement of fine aggregate in copper slag and coarse aggregate in recycled coarse aggregate. There is need to discover a cost

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OPTIMAL INTEGRATION OF DISTRIBUTED GENERATION & CAPACITORS IN SMART GRID USING PARTICLE SWARM OPTIMIZATION

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[2]Professor/Head, Department of Electrical and Electronics Engineering
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Abstract:

Distributed generation (DG) places the major role in smart grid environment. It has become mandatory to allow for a seamless integration of Distributed generation and capacitors to improve the performance of smart grid, while still meeting increasing or decreasing demands with minimum operating cost. The objective of this paper is to minimize the real and reactive power loss and to improve the voltage profile in the distribution system. A Fuzzy logic technique has utilized to identify the weak bus for DG and capacitor placement. After identifying the weak bus, the particle swarm optimization technique is used for sizing Distribution Generation and capacitor with minimization of power loss in the smart distribution system with dynamic load. The variable load is done by increasing and decreasing the test system load by 25%, 50% of the base case. Comparison of results before and after the DG and capacitor installation for varying load has been carried out. The results prove the reduction of power loss and improvement in voltage profile. IEEE 33 bus system demonstrates the applicability of the proposed method.

Keywords: Particle swarm Optimization, Distributed Generation, Smart grid

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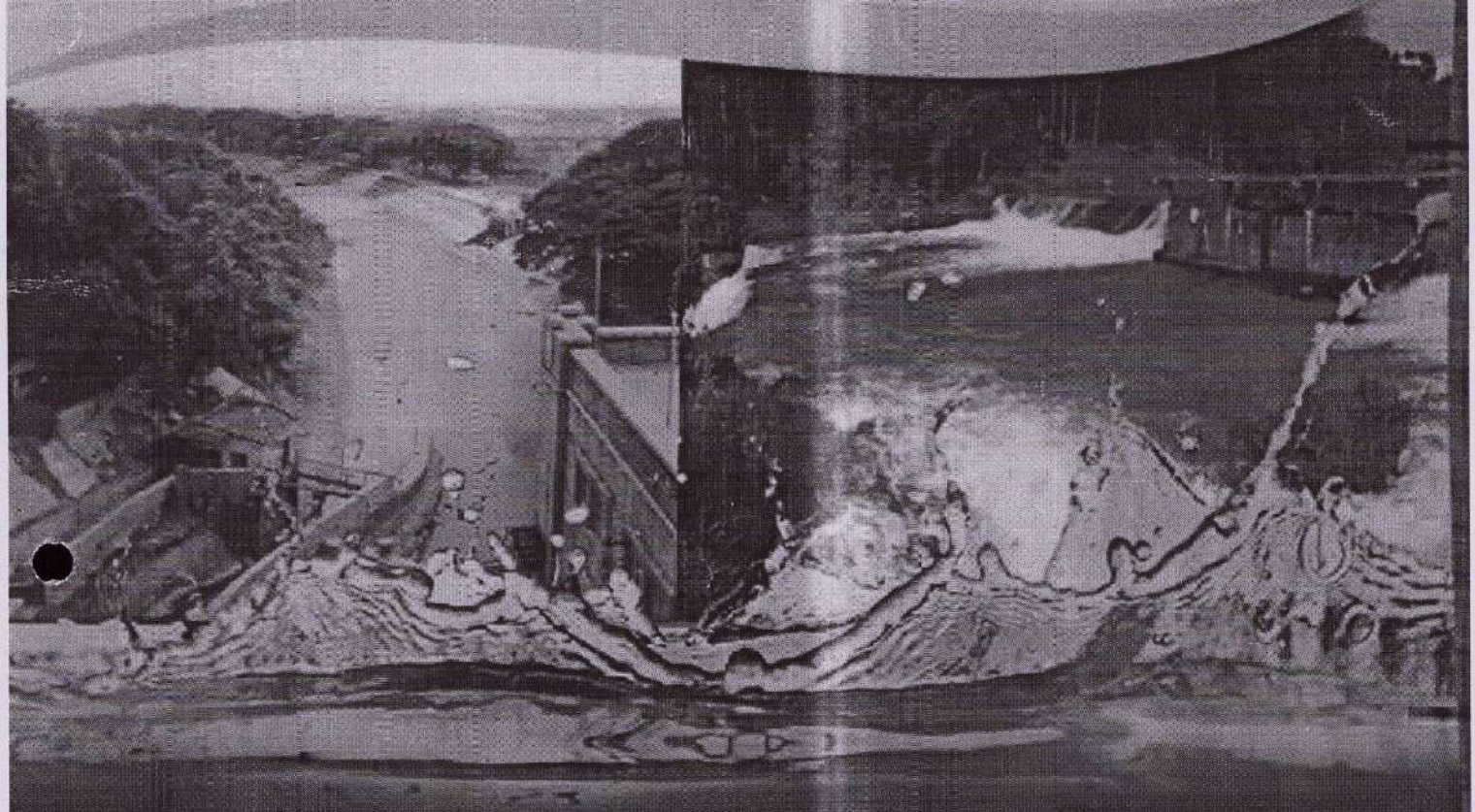

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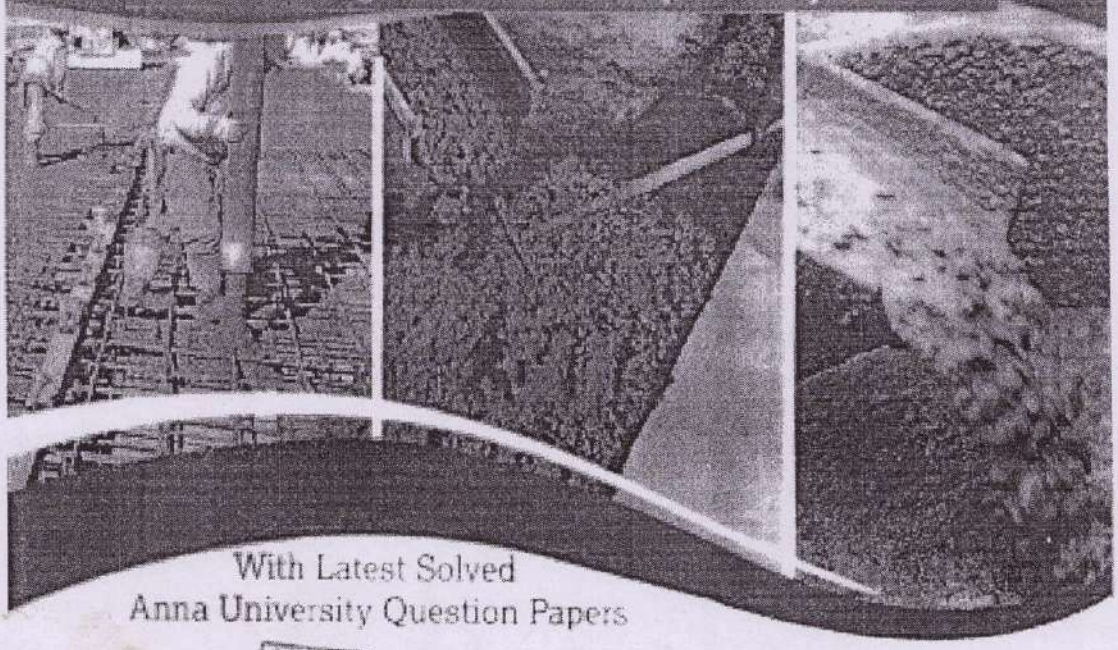

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Home and Office Automation System Using Human Activity Recognition

Mary Gladence.L, Hari Haran Sivakumar, Gobinath Venkatesan and Shanmuga Priya.S

Abstract—**The recent years have witnessed significant progress in the automation of human activity recognition in order to realize intelligent environments which are capable of detecting users actions and gestures so that the needed services can be provided automatically and instantly for maximizing the user comfort and safety as well as minimizing energy. If a person enters into the room and sits/stands/lies down then the fan or AC should be automatically turned on. If a person comes and walks away or keeps roaming around, then they should not be turned on thus saving energy.**

Index Terms—energy efficiency; fuzzy logic system; Human Silhouette.

I. INTRODUCTION

We aim to contribute towards creating ambient intelligent environments which can intelligently understand the users by activity recognition so that the needed services can be provided automatically and instantly to maximize the user comfort and safety while minimizing the utilized energy. In order to realize such intelligent environments, there is a need first to automatically recognize the user behavior so that the best environment action can be taken in order to satisfy the environment objectives.

Automation lowers the human judgment to the lowest degree possible but does not completely eliminate it. The recent developments in technology which permit the use of Arduino have enabled different devices to have capabilities of connecting with each other. Using a WIFI shield to act as a Micro web server for the Arduino eliminates the need for wired connections between the Arduino board and computer which reduces cost and enables it to work as a standalone device.

Mary Gladence.L, Assistant Professor, School of Computing, Sathyabama University (email: lgladence@gmail.com)
Hari Haran Sivakumar and Gobinath Venkatesan are the UG Student, School of Computing, Sathyabama Univesity (email: hari.mrcool007@gmail.com)
Shanmuga Priya.S, Assistant Professor, Department of IT, MIET Engineering College, Trichy

The Wi-Fi shield needs connection to the internet from a wireless router or wireless hotspot and this would act as the gateway for the Arduino to communicate with the Internet. With this in mind, an internet based home automation system for remote control of home appliances is designed. Our context involves 5 activities namely sitting, standing, walking, lying & No person down. So it involves 3-d feature set extraction only which includes dimensions of the Human Silhouette (width and height) and motion characteristics. Sensors are used to track the number of people entering and leaving the room and turn on/off light and fan. The approaches of activity recognition utilize complicated feature models which increase the level of complexity in constructing the fuzzy logic system.

A. NEED FOR HOME AUTOMATION

Our Home automation system is entirely based on the human activities. Because the motion detected by the motion sensor alone cannot be a sufficient input. There are certain activities for which the appliances need not be turned on. So we use the real time video input to detect Human activities based on which the automation is done.

B.CHALLENGES IN HOME AUTOMATION

Existing human activity recognition methods rely on assumptions or computationally expensive approaches. Some of the challenges faced are, obtaining accurate results in case of illumination changes, shadow regions that are projected by foreground objects and are detected as moving objects, movement of various objects in the background and multi person entering a single frame etc.

