

Table of Contents

Preface, Organising Committee and Sponsors

Chapter 1: Construction and Structures

Lateritic Soil Stabilization of Reclaimed Asphalt Pavement as Flexible Highway Pavement Materials	
J.E. Edeh, A.O. Eberemu and O. Agnes	3
Strength-Based Appropriateness of Sawdust Concrete for Rigid Pavement	
O.M. Ogundipe and Y.A. Jimoh	13
Effect of Oil Contamination on Particle Size Distribution and Plasticity Characteristics of Lateritic Soil	
T.S. Ijimdiya	19
The Effect of Compactive Efforts on the Hydraulic Conductivity Behaviour of Oil Contaminated Lateritic Soils	
T.S. Ijimdiya and F. Elaigwu	27
Cost Effectiveness of Scheffe's Optimized Five-Component-Concrete with Mound Soil as a Mix Component	
O.U. Orie and N.N. Osadebe	33
Performance of Cement Kiln Dust in Stabilizing Lateritic Soil Contaminated with Organic Chemicals	
A.A. Amadi and A.O. Eberemu	41
An Investigation on the Behaviour of Concrete with Waste Tyre Rubber Fibres as a Partial Replacement of Coarse Aggregate	
G.S. Kumaran, M. Lakshmi pathy and N. Mushule	49
Feasibility Study of Low Cost Concrete Products as an Appropriate Alternative Construction Material in the Rwandan Construction Industry	
K.P. Dedek, M.A.M. Claude and G.S. Kumaran	55
Hydraulic Conductivity of Compacted Tropical Clay Treated with Rice Husk Ash	
A.O. Eberemu, A.A. Amadi and J.E. Edeh	63

Chapter 2: Electrical and Electronic Technology

Optimal Two-Way Conductor Design Using Computable Convex Functions Approach	
G.N.O. Asemota	75
Two Layered Embedded Encryption for Multiple Frequency RFID Tags	
K. Karthikeyan and G. Bajpai	83
Simulink Implementation of Direct Torque Control Drive for Induction Machines	
U. Zangina, H.N. Yahaya, M. Aminu and Z.O. Niya	89
Power Distribution in Lagos Metropolis: Assessment of 132kv Network Capacity	
M.O. Adegoke and O.G. Olomo	97
Rural Electrification in Oyo State of Nigeria: Assessment of Existing 33kv Feeder Network Capacity	
M.O. Adegoke and A.J. Ajeigbe	107
Modeling Distribution Component Deterioration: An Application to Transformer Insulation	
A.U. Adoghe, C.O.A. Awosope and S.A. Daramola	117
Linear Conditioning of an NTC Thermistor Using Nonlinear Operational Amplifier Circuits	
J.T. Agee, S. Masupe and T.G. Modise	125
Artificial Neural Network Approach for Solving Power Flow Problem: A Case Study of Ayede 132 KV Power System, Nigeria	
P.B. Osofisan and J.O. Ilevbare	133

Reliability Assessment of 4.2 MW Single Shaft Typhoon Gas Fired Turbine Power Generation Station (2003 – 2008)	
B.A. Adegboye and K.R. Ekundayo	143
Outage Analysis and System Integrity of an 11kV Distribution System	
B.A. Adegboye and E. Dawal	151
Investigating the Quality of Power Supply to a Large Commercial Installation	
B.A. Adegboye and M.G. Mele	159
Computer Simulation of Lightning Strikes to a Horizontally Buried Earth-Electrode: A Parametric Analysis	
E.U. Ubeku and S.A. Ike	167

