THE DHAKA UNIVERSITY JOURNAL OF SCIENCE

Vol. 58, No. 2 **July, 2010**

Editor

Professor Dr. A. F. M. Yusuf Haider
Department of Physics
Dhaka University, Dhaka-1000, Bangladesh

Members of the Editorial Board

Prof. Dr. Tajmeri S. A. Islam
Dean, Faculty of Science
Dhaka University

Prof. Dr. Golam Mohammed Bhuiyan
Department of Theoretical Physics
Dhaka University

Prof. Md. Abdur Rahman
Department of Mathematics
Dhaka University

Prof. Dr. A. M. Sarwaruddin Chowdhury
Department of Applied Chemistry and
Chemical Engineering
Dhaka University

Prof. Dr. Etmina Ahmed
Department of Chemistry
Dhaka University

Sayema Sharmin
Department of Statistics, Biostatistics and
Informatics
Dhaka University

Prof. Dr. Nasreen Ahmad
Department of Geography and Environment
Dhaka University

Prof. Dr. Mahmood Alam
Department of Geology
Dhaka University

Prof. Dr. Subrata Kumar Aditya
Department of Applied Physics, Electronics and
Communication Engineering
Dhaka University

Mr. Md. Mosaddek Hossain Kamal
Department of Computer Science
and Engineering
Dhaka University

Published in July, 2010 by the Editor on behalf of the Editorial Board of the Journal. Computer Typesetting and Printing by: Noor Card Board Box Factory (Offset Press) 19/1, Nilkhat, Babupura, Dhaka 1205, Phone : 8627368

THE DHAKA UNIVERSITY JOURNAL OF SCIENCE

General Information

PUBLICATION : Dhaka Univ. J. Sci. is generally published half-yearly in January and July as two issues per annual volume.

SUBSCRIPTION INFORMATION : Subscription price per issue is : Tk. 100.00 (Inland)/US$ 15.00 (Foreign). Subscription orders should be sent to : Dhaka Univ. Journal of Science. Science Workshop Building. Curzon Hall Campus, Dhaka University, Dhaka-1000, Bangladesh.

EDITORIAL CORRESPONDENCE : Editorial correspondence should be addressed to : Professor Dr. A. F. M. Yusuf Haider, Dhaka Univ. J. Sci., Department of Physics, Dhaka University, Dhaka-1000, Bangladesh.

Information for Authors

SCOPE : Dhaka Univ. J. Sci. publishes original research papers and short communications submitted by the teachers and scholars of the Dhaka University on any branch of Physical and Mathematical Sciences and their applications. In the case of joint authorship of a paper, one of the authors must be from Dhaka University.

FORM OF MANUSCRIPT : Manuscript must be **typed double spacing** (font size 11) on one side of A4 (210 mm x 297 mm) bond papers with margins. The first page of the typescript should contain title of article, name(s) of author(s) with academic or professional affiliation(s) and address of the author (in case of joint authorship) to whom communications should be made. The title, **not exceeding 50 characters,** should be provided for page headings. The title page should be followed by a page containing only the full title and in case of a full paper, an abstract of up to **150 words** describing the main results. No abstract is necessary for short communications. Considering the high cost of printing, contributions should be as concise as possible, and must not exceed **ten typed pages** in the case of full papers and **two typed pages** in the case of short communications. Tables, graphs and figures should be kept to a minimum. Tables of data represented by graphs should not be included unless they are absolutely necessary. Footnotes should be avoided as far as possible. **Disk, in MS Word, must be supplied with final manuscript.**

REFERENCES : All references must be numbered consecutively according to their occurrence in the text. Reference citations in the text should be indicated by superscripts, e.g., Smith[1], solution[2,3] and keyed to a numbered reference list at the end according to the following style:

For a paper in a journal : Edmonds, J and K.M. Karp, 1997. Theoretical Inprovements in Algorithmic Efficiency for Network Flow Problems. *J. assoc. Comput. mach **19**, 248-264.*

For a book : pines, D, and P. Noziirs, 1966. The Theory of Quantum Liquids. Vol. 1, Benjamin, N.Y.