The related work and proposed work of this paper is described in Section II and III respectively. Section IV describes the system architecture. Section V and VI discuss about the result and concludes the paper respectively.

II. RELATED WORK

There are a few research papers which serve as the base idea of the work is referred from [1-10].

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in the International Conference on Recent Innovations in Engineering'18 Organized by the Department of ~~CIVIL~~ / CSE / ~~ECE~~ / ~~EEE~~ / ~~IT~~ / ~~MECH~~ at Sri Subramanya College of Engineering and Technology, Palani, Tamilnadu on 24th March, 2018.

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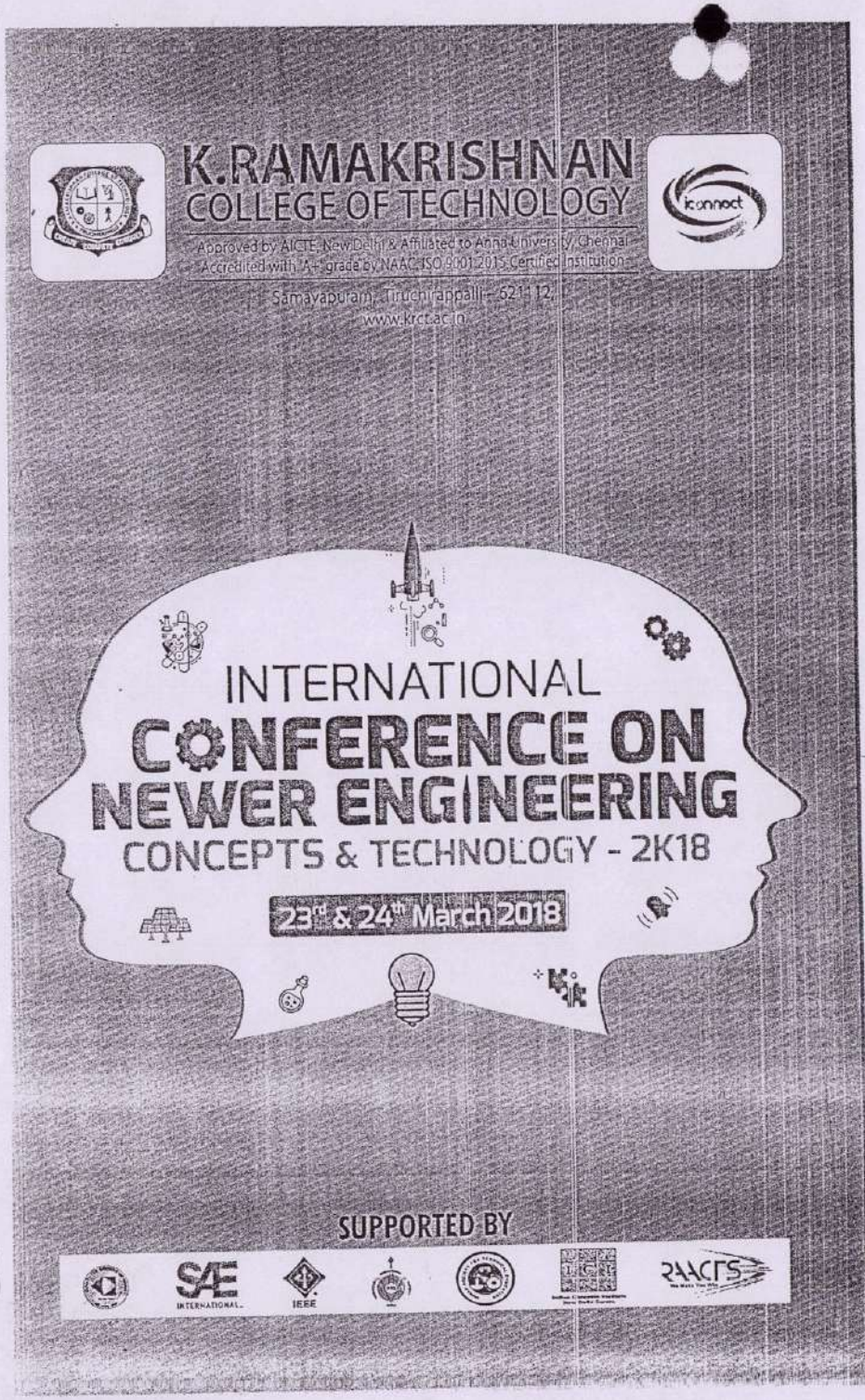

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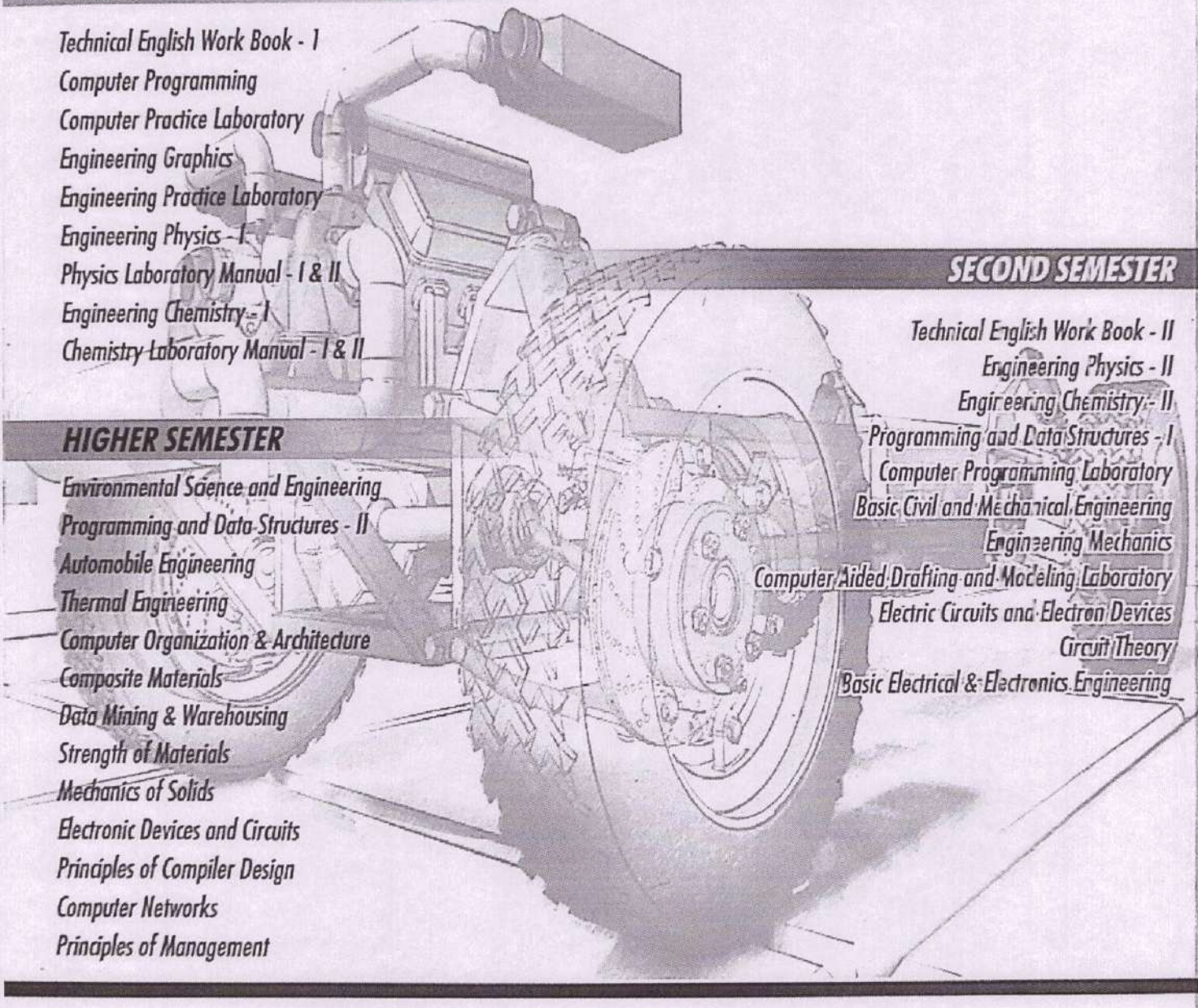

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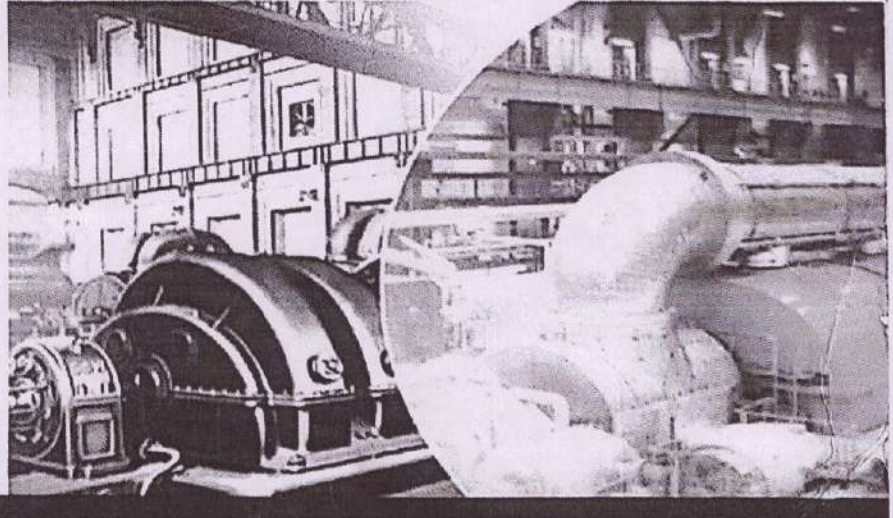

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A - CIVIL ENGINEERING

UNIT-I SURVEYING AND CIVIL ENGINEERING MATERIALS

Surveying: Objects-types-classification-principles-measurements of distances-angles-levelling-determination of areas-illustrative examples.

Civil Engineering Materials: Bricks-stones-sand-cement-concrete-steel sections.

UNIT-II BUILDING COMPONENTS AND STRUCTURES

Foundations: Types, Bearing capacity - Requirement of good foundations.

