



(Approved by AICTE, Affiliated to MGU / APJ Abdul Kalam Technological University, NAAC Accredited & ISO Certified Institution)

3.3.1.1. Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year-wise during last five years

AY: 2016-17

SL NO	NAME OF TEACHER	TITLE OF PAPER	TITLE OF BOOK PUBLISHED	TITLE OF THE PROCEEDING O THE CONFERENCE/WORKS HOP/SYMPOSIA	NAME OF THE PUBLISHER	YEAR OF PUBLICATION (ACADEMIC YEAR)	NATIONAL/INTERNATIONAL	ISBN NUMBER
1	Dr. Siby C. Chithran	Teaching Business Models through Business Simulation Games: A Study about Designing Simulation Games for Effective Learner Engagement	Proceedings of the National Conference on Business Models: Business Models for Startups and Small Firms	Proceedings of the National Conference on Business Models: Business Models for Startups and Small Firms	School of Management and Business Studies, Mahatma Gandhi University	2016	National	978-93-5258-523-6
2	Dr. Siby C. Chithran	Bettering Learning Engagement of Business Graduates for Effectively Facing Business Challenges: A Business Simulation Game Perspective	Managing Uncertainties of Business: A Sicio-Cultural Approach	Managing Uncertainties of Business: A Sicio-Cultural Approach	Managing Uncertainties of Business: A Sicio-Cultural Approach	2016	International	978-93-5254-125-6
3	Dr. Siby C. Chithran	Emerging Trends In Tra	Managing Uncertainties of Business: A Sicio-Cultural Approach	Managing Uncertainties of Business: A Sicio-Cultural Approach	Managing Uncertainties of Business: A Sicio-Cultural Approach	2016	International	978-93-5254-125-6
4	Mr. Aneesh K.S	Goal Programming Model for Working Capital Optimization at Agro-Chemical Unit			International Journal of Science Technology & Engineering	2016-17	International	2349-784X
5	Prof. ASHA PANICKER		Basics of Electronics Engineering		S CHAND PUBLICATIONS	2017		10HE000005
6	MARIYA VINCENT	A NOVEL FUZZY BASED RELAY NODE DEPLOYMENT SCHEME FOR MULTI HOP RELAY NETWORK		INTERNATIONAL; CONFERENCE ON ELECTRONICS & COMMUNICATION SYSTEM		2016	INTERNATIONAL	
7	MARIYA VINCENT	A NOVEL FUZZY LOGIC BASED RELAY STATION SELECTION SCHEME FOR 4 G CELLULAR SYSTEM		INTERNATIONAL CONFERENCE ON COMMUNICATION & SIGNAL PROCESSING		2016	INTERNATIONAL	

PRINCIPAL

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

A Novel Fuzzy Logic Based Relay Station Selection Scheme for 4G Cellular System

Mariya Vincent, K. Vinoth Babu, M. Arthi and P. Arulmozhivarman

Abstract—In 4G and beyond 4G cellular communication systems, multi-hop relay network (MHR) plays a vital role. Improper deployment of relay station (RS) in MHR network creates some severe issues. The conventional studies on RS deployment have not considered the practical issue of link overloading. In this paper, a two-phase, fuzzy based selection and deployment scheme for RSs is proposed by considering link overloading issue. The study also analyses the trade-off between deployment budget, network throughput and overall service coverage. Simulation results show that the proposed scheme performs better than the conventional scheme.

Index Terms—Base station (BS), Fuzzy logic, Selection factor (SF), Service coverage ratio (SCR), Traffic ratio (TR)

I. INTRODUCTION

In the recent years, MHR has been globally considered and accepted in the next generation mobile communication standards such as Long term evolution (LTE), Worldwide interoperability for microwave access (WiMAX) IEEE 802.16j and IEEE 802.16m. IEEE 802.16e standard, comprises of BS, Mobile Station (MS), and Subscriber Station (SS), which aims at a better system throughput. However, to accomplish full coverage, we have to deploy more number of BSs which increases the deployment cost. Therefore IEEE 802.16j introduced the concept of RSs to extend the coverage area. By the proper deployment of RSs, we can reduce the effective distance between two communicating nodes, path loss, power consumption and cost. This also enhances the network capacity and at the same time enables communications at high data rate [1]. In such a system, MS can communicate BS directly or indirectly through RS. Hence, the overall system coverage can be enhanced and more MSs can be included in the system. The BS is connected to a mobile switching center (MSC) which interconnects both wired and wireless network.

IEEE 802.16j defines two types of relays namely transparent

and nontransparent. In transparent relay mode, the RSs are deployed within the coverage area of BSs, which improves network capacity. In such modes, RSs are scheduled by BS and the control signals from BS are directly send to the MS, while data traffic is relayed via RS. The nontransparent relay works effectively for coverage extension because they are deployed at the cell edge. They are scheduled either by BS or RS. The transparent and nontransparent relay can co-exist in MHR network [2]. Fig. 1 shows the concept of transparent and nontransparent relay modes in MHR networks.

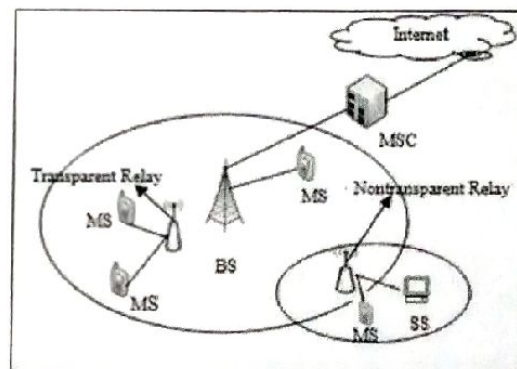


Fig. 1. Concept of transparent and nontransparent relay modes

Many researchers have studied and considered the challenges in MHR network. In [3], authors discussed an optimal deployment of BSs and RSs for IEEE 802.16j which improves the Quality of Service (QoS). But the realistic issues like interference and handovers were not considered. More number of RSs leads to path selection problem because each MS acquires multiple path. Since many of the applications are time bounded, we need an optimum path for transmission. Improper path selection may introduce packet queuing delay. To address this issue, Load Aware Routing Metric (LARM) based path selection and a low complex Burst Profile (BP) based RS deployment schemes were proposed in [4]. The simulation results show that LARM scheme offers an average network throughput improvement of 10.37% over Radio Resource Utilization Index (RRUI) scheme. The practical impairments like link error and channel information feedback delay are not considered in [4]. In [5], Chang et al. put forward RS deployment schemes aiming to determine the best