For a paper in a contributed volume : Zahed, I.A., 1974. *Calculas of Fuzzy restrictions. In :* I. A. Zahed, K.S., Fu, K. Tanaka and M. Shimura (ed.). Fuzzy Sets ad their application to Cognitie and Decision Process, Academic Press, N. Y.

SUBMISSION OF MANUSCRIPT : Authors should submit two copies of their manuscripts typed as per style and format of the journal and complete with necessary diagrams to the Editor. The authors, at the time of submitting their manuscript, must certify that the work was carried out by him/them and the contents of the paper were not published before or submitted for publication in any other Journal.

To assist the referees, authors are requested to furnish copies of relevant unpublished or inaccessible references.

EDITORIAL PROCESS: All papers will be refereed. The Editor will process the paper in consultation with the department member of the Editorial Board, and the authors may be required to incorporate necessary changes as suggested by the referees. Final decisions on the papers will be made by the Editorial Board on the basis of the reports of the referees.

PROOFS : Authors will receive page-proofs. These should be corrected and returned within forty-eight hours of receipt. No new material may be inserted in the text at the time of proof reading, except where permission in advance has been obtained from the Editor.

OFFPRINTS : Twenty five offprints of each article published will be supplied free of charge. Additional offprints may be ordered at cost price at the time of returning the corrected page-proofs.

THE DHAKA UNIVERSITY JOURNAL OF SCIENCE

Vol. 58, No. 2 **July, 2010**

CONTENTS

1. **Implementation and Performance Analysis of a WiMAX Module in ns-2** 145
Tahmina Zebin, Sanwarul Hoque, and Shahida Rafique

2. **Designing Imbricated Cells Multilevel PWM Inverter for Large Induction Motor Drive** 151
Sazzad Muhammad Samaun Imran, Rezaul Karim Mazumder and Subrata Kumar Aditya

3. **Directed *ortho* Lithiation of Sulfonylazulenes. An Efficient Method to Introduce Substituents at the 2-position of Azulene** 157
A. F. M. Mustafizur Rahman and Mohammad Nurnabi

4. **Matrix Method of Designing Asymmetrical Factorial Experiment** 161
M A Jalil, and S. A. Mallick

5. **Matrix Method of Designing Simultaneous Confounding of Two Factorial Effects In 3^n-Factorial Experiment** 165
M A Jalil, and S. A. Mallick

6. **Benzylation of *p*-Chlorophenol: A Statistical Study** 169
Mirza Galib, Manoranjan Saha, Dipti Saha, Md. Tafsir Uddin Bhuyan, Md. Shahruzzaman and Md. Mizanur Rahman

7. **Human Facial Expression Recognition Using Region-based Motion Estimation** 175
Ahmedul Kabir and Shaily Kabir

8. **Median-Product Regression Estimators: New Robust Estimators for Bivariate Data** 183
A. Z. M. Shafiullah and Jafar A. Khan

9. **Effect of pH, Ions and Ionic Strength on TiO_2-mediated Photodegradation of Brilliant Orange** 187
Md. Safiqul Islam, Md. Mufazzal Hossain and Tajmeri SA Islam

10. **Phytochemical and Biological Investigations of *Casuarina equisetifolia*** 191
Humayun kabir, M. Mahboob Ali Siddiqi, Al-Mansur M. A., M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

11. **Chemical and Biological Investigations of *Stereospermum chelonoides*** 195
M.Saifur Rahman, M. Mahboob Ali Siddiqi , Al-Mansur M. A., M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

12. **Antimicrobial and Cytotoxic Activities of the Crude Extracts of *Abroma augusta*** 199
Mostafa Md.Faisal Kabir, M.Mahboob Ali Siddiqi, Al-Mansur M.A., M. H. Sohrab, Choudhury M.Hasan and A.M. Sarwaruddin Chowdhury

13. **Socio-economic Inequality in Under-Five Child Mortality: A Statistical Approach to Determine Development Edge in Bangladesh** 201
Sifat Sharmin and Md. Israt Rayhan

14. **Risk Factors for Diabetes Mellitus: A Population Based Study** 205
Sayema Sharmin, Md. Golam Rabbani and Wasimul Bari

