

Table of Contents

Preface and Committee

Chapter 1: Non Conventional Processing Technology in Mechanical Engineering

Effect of Gap Voltage and Pulse-On Time on Material Removal Rate for Electrical Discharge Machining of Al_2O_3	
M.A. Moudood, A. Sabur, Y.A. Mohammad and I.H. Jaafar	3
Effect of Powder Concentration on EDM Performance during Machining Mild Steel	
A.A. Khan, N.W. Azmi, M.A. Odenan and Z.M. Zain	7
Investigation of Surface Roughness and Material Removal Rate for High Speed Micro End Milling on PMMA	
N. Atiqah, Y.A. Mohammad, A.R. Mohamed and M.S.H. Chowdhury	12
Investigation of Surface Roughness in Micro-EDM of Nonconductive ZrO_2 Ceramic with Powder Mixed Dielectric Fluid	
A. Sabur, S. Mohammed Mehdi, Y.A. Mohammad, M.A. Maleque and A. Moudood	16
Material Removal Rate of Zirconia in Electro Discharge Micromachining	
B. Asfana, Y.A. Mohammad, A.R. Mohamed and W.N.P. Hung	20
Surface Quality Produced in EDM with Tungsten Carbide and Copper Compacted Electrodes	
A. Ali Khan, M. Baba Ndaliman, U.A.K. binti Mohamad, N.F. binti Sulong and Z. Mohd Zain	24
The Effect of Etchant Concentration and Temperature on Surface Finish of Silicon Wafer Thinning	
M.A. Safaruddin, S.F.M. Shahar and I.H. Jaafar	29
Hybrid Fabrication of Stainless Steel Channels for Microfluidic Application	
D. Berestovskyi and N.P. Hung	33

Chapter 2: Conventional Technologies of Processing in Mechanical Engineering

Achievement of Ductile Regime Machining in High Speed End Milling of Soda Lime Glass by Using Tungsten Carbide Tool Insert	
A.K.M.N. Amin, A.A.C. Omar, M.A. Mohammed Kamal, M.M.A. Nassar, N.F. Mohd Zaib and M.D. Arif	39
Characterization of Micromist for Effective Minimum Quantity Lubrication	
I. Lerma, M. Jimenez, I. Edinbarough, J. Krell and N.P. Hung	43
Cutting Temperature Behaviours in End Milling of Pocket by Applying Contour-In Tool Path Strategy	
M. Riza, E.Y.T. Adesta and M.Y. Suprianto	47
Effect of Cutter Diameters on Surface Roughness Attained in High Speed End Milling of Soda Lime Glass	
A.K.M.N. Amin, A.A.C. Omar, M.A.M. Kamal, M.M.A. Nassar, N.F. Mohd Zaib and M.D. Arif	51
Effect of Lubrication Conditions to the Cutting Force Coefficients in Machining Process	
W.M.A. Nowalid, M.A. Shaharun and A.R. Yusoff	55
Effect of Microwave Sintering Treatment to the Flank Wear of Titanium Carbide Tools in Milling Operations	
M. Iqbal, T.F. Ariff, M.S.F. bin Mat Roseh, M.H.F. Al-Hazza, I. Hilmy and Suryanto	59
Evaluating Delamination at Entry of Drilled Carbon Fiber Reinforced Polymer (CFRP) Composite with Diamond Coated Ball Nose Drills	
M. Konneh, M.H.F. Al Hazza, A.A. Sidek and R.H. Samsul Bahri	64
Experimental Analysis of Cutter Engagement during High Speed End Milling of H13	
M.Y. Suprianto, E.Y.T. Adesta and M. Riza	70