Mariya Vincent is pursuing M.Tech in Communication Engineering, VIT University, Vellore, Tamil Nadu, India. (email: mariyavncnt@gmail.com).
K. Vinoth Babu is Associate professor in School of Electronics Engineering, VIT University, Vellore, Tamil Nadu, India. (email: vinothbab@gmail.com).
M. Arthi is pursuing Ph.D in School of Electronics Engineering, VIT University, Vellore, Tamil Nadu, India. (email: arthimdas@gmail.com)
P. Arulmozhivarman is professor in School of Electrical Engineering, VIT University, Vellore, Tamil Nadu, India. (email: parulmozhivarman@vit.ac.in)



International Conference on Emerging Trends in Engineering, Science and Technology (ICETEST - 2015)

A Novel Fuzzy based Relay Node Deployment Scheme for Multi-hop Relay Network

Mariya Vincent^{a*}, K Vinoth Babu^b, M Arthi^c, P Arulmozhivarman^d

^{a,b,c,d}School of Electronics Engineering, VIT University, Vellore and 632014, India

Abstract

In cellular communication, a multi-hop relay (MHR) network plays an important role by reducing the cost of deployment and extending the coverage area. To achieve high transmission rate and coverage, an efficient placement of relay nodes (RN) is needed in MHR network. In this paper, a suitable deployment scheme is proposed for the RNs to obtain high system performance. By using fuzzy logic, optimum deployment sites are selected for RNs, which results in better throughput and coverage. Simulation results shows that our proposed scheme gives a better throughput and coverage performance than the existing uniform clustering and joint base station and relay station placement (JBRP) scheme.

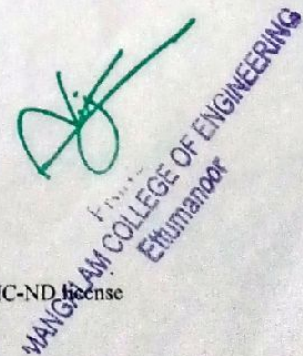
© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).
Peer-review under responsibility of the organizing committee of ICETEST – 2015

Keywords: Coverage ratio (CR); Fuzzy logic; MHR network; Relay node (RN); Traffic ratio (TR); User node (UN).

1. Introduction

MHR network have been proposed and considered in the wireless communication system such as Long term evolution (LTE) and worldwide interoperability for microwave access (WiMAX) IEEE 802.16j and IEEE 802.16m. In [1], MHR provide solutions to coverage extension by reducing the deployment as well as maintenance costs.

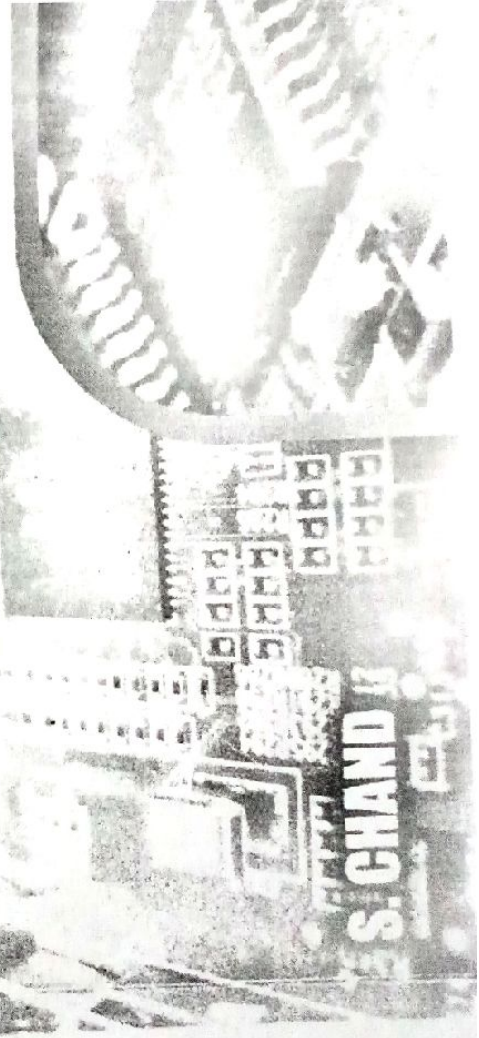
* Corresponding author. Tel.: +919443143314;
E-mail address: mariya.vincent2014@vit.ac.in