Chapter 3: Information and Communication Technology

Performance Evaluation of GSM Service Providers around Igbinedion University Campuses	
A. Abayomi-Alli, P.I. Ezomo, D.J. Etuk, I. Oghogho and F. Izilein	177
On the Generation of Random Numbers for Symmetric Cryptography Utilizing Astronomical Data	
P.M. Rubesh Anand, V. Bhaskar, G. Bajpai and G.N.O. Asemota	185
Predicting Telephone Traffic Congestion Using Multi Layer Feedforward Neural Networks	
E.D. Markus, O.U. Okereke and J.T. Agee	191
Analysis of a Weaver, Hartley and Saw-Filter Based, Image Reject Architectures for Radio Receiver Design	
F.E. Idachaba and H.E. Orovwode	199
Comparative Analysis of Gaussian Minimum Shift Keying and Binary Differential Phase Shift Keying Signalling Schemes with Maximal Ratio Combiner over Rayleigh Environment	
Z.K. Adeyemo and R.O. Abolade	205
Rural Mobile Telephony: A VSAT (Satellite) Based Approach	
F.E. Idachaba and F.O. Edeko	215
Investigation of Causes of Call Drops in GSM Network: A Case Study of Zain Nig. Ltd. in Benin City, Nigeria	
P.O. Otasowie and O. Evbomwan	223
Adaptive MMSE Multiuser Detection in MIMO OFDM Wireless Communication System	
T. Eneh, P. Rapajic, K. Anang and B. Lawal	233
An Adaptive Approach to Improve the Accuracy of Packet Pre-Filtering	
S. Jesudoss, A. Jesudoss and A. Sulaiman	241
Performance Optimisation of Mobile Ad hoc Reactive Routing Protocols	
B. Lawal, P. Bakalis, S.J. Manam and T. Eneh	249

Chapter 4: Manufacturing Systems

Challenges Faced by SMEs in Developing Countries in Implementing Cleaner Production (CP)	
J. Agwa-Ejon and S. Fore	257
Formation of Segmented Chips in Semi-Finish Turning of α-Titanium Alloy BT5	
O.O. Awopetu, O.A. Dahunsi, A.A. Aderoba and T.O. Johnson	265
Modeling Flank Wear Hardness of Selected HSS and HCS Single Point Cutting Tools with or without Cutting Fluid	
B. Kareem and M.O. Idris	273
Computer Aided Costing (CAC) for Sand Casting Products	
P.B. Mogaji and S.B. Adejuyigbe	279
Numerical Investigation of Thermo-Mechanical Behaviour of Ball Grid Array Solder Joint at High Temperature Excursion	
E.H. Amalu, N.N. Ekere, R.S. Bhatti, S. Mallik, G. Takyi and A.O.A. Ibadode	287
Reengineering a Workplace to Improve Layout: A Study of a South African Design Studio	
M. Nemarumane and C. Mbohwa	293

Thermal Management Materials for Electronic Control Unit: Trends, Processing Technology and R and D Challenges K.C. Otiaba, N.N. Ekere, E.H. Amalu, R.S. Bhatti and S. Mallik	301
---	-----

Chapter 5: Materials Processing

A Study of the Extraction of Pectin from Dried Lemon Peels L. Lerotholi, M. Carsky and D.I.O. Ikhu-Omoregbe	311
Corrosion Inhibition of Multi-Component Aluminium Alloy in Hydrochloric Acid Solution by Aqueous Extracts of Bitter Leaf (<i>Verninia amygdalina</i>) Powder M. Abdulwahab, A. Kasim, B. Kamilu Bello and J.O. Gaminana	319
SEM Studies of Adhesion Property of Red Oxide Primer on Selected Metal Substrates M.A. Bolarinwa, A.R. Adetunji and O.O. Adewoye	327
Evaluation of Wood Properties of <i>C. albidum</i> Tree Grown in Akinyele Local Government Area of Ibadan, Nigeria in Relation to its Utilization N.A. Adewole and A.B. Ajibi	335
Rheological and Some Fuel Properties of Fatty Acid Methyl Esters of the Oils of Palm, Palm Kernel and Groundnut V.C. Eze, P.M. Ejikeme and D.O. Onukwuli	343
Use of "Shikoko" Clay for Synthetic Sand Moulding E.O. Eze and L.E. Ileli	353
Adsorption Isotherms for Naphthalene on Clay and Silt Soil Fractions: A Comparison of Linear and Nonlinear Methods C.N. Owabor, I.O. Oboh and F.A. Omiojieahior	359