Influence of Machining Parameters on Temperature when Drilling Carbon Fiber Reinforced Polymer (CFRP) Using Coated Diamond Drills M. Konneh, M. Iqbal, M.H. Ani and M.Z. bin Yayah	74
Investigation of Delamination at Exit of Drilled Carbon Fiber Reinforced Polymer (CFRP) Composite with Diamond Coated Ball Nose Drills M. Konneh, K.A. Abdullah, S. Izman and M.A. Jusoh	80
Preliminary Study: The Effect of Tool Engagement and Cutting Speed on Cutting Temperature during Contour Tool Path Strategy R. Hamidon, E.Y.T. Adesta and M. Riza	86
Surface Roughness in Drilled Carbon Fiber Reinforced Polymer (CFRP) Composite Using Diamond Coated Ball-Nose Drills M. Konneh, S. Izman, A.A. Sidek and M. Salahuddin Salleh	90
Tool Wear during Milling Laminated Carbon Fibre Reinforced Plastic M.K.N. Khairusshima, A.K.M. Amin, C.H. Che Hassan and A.G. Jaharah	96
Magnetic Damping in Turning of Stainless Steel AISI 304 for the Reduction of Machining Vibration and Tool Wear A.K.M.N. Amin, M.D. Arif, S.A.B. Haji Subir and F.M. Abdullah	100
Energy Cost Optimization in High Speed Hard Turning Using Simulated Annealing Algorithm M.H.F. Al Hazza, E.Y.T. Adesta, M.H. Hasan and N.M. Shaffiar	104
Finite Element Modeling of Clinching Process for Joining Dissimilar Materials M. Eshteyah, M. Hrairi, M.S. Dawood and A.K.M. Mohiuddin	109
Multi Objective Optimisation for High Speed End Milling Using Simulated Annealing Algorithm M.H.F. Al Hazza, A.M.F. Seder, E.Y.T. Adesta, M. Riza and N.M. Shaffiar	113
Optimization of Tool Wear Using Coupled RSM-GA Approach in Turning of Stainless Steel AISI 304 with Magnetic Damping of Tool Shank A.K.M.N. Amin, S.A.B. Haji Subir and M.D. Arif	117
Surface Roughness Prediction in High Speed End Milling Using Adaptive Neuro-Fuzzy Inference System M.H.F. Al Hazza, A.M.F. Seder, E.Y.T. Adesta, M. Taufik and A.H. bin Idris	122
Using the Desirability Function as an Effective Tool in Target Costing Model M.H.F. Al Hazza, M. Konneh, M. Iqbal, A.H. Taha and M.H. Hasan	126

Chapter 3: Ceramics and Building Materials

Characterization of Doped Titanium Oxide Varistor Powder Processed with Latex Binder S. Begum, I. Rasyada and A. Panimeerselvam	133
Effect of Calcium Carbonate Replacement on Workability and Mechanical Strength of Portland Cement Concrete M. Ali, M.S. Abdullah and S.A. Saad	137
Effect of Electron Beam Irradiation on the Morphology of Alumina Ceramic N.E.F. Othman, Y. Abdullah, H. Purwanto and K.H. Zaini	142
Effect of Polycarboxylate Ether (PCE) Addition to Physical and Mechanical Characteristics of High Performance Concrete M. Ali, M.Z. Ahmad and S.A. Saad	146
Effect of Rice Husk Ash (RHA) on Physical Property and Mechanical Strength of Concrete M. Ali, M.S. Fadzil and S.A. Saad	150
Investigation of Low Voltage Varistor Using TiO₂ as Base Material and SiO₂, Bi₂O₃ and WO₃ as Dopants S. Begum, Z. Kothadapani, M.K. Selvaraj and M. Muntasir	156
Physical and Mechanical Properties of Concrete Incorporating Manufactured Sand M. Ali, M.H. Nordin and S.A. Saad	160
Synthesis of Co-Deposited Hexagonal Boron Nitride for Thermally-Efficient Tribological Performance K.A. Bello, M. Md Abdul, A. Zuraida and S. Mirdha	166
Synthetic of Pure Alumina from Aluminum Scrap A.S.K.A. Najib Khan, N.E.F. Othman, H. Purwanto, H. Abdul Halim and A.F. Shamsul Baharin	170

Wear Characteristics of Multiple Particle Size Silicon Carbide Reinforced Aluminium Composite	174
A.A. Abdulmumin, M.A. Maleque and Y.A. Mohammad	
The Glass Transition Temperature of Iron and Titanium Containing Phosphate Based Glasses	178
S.I.S. Shaharuddin, I. Ahmed, D. Furniss, A.J. Parsons and C.D. Rudd	
Effect of Tropical Climate Condition to Compressive Strength and Microstructure Properties of High Performance Fiber Reinforced Concrete (HPFRC)	182
S.A. Saad, F.N.A. Abdul Aziz and M. Ali	
Compressive Behaviour of Polyacrylonitrile Fibre Reinforced Lightweight Aggregate Concrete Composite	188
K.H. Mo, U.J. Alengaram and M.Z. Jumaat	
Cost Analysis of Using Hybrid Microwave Post-Sintered Silicon Nitride Inserts	192
T.F. Ariff, M. Iqbal and R. Bahar	