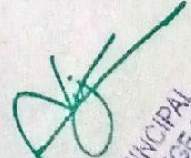


Dr. A.P. Abdul Kalam Technological University, Kerala

Basics of Electronics Engineering

B Basavaraj
Asha Panicker

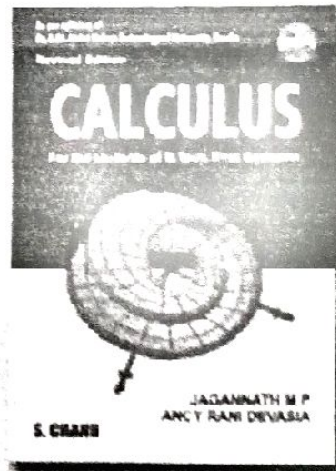
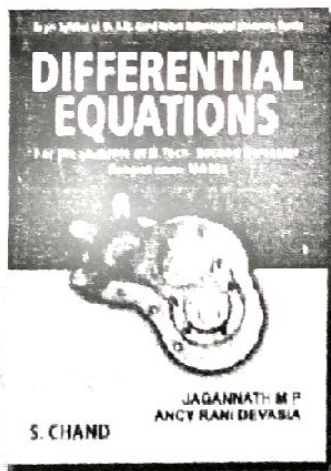
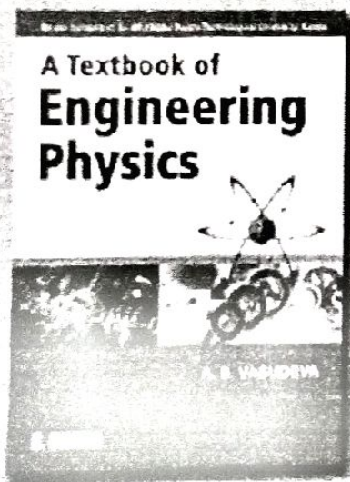
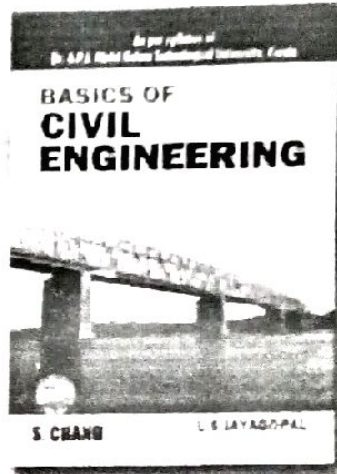
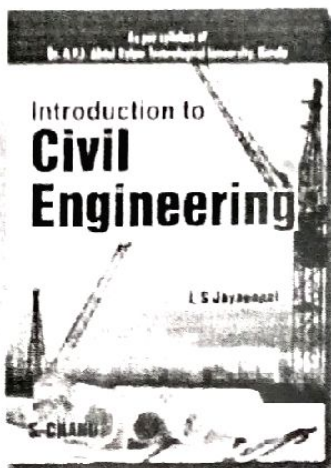
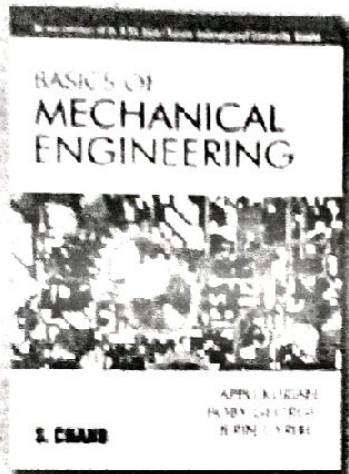



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettimanoor



As per the syllabus of
Dr. A.P.J. Abdul Kalam Technological University, Kerala

OTHER IMPORTANT BOOKS



S. CHAND PUBLISHING

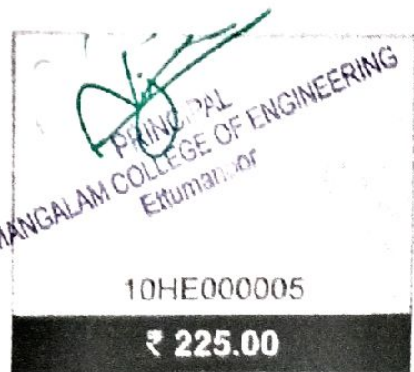
A division of S Chand And Company Limited

(An ISO 9001 : 2008 Company)

Website: www.schandpublishing.com

E-mail: helpdesk@schandpublishing.com

Customer care (toll free) No.: 1800-30702850



1L16VP11

As per the syllabus of
Dr. A.P.J. Abdul Kalam Technological University, Kerala

Basics of Electronics Engineering


B Basavaraj
Asha Panicker


APJKTU
K. J. SOMAIYAS
AMMAM COLLEGE OF ENGINEERING
Eranthoor

S. CHAND

33
0313033


Contents

Preface	v
Syllabus	vii
Chapter 1	
Introduction to Electronics	1
1.1 Definition	1
1.2 Development of Electronics	2
1.2.1 Vacuum Tube Devices	2
1.2.2 Semiconductor Devices	3
1.3 Digital Integrated Circuits	4
1.4 Analog Integrated Circuits	5
1.5 Microprocessors	5
1.6 Microcontrollers	6
1.7 Optoelectronics (Photonics)	6
1.8 Nano Electronics - Future Trend in Electronics	7
1.8 Applications of Electronics	8
1.8.1 Communication	8
1.8.2 Entertainment	9
1.8.3 Defence Applications	9
1.8.4 Industrial Applications	9
1.8.5 Medical Applications	10
1.9 Impact of Electronics on Quality of Life	10
Questions	11
Chapter 2	
Passive Electronic Components	15
2.1 Introduction	15
2.1.1 Active Components	15
2.1.2 Passive Components	15
2.2 Resistors	15
2.2.1 Applications of Resistor	16
2.2.2 Specifications of Resistors	16
2.2.3 SI Unit of Resistance	17


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Erumambur

X Contents

2.3 Types of Resistors	
2.3.1 Fixed Resistors	17
2.3.2 Carbon Composition Resistors	18
2.3.3 Metal Film Resistors	18
2.3.4 Wire Wound Resistors	19
2.4 Variable Resistors	19
2.4.1 Potentiometers	20
2.4.2 Carbon Potentiometers	21
2.4 Importance of Power Rating in Resistors	21
2.4.1 Resistor Troubles	22
2.5 Colour Coding of Resistors	22
2.6 Capacitors	22
2.7 Capacitance	25
2.7.1 SI Unit of Capacitance	26
2.8 Specifications of Capacitors	26
2.9 Types of Capacitors	27
2.10 Fixed Capacitors	28
2.10.1 Ceramic Capacitors	28
2.10.2 Polystyrene Capacitors	28
2.10.3 Electrolytic Capacitors	29
2.10.4 SMD Capacitors	30
2.11 Variable Capacitors	30
2.11.1 Ganged Capacitor	31
2.11.2 Trimmers and Padders	31
2.12 Inductors	32
2.12.1 Factors Determining the Inductance of an Inductor	33
2.12.2 Specifications of an Inductor	33
2.13 Types of Inductors	34
2.13.1 Air-Core Inductor	34
2.13.2 Iron-core Inductor	34
2.13.3 Ferrite-core Inductor	35
2.14 Transformer	36
2.14.1 Distinguish between Step up Transformer and Step down Transformer	36
2.14.2 Transformer Losses	36
2.14.3 Transformer Efficiency	38
2.14.4 Applications of Transformers	34
2.15 Types of Transformers	34
2.15.1 Audio Frequency (AF) or Communication Transformers	34
2.15.2 Radio Frequency (RF) Transformers	40
2.15.3 Intermediate Frequency (IF) Transformers	40
2.15.4 Pulse Transformers	41