Chapter 6: Oil and Gas

Challenges of Deepwater Developments B.M. Oyeneyin	367
Theoretical Dimensionless Breakthrough Time of a Horizontal Well in a Vertically-Stacked Two-Layered Reservoir System with Varying Architecture Part I: Letter 'B' Architecture, Edge Water Drive Mechanism E.S. Adewole	375
Theoretical Dimensionless Breakthrough Time of a Horizontal Well in a Vertically-Stacked Two-Layered Reservoir System with Varying Architecture Part II: Letter 'B' Architecture, Bottom Water Drive Mechanism E.S. Adewole	385
Rheological Characterisation of Heavy Oil and Impact on its Production Enhancement A. Bali, B.M. Oyeneyin and E. Adom	393
Optimisation of Steam Assisted Gravity Drainage [SAGD] for Improved Recovery from Unconsolidated Heavy Oil Reservoirs B.M. Oyeneyin, A. Bali and E. Adom	403
A Novel Approach to Subsea Multiphase Solid Transport K. Bello, B.M. Oyeneyin and G.F. Oluyemi	413
Heavy Oil Recovery: A Cold Process Using CO₂-EOR Technique E. Tchambak, B.M. Oyeneyin and G.F. Oluyemi	421
Calculating Hydrodynamic Loads on Pipelines and Risers: Practical Alternative to Morison's Equation I. Iyalla, M. Hossain and J. Andrawus	431
Modeling Gel Break-Time in Gravel Pack Fluids as a Function of Breaker and Activator Concentrations with Temperature U.U. Akonye and O.F. Joel	439
Environmental Compliance Monitoring of Selected Physico-Chemical Parameters of Effluent Discharge from Gulf of Guinea Near-Shore / Offshore Facilities O.F. Joel and S.B. Akinde	449
Modeling Declining Incomes from Non-Renewable Natural Resources K.I. Idigbe and A.A. Adeniji	457

Determining the Subsidence of Oil Storage Tank Walls from Geodetic Leveling R.I. Ehigiator, J.O. Ehiorobo, M.O. Ehigiator and A.A. Beshr	467
Determination of the Ovality of Crude Oil Storage Tanks Using Least Squares R.I. Ehigiator, J.O. Ehiorobo, A.A. Beshr and M.O. Ehigiator	475

Chapter 7: Renewable Energy

Frictional Effects in a Low Speed Polar-Axis Solar Tracker J.T. Agee and A.A. Jimoh	487
Design, Construction and Testing of a Solar Adsorption Refrigerator Using Synthesised Zeolite A and Water as Adsorbent/Adsorbate Pair I. Amber, C.O. Folayan, R.B.O. Suleiman and A.Y. Atta	495
Production of Bio-Diesel from Palm Kernel Oil and Groundnut Oil S.J. Ojolo, A.O. Adelaja and M.G. Sobamowo	501
Determination of the Performance of Photovoltaic Modules Using Environmental Conditions T.H. Sikiru, O. Ojo and B. Jimoh	507
An Indirect Passive Solar Dryer for Drying A.F. Alonge and O.O. Oniya	517
Determination of Operational Parameters of a Single Cylinder Two Stroke Engine Run on Jatropha Biodiesel G.A. Duvuna and A.A. Wara	525
Design and Testing of a Mini-Plant for Conversion of Organic Waste to Biogas P. Ebunilo and D. Otiede	537

Chapter 8: Solid Minerals Technology

Property Analysis for Correlation of Specific Energy with Penetration Rate and Bit Wear Rate B. Adebayo and W.A. Bello	547
Evaluation of Tri-Cone Bit Performance on Limestone Formation B. Adebayo and V.O. Akeju	555
Vertical Electrical Sounding as a Tool for Estimating Thickness of Clay Deposit in Delta North District, Nigeria F.O. Ezomo	561
Evaluation of Slope Stability in Open Pit Mine and its Effects E.O. Ifelola and E.E. Bassey	567
Assessment of the Operations of Stone Crushers in Artisanal and Small Scale Granite Quarries M.M. Melodi	575
Variability in Rock Strength Prediction Using Ultrasonic Pulse Velocity E.O. Eze	581