15. **Structural Properties of Some Liquid 3d Transition Metals** 211
M. Shahjahan, F. Iasmin

16. **Application of Non-Parametric, Semi-Parametric and Parametric Survival Methods on Infant Mortality Data of Bangladesh** 215
Muhammad Iftakhar Alam and M H M Imrul Kabir

17. **Generalized Linear Mixed Models for Longitudinal Data Analysis: An Application to Maternal Morbidity Data** 219
Muhammad Abu Shadeque Mullah, Nabila Parveen and M. Zakir Hossain

18. **Coupling of Conduction with Laminar Natural Convection Flow from a Vertical Flat Plate** 225
M. Z. I. Khan, S. Sultana and M. K. Jaman

19. **A Computer Technique for Sensitivity Analysis in Linear Programs** 233
Roni Saha and M Babul Hasan

20. **Chemical and Biological Investigations on the Leaves of *Jatropha gossypefolia*** 239
Momotaz Begum, Al-Mansur M. A., Yunus Ahmed M. H. Sohrab, Choudhury M. Hasan and A. M. Sarwaruddin Chowdhury

21. ***tert.*-Methylcyclohexylation of *o*-Cresol with Methylcyclohexanol in the Presence of Sulphuric Acid** 243
Mirza Galib, Manoranjan Saha, Dipti Saha, Hira Lal Paul, Tafsir Uddin Bhuyan, Md. Shahruzzaman and Mohammad Ismail*

22. **Alkylation of Phenol with *n*-Alcohols (C_5-C_7) in the Presence of Sulphuric Acid** 247
Manoranjan Saha, Md. Kabir Hossain, Md. Ashaduzzaman, Mirza Galib, Dipti Saha,A. M. Sarwaruddin Chowdhury, Md. Tafsir Uddin Bhuyan and Md. Shahruzzaman*

23. **Regioselective Addition to Diarylideneacetones – Synthesis of 2-Oxo-1-Acyl-6-Aryl-4[(2-aryl)-vinyl]-Cyclohex-3-ene** 253
M. Giasuddin Ahmed, U.K.R. Romman, Kawsari Akhter, Abdul Hakim Siddiki and M. Mostafizur Rahman

24. **Returns to Education in Nepal: Evidence from Living Standard Survey** 257
Md. Abdus Salam Akanda

25. **Phytochemical and Biological Investigations of *Carica papaya*** 265
Shahab Uddin Ahmed, Al-Mansur M. A., Yunus Ahmed, M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

26. **Analysis of a Chemostat Model with Quadratic Variable Yield Coefficient** 269
Sarker Md. Sohel Rana

27. **Removal of Arsenic(III) from Aqueous Solutions by Used Black Tea Leaves** 275
Md. Nurul Amin

28. **A Computer Technique for Solving Quadratic Fractional Programming Problems** 279
M. Rashidul Hasan and M. Babul Hasan

29. **Scopoletin Isolated from Stem Bark of *Burs era serrata* Wall. With Antimicrobial and Cytotoxic Activities of the Crude Extract** 287
Mohammad Habibullah, Al-Mansur M. A., M. Mahboob Ali Siddiqi, A. M. Sarwaruddin Chowdhury, M. H. Sohrab and Choudhury M. Hasan

30. **Robust Stepwise Algorithms for Linear Regression: A Comparative Study** 291
Md Siddiqur Rahman and Jafar A. Khan

31. **Scaling Rules to Understand Current Limiting Mechanisms in High Temperature Superconductors** 297
Mitul Anwar Chowdhury

32. **Antioxidant Activities of *Sesbania sesban* and *Moringa oleifera* Extractives** 301
Md. Alamgir Hossain A. M. Sarwaruddin Chowdhury, Mohammad A. Rashid and Choudhury. M. Hasan

33. **Effects of Radiation and Heat Generation on MHD Free Convection Flow Along a Stretching Sheet** 305
M. A. Samad and Tania S. Khaleque

34. **Local and Global Geometries of the Bundles** 313
Md. Abu Hanif Sarkar and Md. Showkat Ali