PRINCIPAL
VADIGALAM COLLEGE OF ENGINEERING
Erumamoor

2.16 Electromechanical Components	42
2.17 Relays	42
2.17.1 Specifications of Relays	44
2.17.2 Advantages of Relays	44
2.17.3 Applications of Relays	44
2.18 Contactors	44

Chapter 3

<i>p-n</i> Junction Diode	47
3.1 <i>p-n</i> Junction	47
3.1.1 Formation of Depletion Layer	47
3.1.2 Barrier Potential	48
3.1.3 Effect of Temperature on Barrier Potential	49
3.1.4 Semiconductor Diode	49
3.2 Biasing the <i>p-n</i> Junction	50
3.2.1 Forward Biased <i>p-n</i> Junction	50
3.2.2 Reverse Biased <i>p-n</i> Junction	51
3.2.3 Minority - Carrier Current (Reverse Saturation Current)	52
3.3 <i>V-I</i> Characteristics of <i>p-n</i> Junction Diode	53
3.3.1 Forward Bias Characteristics	53
3.3.2 Reverse Bias Characteristics	54
3.4 Diode Equation	55
3.5 Diode Resistances	56
3.6 Power Rating of a Diode	59
3.7 Peak Inverse Voltage (PIV) Rating	59
3.8 Diode Approximations	59
3.8.1 First Approximation or Ideal Diode	60
3.8.2 Second Approximation or Practical Diode	61
3.8.3 Third Approximation or The Complex Diode Model	62
3.9 Diode Specifications	62
3.10 Comparison of Ideal Diode and Practical Diode	63
3.11 Comparison of Silicon Diode and Germanium Diode	64
3.12 Applications of a <i>p-n</i> Junction Diode	64
Questions	72
Exercises	73

Chapter 4

Special Purpose Diodes	77
4.1 Introduction	77
4.2 Photodiode	77



 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

XII Contents

4.2.1 Characteristics of Photodiode	78
4.3 Light Emitting Diode (LED)	79
4.4 Solar Cell	80
4.4.1 Construction and Working	81
4.4.2 I-V Characteristics of a Solar Cell	81
4.4.3 Applications of Solar Cell	82
Questions	82
Chapter 5	
Bipolar Junction Transistor	85
5.1 Introduction	85
5.2 Structure of Bipolar Junction Transistor	85
5.2.1 Naming the Transistor Terminals	86
5.3 Unbiased Transistor	87
5.4 Biased Transistor	88
5.5 Transistor Operation	89
5.5.1 Working of an n-p-n Transistor	89
5.6 Transistor as Transfer Resistor	90
5.7 Transistor Circuit Configurations	91
5.8 Current Gain of the Transistor	92
5.8.1 Current Relations in Common-Base Configuration	92
5.8.2 Current Relations in Common-Emitter Configuration	92
5.8.3 Relation between α_{dc} and β_{dc}	93
5.9 V-I Characteristics of a Transistor	94
5.10 Common-Emitter Characteristics of a Transistor	94
5.10.1 Input Characteristics (V_{CE} versus I_B) $V_{CE} = \text{Constant}$	95
5.10.2 Output Characteristics (V_{CE} versus I_C) $I_B = \text{Constant}$	95
5.11 Typical Specification of Transistors	96
Solved Problems	100
Questions	101
Exercises	104
Chapter 6	
Rectifier and Power Supplies	105
6.1 Introduction	105
6.2 Rectification	105
6.3 Half-Wave Rectifier	105
6.4 Full-Wave Rectifier	105
6.5 The Bridge Rectifier	111
6.6 Comparison of Practical Rectifier Circuits	111

MAVSALAM COLLEGE OF ENGINEERING
Ethamparam

6.7 Filters	115
6.7.1 Need for filters	115
6.8 Shunt Capacitor Filter	115
6.9 Voltage Regulator	116
6.10 Zener Diode as a Voltage Regulator	117
6.10.1 Regulation with Varying Input Voltage (Line Regulation) (Fixed R_L)	117
6.10.2 Regulation with Varying Load Resistance (Load Regulation) (Fixed V_{in} , Variable R_L)	118
6.10.3 Percentage Regulation	119
6.10.4 Line Regulation	119
6.10.5 Load Regulation	119
6.10.6 Calculation of Minimum Value of Load Resistance $R_{L(min)}$	120
6.10.7 Optimum Value of Current Limiting Resistor	120
6.11 Design of Practical Regulated Power Supplies	121
6.11.1 IC Voltage Regulators	122
6.11.2 Fixed Positive Voltage Regulator Using IC 7812	123
Solved Problems	126
Questions	134
Exercises	136
Chapter 7	
Amplifiers and Oscillators	139
7.1 Introduction	139
7.2 Decibel	139
7.2.1 Power Measurement in Decibels	140
7.2.2 0 dB Reference	141
7.2.3 Uses of dB	141
7.2.4 Expressing in dB the Relative Gain of an Amplifier at the Lower Cutoff Frequency	142
7.3 Small Signal Amplifiers	142
7.3.1 AC Quantities	143
7.3.2 The Basic C-E Single Stage Amplifier	143
7.3.3 Practical Circuit of Single-Stage Transistor Amplifier	145
7.4 Feedback in Amplifiers and Oscillators	147
7.5 Feedback Principles	148
7.5.1 Types of Feedback	148
7.6 Series Voltage Negative Feedback	149
7.7 Advantages of Negative Feedback	151
7.7.1 Disadvantages of Negative Feedback	151
7.8 Oscillators	151
7.9 Positive Feedback	152