Superstructure: Bricks masonry - stone masonry - beams - columns - lintels - roofing - flooring - plastering - Mechanics - Internal and external forces - stress-strain - elasticity - Types of Bridges and Dams - Basics of Interior Design and Landscaping.

B - MECHANICAL ENGINEERING

UNIT-III POWER PLANT ENGINEERING

Introduction, Classification or Power Plants - Working Principle of Steam, Gas, Diesel, Hydro - electric and Nuclear Power Plants - Merits and Demerits - Pumps and Turbines - Working Principle of Reciprocating Pumps (single acting and double acting) - Centrifugal Pump.

UNIT-IV IC ENGINES

Internal combustion engine as automobile power plant-Working principle of Petrol and Diesel Engines - Four Stroke and Two Stroke Cycles - Comparison of four stroke and two stroke engines - Boiler as a power plant.

UNIT-V REFRIGERATION AND AIR CONDITIONING SYSTEM

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system - Layout of typical domestic refrigerator - Window and Split type room Air conditioner.

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UNIT -1 SURVEYING AND CIVIL ENGINEERING MATERIALS

SURVEYING

UNIT – 2 BUILDING COMPONENTS AND STRUCTURES

FOUNDATIONS

SUPER STRUCTURES

UNIT – 3 POWER PLANT ENGINEERING

POWER PLANT

PUMPS

TURBINES

UNIT - 4 IC ENGINES

IC ENGINES

BOILER AS A POWER PLANT

UNIT - 5 REFRIGERATION AND AIR CONDITIONG SYSTEM

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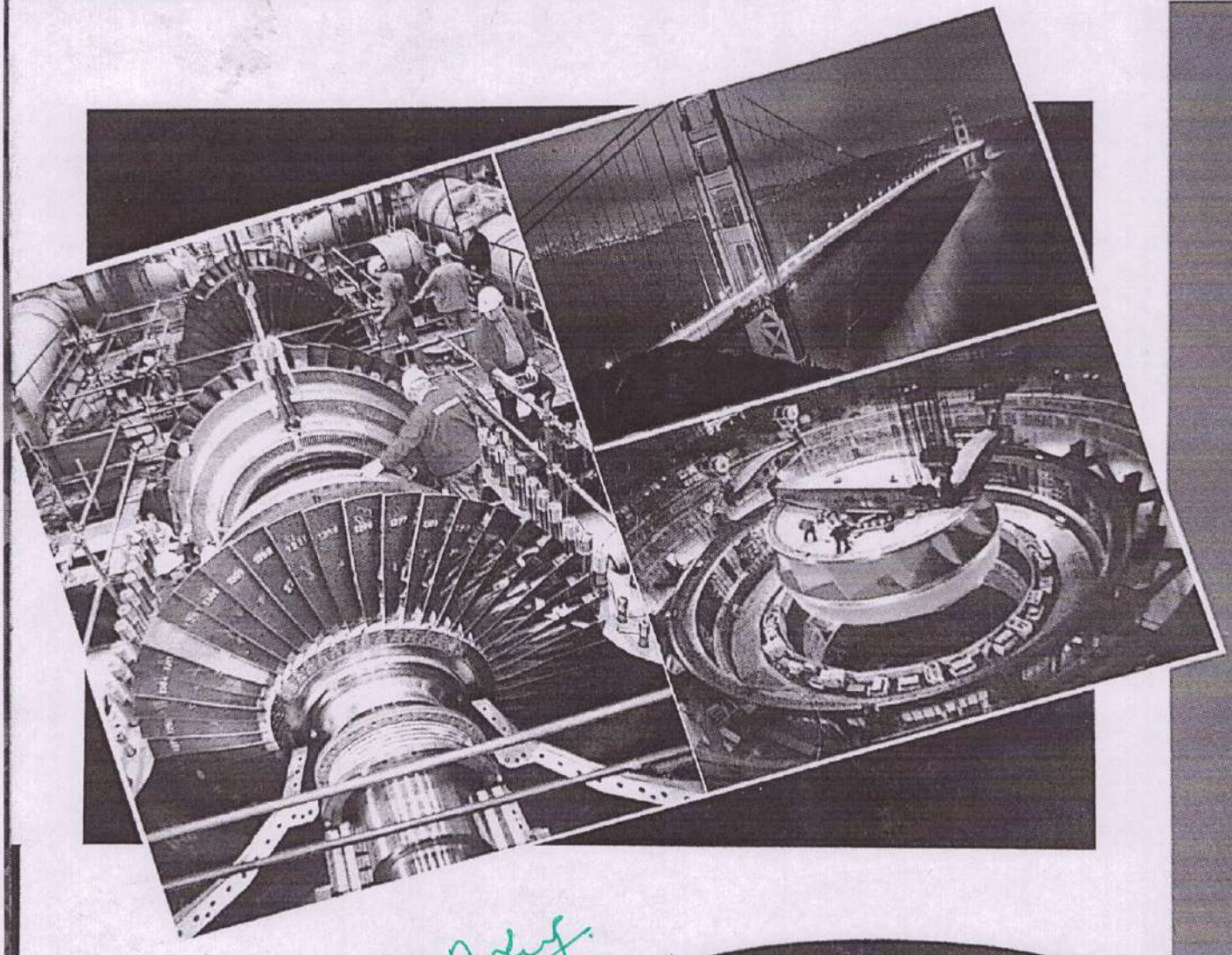

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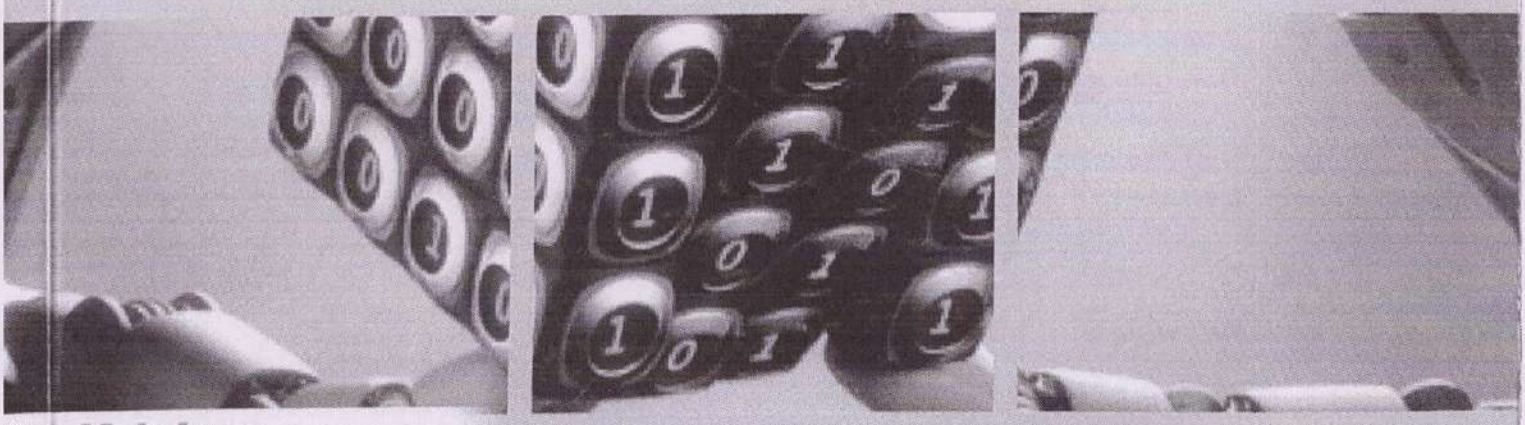

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SYLLABUS

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Introduction to Mechatronics - Systems - Concepts of Mechatronics approach - Need for Mechatronics - Emerging areas of Mechatronics - Classification of Mechatronics. Sensors and Transducers: Static and dynamic Characteristics of Sensor, Potentiometers - LVDT - Capacitance sensors - Strain gauges - Eddy current sensor - Hall effect sensor - Temperature sensors - Light sensors.

UNIT - II :8085 MICROPROCESSOR AND 8051 MICROCONTROLLER

Introduction - Architecture of 8085 - Pin Configuration - Addressing Modes - Instruction set, Timing diagram of 8085 - Concepts of 8051 microcontroller - Block diagram.

UNIT - III : PROGRAMMABLE PERIPHERAL INTERFACE

Introduction - Architecture of 8255, Keyboard interfacing, LED display interfacing, ADC and DAC interface, and Temperature Control - Stepper Motor Control - Traffic Control interface.

UNIT - IV : PROGRAMMABLE LOGIC CONTROLLER

Introduction - Basic structure - Input and output processing - Programming - Mnemonics - Timers, counters and internal relays - Data handling - Selection of PLC.

UNIT - V : ACTUATORS AND MECHATRONIC SYSTEM DESIGN

Types of Stepper and Servo motors - Construction - Working Principle- Advantages and Disadvantages. Design process-stages of design process - Traditional and Mechatronics design concepts - Case studies of Mechatronics systems - Pick and place Robot - Engine Management system - Automatic car park barrier.

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UNIT - 5 : ACTUATORS AND MECHATRONIC SYSTEM DESIGN .... 5.1 - 5.64

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UNIT I: METAL CASTING PROCESSES

9

Sand Casting : Sand Mould – Type of patterns - Pattern Materials – Pattern allowances – Moulding sand Properties and testing – Cores –Types and applications – Moulding machines – Types and applications; **Melting furnaces** : Blast and Cupola Furnaces; **Principle of special casting processes:** Shell - investment – Ceramic mould – Pressure die casting - Centrifugal Casting - CO_2 process – Stir casting; **Defects in Sand casting.**

UNIT II: JOINING PROCESSES

9

Operating principle, basic equipment, merits and applications of : Fusion welding processes : Gas welding - Types – Flame characteristics; Manual metal arc welding – Gas Tungsten arc welding - Gas metal arc welding – Submerged arc welding – Electro slag welding; **Operating principle and applications of** : Resistance welding - Plasma arc welding – Thermit welding – Electron beam welding – Friction welding and Friction Stir Welding; Brazing and soldering; **Weld defects:** types, causes and cure.

UNIT III: METAL FORMING PROCESSES

9

Hot working and cold working of metals – Forging processes – Open, impression and closed die forging – forging operations. Rolling of metals – Types of Rolling – Flat strip rolling – shape rolling operations – Defects in rolled parts. Principle of rod and wire drawing – Tube drawing – Principles of Extrusion – Types – Hot and Cold extrusion.