35. **Design of Shift Register Counters Using Quantum Principle** 319
Nishatul Majid, Shuvabrata Saha and S. K. Aditya

Short Communication

36. **Bangladesh Law and Order Situation: Clustering-Based Discriminant Analysis.** 325
Matiur Rahman

37. **Investigation of Some Constituents of Two Plants (*Alternanthera philoxeroides* and *Alternanthera sessilis*) of Amaranthaceae Family** 327
Arif Mahbub, Nusrat Jahan, Tanvir Muslim and Md. Azizur Rahman

THE DHAKA UNIVERSITY JOURNAL OF SCIENCE

Vol. 58, No. 2 **July, 2010**

CONTENTS

1251 **Implementation and Performance Analysis of a WiMAX Module in ns-2** 145
Tahmina Zebin, Sanwarul Hoque, and Shahida Rafique

1264 **Designing Imbricated Cells Multilevel PWM Inverter for Large Induction Motor Drive** 151
Sazzad Muhammad Samaun Imran, Rezaul Karim Mazumder and Subrata Kumar Aditya

1291 **Directed *ortho* Lithiation of Sulfonylazulenes. An Efficient Method to Introduce Substituents at the 2-position of Azulene** 157
A. F. M. Mustafizur Rahman and Mohammad Nurnabi

1295 **Matrix Method of Designing Asymmetrical Factorial Experiment** 161
M A Jalil, and S. A. Mallick

1296 **Matrix Method of Designing Simultaneous Confounding of Two Factorial Effects In 3^n -Factorial Experiment** 165
M A Jalil, and S. A. Mallick

1300 **Benzylation of *p*-Chlorophenol: A Statistical Study** 169
Mirza Galib, Manoranjan Saha, Dipti Saha, Md. Tafsir Uddin Bhuyan, Md. Shahruzzaman and Md. Mizanur Rahman

1301 **Human Facial Expression Recognition Using Region-based Motion Estimation** 175
Ahmedul Kabir and Shaily Kabir

1306 **Median-Product Regression Estimators: New Robust Estimators for Bivariate Data** 183
A. Z. M. Shafiullah and Jafar A. Khan

1307 **Effect of pH, Ions and Ionic Strength on TiO_2-mediated Photodegradation of Brilliant Orange** 187
Md. Safiqul Islam, Md. Mufazzal Hossain and Tajmeri SA Islam

1308 **Phytochemical and Biological Investigations of *Casuarina equisetifolia*** 191
Humayun kabir, M. Mahboob Ali Siddiqi, Al-Mansur M. A., M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

1309 **Chemical and Biological Investigations of *Stereospermum chelonoides*** 195
M.Saifur Rahman, M. Mahboob Ali Siddiqi , Al-Mansur M. A., M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

1310 **Antimicrobial and Cytotoxic Activities of the Crude Extracts of *Abroma augusta*** 199
Mostafa Md.Faisal Kabir, M.Mahboob Ali Siddiqi, Al-Mansur M.A., M. H. Sohrab, Choudhury M.Hasan and A.M. Sarwaruddin Chowdhury

1312 **Socio-economic Inequality in Under-Five Child Mortality: A Statistical Approach to Determine Development Edge in Bangladesh** 201
Sifat Sharmin and Md. Israt Rayhan

1313 **Risk Factors for Diabetes Mellitus: A Population Based Study** 205
Sayema Sharmin, Md. Golam Rabbani and Wasimul Bari

1319 **Structural Properties of Some Liquid 3d Transition Metals** 211
M. Shahjahan, F. Iasmin

1322 **Application of Non-Parametric, Semi-Parametric and Parametric Survival Methods on Infant Mortality Data of Bangladesh** 215
Muhammad Iftakhar Alam and M H M Imrul Kabir

1323 **Generalized Linear Mixed Models for Longitudinal Data Analysis: An Application to Maternal Morbidity Data** 219
Muhammad Abu Shadeque Mullah, Nabila Parveen and M. Zakir Hossain

1330 **Coupling of Conduction with Laminar Natural Convection Flow from a Vertical Flat Plate** 225

M. Z. I. Khan, S. Sultana and M. K. Jaman

1334 **A Computer Technique for Sensitivity Analysis in Linear Programs** 233
Roni Saha and M Babul Hasan

1336 **Chemical and Biological Investigations on the Leaves of *Jatropha gossypefolia*** 239
Momotaz Begum, Al-Mansur M. A., Yunus Ahmed M. H. Sohrab, Choudhury M. Hasan and A. M. Sarwaruddin Chowdhury

1337 ***tert.*-Methylcyclohexylation of *o*-Cresol with Methylcyclohexanol in the Presence of Sulphuric Acid** 243
Mirza Galib, Manoranjan Saha, Dipti Saha, Hira Lal Paul, Tafsir Uddin Bhuyan, Md. Shahruzzaman and Mohammad Ismail*

1339 **Alkylation of Phenol with *n*-Alcohols (C_5-C_7) in the Presence of Sulphuric Acid** 247
Manoranjan Saha, Md. Kabir Hossain, Md. Ashaduzzaman, Mirza Galib, Dipti Saha,A. M. Sarwaruddin Chowdhury, Md. Tafsir Uddin Bhuyan and Md. Shahruzzaman*

1340 **Regioselective Addition to Diarylideneacetones – Synthesis of 2-Oxo-1-Acyl-6-Aryl-4[(2-aryl)-vinyl]-Cyclohex-3-ene** 253
M. Giasuddin Ahmed, U.K.R. Romman, Kawsari Akhter, Abdul Hakim Siddiki and M. Mostafizur Rahman

1341 **Returns to Education in Nepal: Evidence from Living Standard Survey** 257
Md. Abdus Salam Akanda

1342 **Phytochemical and Biological Investigations of *Carica papaya*** 265
Shahab Uddin Ahmed, Al-Mansur M. A., Yunus Ahmed, M. H. Sohrab, A. M. Sarwaruddin Chowdhury and Choudhury M. Hasan

1349 **Analysis of a Chemostat Model with Quadratic Variable Yield Coefficient** 269
Sarker Md. Sohel Rana

1351 **Removal of Arsenic(III) from Aqueous Solutions by Used Black Tea Leaves** 275
Md. Nurul Amin

1356 **A Computer Technique for Solving Quadratic Fractional Programming Problems** 279
M. Rashidul Hasan and M. Babul Hasan

1358 **Scopoletin Isolated from Stem Bark of *Burs era serrata* Wall. With Antimicrobial and Cytotoxic Activities of the Crude Extract** 287
Mohammad Habibullah, Al-Mansur M. A., M. Mahboob Ali Siddiqi, A. M. Sarwaruddin Chowdhury, M. H. Sohrab and Choudhury M. Hasan

1360 **Robust Stepwise Algorithms for Linear Regression: A Comparative Study** 291
Md Siddiqur Rahman and Jafar A. Khan

1374 **Scaling Rules to Understand Current Limiting Mechanisms in High Temperature Superconductors** 297
Mitul Anwar Chowdhury

1377 **Antioxidant Activities of *Sesbania sesban* and *Moringa oleifera* Extractives** 301
Md. Alamgir Hossain, A. M. Sarwaruddin Chowdhury, Mohammad A. Rashid and Choudhury. M. Hasan

1379 **Effects of Radiation and Heat Generation on MHD Free Convection Flow Along a Stretching Sheet** 305
M. A. Samad and Tania S. Khaleque

1382 **Local and Global Geometries of the Bundles** 313
Md. Abu Hanif Sarkar and Md. Showkat Ali

1391 **Design of Shift Register Counters Using Quantum Principle** 319
Nishatul Majid, Shuvabrata Saha and S. K. Aditya

Short Communication

1304 **Bangladesh Law and Order Situation: Clustering-Based Discriminant Analysis.** 325
Matiur Rahman

1326 **Investigation of Some Constituents of Two Plants (*Alternanthera philoxeroides* and *Alternanthera sessilis*) of Amaranthaceae Family** 327
Arif Mahbub, Nusrat Jahan, Tanvir Muslim and Md. Azizur Rahman