 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

CHAPTER

1

INTRODUCTION TO ELECTRONICS

1.1 Definition

The word "electronics" has been derived from a Greek word "elektron", which means the study of behaviour of an electron under different conditions of externally applied fields. The Institution of Radio Engineers (IRE) has a given standard definition of electronics in the proceedings of I.R.E. Vol. 38 (1950) as that **field of science and engineering, which deals with the study, design and use of devices, which depends on conduction of electricity through a vacuum, gas or semiconductors.** Electronics can be broadly divided into **Analog and Digital Electronics.** Electronics mainly deals with the communications of information and/or data handling. Until recently, it was considered as an integral part of Electrical Engineering. But due to its tremendous advancement, during the last few decades, it has achieved its own place in the field of science and technology.


Nowadays, the field of electronics has become the most important branch of engineering in our society. As a matter of fact, it is a field, in which rapid developments are taking place everyday. The electronic devices and gadgets are being used in almost all industries for quality control and automation. Because of the growing applications of Electronics, in almost all fields, the students of all Engineering disciplines have to be taught Electronics at the undergraduate level.

These days, we find that the sphere of Electronics has spread so vast, that it plays an important role in almost every activity of life. It has penetrated into our homes, our work places and our means of communication from one place to another. Electronics has a large number of applications. The development of Electronics has been so fast that many sub-branches of Electronics such as **Communication Engineering, Instrumentation and Control applications, Computer science Engineering, Information Technology, Medical Electronics, Mechatronics** etc., are set up as full-pledged Engineering courses in almost all universities. Electronics makes possible such modern wonders as television, radio, stereo systems, tape recorders, high-speed computers, internet, cellular phone, radar, X-rays etc.

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

XIV Contents

7.10 Barkhausen Criterion	153
7.11 RC Oscillators	154
7.12 Phase Shift Oscillator	154
Solved Problems	158
Questions	162
Exercises	163
Chapter 8	
Operational Amplifiers	165
8.1 Introduction	165
8.2 Op-amp Symbol and Terminals	166
8.2.1 Power Supply Terminals	166
8.3 The Ideal Op-amp	166
8.3.1 Ideal Op-amp Characteristics	167
8.4 Saturable Property of an Op-amp (The Comparator)	168
8.4.1 Comparator	169
8.5 Inverting Amplifier	171
8.6 Non-Inverting Amplifier	172
Solved Problems	173
Questions	175
Exercises	176
Chapter 9	
Logic Gates	179
9.1 Introduction	179
9.2 Logic Designation	179
9.3 The OR Gate	180
9.4 The AND Gate	181
9.5 The NOT (Inverter) Gate	181
9.6 The NOR Gate	183
9.7 The NAND Gate	184
9.8 Summary of Logic Gates	184
Questions	185
Chapter 10	
Electronic Instrumentation	
10.1 Introduction	186
10.2 Essentials of Electronic Instrument	187
10.2.1 Classification	188


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor


10.3 Multimeter	189
10.4 Digital Multimeter	199
10.5 Cathode Ray Oscilloscope	189
10.6 Digital Storage Oscilloscope	191
10.7 Function Generator	193
Questions	195

Chapter 11

Radio Communication

197

11.1 What Is a Communication System?	197
11.2 Block Diagram of a Communication System	197
11.3 What Is Modulation?	199
11.3.1 Need for Modulation	199
11.4 Types of Modulation	200
11.5 Amplitude Modulation	200
11.5.1 Analysis of an Amplitude Modulated (AM) Wave	201
11.5.2 Sidebands and Frequency Spectrum of an AM wave	202
11.5.3 Bandwidth	203
11.5.4 Modulation Index (m_o)	203
11.5.5 Expression for Modulation Index in Terms of V_{max} and V_{min}	204
11.5.6 Amplitude Modulated Waves with Various Degrees of Modulation	205
11.5.7 Power Relations in AM Wave	206
11.5.8 Efficiency of Transmission	207
11.5.9 Current Calculation for AM Wave	208
11.6 Frequency Modulation (FM)	208
11.6.1 Analysis of Frequency Modulated Wave	208
11.6.2 Modulation Index (m_f)	210
11.6.3 Deviation Ratio	211
11.6.4 Guard Bands	211
11.6.5 Frequency Spectrum of the FM Wave	211
11.6.6 Sidebands	211
11.6.7 Bandwidth	212
11.6.8 Power in FM Wave	213
11.6.9 Broadcast FM	213
11.6.10 Advantages of FM	213
11.6.11 Disadvantages of FM	214
11.7 Phase Modulation (PM)	214
11.7.1 Analysis of Phase Modulated Wave	214
11.7 Radio Receivers	214
11.8 Superheterodyne Receiver	215


 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettimanoor

XVI Contents

Solved Problems	218
Questions	224
Exercises	225

Chapter 12


Radar	229
12.1 Introduction	229
12.2 Principles of Radar	229
12.3 Radar Waveform and Range Determination	230
12.3.1 Radar Range	232
12.4 Basic Pulsed Radar System	233
12.5 Radar Applications	235
Questions	235

Chapter 13


Satellite Communication	237
13.1 Satellite Communications	237
13.1.1 Satellite Systems	237
13.1.2 Transponders	239
13.2 Geostationary Satellite	240
13.3 Global Positioning System	242
Questions	243