UNIT IV: SHEET METAL PROCESSES

9

Sheet metal characteristics – shearing, bending and drawing operations – Stretch forming operations – Formability of sheet metal – Test methods – special forming processes-Working principle and applications – Hydro forming – Rubber pad forming – Metal spinning– Introduction of Explosive forming, magnetic pulse forming, peen forming, Super plastic forming – Micro forming

UNIT V: MANUFACTURE OF PLASTIC COMPONENTS

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Types and characteristics of plastics – Moulding of thermoplastics – working principles and typical applications – injection moulding – Plunger and screw machines – Compression moulding, Transfer Moulding – Typical industrial applications – introduction to blow moulding – Rotational moulding – Film blowing – Extrusion – Thermoforming – Bonding of Thermoplastics.

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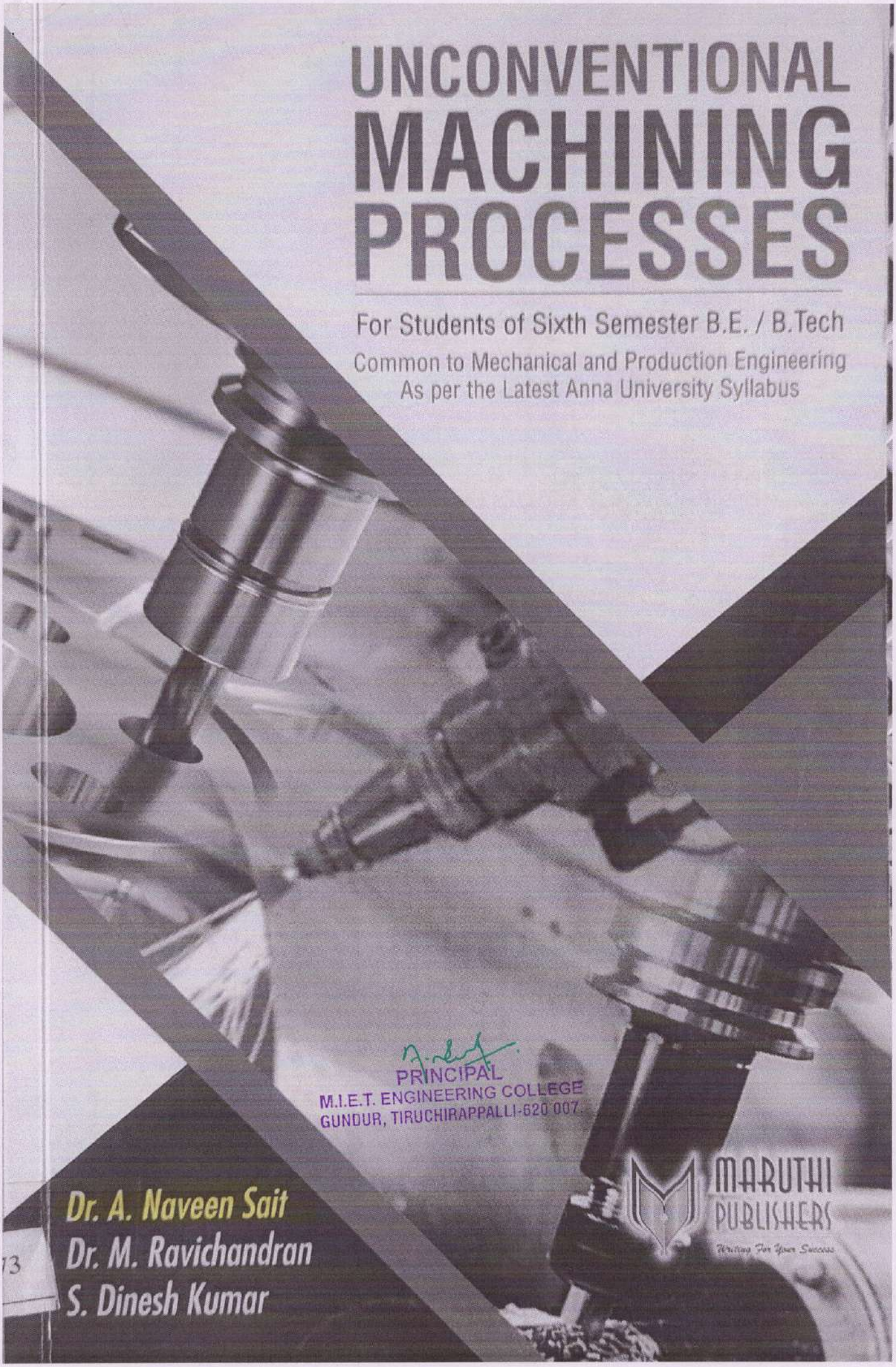

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3003

OBJECTIVES:

To learn about various unconventional machining processes, the various process parameters and their influence on performance and their applications.

UNIT I INTRODUCTION 6

Unconventional machining Process – Need – classification – Brief overview.

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TOTAL: 45 PERIODS

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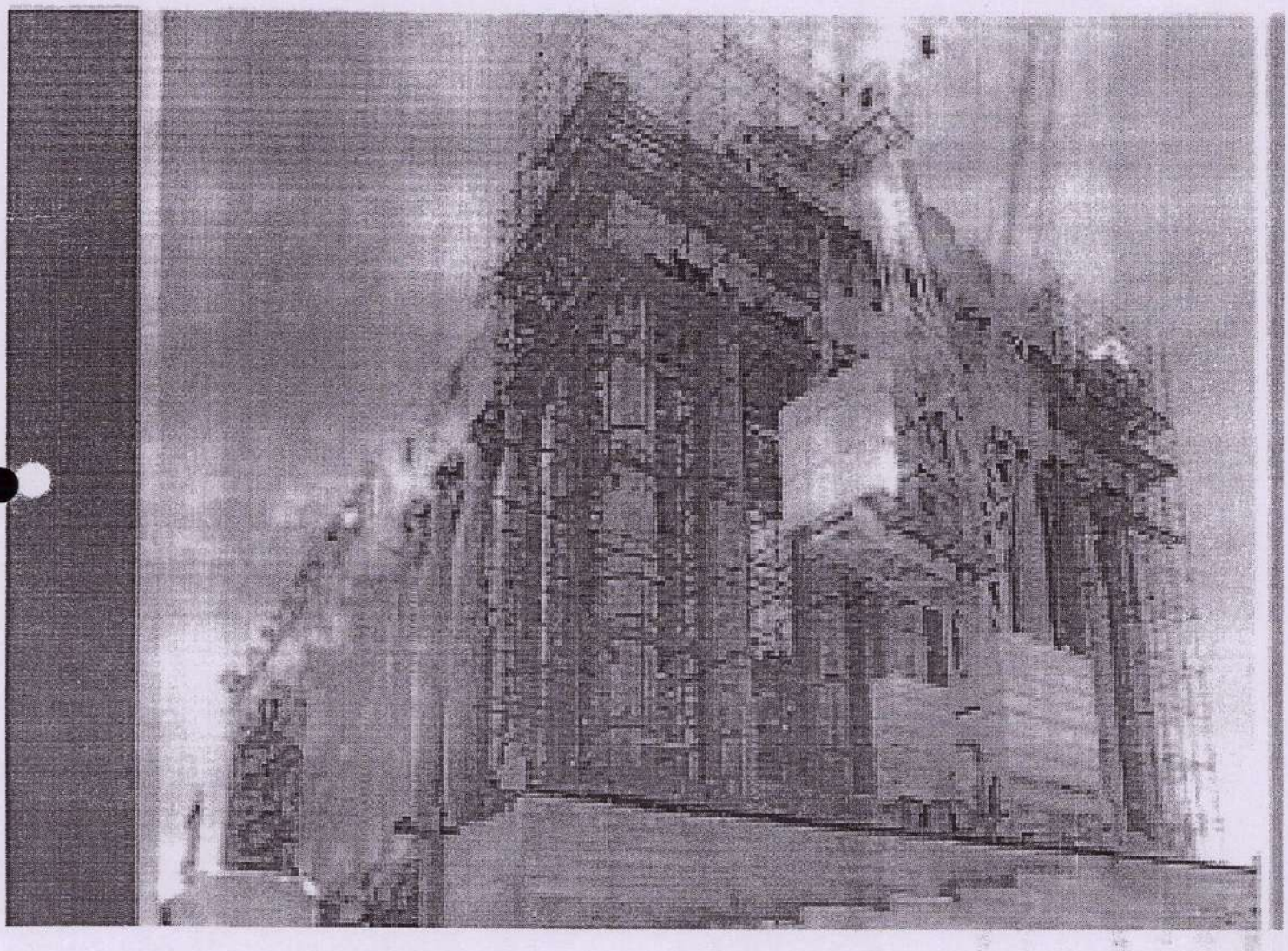

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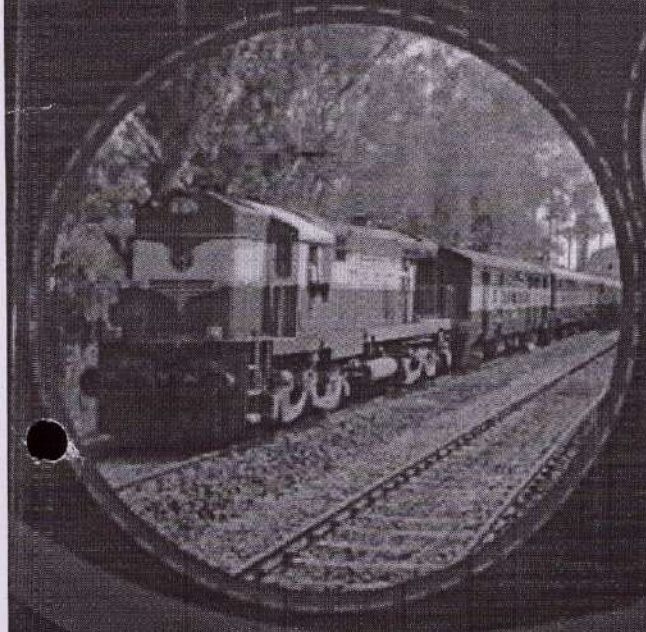