Chapter 4: Metals and Alloys

Effect of Sintering Schedule to the Alloyability of FeCrAl Powder Mix Formed at above Ambient Temperature	199
M.M. Rahman and A.A.A. Talib	
Effect of Temperature on the Wear Properties of Alloy Steel under Jatropha Curcas Biodiesel	203
N.A. Shaufe, M.A. Maleque, A.S. Ahmed and P. Paruka	
Fracture Behavior Issues in HSLA Pipeline Steels - A Review	207
M.H.A. Musa, M.A. Maleque, Y.A. Mohammad and M.H. Hasan	
The Effects of Sliding Parameters on Dry Wear Characteristics of Ti-6Al-4V Alloy	213
M.B. Ndaliman, K.C. Bala, A.A. Khan, Y.A. Mohammad, U. Abdullahi and A.A. Abdulmumin	
Prediction of Crack Growth Propagation of a Super Alloy through ANN Modeling	217
M.H. Hasan, S. Mollik and M.H. Faizi	

Chapter 5: Surfaces and Coatings

Effects of Surfactant on Corrosion Behavior of Carbon Steel in Simulated Crude Oil	223
M. Zakaria, Suryanto and I. Hilmy	
Formation of Hydrophobic Surface Using Two Stages Electrodeposition Method	226
M.H. Ani, N.S. Ramli, W.A.Y. Wan Yusoff, Y.M. Mustafah and R. Othman	
Physical Properties of Electroless Nickel-Tungsten Coating on Mild Steels Obtained from Acetic Bath	230
H. Mahmood, N. Harun, Suryanto and I. Hilmy	
Surface Features of TIG Melting Coated CP-Titanium	234
S.A. Adeleke and M.A. Maleque	
Optimization of Hardness Behaviour of TIG Modified Ceramic Coating Using the Taguchi Approach	238
K.A. Bello, M.A. Maleque, Z. Ahmad and S. Mridha	
Corrosion of Surface Modified AISI 4340 Steel in Jatropha Biodiesel	243
M.A. Maleque, B.A. Ghazal, Y.A. Mohammad, M. Hayyan and A.A. Saleh	

Chapter 6: Polymers and Composites

A Study on the Mechanical and Thermal Properties of ENR Filled with Dual Fillers	249
M.K. Mansor and D.H.A. Ismawi Hassim	
Conductive Polymer Composites from Polylactic Acid/Natural Rubber Filled with Carbon Black	253
Y.F. Buys and N.A.S. Lokman	
Crush Zone Morphology of Epoxy-Glass Fiber-Aluminium Composite Columnar Tube due to Longitudinal Crushing Force	258
P. Paruka, M.H. Mat Yasin, R. Mamat, M.A. Maleque and M.K. Md Shah	

Effect of Clamshells Filler Loading on the Tensile Properties of Polyhydroxybutyrate M. Othman, M.Y. Hashim, I.N. Azowa, K. Khalid and S.A. Mohamad	262
Effect of Electron Beam Radiation on Water Absorption of Hybrid Kenaf-Glass Unsaturated Polyester Composite M.A. Maleque, A. Atiqah, M. Fazal, M.M. Iqbal and P. Paruka	266
Mechanical Properties of Bamboo Fibre Composite Incorporating Pulverized Fuel Ash M. Ali, S.A. Saad, N. Farah Elyani Khairuddin, A.H. Sidek and M.F.M. Salim	270
Mechanical Properties of Kenaf Core Sandwich Panel Toughened with Modified Epoxy J.N. Hasnidawani, N.A. Hassan, H. Norita, Z. Halim and A. Zuraida	275
Morphology and Mechanical Properties of MIM Feedstock Using TPNR Backbone Binder H. Norita, S. Ahmad, N. Muhamad, M.A. Omar and N.A. Hassan	279
Numerical and Experimental Investigation on Tensile Properties of Natural-Sand Reinforced Polypropylene A.N. Oumer, I.M. Sahat, M.A. Nik Mu'tasim and T. Kurniawan	283
Performance Properties of Hybrid Aluminium–Composite Columnar Tube under Axial Crush Force P. Paruka, M.H. Mat Yasin, R. Mamat, M.A. Maleque and M.K. Md Shah	288
Physical and Mechanical Properties of Waste Sawdust Polymer Composite for Marine Application M.A.M. Mohd Idrus and M.F.S. Othman	292
Polyhydroxybutrate Filled Clamshell Biofiller: Effect of Polyvinylpyrrolidone M. Othman, M. Yusoff Hashim, I.N. Azowa, K. Khalid and S.A. Mohamad	296
SEM Analysis of Kenaf Sandwich Panel Z. Halim, M. Othman and S.K. Abdul Rahman	300
The Effects of Various TPNR Binder Compositions on Feedstock Preparation for MIM Process H. Norita, S. Ahmad, N. Muhamad, M.A. Omar and N.A. Hassan	304
A Light Material for Wind Turbine Blades S.A.M. Al-Bat'hi, S.A.M. AlBat'hi, Y.F. Buys, M.H. Hadzari and M. Othman	308