Chapter 14

Mobile Communication	245
14.1 Introduction	245
14.2 Cellular Telephone System	246
14.2.1 Cellular Concepts	246
14.2.2 Frequency Reuse	247
14.2.3 Cell Splitting to Increase Capacity	247
14.2.4 Hand-off and Central Control	248
14.2.5 System Operation	248
14.2.6 Frequency Assignments	248
14.3 Solutions Offered by Cellular Systems	248
14.3.1 Good Transmission Quality	248
14.3.2 Good Service Quality Antenna	250
14.3.3 Full-Duplex Service	250
14.3.4 Practicality	250


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
PILLAGAL
250

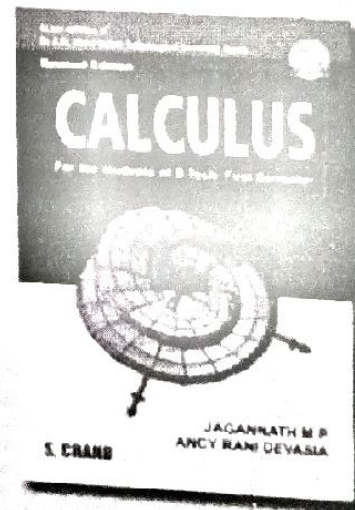
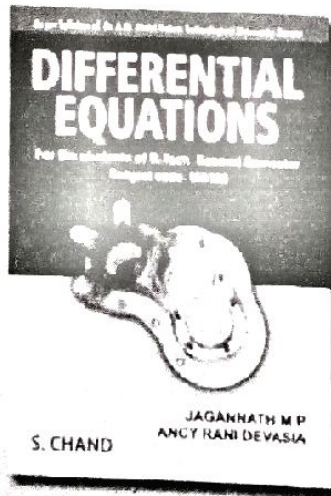
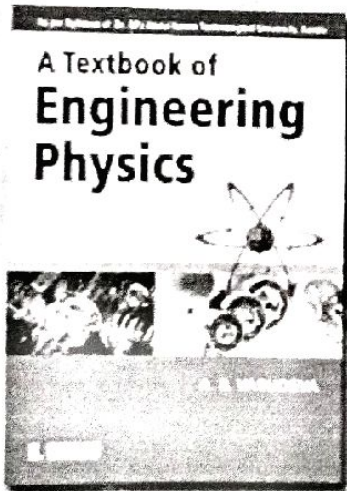
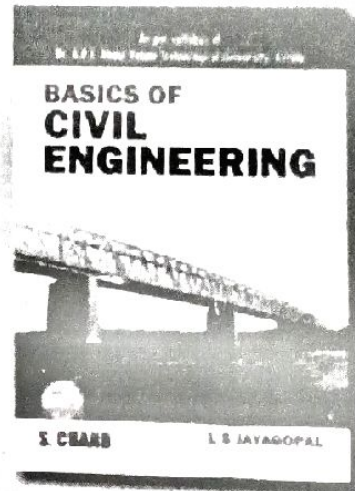
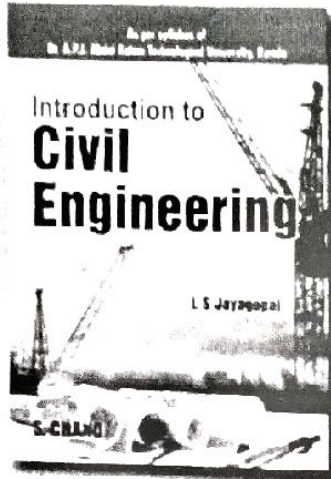
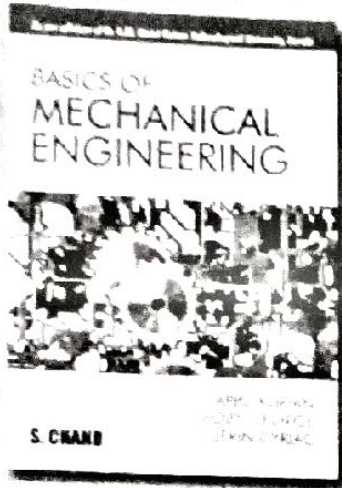
14.4 Global System for Mobile Communications (GSM)	250
Questions	252
Chapter 15	
Optical Communication	253
15.1 Introduction	253
15.2 Why Optical Fibers?	254
15.3 Optical Fibers	254
15.3.1 Propagation of Light Through a Cladded Fiber	255
15.4 Block Diagram of an Optical Fiber Communications System	256
Questions	258
Chapter 16	
Entertainment and Security Electronics Technology	259
16.1 Television	259
16.2 Cable Television	261
16.3 Closed - Circuit Television (CCTV)	263
16.4 Direct - to - Home (DTH) System	264
16.5 High-Definition Television (HDTV)	265
16.6 Plasma Television	265
16.7 Liquid Crystal Display Television (LCD TV)	266
16.8 Light - Emitting Diode Television (LED TV)	268
Questions	268
Question Bank	271
First Semester B.Tech. Degree Examination, January 2016	285
Second Semester B.Tech. Degreeexamination, May/June 2016	289


 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettimamoor



**As per the syllabus of
Dr. A.P.J. Abdul Kalam Technological University, Kerala**

OTHER IMPORTANT BOOKS



S. CHAND PUBLISHING

A division of S Chand And Company Limited
(An ISO 9001 : 2008 Company)

Website: www.schandpublishing.com

E-mail: helpdesk@schandpublishing.com

Customer care (toll free) No.: 1800-30702850

(Signature)
PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
10F, Mangalapuram
10FIF000005
₹ 225.00

1L16VP11



S Chand And Company Limited

(An ISO 9001 2008 Company)