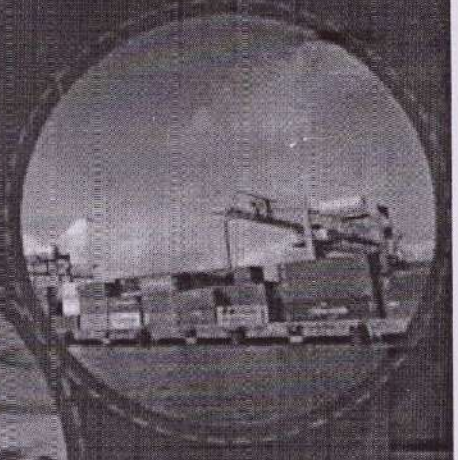

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A Decision Support System for the Condition Assessment of Distressed Concrete Buildings

T. Barkavi[1] and C. Natarajan[2]

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Abstract

Concrete is one of the most versatile and durable construction material used worldwide. During its service life, concrete undergoes several deteriorations. The most prominent sign of deterioration is cracking. Cracks in structural concrete are similar to *Hieroglyphics* i.e: pictures which can communicate the damage. Since a considerable expertise is required to understand the pattern of cracking and failure, the tasks of diagnosing concrete deterioration are carried out by professional specialist. It's noteworthy that human expertise in this field is quite limited and expensive, which can lead to the investigation by inexperienced engineers and ultimately expensive misconceptions. Hence, there is a need to develop a user interface using engineering computation to support the visual examiner in decision making. This paper discusses a new support system named as ConASCon-16 developed by the authors for assessing concrete deterioration. The system uses fault trees as its rule. The interface has three modules namely REVIEW, SEEN and HIDDEN. The first module is a database on concrete deterioration, Visual Inspection and Non-Destructive Testing (NDT) with appropriate photos to help the user/engineer understand, the second and third module specifies the cause of visible deteriorations and unseen distresses in concrete and predicts the condition of the structure by a simple questionnaire. A hypothetical case study has been described to demonstrate the applicability of ConASCon-16.

INTRODUCTION

Preserving the integrity of concrete is much important to achieve its desired service life. Many of the older structures were built in the first half of 20th century; they are reaching the end of the expected service life, and therefore are subjected to increasing deterioration. But the worst case is newer structures have also shown signs of early distress (Lorenzi.A, et al. 2009). Demolition of structures which does not get comply with the requirement of current loading levels or which shows signs of distress would be unthinkable both practically and economically. Structures, which suffer total or partial collapse, are easy to identify, however it is difficult to assess the structural state of the standing structures. Hence there is a growing concern regarding how to determine the current state of the structure, in order to ensure its serviceability and safety (Grantham M, 2011).

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INFLUENCE OF MINERAL ADMIXTURES ON STRENGTH AND DURABILITY PROPERTIES OF CONCRETE

[1] Belin Jude.A, [2]Bala Vignesh.U, [3] Jeganraj.M
[1,2,3] Department of Civil Engineering, M.I.E.T. Engineering College, Tiruchirappalli

Abstract-This paper describes about an experimental investigation was conducted to study the strength and durability properties of concrete with and without mineral admixtures. The conventional concrete has several drawbacks like very low tensile strength, lack of durability, etc. These drawbacks may be overcome by introducing mineral admixtures. The scope of the project is to improve the strength and durability properties of concrete by the way of including mineral admixtures in the concrete at the different level of replacement of cement. About 30% of cement and sand is replaced by the combination of admixtures. For the admixture with higher fineness it is replaced with sand. Super plasticizer is used at 0.2% by weight of cement in order to improve the properties of fresh concrete. Strength and durability characteristics have been carried out for both the control concrete as well as blended concrete.

Keywords - Strength, durability, fly ash, silica fume

I. Introduction

Concrete is an artificial material, which has wider application in construction industry. The basic ingredients of concrete are

- Cement
- Sand
- Coarse aggregate
- Water

Now a days concrete is being used for wide varieties of purpose to make it suitable in different conditions. In these conditions ordinary concrete may fail exhibit the required quality performance or durability. In such cases, admixture is used to modify the properties of concrete so as to make it more suitable for any situation. Since the cost of cement and sand have increased due to increased cost of production and or increased demand, there is an urgent need to replace them partially or wholly by cheaper material.

Admixture is defined as a material, other than cement, water, aggregates, that is used as an ingredient of concrete and is added to the batch immediately before or during mixing. It will be slightly difficult to predict the effect and the results of using admixtures because the change in the brand of cement, aggregate grading, mix proportions and richness of mix alter the properties of concrete. At times, they affect the desirable properties adversely. Sometimes more than one admixture is used is used in the same mix. Admixtures can be used to improve the concrete properties either in the handling process or consolidation of fresh concrete, in the performance of concrete both in fresh and hardened stages and even for economy in the cost of construction. Almost every property of concrete can be modified to some extent. However the effectiveness of an admixture in a concrete mix depends on type and amount of cement, temperature of concrete, etc.

A. Role of Admixtures

It has been demonstrated that the best pozzolans in optimum proportion mixed with Portland cement improves many qualities of concrete, such as

- Improvement in workability
- Lower the heat of hydration and thermal shrinkage
- Increase the water tightness
- Reduce the alkali aggregate reaction
- Improve resistance to attack by sulphate soils and sea water
- Reduction in bleeding and segregation
- Increased impermeability
- Increase in setting time
- Improved strength at lower cost
- Decrease in capillary flow of water
- Prevention of shrinkage
- Increase in bond between steel reinforcement and concrete.

The siliceous or aluminous compound in a finely divided form react with the calcium hydroxide to form highly stable cementitious substances of complex composition involving water, calcium and silica. Generally, amorphous silicate reacts much more rapidly than the crystalline form. It is pointed out that calcium hydroxide; otherwise, a water soluble material is converted into soluble cementation material by the reaction of pozzolanic material.

[1]Corresponding Author

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EFFECT ON CONCRETE WITH ENGINEERED CEMENTITIOUS COMPOSITE USING POLYPROPYLENE FIBRE.

[1] Belin Jude.A, [2] Venkatesh.V, [3] Santhosh Kumar.E
[1,2,3] Department of Civil Engineering, M.I.E.T. Engineering College, Tiruchirappalli

Abstract- An Engineered Cementitious composite is a high ductile cementitious composite which possess high crack resistance, tensile strain capacity which surpasses property of normal concrete. Engineered Cementitious Composites are kind of a Fiber Reinforced Concrete, but in ECC the fiber percentage is optimized to get the better performance and absence of coarse aggregates reduces transition zone effect thus altering behaviour of ECC. In this experiment an attempt is made to study the interaction of poly propylene fibers with the matrix prepared by incorporating the mineral admixture Metakaolin. In this experiment flexural tests were carried out to examine the behaviour with different percentage of fibers.

Keywords - ECC, poly propylene fibers, metakaolin, super plasticizers

I. Introduction

Engineered Cementitious Composites (ECC also known as bendable concrete), developed in the last decade, may contribute safer, more durable and sustainable concrete infra-structure that is cost-effective and constructed with conventional construction equipment. With two percentage of short fibers, ecc has been prepared.

ECC is ductile in nature. Under flexure, normal concrete fractures in a brittle manner. In contrast, very high curvature can be achieved for ECC at increasingly higher loads, much like a ductile metal plate yielinding. Thus improving tensile strain capacity 3-7% for ECC containing 2% fiber by volume. Micromechanial interaction recounts macroscopic properties of the microstructure of composite and forms spine for ECC material design theory. Especially books for microstructure tailoring of ECC along with material optimization.

II. Objectives

A. To investigate the properties of ingredients of Engineered Cementitious composites (ECC)

B. To investigate the Mix Design of ECC

C. To investigate the hardened properties of the ECC

D. To check the ductile behavior of the concrete.

III. Ingredients of ECC Concrete

A. Cement

Cement is a binding material that sets and hardens independently, and can bind other materials together. It hardens and attains strength from chemical reaction with the water known as hydration. The grade 43 ordinary Portland cement is used for this research work.

B. Fine Aggregate

Normal dry river sand is used as a fine aggregate, the sand passing through IS 4.75mm sieve with fineness modulus of 2.87 and specific gravity of 2.62 is used as a fine aggregate.

C. Superplasticizer

Super plasticizer used is Melamine Formaldehyde Sulphonate. This is used to control rheological properties of fresh concrete. Super plasticizers are additives to fresh concrete which help in dispersing the cement uniformly in the mix. This is achieved by their deflocculating action on cement agglomerates by which water entrapped in the groups of cement grains is released and it is available for workability. Typically super plasticizer increase slump from say 5cm to about 18-20cm without addition of water. When used to achieve reduction in mixing water they can reduce water up to 15-20% and hence decrease W/C ratio by same amount. This results in increase in strength and other properties like density, water tightness. Where thin sections are to be cast super plasticizer can increase workability to pump able level and almost no compaction is required. This help in avoiding honeycombing. The permeability of concrete is a guide to its durability. Gross porosity is usually due to continuous passage in the concrete due to poor compaction or cracks which can be minimized by the use of super plasticizer, the incorporation of which provides increased workability maintaining low w/c ratio. It is reported that coefficient of permeability of cement paste reduces considerably with the reduction in w/c ratio. Thus super plasticizer can be used effectively to improve the properties of concrete and avoid defect. Melamine based Super plasticizer are used to assess their effectiveness in improving durability. Melamine based super plasticizer are reported to be the best and hence chosen for the research work..

D. Water

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Heuristics For Privacy Preserving Data Mining: An Evaluation

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Abstract*— Availability of information in profusion in the internet and databases is common knowledge. It has to be viewed in the backdrop of chances for disclosure of such information by a third party. Privacy Preserving Data Mining (PPDM) is in use for maintaining the privacy of individuals. Numerous updated methods are available for the purpose. Evolutionary Algorithms (EA's) are able to provide effective solutions for real-world optimization problems. They find use in business practice too. This work has a proposal for the implementation of an EA using K-Anonymization; particle swam optimization (PSO), Ant colony optimization (ACO) and a Genetic Algorithm (GA). We herein propose Genetic algorithm and particle swam optimization work with the same data. The use of generalization of the original dataset is meant for achieving K-anonymity. A collection of people called "chromosomes" frame the populace which shows an aggregate solution for a characterized issue in the proposed GA. The achievement of good accuracy is obtained by GA optimization, recall and precision in comparison with K-Anonymization, PSO and ACO methods.

Keywords: Data Mining, Privacy Preserving Data Mining (PPDM), K Anonymization, Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO), Genetic Algorithm (GA)

I. INTRODUCTION

Advancements in hardware and software have brought in the advantage of increased storage capability. Information on personal data regarding individuals available in the internet and databases has been proliferating. Data mining is an easy fits but it is also a threat to privacy of data. Here comes PPDM which finds broad use in keeping up the protection of the fundamental information. The development of PPDM guarantees the private information mined is not noticeable to the client running the calculation. PPDM has sympathy toward the delicate crude information namely names, addresses that are get altered from the master database, leading to the inability for the user of data to compromise another person's privacy. There is also the imperative need for exclusion of sensitive knowledge obtained from mining that can compromise data privacy. Hence, there is need to integrate privacy preservation at two levels, viz, user's personal information and information pertaining to the collective activity. The former goes by the name individual privacy preservation and the latter by collective privacy preservation [1].

Privacy preserving of data has to offer safeguard divulging sensitive data during publication of individual data. Many techniques are available for modifying or transforming data with a view to maintain privacy. Anonymization of data is required for obtaining data misuse. Many data mining techniques go through modification to ensure privacy. Cryptography, data mining and information hiding [2] form the basis for PPDM. As a general practice statistics based and crypto based approaches are in the use of tackling PPDM. In the former case, data owners sanitize the data through perturbation or generalization as also through use of knowledge models like decision trees. The latter has the specific advantage of the capability to handle to handle huge volume of datasets [3]. In the crypto-based PPDM approach, information proprietors need to execute exceptionally composed data mining algorithm [4] on a collaborative basis despite the achievement of undeniable security assurance and improved data mining execution, these calculations face execution and versatility issues [5].

Privacy preserving data for a single database has the subject matter of extensive study in recent years [6]. Data anonymization transforms a dataset to help upholding of privacy though use of different approaches, for example K-Anonymity via generalization or suppression methods. This helps masking of individually identifiable information. -Anonymity transforms data to classes of corresponding equivalent level, with each class having a set of K-records that can help distinguishing each other [7]. Whatever problems we seen in this approach have been solved through use of techniques like l-diversity and t-closeness. Generalization is the commonly known techniques of k-anonymity. Here some of the values are swapped with less specific information while maintaining the meaning of the content intact. There is suppression of the values otherwise. NP-hard [8] denotes the difficulty involved in finding out optimal K-anonymous datasets. It is possible to minimize data loss through optimization of an aggregated value in all features and records.

An Evolutionary Algorithm (EA) is basically one that has been inspired by the principles of natural selection and natural genetics. It is a concept known for its simplicity. Continuous evolution of individual, getting adapted to environment is a fact. Each individual in EA relates to a candidate solution for the target problem, which can be represented as a very simple environment. Evaluation of each individual obtained with the help of fitness function that proves the quality of the candidate solution characterized by the individual. The best individuals (candidate solutions) for each generation (iteration) are deemed to have a higher probability of getting selected for the next

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ROBUST CELL DETECTION OF HISTOPATHOLOGICAL BRAIN TUMOR IMAGES USING SEGMENTATION AND EDGE DETECTION.

in the International Conference on "Scientific Research of Engineering and Technology (ICSRET'2017)" held at Ranganathan Engineering College Coimbatore during 17th, 18th March 2017.

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Mr/Ms M. JILSATH BEGUM *of*

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Performance Characteristics of Hybrid Fibre Concrete Using Waste Materials

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Abstract:

The concrete characterized for its high strength and durability. But it is well known for its brittle and tensile nature which makes complete loss of loading capacity, once failure is initiated. To overcome this weakness in concrete, the fibre is added in which it act as a bridge between the cracks and delay the time of failure and it also reduce the micro cracks. The two fibre combinations which increase the properties of concrete compared to mono fibre concrete in which one fibre is stronger, stiffer and provides strength, while the other is more ductile provides toughness at high strains. Thefibres are waste materials which are easily available and cheap may be used for manufacture of structural units and now there is serious problem with the disposal of waste tyre tube, PolyethyleneTerephthalate (PET) bottles and other wastes. The wastes are hard to biodegrade and involve processes either to recycle or reuse. The construction industry is in requiring of finding cost effective materials for increasing the strength of concrete structures and which is the alternative way to disposal of waste In the present investigations to study the influence of addition of waste tyre tube fibre and PET bottle fibre in concrete. The fibres are added as 0.5%, 1%, 1.5% and 2% to weight of the cement in concrete and hybrid combination is studied for various percentages is studied.

Keywords:Strength,Two fibre, Waste tyre tube, PolyethyleneTerephthalate

Assessment of Damage in Concrete Beam using Fuzzy Inference

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Repair and maintenance of existing concrete structures have become one of the most important in the field of civil engineering. Considerable experiential knowledge is required to diagnose the condition of the member and to recommend a proper repair and retrofitting procedure. Hence, there is a need for engineering computations for a proper damage assessment. This paper researches on fuzzy inference i.e., if-then rule-based program for assessment of reinforced concrete beams by considering certain parameters. This program is named as FuzDam in this paper, and it is developed using Visual Basic.

Keywords: Concrete structures, Diagnose, Damage Assessment, Fuzzy Inference.

1. Introduction

Concrete is one of the most durable construction material used worldwide. But it contracts and expands with changes in moisture and temperature; deflects depending on load and support conditions. Cracks and failures occur in the concrete member when appropriate provision is not made to accommodate these movements in design and construction. Technology advancement and increased expectation of the user have led to an issue: whether to retrofit/refurbish the damaged structure or to demolish and rebuild. Demolishing and rebuilding has its practical problems like decanting, access during construction and recycling of waste materials. It is noteworthy that the cost of refurbishment in many cases is less than half of the rebuilding cost[1].

Damage Assessment can be done by visual or localized experimental methods, which require known vicinity of deterioration and ready accessibility. Usually, visual inspection is followed by an oral assessment that describes the condition of the structure and noticeable failure[7]. The globalized method of assessment is formulated based on response parameters of the structure. An important contribution in this field has been made by Park and Ang[2], Banon et

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CERTIFICATE OF APPRECIATION

Presented to

MRS. JILSATH BEGUM. M.

M.I.E.T ENGINEERING COLLEGE, TRICHY

in recognition of his/her presentation on DISCOVERING CONTENT SIMILARITY ON-DEMAND DATA ACCESS IN IAAS CLOUD.

in the "3rd National Level Conference on Ubiquitious Techonogies in Electronics" (NCUTE 16) held at Theni Kammavar Sangam College of Technology on 19th March 2016

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Secure Transmission Against Provenance Forgery And Packet Drop Attacks In Wireless Sensor Networks

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Abstract—. Data are flowed from various sources through transitional processing nodes that aggregate information and cruel opposition may introduce extra nodes in the network or compromise existing ones, assuring high data trustworthiness is crucial for correct decision-making. Data provenance (origin) represents a key factor in evaluating the trustworthiness of sensor data. A lightweight scheme has been proposed, to securely transmit provenance for sensor data, that technique relies on in-packet Bloom filters to encode provenance. An competent mechanism has been introduced for provenance verification and reform at the base station. The secure provenance scheme can be extended with functionality to detect packet drop attacks dramatic by cruel data forwarding nodes. The proposed technique has been evaluated to prove the effectiveness and efficiency of the trivial secure provenance scheme in detecting packet forgery and loss attacks in wireless network environments.

Key words—**Provenance,Security,Bloom Filter,Packet Drop.**

I. INTRODUCTION

Sensor networks are used in application domains such as cyber physical communications, ecological checking, whether monitoring power grids, etc. The data that should be large sensor node sources and processed in-network with their way to a Base Station (BS) that performs which decision should be taking. Information is considered in the decision process or making. Data provenance is an effective method to assess data trustworthiness, and the actions performed on the data. Provenance in sensor networks has not been present properly addressed. Investigate the problem of secure and efficient provenance transmission and handling for sensor networks, and we use origin to detect packet failure attacks dramatic by cruel sensor nodes. In a multi-hop sensor network, data origin allows the BS to trace the source and forwarding path of an individual data packet. Origin must be witnessed for each packet, but important tests arise due to the tight storage, energy and bandwidth of sensor nodes. More sensors often operate in an untrusted environment, it may be subject to show aggressions. To address the security such as confidentiality, integrity and freshness of provenance. Propose a provenance encoding strategy for each node on the data packet securely embeds provenance data with a Bloom filter (BF) that is transmitted along with the data. Upon on receiving the packet, the BS extracts and prove the provenance information. To extend the provenance encoding scheme allows the BS to detect packet drop attacks during the sensor node transmission. In the existing research that employs separate transmission channels for data provenance, it only requires a single channel for both. Usual origin security solutions use seriously cryptography and digital signatures and they employ appended based data structures to store provenance, leading to prohibit costs. Use message authentication code (MAC) schemes and Bloom filter, which are fixed-size data structures that compactly represent provenance.

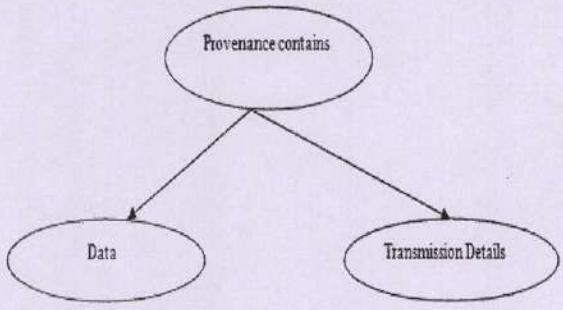

Fig. 1. Provenance

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Improving Selfish Node Detection In MANET Using A Collaborative Watchdog

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***Abstract*—Mobile ad-hoc networks (MANETs) assume that mobile nodes voluntary cooperate in order to work properly. This cooperation is a cost-intensive activity and some nodes can refuse to cooperate, leading to a selfish node behaviour. Thus, the overall network performance could be seriously affected. The use of watchdog is a well-known mechanism to detect selfish nodes. However, the detection process performed by watchdogs can fail, generating false positives and false negatives that can induce to wrong operations. Moreover, relaying on local watchdogs alone can lead to poor performance when detecting selfish nodes, in term of precision and speed. This is especially important on networks with sporadic contacts, such as delay tolerant networks (DTNs), where sometimes watchdogs have lack of enough time or information to detect the selfish nodes. Thus, proposing collaborative contact-based watchdog (CoCoWa) as a collaborative approach based on the diffusion of local selfish nodes awareness whwn a contact occurs, so that information about selfish nodes is quickly propagated. This collaborative approach reduces the time and increases the precision when detecting selfish nodes.**

Key words*—Selfish nodes,MANETs,CoCoWa,*Watchdog

I. INTRODUCTION

A set of autonomous wireless mobile nodes constructing a temporary network without the aid of a centralized infrastructure called MANET. Which communicate through multiple hops. The nature of MANET makes cooperation among the nodes essential for the system to be operational. Due to this fact, some nodes are not willing to forward packets to other misbehaving nodes. MANET is composed of mobile nodes without any pre-existent infrastructure and can be installed without any base station and dedicated routers. In MANETs, nodes act as both routers and end users. There are two types of MANETs: open and closed. In a closed MANET, all nodes will have a common goal and work towards that goal. In an open MANET, different nodes have different objectives. Data transmission is the most expensive function in the MANET compared to other functions. Misbehaving nodes are identified on the basis of packet dropped during the transmission of the next hop. When a node forward packets, proper transmission of packets by the next node is verified by watchdog. Misbehaviour is noticed, if that node refuses to transmit the packets. The misbehaving nodes can be identified in the level of connection as well as is forwarding level, Which is advantages of watchdog. The watchdog drawbacks are, False misbehaving, Minor dropping, Limited transmission power, Collision. There are two main strategies which help to deal with selfish behaviour: a) motivation or incentive based approaches, and b) detection and exclusion.

A wireless sensor network is an ad-hoc network which consists of large number of small inexpensive devices which are known as nodes. WSN consists of base station along with number of nodes that sense the environment and send data to the base station. The base station is more powerful than other nodes in terms of energy consumption and other parameters and serves as an interface to the outer world. When any node needs to send a message to the base station that is outside of its radio range, it sends it through internal nodes.

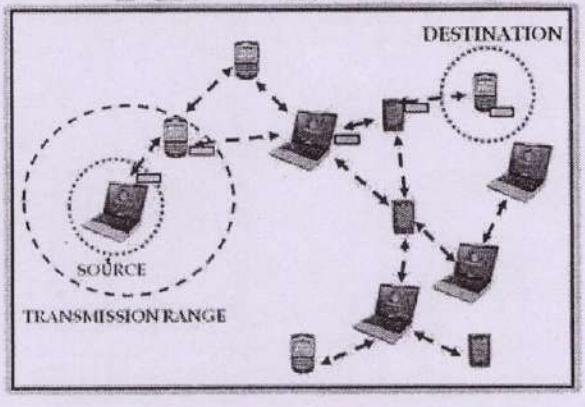

Fig. 1. MANET Architecture

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A New Variable Frequency Inverted Sine Carrier PWM Modulated Semi-Cross Switched Multilevel Inverter Topologies

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Abstract— To take out a variable frequency variable amplitude output voltage a new single-phase H-bridge multilevel inverter (MLI) topology is constructed through VFISCPWM modulated semi-cross switched voltage sources along with a hybrid pulse width modulation (PWM) strategy. The principle avoids a shrewd attitude to employ PWM approach only for a meticulous H bridge that serves to produce the desired level while the remaining add-on modules function with the theory of basic switching. The use of reduced number of switching devices involves for a precise number of output voltage levels in comparison with conservative MLIs. The design of the hybrid PWM appropriate to power the suitable switches add strength to its formulation in the sense it requires only either addition or subtraction to generate the square wave modulated pulses for the power devices in the other units other than that responsible for offering the preferred level of output voltage. Simulation results are obtained from MATLAB Simulink environment and validated predict the emergence of a novel variety of MLIs and falsify a diverse dimension for inverter interfaces in power control applications.

Keywords—Bidirectional Switch; Cross switch; Lagrange Multiplier; Multi Level Inverter.

I. INTRODUCTION

Multilevel inverters (MLIs) Endeavour to create high-superiority output voltage with minimum filter requirements over the conformist two-level inverters, to make them suitable for high power and high voltage industrial applications. Pulse-width modulated (PWM) MLIs are deemed to be an essential substitute for the conventional two-level inverters as they are competent of operating with nearly sinusoidal current waveforms and advanced stepped output voltages [1–3]. The MLIs claim an unique range of use in medium voltage drive applications to determine its place over customary inverters [4–6].The cascaded H-bridge (CHB) MLI uses a string of H-bridge inverters in every phase leg. Each inverter comprises a three-phase uncontrolled six-pulse rectifier at the input side with a capacitive filter. It induces current harmonics at the input of every inverter cell. These harmonics are decreased by introducing phase-shifted secondary in the input transformer, resulting in a more confused construction and higher cost. Years later, hybrid topologies in which each inverter phase leg is structured by cascading diode clamped or flying capacitor inverter and CHB MLI to produce any number of voltage levels are developed [7–9]. The drawback of hybrid structure is the presence of non-isolated dc sourced H-bridge topologies that synthesis disturbed voltage levels in their respective output stages.

Even though MLI presents quite a few separate advantages, its application is limited due to power rating constraints. In this view, an effort is made by paralleling two diode-clamped inverters throughout an inter-phase reactor in order to overcome power rating constraints [10]. Numerous efforts are being carried out to augment the number of voltage levels with decreased number of switching devices and one such topology is the new single-phase MLI topology [11] in which the number of voltage levels is increased by using a split-wound coupled inductor inside in each inverter leg. The main advantage of this topology is to provide low value of high-frequency current ripple in the load circuit and reduced shoot-through fault against dc-rails. A new balanced cascaded MLI is devised [12] in which cascade connection of sub-cells is attained using two dc sources and four switches through an H-bridge inverter. Regardless of the fact that this topology enjoys high modularity and the ability to increase the number of voltage levels with decreased total harmonic distortion, it undergoes from the drawback that the devices in the H-bridge need to withstand high blocking voltages.

An isolated cascaded MLI, employing low-frequency three-phase transformers and a single dc input power source and avails the use of lower number of power devices, has been recommended in [13–15]. The higher execution cost has been related to the fact that the number of low-frequency transformers increases with concurrent increase in the number of voltage levels. A dual structure-based MLI that consists of an H-bridge inverter to switch the dc voltages sources in series and parallel and another H-bridge inverter module for increasing the voltage level has been presented in [16, 17]. A balanced cascade MLI composed of series connection of quite a few sub-MLI units has been shown to proffer similar number

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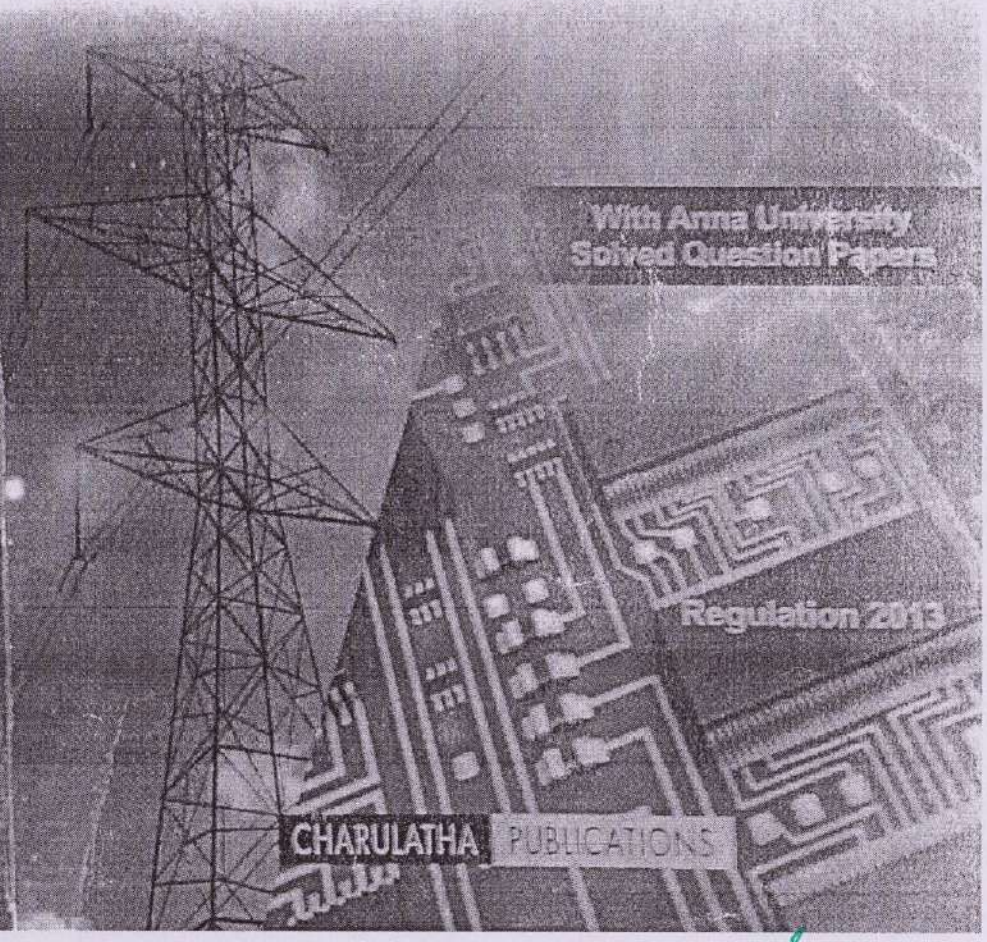

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I am grateful too for the support and advice from my faculty colleagues in department of EEE, Mohamed sathak engineering college, kilakarai.

Syllabus

GE6252 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

UNIT I ELECTRICAL CIRCUITS & MEASURMENTS

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits. Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

UNIT II ELECTRICAL MECHANICS

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

UNIT IV DIGITAL ELECTRONICS

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING

Types of Signals: Analog and Digital Signals – Modulation and Demodulati Principles of Amplitude and Frequency Modulations. Communication Systems: Radio, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

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		10. Basic Electrical Electronics Engineering

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11. Operating System	16. Operating System	
12. Computer Networks	17. Software Engineering	
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29. Software Testing	37. Soft Computing	GEN
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VII SEMESTER

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ELECTIVES	ELECTIVES	ELECTIVES	
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51. Social Network Analysis	58. Theory of Distributions	61. High Voltage Direct Current Transmission	
52. Knowledge Management	59. Design Theory & Applications	62. Embedded Real Time Systems	
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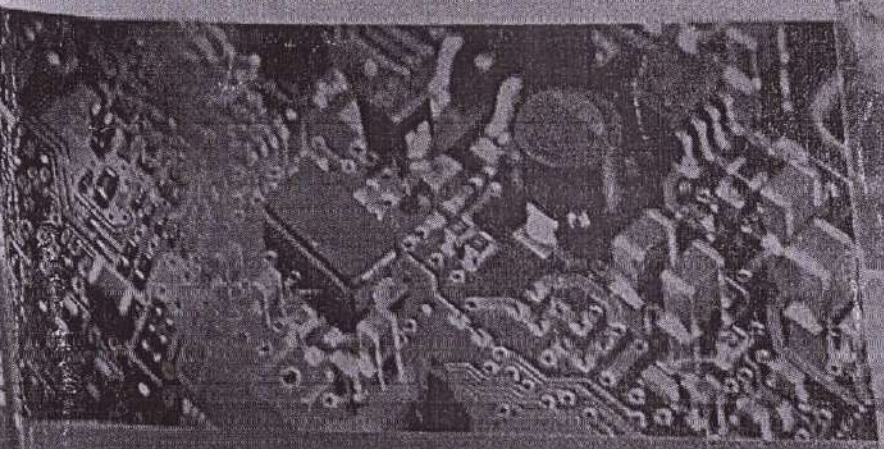

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CONTENTS

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Input Current Ripple Reduction Based Boost Converter Through T-Filter Network

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***Abstract*—This project presents a boost converter with an input current ripple reduction using T-filter network. A boost converter with a tapped inductor can be easily realized by adding an extra tap in the main inductor of the conventional boost converter. A small capacitor is enough to reduce the current ripple instead of a conventional LC filter. The simulation show that the proposed converters can achieve input current ripple reduction with better efficiency than the existing system.**

***Index Terms*—T-filter network, boost converter, ripple reduction.**

I. INTRODUCTION

In many applications, switched mode supplies can be used for many purposes including DC to DC converters. Often, although a DC supply, such as a battery may be available, its available voltage is not suitable for the system being supplied. The input current for a boost power stage is continuous, or non-pulsating, because the output diode conducts only during a portion of the switching cycle. The output capacitor supplies the entire load current for the rest of the switching cycle. By selecting proper parameters rating of ripple reduction branch without increasing the size and weight of the converter. A well-designed input filter is able to reduce the input current ripple, but the size and weight of the filter are quite unacceptable particularly in high-power applications.

Current ripple reduction technique for dc-dc converters using coupled inductor has been a hotspot, and many different types of have been proposed. The multitapped inductor and the seven order transfer function of this topology cause it difficult to build and control. Tapped inductor for switched-mode dc-dc converter aimed to increase the step-up or step-down ratio of the boost/buck converters. MOSFET devices are not bi-directional, nor are they reverse voltage blocking. MOSFET operate as majority carrier device and input impedance of it is higher than that of junction type FETs.

However, the input current ripples of these converters still deteriorate the quality of input power supply particularly in the large current applications. A new boost-derived topology, inductor boost with a capacitor, was proposed. It shows that the proposed tapped inductor boost converter with a capacitor has several advantages over the CBC. The ripple reduction branch minimizes the input current ripple of the boost converter without introducing extra EMI problem and deteriorating the reverse-recovery problem of the output diodes by adding an extra capacitor.

II. FILTERS

A filter circuit consists of passive circuit elements like inductors, capacitor, resistors and their combination. It is a device to remove the A.C components of the rectified output, but allows the D.C components to reach the load. A filter circuit is in general a combination of inductor (L) and Capacitor (C) called LC filter circuit. So a suitable L and C network can effectively filter out the A.C component from rectified wave. There are two main types of filters are

- Passive filters
- Active filters.

Passive implementations of linear filters are based on combinations of resistors (R), inductors (L) and capacitors (C) and they do not depend upon an external power supply and/or they do not contain active components such as transistors. Inductors block high-frequency signals and conduct low-frequency signals, while capacitors do the reverse. A filter in which the signal passes through an inductor, or in which a capacitor provides a path to ground, presents less attenuation to low-frequency signals than high-frequency signals and is therefore a low-pass filter. Resistors on their own have no frequency-selective properties, but are added to inductors and capacitors to determine the time-constants of the circuit, and therefore the frequencies to which it responds. The types of passive filter are,

- Inductor Filter
- Capacitor Filter
- LC Filter
- π / T-Filter.

Active filters are implemented using a combination of passive and active (amplifying) components, and require an outside power source. Ripple factor may be defined as the ratio of the root mean square value of the ripple voltage to the absolute value of the dc component of the output voltage, usually expressed as a percentage. However, ripple voltage is also commonly expressed as the peak-to-peak value. Operational amplifiers are frequently used in active filter

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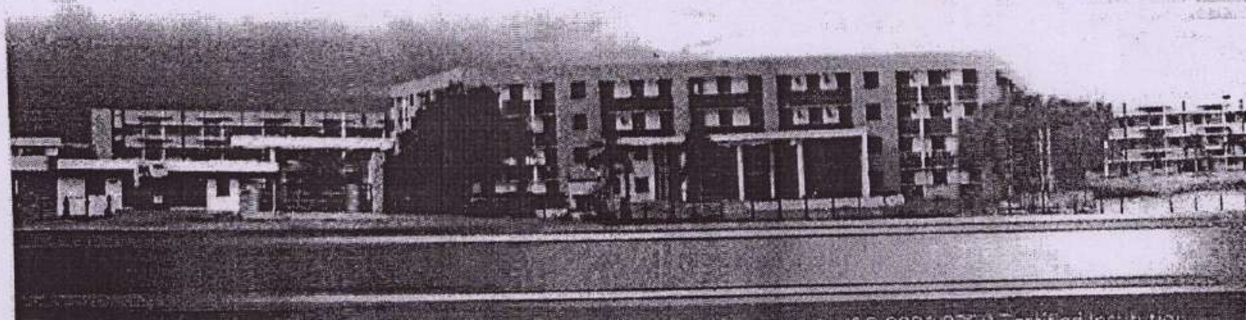

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A New Multi Level DC Link Inverter Topology with Variable Frequency Inverted Sine Carrier PWM under Equal Switching Transition

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***Abstract*—This paper presents with a novel course group of multilevel topology to trim down the number of switches, clamping diodes and dearth of capacitors based on DC link. A new variable inverted sine carrier PWM is used as a switching technique with equal switching transition. A multilevel voltage source inverter can be shaped by connecting a Multi Level DC Link (MLDCL) with a single-phase bridge inverter. The MLDCL provides a dc voltage with the shape of staircase reminiscent of the rectified form of a commanded sinusoidal wave, with or without pulse width modulation to the bridge inverter, which in turn alternates the polarity to generate an ac voltage. Compared with the cascaded H-bridge, diode-clamped, flying-capacitor multilevel inverters, the MLDCL inverters can appreciably trim down the switch count as well as the number of gate drivers as the number of voltage levels increases. A new variable frequency inverted sine carrier pulse width modulation (VFISCPWM) with equal switching transition is used to control this proposed topology Simulation results are obtained and compare with multi carrier phase disposition pulse width modulation (MCPDPWM) to validate the proposed inverter.**

***Index Terms*—Multi Level Inverter, PWM, THD, Equal Switching Transition, Voltage Level**

I. INTRODUCTION

Multilevel inverter is an effective and practical solution for increasing power demand and reducing harmonics of AC waveforms. Function of a multilevel inverter is to synthesize a desired voltage wave shape from several levels of DC voltages. The principal function of multilevel inverters is to synthesize a desired ac voltage from several separate dc sources, which may be obtained from batteries, fuel cells, or solar cells. The desired output voltage waveform can be synthesized from the multiple voltage levels with less distortion, less switching frequency, higher efficiency, and lower voltage devices [1]-[5]. Multilevel voltage-source inverters based on the diode-clamped phase legs, flying-capacitor phase legs, or cascaded H-bridges were proposed for replacing the two-level inverters with series connection of switches or transformer-coupled multiple two-level inverters in medium and high-voltage level applications such as motor drives and static var compensators [6]–[7]. The multilevel structures can ensure even voltage sharing, both statically and dynamically, among the active switches while it is difficult for a two-level inverter with a series connection of switches to do so. Substantial reduction in size and volume is possible due to the elimination of the bulky coupling transformers or inductors. Multilevel inverters can offer better voltage waveforms with less harmonic content and, thus, can significantly reduce the size and weight of passive filter components.

The last feature was further explored in multilevel inverters using insulated gate bipolar transistors (IGBTs) for replacing gate-turn-off-thyristor (GTO)-based two-level inverters because IGBTs can switch faster and have less demanding gate drive requirements than GTOs. On the other end of the power spectrum, because of their low cost resulting from widespread use in the automotive and power supply industries, low on-resistance, and fast switching capability, low-voltage MOSFETs are utilized in multilevel inverters to reduce the inverter cost or to provide a high bandwidth sinusoidal output voltage at high efficiency that it is unable to achieve with linear amplifiers [8]–[10]. Despite the superior voltage waveform quality provided by higher level inverters, the neutral point-clamped inverter in [11] perhaps the most widely used multilevel structure because of its relatively small number of switches. The high switch count and the difficulty in balancing the voltage of the capacitors in the diode-clamped configuration have prevented the wide acceptance of the higher level inverters in practical applications. As the number of voltage levels m grows, the number of active switches increases according to $2 \times (m-1)$ for the cascaded H-bridge, diode-clamped, and flying-capacitor multilevel inverters. In addition, for each phase, the diode-clamped inverter requires at least $2 \times (m-2)$ clamping diodes and $(m-1)$ capacitors for dividing the dc voltage, and the flying-capacitor inverter needs $(m-2)$ clamping capacitors.

This paper presents a new class of multilevel inverters based on an MLDCL and a bridge inverter with a new variable frequency inverted sine carrier PWM implementation [12] under equal switching transition. Compared with the

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