Chapter 7: Green Materials and Waste Recycling, Biotechnologies and Biomaterials

Characterization of Rattan Waste for Binderless Particleboard (BPB) Production T. Maisarah, Z. Ahmad, A. Roszalia and M.A. Luqman	317
Effect of Fibre Surface Treatment on the Properties of Eco-Core Sandwich Structures Z. Halim, Z. Ahmad and S.N.A. Syed Taha	321
Effect of Organic Loading Rate (OLR) of Slurry on Biogas Production Quality M. Mel, N. Mohd Suhuli, Avicenna, S.I. Ihsan, A.F. Ismail and S. Yaacob	325
Green Polyurethane Adhesives for Wood Bonding M.A.F. Amran and S.A. Ernie	331
Production and Chemical Compounds of Gaharu Extract by Using Supercritical Fluid Extraction (SFE) of Unsoaked Gaharu at Different Pressure M.R. Haji Che Daud and H. Hamdan	337
Sol-Gel Derived Zinc Doped Calcium Phosphate Bioceramics Prepared via Different Sintering Strategies I. Sopyan, Gunawan and Suryanto	341
Structural Applications and Emerging Trends of Nano- and Biocomposites: A Review S. Mollik, I. Tariq and M.H. Hasan	345
Tensile and Statistical Analysis of Sisal Fibers for Natural Fiber Composite Manufacture M.M.R. Abir, S.M. Kashif and M.A. Razzak	349
Thermal Analysis on Dehydroxylation of Sol-Gel Derived Zinc Doped Calcium Phosphate Powders Gunawan and I. Sopyan	353
Trans-Esterification of Crude Palm Oil Liquid Waste to Biodiesel Harmiwati and D. Rahmad	357

Production of Carbon via Electrochemical Conversion of CO₂ in Carbonates Based Molten Salt	
M. Gakim, L.M. Khong, J. Janaun, W.L. Yun Hsien and N.J. Siambun	361

Chapter 8: Nanomaterials and Nanotechnology

Characterization and Preparation of Sago Starch (SS) Based Reinforced with Silver Nanoparticle (SNP)	
Z. Ahmad, A.K. Ahmad Ulwi, T. Maisarah and A. Maisarah	369
Effect of Copper Concentration on the Optical Properties of Cu₂Zn_{0.8}Cd_{0.2}SnS₄ Pentary Alloy Nanostructures	
A.S. Ibraheam, Y. Al-Douri and U. Hashim	373
Effect of Dispersants on Microstructures of Nano Alpha Alumina Developed from Aluminium Dross Waste	
S. Anis Sofia, N. Samat and M.Y. Meor Sulaiman	378
Effect of Nanofiller on Flexing Mechanism of HDPE/EPR Nanocomposite for Sport Shoe Sole Application	
H.A. Lutpi, H. Anuar and N.M. Shaffiar	382
Effect of Voltage on Colloidal Gold (Au) Nanoparticles Produced Using Electro-Dissolution-Reduction Method	
H. Haiza, I. Yaacob and A.Z.A. Azhar	386
Gamma Irradiated Starch Based Hydrogel Impregnated with Silver Nanoparticle	
F. Eslami, Z. Ahmad and N.H. Abdul Razak	390
Mechanical and Physical Properties of Sago Starch/Halloysite Nanocomposite Film	
Z. Ahmad, H.Y. Hermain and N.H. Abdul Razak	394
Morphology of CNT-AL Nanocomposite under Different Ball Milling Parameters	
M.A. Maleque, U. Abdullahi and Y.A. Mohammad	398
Study of Mechanical and Flammability Properties of Polypropylene/Microcrystalline Cellulose Composites Filled with Nano-sized Aluminium Hydroxide (ATH) Particles	
N. Samat, N. Zulkapli, Z. Halim, Z. Ahmad and A.I.H.D. Habibah	402
The Effects of Coupling Agent on the Flame Retardant Properties of PP/ATH Nanocomposites	
F.A. Sabaruddin, N. Samat and A.I.H.D. Habibah	406
Finite Element Analysis of HDPE/EPR-CNT Nanocomposite under Tensile Loading	
N.M. Shaffiar, M.A. Hasnan, H. Anuar and M.H.F. Al Hazza	410
Finite Element Analysis of Tensile Test for HDPE/EPR-MMT Nanocomposite	
N.M. Shaffiar, M.K.A. Halim, H. Anuar and M.A.H.A. Majid	414
Fabrication and Characterization of Graphene from Solid Carbon Dioxide	
A. Arifutzzaman, I. Yaacob, M.A. Hawlader and M.A. Maleque	418
Effect of Temperature on the Optical and Morphological Properties of Zinc Oxide Thin Films Prepared by RF Magnetron Sputtering	
S.A.M. Al-Bat'hi and M. Othman	422
Low-Cost Synthesis and Characterizations of Metal-Organic Framework (MOF-199) Materials by Nonsurfactant Templating Method	
N. Mahadi, H. Misran, S.Z. Othman, A. Manap, M.A. Salim, N.N.H. Shah, N.A.A. Razak and N.F.S. Anuar	426

Chapter 9: Details and Machine Components, Mechatronics and Automation

A Triangular Double Layer Microchannel Heat Sink: Effect of Parallel and Counter Flow	
H. Manaf, S. Ahmed, M.I. Ahmed and M.N.A. Hawlader	433
Active Vehicle Suspension Control Using Full State-Feedback Controller	
M.M. Bello, A. Akramin Shafie and R. Khan	440
Design and Development of a Solar Based Air Conditioning Blower System for Vehicle	
M.A. Abdullah, S. Ahmad and S.F. Toha	446
Design, Fabrication and Flight Testing of a Surveillance UAV	
M. Idres, B. Makame, B.N. Ahmad, S. Naji and A. Safiuddin	450

Development of a Shape Memory Alloy (SMA) Based Assistive Hand A.M.B. Hamid, M.R. Makhdoomi, T. Saleh and M. Bhuiyan	454
Development of an Automatic Plant Monitoring System M. Bhuiyan and T.M.A. bin Tengku Azmi	458
Development of Catalytic Converter Using Non-Precious Metals A.K.M. Mohiuddin	462
Effect of Coolant Plate Geometry and Material in a Freshwater Production System: An Experimental Study R. Bahar, M.N. Alam Hawlader and T.F. Ariff	468
Evaluation of Orifice Flow Meter Accuracy under Pulsation Conditions M. Abdullah and M. Idres	472
Experimental Investigation on Magnetorheological Damper's Characterization M.M. Ferdaus, M.M. Rashid, M.N.T. Shanta and M.H. Hasan	476
Fundamental Study of Diesel Engine Performance by Implementing Oil from Tropical Kepayang Seeds (<i>Pangium edule</i>) Khairil, S. Thalib and D. Turmizi	480
Mini-ATX Computer System in Vehicle M. Sami and A.M. Zeki	484
Performance Analysis of Heat Pipe Heat Exchanger for Solar Hybrid Desiccant Air-Conditioning System Z.M. Enggsa, A. Rachman, L. Nesti, S. Mat and K. Sopian	488
Remote Interior Temperature Control of Parked Vehicles M. Latief, M.A. Ali, A. Mannan, T. Saleh, M. Bhuiyan and M. Raisuddin Khan	494
Two Degree of Freedom Plotter Using Robotic Arm M. Bhuiyan and M.M. bin Hanafi	499
Weld Hardness Study of P91 Welded Pipes with Post Weld Heat Treatment for Elevated Temperature Application in Power Plants M. Sarwar and M.A. bin Abd Majid	503
A Higher Order Theory for Bending of Cross Ply Laminated Cylindrical Shell under Hygrothermal Loads J.S.M. Ali, S. Alsubari and Y. Aminanda	509
Design and Fabrication of a Winged Hybrid Airship Model for IIUM-LSWT A. Ul Haque, N.M. Amri Hafiz, S.M. Kashif, W. Asrar, A.A. Omar, E. Sulaeman and J.S.M. Ali	513
Mode I Stress Intensity Factor for a Cracked Plate with an Integrated Piezoelectric Actuator A. Abuzaid, M. Hrairi and M.S. Dawood	517
Simulation of Low Velocity Impact Test on Carbon/Epoxy Composite Plates Z. Buang and S.M. Kashif	523
Stress and Deformation Analysis of Aircraft's Fuel Tank under Different Inertia Load Cases in Addition to a Static Test Pressure Using FEA D.R. Reddy, M.V. Aditya Nag and M.S.N. Gupta	527
Transfer Function Prediction of a Lithium Iron Phosphate Battery with Nature-Inspired Approach S.F. Toha	531
Design and Development of a Versatile Ice Clamping System R. Bahar, N.A. Yahya and T.F. Ariff	535
Finite Element Simulation of Electro-Mechanical Impedance Technique K. Tahmasebpour, M. Hrairi and M.S.I.S. Dawood	539
Microelectrode Design for Particle Trapping on Bioanalysis Platform S.N. Ibrahim and M.M. Alkaisi	543
A Piezoelectric Based Energy Harvester with Magnetic Interactions: Modelling and Simulation D.S. Ibrahima, A.G.A. Muthalif and T. Saleh	549
Comparative Study of SPWM and HEPWM Techniques for Photovoltaic Inverter D. Bendib, F. Akel, M. Chikh, C. Larbes, M. Laour and A. Mahrane	555
Effects of Piezoelectric Actuation on Delamination in Transversely Loaded Composite Plates N. Ghazali, M.S. Dawood and S.M. Kashif	560

Thermoelastic Solutions for Flexure of Anisotropic Cylindrical Shells J.S.M. Ali	564
IUM CubeSat Structural Subsystem Design S.S. Isharuddin, M. Okasha and S. Ibrahim	568
Clustering Using Genetic Algorithm-Based Self-Organising Map A. Hassan, M.R. Andi Purnomo and P.D. Annisa	573
LEADME: An Educational Software for Composite Laminate Analysis and Design J.S.M. Ali and A.A. Rubeya	578

Chapter 10: Manufacturing and Engineering Management

A Case Study on Business Environmental Assessment in Malaysia and UK Metal and Fabrication SMEs A.A. Sidek, A. Abdullah and C.J. Backhouse	585
Adoption and Adaptation of Japanese Manufacturing Management in an Automotive Company of Malaysia A.K.M. Mohiuddin, M.A. Rahman and J.B.H.A. Jabar	589
Painting Process Improvement through Six Sigma Approach in a Malaysian Vehicle Assembly Company M.A. Rahman, A.K.M. Mohiuddin and H. Abdullah	596
Ranking of Manufacturing Attributes Affecting Bread Quality: Application of Analytic Hierarchy Process M.N.B.A. Nazri, M. Haque, A.N.M. Karim and F.B. Muhamad	601
Development of Design Structure Matrix of Product Architecture Case Study: Multi Purpose CNC Router I. Hilmy, E.Y.T. Adesta, N.N. binti Samsul Bahrim, A.N. binti Azhar and S.F. binti Mohd Shahar	606
Design of a Heuristic for Balancing a Multi-Stage Production Flow Line H.M.E. Kays, A.N.M. Karim, M.N.B. Tajudin and M. Abdesselam	610
Formulation of an IP-Based Model for Reactive Flow-Shop Scheduling Problem Subject to Arrival of New Orders M. Abdesselam, A.N.M. Karim, H.M. Emrul Kays, M.A. Rahman and R.A. Sarker	616
Parameter Optimization of VMI System in a Manufacturer and Multi Retailer Using Genetic Algorithm A. Hassan, C. Saleh, B. Md Deros, M.N. Ab Rahman, R.A.C. Leuveano and A. Adiyoga	622
Rapid Prototyping as a Tool of Fabricating Biomodel in Medical Applications: Technique and Cost Evaluation W. Yusoff and E. El-Kashif	627