Head Office: 7361, RAM NAGAR, NEW DELHI - 110 055

Phone: 23672080-81-82, 9899107446, 9911310888 Fax: 91-11-23677446

www.schandpublishing.com; e-mail: helpdesk@schandpublishing.com

Branches

Ahmedabad	: Ph: 27541965, 27542369, ahmedabad@schandpublishing.com
Bangalore	: Ph: 22268048, 22354008, bangalore@schandpublishing.com
Bhopal	: Ph: 4274723, 4209587, bhopal@schandpublishing.com
Chandigarh	: Ph: 2625356, 2625546, chandigarh@schandpublishing.com
Chennai	: Ph: 28410027, 28410058, chennai@schandpublishing.com
Coimbatore	: Ph: 2323620, 4217136, coimbatore@schandpublishing.com (Marketing Office)
Cuttack	: Ph: 2332580, 2332581, cuttack@schandpublishing.com
Dehradun	: Ph: 2711101, 2710861, dehradun@schandpublishing.com
Guwahati	: Ph: 2738811, 2735640, guwahati@schandpublishing.com
Hyderabad	: Ph: 27550194, 27550195, hyderabad@schandpublishing.com
Jaipur	: Ph: 2219175, 2219176, jaipur@schandpublishing.com
Jalandhar	: Ph: 2401630, 5000630, jalandhar@schandpublishing.com
Kochi	: Ph: 2378740, 2378207-08, cochin@schandpublishing.com
Kolkata	: Ph: 22367459, 22373914, kolkata@schandpublishing.com
Lucknow	: Ph: 4026791, 4065646, lucknow@schandpublishing.com
Mumbai	: Ph: 22690881, 22610885, mumbai@schandpublishing.com
Nagpur	: Ph: 6451311, 2720523, 2777666, nagpur@schandpublishing.com
Patna	: Ph: 2300489, 2302100, patna@schandpublishing.com
Pune	: Ph: 64017298, pune@schandpublishing.com
Raipur	: Ph: 2443142, raipur@schandpublishing.com (Marketing Office)
Ranchi	: Ph: 2361178, ranchi@schandpublishing.com
Siliguri	: Ph: 2520750, siliguri@schandpublishing.com (Marketing Office)
Visakhapatnam	: Ph: 2782609, visakhapatnam@schandpublishing.com (Marketing Office)

© 2017, S Chand And Company Limited

All Rights Reserved. No part of this publication may be reproduced or copied in any material form (including photocopying or storing it in any medium in the form of graphics, electronic or mechanical means and whether or not transient or incidental to some other use of this publication) without written permission of the publisher. Any breach of this will entail legal action and prosecution without further notice.

Jurisdiction: All disputes with respect to this publication shall be subject to the jurisdiction of the Courts, Tribunals and Forums of New Delhi, India only.

First Edition 2017

Code: 10HE00001

This book is for sale in India & other SAARC countries only.

PRINTED IN INDIA

By Vikas Publishing House Pvt. Ltd., Plot 20/4, Site-IV, Industrial Area Sahibabad, Ghaziabad-201010
and published by S Chand And Company Limited, 7361, Ram Nagar, New Delhi - 110 055


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Bhimnagar

Mahatma Gandhi University
School of Management and Business Studies
PD Hills, Kottayam, Kerala-686 560



Proceedings of the
**National Conference on Business Models
(NCBM2016)**
"Business Models for Startups and Small Firms"

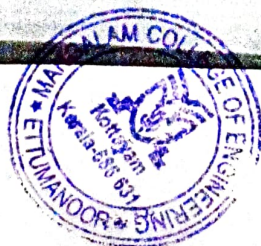
25th and 26th February 2016

Edited by
Prof. (Dr) K. Sreeranganadhan

Co-editors
Afsal E.M.
Biju M.K



2016



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Teaching Business Models through Business Simulation Games: A Study about Designing Simulation Games for Effective Learner Engagement

Sibu C. Chithran

Mangalam College of Engineering, Kottayam
(sibuktm@gmail.com)

Arun.V

Farook Institute of Management Studies, Calicut
(arunjithetao@gmail.com)

Entrepreneurship and entrepreneurial education is more important for economic growth than it has ever been. For entrepreneurs, skills and attitudes are equally or even more important than facts and raw knowledge, and an inductive learning approach is therefore most suitable. Business simulation games are widely used for training managerial, technical, and problem-solving skills, based on the experiential learning principles as they significantly increase the motivation and interest level of trainees. (Yuri Merkurjev, Jana Bikovska, 2012). The same method can be effectively utilized to teach Business Models for budding entrepreneurs and better simulation design will result in effective learner engagement. This study is exploring the potentials of business simulation games to teach concepts about business models. The study also proposes a design framework which will help educators to develop better learner engagements.

Key words: Business Simulation Game Design, Learner Engagement, Teaching

1. Introduction

Globalization and the revolution in information technology have induced an intense demand for entrepreneurship and entrepreneurial education is more important for economic growth than it has ever been. (Thurik R., Audretsch D 1998) Governments and universities worldwide are pushing for education programs that produce more "entrepreneurial engineers" who possess managerial and technical competencies. (Verzat, C., Byrne, J., & Fayolle, A 2009). The recent start up trends in our country is an evidence for the same.

2. The need for study

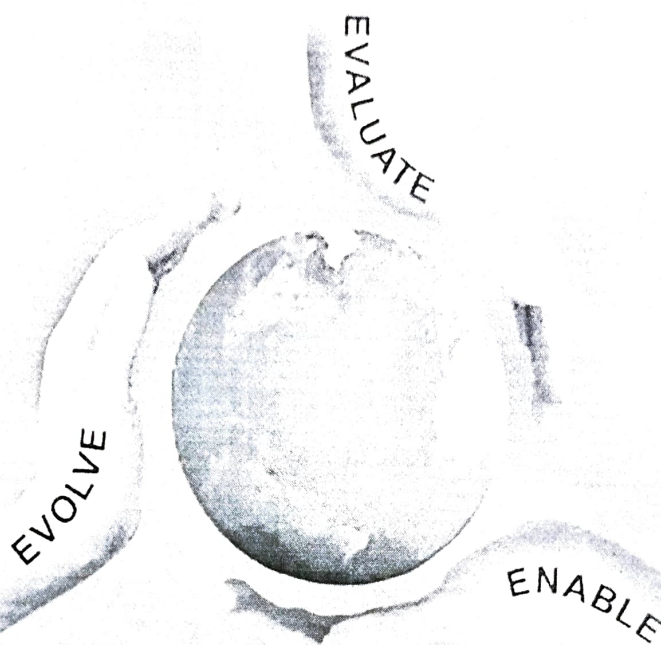
For entrepreneurs, skills and attitudes are equally or even more important than facts and raw knowledge, and an inductive learning approach is therefore most suitable. Since skills and attitudes completely student centered, a strong relation between the student and the entrepreneurship-subject becomes essential. The school and teachers are only a means for students to reflect upon his or her skills and attitudes. An example of an inductive learning approach is game-based learning, which is getting increased attention from the learning fraternity. (Benek-Rivera J. and Mathews V)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