Chapter 9: Systems Design and Analysis

Blackboard as a Tool for Peer Learning and Interaction for Engineering Students J. Uziak and M.T. Oladiran	591
Tracking Design Elements in a Mechanical Engineering Curriculum M.T. Oladiran, J. Uziak and V.P. Kommula	601
Activity Sampling Based Work and Performance Analysis at a Tourist Services Company in South Africa N. Myaka, C. Mbohwa and M. Nemarumane	611
Quality Management in Further Training and Education Institutions: A Case Study of FTE Colleges in Gauteng Province, South Africa J. Agwa-Ejon	619

Multi-Item Multi-Period Dynamic Capacity-Constrained Lot-Sizing Model with Parallel Machines and Fuzzy Demand L. Ogunwolu, O.A. Alli, C. Onyedikam and A.A. Sosimi	627
A Computer-Aided System for Job-Shop Flow Time and Due-Date Prediction B.O. Akinnuli, S.A. Oluwadare and A.A. Aderoba	639
Development of a Heuristics Model for Simplifying a Multi-Channel Queuing System B. Kareem and A.A. Aderoba	647
A Generalized Algorithm for Solving Multicriteria Scheduling Problems E. Oyetunji and A.E. Oluleye	653
Performance Indicators for Sapele Thermal Power Station, Nigeria: 1997-2006 O. Obodeh and F.O. Isaac	667
Modeling Analysis of the Wire-Drawing Operation Using the Weighted-Residual Finite Element Method M.H. Oladeinde and J.A. Akpobi	677
Transportation Cost Minimization of a Manufacturing Firm Using Linear Programming Technique R.O. Edokpia and K.O. Ohikhuare	685

Chapter 10: Tools, Machines and Equipment

Development of a Small Scale Sugarcane Juice Extractor Using a Screw Pressing System A.M. Olaniyan and O.O. Babatunde	699
Development of a Small Scale Machine for Recovering Bush Mango Kernel from Bush Mango Nut A.M. Olaniyan	711
Development and Performance Evaluation of a Cocoa Pod Breaking Machine S.A. Aliu and P. Ebunilo	725
Computer Aided Analysis of Thermal and Mechanical Design of Shell and Tube Heat Exchangers A.O. Adelaja, S.J. Ojolo and M.G. Sobamowo	731
Design and Development of an Integrated Small-Scale Oil Palm Fruit Processing Mill C.O. Ilechie, A.O.A. Ibadode and B.O. Abikoye	739
Development and Performance Evaluation of a Multipurpose Dryer C.O. Ilechie, G.F. Aibangbee, S.R. Ogblechi and B.O. Abikoye	745
Computer Aided Design of Power Transmission Screw J.A. Akpobi, R.O. Edokpia and M.H. Oladeinde	753

Chapter 11: Water, Waste and Environment

Current Trends in Water Resources Research A.E. Taigbenu	779
Geophysical Survey as a Surface Tool in Groundwater Exploration in Delta North District, Nigeria F.O. Ezomo and C.N. Akujieze	795
Measurement of Gamma Radiation in Automobile Mechanic Workshops in an Area of Benin City, Nigeria O.D. Nworgu, O.D. Osahon and F.E. Obinyan	801
Integrated Solid Waste Management System – A Case Study of Solid Waste Source Sorting Alternative in a Tertiary Institution in Nigeria D.I. Igbinomwanhia and N.J. Alao	807
Application of Erosion 2D Model for Erosion Studies in Makurdi Metropolis of Benue State, Nigeria M.O. Isikwue and T.G. Amile	815
Determination of the Efficiency of Aerated Lagoon in Biological Treatment of Human Waste (Faeces) T. Omotoso and O.P. Folorunso	827

Partial Root Zone Drying Application in the Propagation of Vegetable in Northern Nigeria O.P. Abimbola and T.A. Ewemoje	831
Effect of Flare Stack Radiation on the Mixing Height over Olorunsogo Area of Ogun State, Nigeria G.O. Umosekhaimhe and A.I. Igbafe	839
Theoretical Rate Evaluation of Gas Phase Atmospheric Ozone Reactions A.I. Igbafe and O.F. Omobude	849