Managing Uncertainties of Business

A Socio-Cultural Approach



★ 3E ★

Empowering Professionals

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Editors

Dr. Rajesh S. Pyngal
Dr. Prakash R. Pillai
Dr. Manish Madan
Ms. Bhavana Kapoor

BETTERING LEARNING ENGAGEMENT OF BUSINESS GRADUATES FOR EFFECTIVELY FACING BUSINESS CHALLENGES – A BUSINESS SIMULATION GAME PERSPECTIVE

Arun V

Assistant Professor

*Farook Institute of Management Studies
Calicut, Kerala, India*

Dr Siby C Chithran

*Professor & Head (Management Studies),
Mangalam College of Engineering
Kottayam, Kerala, India*

ABSTRACT

There is an increasingly wide 'gap' between the skills and capabilities of graduates and the business world requirements. Management graduates are not effectively equipped to face real time challenges. Business simulation games are found to be effective tools for engaging students in the learning environment. Better learning engagements also results in effective skill acquisition

Key words: Engagement, Learner Engagement, Business Simulation Game, Management Graduates, Globalization

INTRODUCTION

Serious concerns have been expressed about an increasingly wide 'gap' between the skills and capabilities of graduates, and the requirements and demands of the work environment in an increasingly mobile and globalised society (King, 2003; Yunus and Li, 2005).

In our MBA institutions business graduates are poorly engaged in terms of learning and they are ill equipped to face real life business challenges as a result of this. Universities across the globe are increasingly required to produce highly skilled graduates who are able to respond to the ever changing and complex needs of the contemporary workplace (Wen, 1999; Sleezer et al., 2004; Possa, 2006).



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

EMERGING TRENDS IN TRADE UNIONISM IN KERALA

Vishnu Lal
Research Scholar
Bharathiar University
Coimbatore, Tamil Nadu, India

Dr. Sibin C. Chithran
Professor & Head (Management Studies)
Mangalam College of Engineering
Kottayam, Kerala, India

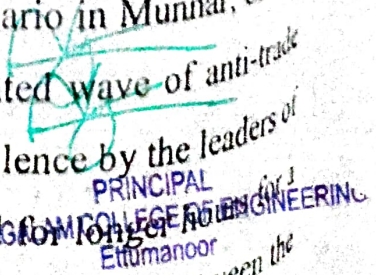
ABSTRACT

We exist in an era, where the incumbent union government proposes wide changes in the laws so as to discourage formation of trade unions in India. On the other side we also see irresponsible trade unionism in various labour intensive industries across the nation. This study questions the very notion of trade unionism, its relevance in the changing environment, its modus operandi and its future prospects. The study, which is empirical in nature attempts to highlight the various aspects of trade unionism in Kerala with specific emphasis to the issue organised by worker's agitation at Kanan Devan Hills Plantations (KDHP), Munnar. Since this issue has escalated to the level of gaining national attention, this work analyses various contributing factors and suggest probable solutions.

Keywords: Trade Unionism, Self-served Leadership, Servant Leadership, Workers Environment.

INTRODUCTION

The ultimate tragedy is not the oppression and cruelty by the bad people but the silence over that by the good people', said Martin Luther King, Jr. This very famous quote assumed currency in the present labour scenario in Munnar, one of the finest tourist destinations in Kerala, as an unprecedented wave of anti-trade unionism hit hard on the serene tea estates. The deafening silence by the leaders of trade unions over the plight of its member workers who toil for longer hours for meagre pay and pathetic living conditions made way for a trust deficit between the union and its members. What was once a



Cycle Time and Idle Time Reduction in an Engine Assembly Line

Amith J Prakash

PG Scholar

*Department of Industrial Engineering & Management
Mangalam college of Engineering Ettumanoor*

Aneesh K S

Associate Professor

*Department of Mechanical Engineering
Mangalam college of Engineering Ettumanoor*

Abstract

This paper focuses on productivity improvement of a tiller assembly line by using operational analysis and assembly line balancing. The existing standard time in the assembly line is too old and inaccurate. A proposal of new standard time has been given to reduce the ineffective time. A heuristic method called Ranked Positional Weighted method is used for assembly line balancing. After the analysis of the existing time required for each tasks non value added time, value added time and production time has been found using stop watch time study. Micro motion study is done to find the ineffective time in each operation.

Keywords: Idle Time, Standard Time Cycle Time, Line Balancing

I. INTRODUCTION

An important problem faced in the production system is that of determining the time it takes to produce a unit of product, in order to thoroughly analyze the problem, the production process for each of product is analyzed. For every manufacturing organization, price of the product primarily comprises of manufacturing cost and desired profit. If a company wishes to increase its profit, one way is to reduce the manufacturing cost with maintaining the quality of the product. Waste reduction, especially the time waste, is an important factor to reduce the manufacturing cost.

II. NEED FOR LINE BALANCING

In an Assembly Line if the workers are not utilized effectively then it results in less efficiency. If the Cycle Time of one work station is high then it will affect the production rate of the whole product, if the line balancing is done in the assembly line. It will result in smooth functioning of the plant without bottleneck. Here this paper focus to do Assembly Line Balancing by heuristic method Rank Position Weighted method (RPW)


PRINTED
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor