

INDIAN STATISTICAL INSTITUTE

SCHEDULE IA—Contd.

Sr. No.	Particulars	Original Cost as on 1st April 1995	Addition during the year	Deletions/ adjustment during the Year	Original Cost, as on 31st March 1997
(1)	(2)	(3)	(4)	(5)	(6)
H.	Electrical Equipment and Installation :				
1.	High Tension Electricity	26,32,132.58	—		26,32,132.58
2.	Electrical Equipment and fittings	88,80,785.09	15,90,445.00		1,04,77,710.09
I.	Furniture and Fixings	1,04,09,482.36	11,44,262.98		1,16,42,895.31
J.	Motor Cars and Vehicles	25,04,288.49	20,58,72.54		27,98,060.73
K.	Water supply arrangement	36,57,316.34	2,36,376.73		38,93,692.94
L.	PABX Installation :				
	Calcutta :	26,22,258.40	3.68,288.00		29,90,546.40
M.	PABX Installation :				
	Delhi :	3,08,810.60	61.90.00		4,94,000.50
N.	V SAT TERMINAL	20,00,000.00	—		20,00,000.00
	TOTAL (I)	18,19,91,807.49	2,07,14,065.10		20,27,05,872.59
II.	Assets acquired out of current Revenue Expenditure				
	Books and Journals	7,39,30,142.67	1,60,47,769.00		9,08,77,911.67
	GRAND TOTAL (I) & (II) :	26,59,21,950.16	3,76,61,834.10		29,36,48,746.28

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

P-17, Mission Row Extn.
Calcutta-700 013
26th September, 1997

For B. C. KONDO & Co
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

SIXTYFIFTH ANNUAL REPORT: 1996-97

SCHEDULE II

SCHEDULE OF INVESTMENT AND LIABILITIES ACCRUED AS ON 31st MARCH 1997

Particulars	Investment		Accrued Interest		Total
	Rs. P.	Rs. P.	Rs. P.	Rs. P.	Rs. P.
1. FIXED DEPOSIT WITH :					
1 United Bank of India :	38,20,000.00		79,142.00	
3 Allahabad Bank	6,00,000.00	34,20,000.00	28,860.00	1,07,792.00
					35,27,792.00

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KHOSLA & Co.
Chartered Accountants

P-17, Mission Row Estate,
Calcutta-700 013
26th September, 1997

S. N. MUKHOPADHYAY
Partner

INDIAN STATISTICAL INSTITUTE

SCHEDULE III

LOANS AND ADVANCES AS AT 31ST MARCH 1997

Previous Year		Particulars	Current Year	
Rs.	P.		Rs.	P.
30,848.34		Advances for land	30,848.34	
2,37,848.71		Security deposit paid	2,31,080.71	
81,360.80		Sundry Debtors Fully recoverable	81,360.80	
86,67,678.00		Charges prepaid	88,07,287.00	
86,46,166.00		Marginal Deposit	85,92,830.00	
360.00		Students Benefit Fund	360.00	
3,171.71		OTD (Giridih & Delhi)	3,171.71	
892.00		Educational Loan	892.00	
42.00		House building loan (Old)	42.00	
47,351.84		Relief (Flood & drought)	46,588.84	
9,74,188.10		Advance against T.A.	9,57,954.84	
3,58,021.47		Advance against LTC	3,16,314.28	
4,788.86		Fan Advance	4,789.98	
1,79,631.16		Advance against purchase of Cycle & Scooter	41,467.16	
		Suspense & Advance (Staff & Other)	7,08,168.78	
64,58,992.89		Suspense and Advance (Party)	55,14,965.71	
6,28,919.60		Festival Advance to Staff	7,58,434.60	
20,000.00		Departmental Imprest	18,660.00	
1,126.30		Loan to/From Funds	60.41	
30,414.90		Group Insurance (Branches except Delhi & Giridih)	31,484.90	
38,198.07		ISI—UEA Collaborative Project	2,18,601.63	
10,364.48		Staff Insurance Premium (Cal)	0.00	
		ISI Co-operative Credit Society Ltd.	46,988.38	
66,770.00		CTD ISI PPU	0.00	
		Staff Insurance Premium (PPU)	4,800.00	
<u>2,03,27,181.78</u>			<u>1,82,01,223.46</u>	

S. SIKHOTTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MAHJAL
Chief Administration Officer

S. B. RAO
Director

P-17, Mission Row Extn.
Calcutta-700 013.
28. September, 1997

For B. C. KUNDU & Co.
Chartered Accountants

S.N. MUKHOPADHYAY
Partner

SIXTYFIFTH ANNUAL REPORT : 1996-97

SCHEDULE IV

LABELLETTER AND AMOUNTS OF OTHER FUNDS AS ON 31st MARCH 1997

Labelletter Rs. P.	Annature	Name of Fund	Annature	Amount Rs. P.
4,67,74,950.86	A	1. Statistical Quality Control Development Fund	A	4,47,74,950.86
24,16,284.22	B	2. Development Fund	B	24,16,284.22
66,857.71	O	3. Mahalanobis International Symposium on Statistics Prize Fund	O	66,857.71
52,716.29	D	4. Daniel Thoresen Memorial Fund	D	52,716.29
26,987.02	E	5. Endowment Fund for Lecture in Economics	E	26,987.02
36,823.20	F	6. Indian Statistical Institute Alumni Association Prize Fund	F	36,823.20
40,526.92	G	7. Haldane Prize Fund	G	40,526.92
6,82,021.48	H	8. Prof. P. O. Mahalanobis Chair/Fellowship Fund	H	6,82,021.48
77,123.50	I	9. Raja Rao Memorial Prize Fund	I	77,123.50
1,11,320.00	J	10. M. N. Murthy Memorial Fund	J	1,11,320.00
2,30,25,410.00	K	11. Project Setting up a Plan and Policy Research Unit at the ISI New Delhi	K	2,30,25,410.00
2,12,255.00	L	12. Ambarnath-Shanti Ghosh Endowment Fund	L	2,12,255.00
<u>7,35,21,801.40</u>				<u>7,35,21,801.40</u>

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administration Officer

S. B. RAO
Director

For B. C. NAYAK & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

P-17, Mission Row Estn.
Calcutta-700 013
29th September, 1997

INDIAN STATISTICAL INSTITUTE

ANNEXURE A

(ANNEXURE A, FORMING PART OF SCHEDULE IV OF THE ACCOUNTS OF THE INSTITUTE)
 "STATISTICAL QUALITY CONTROL DEVELOPMENT FUND" A/C No. 980-889
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
2,76,687.39	To Computer Consumables & Revenue	1,58,100.25	14,76,175.84	By Interest on Investment	17,70,332.29
11,89,487.85	Excess of Income over Expenditure	16,11,232.04			
14,76,176.24		17,70,332.29	14,76,175.84		17,70,332.29

BALANCE SHEET AS AT 31ST MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
5,38,47,158.63	Fund: As per last account	3,83,35,332.94	1,31,11,916.14	1. Fixed Asset	1,32,51,188.14
11,89,487.85	Add: Excess of Income over Expenditure	16,11,232.04	1,41,47,000.00	2. Investment in Fixed Deposit	1,41,47,000.00
	Add: Excess of SQC receipts over Rs. 7,00,000.00 transferred from current expenditure account		3,52,463.00	3. Current Assets: .1 Interest accrued but not due on Fixed Deposit .2 Loan to ISI .3 Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	3,40,123.00
32,88,886.46		48,28,355.88	1,07,23,653.80		1,49,56,811.12
3,83,35,332.94		4,47,74,920.86	3,83,35,332.94		4,47,74,920.86

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

O. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KUNDU & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

P-17 Nandan Row Extn.
Calcutta-700 013
26th September 1997

SIXTYFIFTH ANNUAL REPORT : 1996-97

ANNEXURE B

(ANNEXURE B, FORMING PART OF SCHEDULE IV OF THE ACCOUNTS OF THE INSTITUTE)
"DEVELOPMENT FUND" A/C No. 600-600

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
	To Excess of Income over Expenditure	2,01,683.11	1,20,850.00	By Interest on Investment	2,01,683.11
1,20,859.00		2,01,683.11	1,20,859.00		2,01,683.11

BALANCE SHEET AS AT 31ST MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund :			1. Fixed Asset :	
15,06,583.85	As per last Account	20,87,573.21	12,32,000.00	2. Investment in Fixed Deposit	20,12,000.00
1,20,559.00	Add: Excess of Income over Expenditure	2,01,683.11		3. Current Assets :	
15,000.00	Less: Compensation paid to Sri Niharai Pal of FYF Project	—	48,477.00	.1 Interest accrued but not due on Fixed Deposit	43,031.00
	Add: During the year				
	i) Balance transferred Externally funded Projects completed their activities	—	7,87,266.21	2. Bank Balance forming part of Institute's Cash & Bank Balance with Schedule V1	3,81,350.32
1,29,314.25	ii) Share of overhead charges from Externally funded project	1,52,028.00			
1,34,006.10	Less: Fund provided to acquire asset on a C.S.I.H. project slc no. 209	5,500.00			
		—			
10,67,878.21		24,16,384.32	20,67,878.21		24,16,384.32

S. S. PAMJA
Janya Officer

S. S. PAMJA
Accounts Officer

G. H. MANDAL
Chief Administration Officer

S. D. RAO
Director

For B. C. KUNDU & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

P-11, Narain Row Extn.
Delhi-110 013.
16th September, 1997

INDIAN STATISTICAL INSTITUTE

ANNEXURE C

(Annexure C, Forming Part of Schedule IV of the Accounts of the Institute)
 "Mahalanobis International Symposium on Statistical Price Fund" A/c NO. 670-679

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 1967

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
702.25	To Expenditure for Prize	745.00	5,424.00	By Interest on Investment	6,897.33
	To Excess of Income over Expenditure	5,852.33			
4,715.76		6,597.33	5,484.00		6,897.33

BALANCE SHEET AS AT 31ST MARCH 1967

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund:			1. Fixed Asset:	
58,519.68	As per last account	60,035.38	51,000.00	2. Investment in Fixed Deposit	61,000.00
4,715.76	Add: Excess of Income over Expenditure	5,862.33		3. Current Assets:	
			2,109.00	.1 Interest accrued but not due on Fixed Deposits	1,142.00
			7,738.38	.2 Bank Balance forming part of Institute's Cash and Bank Balance with Schedule VI	4,743.71
60,935.38		66,897.71	60,024.38		66,887.71

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

P-17, Mission Row Etn.
Calcutta-700 013.
26th September, 1967

For B. G. KUNDU & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

SIXTYFIFTH ANNUAL REPORT: 1996-97

ANNEXURE D

(Annexure D, Forming part of Schedule IV of the Accounts of the Institute)
 "DANIAL THÖRNER MEMORIAL FUND" A/O No. 971

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Period Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
	To Honorarium/Travelling	3,000.00	4,828.00	By Interest on Investment	6,029.61
4,586.00	.. Excess of Income over Expenditure	3,029.61	4,828.00		6,029.61
4,586.00		6,029.61	4,828.00		6,029.61

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
46,160.68	Fund : As per last Account	50,680.68		1. Fixed Asset :	
4,858.00	.. Add : Excess of Income over Expenditure	3,029.61	45,000.00	2. Investment in Fixed Deposit	50,000.00
				3. Current Asset :	
			960.00	.1 Interest accrued but not due on Fixed Deposit	810.00
			4,727.68	2. Bank Balance forming part of Institute's Cash and Bank Balance with schedule VI	2,909.29
50,680.68		53,710.29	50,680.68		53,710.29

S. SUDHANA
Accounts Officer

R. S. PANZA
Accounts Officer

O. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

P17, Main Road, P. Trin.
 Calcutta-700 013
 21st September, 1997

For B. C. KUNDU & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

INDIAN STATISTICAL INSTITUTE

ANNEXURE B

(Annexure B, Forming Part of Schedule IV of the Accounts of the Institute)
 "Fellowship Fund for Lectures of Economics" A/C No. 470
 INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
1,788.00	To Excess of Income over Expenditure	2,238.00	1,788.00	By Interest on Investment	2,238.00
<u>1,788.00</u>		<u>2,238.00</u>	<u>1,788.00</u>		<u>2,238.00</u>

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Asset	Current Year Rs. P.
	Fund :			1. Fixed Asset :	
22,001.02	As per last Account	23,849.02	17,000.01	2. Investment in Fixed Deposit	24,000.00
1,788.00	Add : Excess of Income over Expenditure	2,238.00		3. Current Assets	
			416.00	.1 Interest accrued but not due on Fixed Deposit	146.00
			6,433.02	.2 Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	1,741.02
<u>23,849.02</u>		<u>26,087.02</u>	<u>23,849.02</u>		<u>26,087.02</u>

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

O. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KUNDU & Co.
Chartered Accountants

S. N. MUKHOPADHYAY
Partner

P-17, Mission Row Extn.
Calcutta-700 013
28th September, 1997

SIXTYFIFTH ANNUAL REPORT: 1996-97

ANNEXURE 'P'

(Annexure F, Forming Part of Schedule IV of the Accounts of the Institute)
 "Indian Statistical Institute Alumni Association Prize Fund" A/C. NO. 872

INCOME AND EXPENDITURE ACCOUNT FOR TEN YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
2,728.18	To Expenditure for Prize Medal	2,071.95	2,094.00	By Interest on Investment	4,177.74
	To Excess of Income over Expenditure	1,205.70	101.15	By Excess of Expenditure over Income	—
2,728.18		4,177.74	2,768.15		4,177.74

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Asset	Current Year Rs. P.
	Fund:			1. Fixed Assets:	
14,871.55	as per last Account	35,859.00	35,000.00	2. Investment in Fixed Deposit	35,000.00
	Less: Excess of Expenditure over Income	—		3. Current Assets:	
24,447.50				1. Interest accrued but not due on Fixed Deposit	699.00
—	Add: Excess of Income over Expenditure	1,205.70	558.00		
10,000.00	Add: Received from Alumni Association	—		2. Loan Refund to Institute	1,125.20
1,061.50	Add: Loan from the Institute	60.41	—	3. Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	—
36,869.00		36,825.20	35,658.00		36,825.20

S. SUDHOPPA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KUNDU & Co.
Chartered Accountants

S. N. MURKOPADHYAY
Partner

F11, Mission Row Estate,
Calcutta-700 013
26th September, 1997

INDIAN STATISTICAL INSTITUTE

ANNEXURE C

(Annexure G, Forming Part of Schedule IV of the Accounts of the Institute)
"HALDANE PRIZE FUND"

A/C NO. 873

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
2,516.67	To Excess of Income over Expenditure	3,254.50	2,516.67	By Interest on Investment	3,254.50
<u>2,516.67</u>		<u>3,254.50</u>	<u>2,516.67</u>		<u>3,254.50</u>

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current year Rs. P.	
	Fund :			1. Fixed Asset		
24,918.05	As per last Account	27,432.72	25,000.00	2. Investment in Fixed Deposit	25,000.00	
2,516.67	Add : Excess of Income over Expenditure	3,254.50		3. Current Assets :		
				594.00	1. Interest accrued but not due on Fixed Deposit	1,836.00
	Add : Transferred from Haldane Centenary Celebration Project A/c. 524 of Schedule V	9,848.80	1,836.72	2. Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	13,860.00	
<u>27,432.72</u>		<u>40,836.02</u>	<u>27,432.72</u>		<u>40,836.02</u>	

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

O. H. BANDAL
Chief Administrative Officer

S. B. RAO
Director

P.17, Mission Row, Esplanade,
Calcutta-700 013.
26th September, 1997

For R. C. WUJONG & Co.
Chartered Accountants
S. N. MUKHERJEE
Partner

SIXTYFIFTH ANNUAL REPORT: 1966-67

ANNEXURE II

(Annexure II Forming Part of Schedule IV of the accounts of the Institute)
 "Prof. P. C. Mahalanobis Chair/Fellowship Fund" A/C. NO. 876

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1967

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
66,630.48	To Excess of Income over Expenditure	63,611.00	55,630.48	By Interest on Investments	63,611.00
<u>66,630.48</u>		<u>63,611.00</u>	<u>55,630.48</u>		<u>63,611.00</u>

BALANCE SHEET AS AT 31st MARCH 1967

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund:		—	1. Fixed Asset:	
1,00,000.00	As per last account Add: Excess of Income	6,06,630.48	5,00,000.00	2. Investment in Fixed Deposit	6,00,000.00
66,630.48	over Expenditure	63,611.00	—	3. Current Asset:	
			—	.1 Interest accrued but not due on Fixed Deposit	43,576.00
			13,316.00	.3 Bank Balance forming part of Institute's Cash and Bank Balance with Schedule VI	36,456.48
<u>1,66,630.48</u>		<u>6,69,631.48</u>	<u>5,00,630.48</u>		<u>6,69,631.48</u>

I. SREYOVITA
Account Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

P.11, Mission Row Extn.
 Calcutta-700 012.
 16th September, 1967

For B. C. KUNDU & Co.
Chartered Accountants
S. N. MUKHOPADHYAY
Partner

INDIAN STATISTICAL INSTITUTE

ANNEXURE I

(Annexure I, Forming Part of Schedule IV of the accounts of the Institute)
"Raja Rao Memorial Prize Fund" A/C. No. 874

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
4,183.00	To Excess of Income over Expenditure	7,740.00	4,188.00	By Interest on Investment	7,740.00
<u>4,183.00</u>		<u>7,740.00</u>	<u>4,183.00</u>		<u>7,740.00</u>

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund:			1. Fixed Asset:	
65,600.00	As per last account	69,683.00	65,000.00	2. Investment in Fixed Deposit	70,000.00
4,183.00	Add: Excess of Income over Expenditure	7,740.00		3. Current Assets:	
				.1 Interest accrued but not due on Fixed Deposit	161.00
				.3 Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	7,582.00
<u>69,683.00</u>		<u>77,423.00</u>	<u>69,683.00</u>		<u>77,423.00</u>

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. S. RAO
Director

For: B. G. KHOWD & Co.
Chartered Accountants

B. N. MUKHOPADHYAY
Partner

P-17, Mission Row Extn.
Calcutta-700 013.
16th September, 1997

SIXTYFIFTH ANNUAL REPORT: 1996-97

ANNEXURE J

(Annexure J, forming part of Schedule IV of the Accounts of the Institute)
"M N Murthy Memorial Fund" A/O. No. 876.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
1,354.00	To Excess of Income over Expenditure	13,013.00	1,354.00	By Interest on Investment	13,018.00
1,354.00		13,013.00	1,354.00		13,018.00

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund :			1. Fixed Asset :	
1,00,000.00	As per last account	1,01,354.00		2. Investment in Fixed Deposit	1,00,000.00
1,354.00	Add: Excess of Income over Expenditure	13,018.00	1,00,000.00	3. Current Assets :	
				.1 Interest Accrued but not due on Fixed Deposit	6,345.00
			1,354.00	.2 Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	8,125.00
1,01,354.00		1,14,372.00	1,01,354.00		1,14,370.00

S. SURESH
Accounts Officer

S. S. PANZA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KUNDU & Co.,
Chartered Accountants

S. N. MURKOPADHYAY
Partner

P-11, Mission Row Extn.
Chennai-700013.
30th September, 1997

INDIAN STATISTICAL INSTITUTE

ANNEXURE K

(Annexure K, Forming part of Schedule IV of the Accounts of the Institute)
Project-Setting up a Plan and Policy Research Unit at the
ISI, New Delhi, A/C. No. 570A, Delhi.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1997

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
—	To Computer Software Packages	1,00,000.00	20,91,425.00	By Interest on Investment	24,01,094.00
			—	By Incentive on ICICI Bond	4,00,000.00
20,91,425.00	To Excess of Income over Expenditure	29,43,619.00	—	By Interest on Saving Bank A/C	42,525.00
20,91,425.00		30,48,619.00	20,91,425.00		30,43,619.00

BALANCE SHEET AS AT 31st MARCH 1997

Previous Year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
	Fund :				
2,00,00,000.00	As Per Last Account	2,20,91,425.00		1. Fixed Asset	
20,91,425.00	Add : Excess of Income over Expenditure	29,48,619.00	21,00,000.00	2. Investment in Fixed Deposit	2,00,00,000.00
				3. Current Assets	
			10,91,425.00	.1 Interest Accrued But Not Due on Fixed Deposit	6,01,095.00
				.2 Bank Balance	45,33,949.00
2,20,91,425.00		2,50,36,044.00	2,20,91,425.00		2,50,35,044.00

S. SENGUPTA
Accounts Officer

S. S. PANJA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For R. C. KHOSLA & Co.
Chartered Accountants

S. N. MURHOPADHYAY
Partner

P-17, Mission Row Extn.
Calcutta-700013.
29th September, 1997.

SIXTYFIFTH ANNUAL REPORT : 1966-67

ANNEXURE L

(Annexure L forming part of Schedule IV of the Accounts of the Institute)
 "Ambarashi-Sasti (Shree) Endowment Fund" A/C No. 877
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH 1967

Previous Year Rs. P.	Expenditure	Current Year Rs. P.	Previous Year Rs. P.	Income	Current Year Rs. P.
—	To Expenditure for prize	—	—	By Interest on Investment	—
—	.. Excess of income over Expenditure	—	—		
<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>		<u>0.00</u>

BALANCE SHEET AS AT 31st MARCH 1967

Previous year Rs. P.	Liabilities	Current Year Rs. P.	Previous Year Rs. P.	Assets	Current Year Rs. P.
—	Fixed :	2,13,376.00	—	1. Fixed Asset	—
—	Add : Excess of Income Over Expenditure	—	—	2. Investment in Fixed Fixed Deposit	2,10,000.00
				3. Current Assets	
			—	.1 Interest Accrued but not Due on Fixed Deposit	—
			—	.2 Bank Balance forming part of Institute's Cash & Bank Balance with Schedule VI	3,376.00
<u>0.00</u>		<u>2,13,376.00</u>	<u>0.00</u>		<u>2,13,376.00</u>

S. SENCUPPA
Accounts Officer

S. S. PANZA
Accounts Officer

G. H. MANDAL
Chief Administrative Officer

S. B. RAO
Director

For B. C. KUPPU & Co.
Chartered Accountants

S. N. MURKOPADSVAY
Partner

P-17, Mission Road Extn.
Calcutta-700 013
19th September, 1967

7. Documentation Unit : The unit has been bringing out monthly Current Awareness Services publications under the title 'Current Contents of Journals Received in the ISI Library' on the following group of subjects : (a) Statistics and Mathematics, (b) Electronics and Communication Science, (c) Geology, (d) Life Sciences, (e) Economics. It has also been bringing out a monthly publication entitled 'Recent additions to ISI Library'.

8. Reprography & Photography Unit : The unit provided 8,81,721 xerox prints for the users during the period under report. 842 frames of photographs of different nature, 4560 prints of photographic enlargements, 108 frames of lecture slides were made during the period under report. 3,94,730 pages off-set prints were done during the period under report.

Projects undertaken by the Library

(i) Reclassification of books on Mathematics and Statistics

The project is in progress. 7016 books on mathematics have been reclassified and 40,500 catalogue cards have been filed. During the period, 8023 books on Mathematics have been reclassified and 43,246 catalogue cards have been filed.

(ii) Development of computerised Catalogue

The project initiated in August 1996 is in progress. Currently, data base of books in the areas of mathematics is being created and 2335 books records have been created.

(iii) Identification and Selective Rectification of Gaps in the Periodical collection

Completed the inventory of incomplete journals covering the period 1988-94. Approx.2000 journals are there in the collection. The verification of catalogue data of all titles have already been completed.

NBHM Grants to ISI Central Library : The National Board of Higher Mathematics Department of Atomic Energy, Govt. of India has recognised the Central Library, Calcutta as the Regional Library for the Eastern Region. The Library has acquired 86 books and 23 journals out of the grants given by NBHM.

Computerisation of Library Activities

To provide information support and increase efficiency of library services, the Central Library at Calcutta has started the process of providing computerised library services. It is expected that in the near future, the library will be hooked to national and international databases through various library networks and Internet. The E-mail facilities are now being used directly from the Library's Computer Room for contacting universities and research institutions as well as publishers and book-sellers.

CDS-ISIS, a software package developed by the UNESCO for information storage and retrieval has been acquired. The Library by plan has acquired LIBSYS - software for computerisation of its activities. The Library has started CD-ROM based information retrieval services to the users. The MathSci disc CD-ROM version of Mathematical Reviews and Current Mathematical Publications acquired by the Library covers the international research literature in Mathematics and related areas such as statistics, computer science, econometrics etc. The library collection also includes the 1991 Census Data on Floppy. To provide the computerised services to the users, the library has acquired necessary hardwares.

Delhi

1. Acquisitions : Due to budget constraints, only 347 new books could be purchased and added to the stock. Received 48 publications as gift from various sources. 158 sets of loose issues of periodicals, duly bound have been added to the stock, thus raising the stock to 33364 volumes. About 175 Technical reports/Discussion papers/Reprints etc. in Economics, Mathematics and Statistics have been received during the above period.

Standing order for the series "Lectures on Mathematics and Physics (TIFR)" has also been renewed during the period.

2. Periodicals : 240 titles of journals, both foreign as well as Indian have been approved for renewal for the year 1996-97. In addition 29 titles of journals were received as complimentary and against exchange programme. 158 sets of loose issues of journals duly bound were added to the stock.

Ten journal titles have been discontinued and fifteen new titles have been subscribed from the year 1997.

Ten journals have been received under the exchange programme established with different institutions for exchange of journal Sankhya, journal of Maulana Azad College of Technology and publications published under the series "Texts and Readings in Mathematics."

3. Circulation : During the period April 1, 1996 to March 31, 1997, 155 members availed the lending facilities as permanent members and 25 members availed the reference facilities as temporary members. Approximately 6926 publications were circulated during the period among its members. Under the inter library loan program, about 10 publications were lent out to the neighbouring institutes and libraries and 14 publications were borrowed from them for use by Delhi Centre Library members.

4. Reprographic services : Approximately 23128 photocopies were made during the period on the request of users of library. Reprographic facilities have also been provided to researchers of other institutes on a nominal payment of Rs.0.50p. for an exposure on A4 size paper., Rs.0.75p for Foolscape size paper and Rs 1.00 for B4 and A3 size paper.

5. Other activities : National Board of Higher Mathematics, Department of Atomic Energy, Govt. of India has recognised Indian Statistical Institute, Delhi Centre Library as the Regional Library to serve the Northern Region since 1.4.1994 and the annual grant of Rupees 6.00 lakhs has been renewed for the period April 1, 1996 to March 31, 1997. Out of NBHM Grant a total of about 94 new books have been purchased and 25 journal titles have been subscribed.

On October 28, 1996 on the occasion of the release of a publication in honour of Dr. K.R. Parthasarathy, Delhi Centre Library organized an exhibition of the published books/manuscripts of Faculty members of the Centre.

Like every year this year to, library trainees with remuneration were appointed. At the end of their training each trainee was given an experience certificate.

Computer and Statistical Service Centre

The Computer and Statistical Service Centre (CSSC) manages the central computing facility of the Institute at Calcutta. It serves about 400 users including students, research scholars and scientific workers with the inhouse computer system VAX 8650 and SUN SPARCSTATION1. NSSO and CSO (IS wing), Govt of India are using these facilities as well. E-mail and FAX facilities of the Institute are also maintained by the Centre.

Statistical and Computational consultancy services are provided by CSSC. During 1996-97, the centre offered a course on Object-oriented-programming and GUI using C++ and MS-windows for its users. CSSC also trained the personnel of the library on a PC-based database package.

The old PC and PC-XTs of the PC lab have been augmented to PC-486 and Pentium systems.

An ORACLE lab, has been set up with one server and five clients. This package would be beneficial to the students as well as to the faculty members.

CSSC has successfully installed the INTERNET facility in the Institute.

Like all other years, the staff members of CSSC have served as faculty in various courses of the Institute and supervised projects carried out by the students. The staff members of CSSC are also involved in research covering the areas like, database and knowledge bases, image processing, computational geometry, VLSI design etc. The details of the different activities of the centre are enclosed.

4. EXTERNALLY FUNDED PROJECTS

A. Ongoing Projects :

1. **Name of the Project : Development of Statistical Technique as an Aid to Geological Mapping**
Name of the Principal Investigator : J.K. Ghosh
Name of the Project Co-ordinator : Tapas Samanta
Unit involved : Stat-Math., Applied Statistics
Funded by : CSIR
2. **Name of the Project : Bayesian Non-parametric Inference and Computing**
Name of the principal investigator : Mohan Delampady
Unit involved : Stat-Math., Bangalore
Funded by : CSIR.
3. **Name of the Project : Bilingual (Bangla & Devnagari) OCR**
Project leaders : B.B. Chaudhuri and S.K. Parui
Unit involved : Computer Vision and Pattern Recognition
Funded by : Department of Science and Technology, New Delhi.
4. **Name of the Project : Development of CAD tools for identification of logical equivalence of library elements and identification of false paths in a switch-level network.**
Name of the Project Co-ordinators : B.B. Bhattacharya and P. Palchaudhuri
Unit involved : Electronics
Funded by : Motorola India Electronics Ltd. Bangalore.
5. **Name of the Project : Studies of the PBL dynamics using sodar and tower data and to predict a scalar transport model for the monsoon period.**
Name of the Principal Investigators : Jyotirmay Das
Unit involved : Electronics and Communication Sciences
Funded by : DST, New Delhi.
6. **Name of the Project : Development of computer algorithm for recognition and interpretation of sodar patterns.**
Name of the Principal Investigator : Jyotirmay Das
Unit involved : Electronics and Communication Sciences
Funded by : DST, New Delhi.
7. **Name of the Project : A knowledge based framework for diagnosis and therapeutic planning using multimodality medical imaging.**
Name of the Principal Investigator : D. Dutta Majumder
Unit involved : Electronics and Communication Sciences
Funded by : DST, New Delhi.

8. Name of the Project : A neuro-fuzzy image recognition system : Methodology development for forensic applications.
Name of the Chief Investigator : S.K. Pal
Unit involved : Machine Intelligence
Funded by : Council of Scientific and Industrial Research (CSIR), New Delhi

9. Name of the Project : Deformation, metamorphism, anatexis and magmatism across the northern boundary of the Eastern Ghats mobile belt around Rangali, Orissa.
Name of the Project Leader : S. Bhattacharya
Unit involved : Geological Studies
Funded by : Department of Science and Technology, New Delhi.

10. Name of the Project : A study of mathematical techniques in water wave problems
Name of the Project Leader : B.N. Mandal
Unit involved : Physics and Applied Mathematics
Funded by : Council of Scientific and Industrial Research (CSIR), New Delhi.

11. Name of the Project : Unsteady surface water waves in Ocean.
Name of the Project Leader : B.N. Mandal
Unit involved : Physics and Applied Mathematics
Funded by : University Grants Commission (UGC), New Delhi.

12. Name of the Project : Large amplitude ion and electron acoustic waves in relativistic plasma.
Name of the Project Leader : Rajkumar Roychoudhury
Unit involved : Physics and Applied Mathematics
Funded by : Department of Science and Technology (DST), New Delhi.

13. Name of the Project : Development of thin film on a rotating disk
Name of the Project Leader : B.S. Dandapat
Unit involved : Physics and Applied Mathematics
Funded by : Council of Scientific and Industrial Research (CSIR), New Delhi.

14. Name of the Project : Sustainable livelihood studies under environmental stress in eastern plateau of India.
Name of the Project Leader : Dipak Kumar Bagchi
Unit involved : Agricultural Sciences
Funded by : University of East Anglia, U.K.

15. Name of the Project : Rice based cropping system studies in rainfed regions of eastern India plateau.
Name of the Project Leader : Dipak Kumar Bagchi
Unit involved : Agricultural Sciences
Funded by : IRRI, Philippines.

16. Name of the Project : Genetic of quantitative traits of commercial importance in the silkworm
Name of the Project Leader : P.P. Majumder
Unit involved : Anthropology and Human Genetics
Funded by : Central Silk Board, Department of Biotechnology, Govt. of India.

17. Name of the Project : Survey of the possibilities and problems of small industries in Birbhum district.
Name of the Project Leader : Atis Dasgupta
Name of the Co-ordinator : Snigdha Chakrabarti
Units involved : Economic Research and Sociological Research
Funded by : West Bengal Small Industries Corporation, Govt. of West Bengal.

18. Name of the Project : Gender study for district primary education programme (DPEP)
Name of the Project Leader : Anjali Ghosh
Name of Project Coordinator : Suraj Bandyopadhyay
Units involved : Psychology Research and Sociological Research
Funded by : Paschim Banga Rajya Prathamik Shiksha Unnayan Sanstha, Government of West Bengal.

19. Name of the Project : Evaluation of rainfed farming project (RFP).
Name of the Project Co-ordinator : Atis Dasgupta
Units involved : Sociological Research, Psychology Research, Population Studies and Agricultural Sciences.
Funded by : Hindustan Fertiliser Corpn. Ltd. (HFCL).

20. Name of the Project : In-depth studies on the levels of development of scheduled castes and schedules tribes.
Name of the Project Co-ordinator : Atis Dasgupta
Unit involved : Sociological Research
Funded by : Ministry of Welfare, Government of India.

21. Name of the Project : Evaluation of base-line study on district primary education planning (DPEP) in five districts of West Bengal.
Name of the Project Co-ordinators : Atis Dasgupta and Suraj Bandyopadhyay
Units involved : Sociological Research and Psychology Research.
Funded by : Paschim Banga Rajya Prathamik Shiksha Unnayan Sanstha, Government of West Bengal.

22. Name of the Project : Guidance and consultancy services in data processing
Name of the Project Co-ordinator : Prafulla Chakrabarti
Unit involved : Sociological Research
Funded by : Indian Council of Social Science Research, New Delhi.

23. Name of the Project : Total literacy campaign (TLC) project in Purulia district of West Bengal.
Name of the Project Co-ordinator : Atis Dasgupta
Unit involved : Sociological Research
Funded by : Government of West Bengal

24. **Name of the Project :** Change in livelihood trajectories
Name of the Project Co-ordinators : D.K. Bagchi and Ajay Kumar Ghosh
Units involved : Agricultural Sciences and Sociological Research.
Funded by : University of East Anglia, U.K.
25. **Name of the Project :** Application of optican character recognition technology in building bibliographic DBMS.
Name of the Project Leader : A.R.D. Prasad
Unit involved : Documentation Research and Training Centre, Bangalore
Funded by : NISSAT, New Delhi.
26. **Name of the Project :** National mapping of science using COMPENDEX DATABASES under the scientometrics/informetrics programme of NISSAT
Name of the Project Leader : I.K. Ravichandra Rao
Unit involved : Documentation Research and Training Centre, Bangalore
Funded by : NISSAT, New Delhi.
27. **Name of the Project :** NISSAT-DRTC short-term course on Computer Applications to Library and Information Field
Name of the Project Co-ordinator : I.K. Ravichandra Rao
Unit involved : Documentation Research and Training Centre, Bangalore
Funded by : NISSAT, New Delhi.

B. Completed Project :

1. **Name of the Project :** Automatic Feature Extraction from Satellite Images and Image Data Compression
Name of the Project Leader : B.B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
Funded by : Advanced Data Processing Research Institute, Secunderabad.
2. **Name of the Project :** Text Analysis in the Context of Automatic Map Understanding.
Name of the Project Leaders : B.B. Chaudhuri and S.K. Panji
Unit involved : Computer Vision and Pattern Recognition
Funded by : Advanced Data Processing Research
3. **Name of the Project :** ISI-PCL manpower development project on Object Oriented Programming and C++.
Name of the Project Co-ordinator : B.B. Chaudhuri
Unit involved : Computer Vision and Pattern Recognition
Funded by : Peritech Computer Limited, Calcutta.
4. **Name of the Project :** Knowledge based computing
Name of the Principal Investigator : D. Dutta Majumder
Unit involved : Electronics and Communication Sciences
Funded by : CSIR.
5. **Name of the Project :** Poverty measures and the socio-economic characteristics, 1987-88 and 1993-94
Name of the Project Leader : Shubhashis Gangopadhyay
Unit involved : Planning, Delhi
Funded by : Central Statistical Organisation and Department of Statistics, Government of India.
6. **Name of the Project :** Total literacy campaign (TLC) project in Calcutta Municipal Corporation area.
Name of the Project Co-ordinator : Atis Dasgupta
Unit involved : Sociological Research
Funded by : Calcutta Municipal Corporation

5. SYMPOSIA, CONFERENCES, WORKSHOPS, LECTURES AND SEMINARS ORGANISED

The Symposia, Conferences, Workshops, Lectures and Seminars organised by the Institute during the year 1996-97 are listed below :

Symposia, Conferences, Workshops

A two-day symposium on "Recent Developments in Robust and Non-parametric Inference and Exploratory Statistical Analysis" was organised by Stat-Math Unit, Calcutta during December 5-6, 1996.

Workshop on "Optimal Experimental Design and Application" was organised by Stat-Math Unit and Applied Statistics Unit, Calcutta at the Department of Statistics, Sambalpur University during December 19-28, 1996.

Winter School in "Logic & Computer Science" was held at Stat-Math Unit, Calcutta during December 23, 1996 - January 10, 1997.

Workshop on "Percolation Theory" organised by Stat-Math Unit, Delhi at Delhi for two weeks during December 1996.

Conference on "Analysis and Probability" in honour of Professor K.R. Parthasarathy held at Stat-Math Unit, Delhi during January 2-4, 1997.

A two-day seminar on "Theoretical Physics" in honour of P. Bandyopadhyay's 60th Birthday was organised by Physics and Applied Mathematics Unit at ISI, Calcutta during May 14-15, 1996.

A Summer School on "Advanced Econometric Techniques and Their Applications" was organised by the Economic Research Unit at ISI, Calcutta, during June 24 - July 12, 1996.

A two-day conference on "Economic Reforms in India" was organised by the Economic Research Unit at ISI, Calcutta during January 6 - 7, 1997.

A two-day workshop on "Application of Recent Advances in Quantitative Methods to Indian Economic Problems" was conducted by Economic Analysis Unit at Bangalore on March 19-20, 1997.

ISI National workshop on "Statistical and Computational Intervention in Languages in a Plural Society : The Case of India" was organised by Linguistic Research Unit, Calcutta during March 12-13, 1997.

A seminar on "Policy Implications based on National Family Health Survey, West Bengal" was organised jointly by Population Studies Unit, ISI, Calcutta and International Institute for Population Sciences, Mumbai on 19 April 1996 at ISI, Calcutta.

A symposium on "Item Response Theory and its Applications" was organised by Psychology Research Unit at ISI, Calcutta on February 18-19, 1997.

A three-day workshop entitled "Annual workshop on Advances in Information Technology : Impact on Library and Information Field" was sponsored by the DRTC, ISI and NISSAT, New Delhi held at ISI, Bangalore during 28-30 October, 1996.

The Five Laws Lecture on "Disability and Rehabilitation Information system & Services" jointly organised by DRTC, DRTC Alumni Association and the Institute of Information Studies held at ISI, Bangalore on September 27, 1996.

A seminar on "TQM in Textiles" organised by ISI and Bombay Textile Research Association.

International Conference on "Quality Improvement through Statistical Methods" was jointly organized by Statistical Quality Control and Operations Research Division, ISI and University of Cochin during 28-31 December, 1996.

Lectures and Seminars

Lectures/Seminars organised by the Institute and delivered by visiting scientists are listed below :

Theoretical Statistics and Mathematics Division

Calcutta Unit

- Achuthan, N.R., Curtin University of Technology, Australia (15.1.1997) : Algorithms for Vehicle Routing Problems.
- Achuthan, Nirmala, Curtin University of Technology, Australia (17.1.1997) : On Defective Coloring of Complementary Graphs.
- Arumugavelan, S., Anna University (1.1.1997) : Object Oriented Programming Techniques.
- Athreya, K.B., University of Iowa, USA (2.4.1996) : Branching Markov Chains and Theoretical Issues on Markov Chain Monte Carlo.
- Bhattacharya, Bhaskar, Southern Illinois University, USA (8.1.1997) : Tests of Symmetry Against One-Sided Alternatives.
- Barnes, Bruce A., University of Oregon, USA (24.4.96 and 26.4.96) : The Spectral Theory of Extensions of Operators and Spectrum of Convolution Operators.
- Berger, J., Institute of Statistics and Decision Sciences, Duke University, Durham, NC, USA (17.2.1997) : PC Mahalanobis Memorial Lecture Series.
- Das, M.N., Delhi (16.12.1996) : Development of Statistical Algorithms and Software for Experimental Designs and Survey Sampling.
- Doodhar, A. Sachin, TIFR (3.1.1997) : Supervisory Control of Discrete Event Systems.
- Fischer, Gerhard H., University of Vienna, Austria (21.2.97) : Structural Item Response Models for Treatment Effect Studies.
- Ghosh, Sujit K., University of Connecticut, USA (14.6.1996) : Bayesian Analysis of Multiple Event Survival Data.
- Ghosh, Partha Pratim, St. Xavier's College (7.10.1996) : Some Observed Shifts in the Theory of Rings of Continuous Functions.

- Gupta, J.C. Ex-faculty of Stat-Math Unit (3.2.1997, 10.2.1997 and 17.2.1997) : Berg-Kesten Conjecture, Covariance Structures of Spin Variables and Berg-Kesten Inequality.
- Jayakumar, K., Dept. of Economics and Statistics, Govt. of Kerala (17.6.1996) : Mittag-Leffler Distribution and its Applications.
- Jayakumar, K., Department of Statistics, University of Calicut (25.10.1996 and 28.10.1996) : Mittag-Leffler Distribution and its Applications.
- Jayasree, S., University of Hyderabad (26.8.1996) : Determinant of Representations of Division Algebra of Prime Degree Over Local Fields.
- Jayasree, S., University of Hyderabad (14.10.1996) : Determinant of Representations of Division Algebra of Prime Degree Over Local Fields (Part II).
- Maitra, A., University of Minnesota (26.7.1996) : Stochastic Games.
- Marcus, M.B., City University of New York (13.1.1997-31.1.1997) : Local Times of Symmetric Markov Processes and Gaussian Chaos Processes (series of lectures).
- Marcus, M.B., City University of New York, USA (5.2.97 - 6.2.97) : A Surprising Relationship between Gaussian Processes and Local Times of Symmetric Markov Processes and Additive Functionals of Markov Processes and Gaussian Chaos Processes.
- Mehra, Madan Lal, Saclay, France (18.9.1996) : Use of Quaternionic Determinants for Evaluating Multiple Integrals.
- Mukherjee, Gautam, SPIC Science Foundation, Madras (3.4. 1996) : Equivariant Cobordism.
- Narahari, Dept. of Computer Science and Automation, IISc., Bangalore (12.9.1996) : Scheduling in Multiclass Queueing Networks : Models and Issues.
- Narayan, S.K., Central, Michigan University, USA (22.5.1996 and 24.5.1996) : Schur Multiplier Norm of Matrices and Quasidiagonality and Direct Sums of Operators.
- Pal, Nabendu, University of Southwestern Louisiana (31.7.1996) : Estimation of a Correlation Coefficient : Some Second Order Decision-Theoretic Results.
- Prajapat, J., TIFR, Bangalore (29.8.1996) : Conformal Metrics on Annulus with Constant Scalar Curvature and Constant Mean Curvature.
- Purkayastha, Sumitra, IIT, Bombay (17.12.1996 and 26.12.1996) : Some Aspects of Bayesian Image Analysis : I & II.
- Rajput, B.S., University of Tennessee, USA (6.8.1996) : An uniform estimate of semistable measures of small balls in banach spaces.
- Ramamoorthi, R.V., Michigan State University, Michigan (18.6.1996) : Posterior Consistency for Censored Data.
- Ramakrishnan, S., University of Miami, Florida (5.8.1996) : Some Discrete Time Cyclic Queueing Networks.
- Ramakrishnan, S., University of Miami, USA (12.8.1996) : Convergence in Gambling Algorithms.
- Ramaswamy, M., TIFR, Bangalore (20.3.1997) : Viscosity solutions - an introduction.
- Rao, Murali K., University of Florida, USA (29.1.97 - 30.1.97 and 5.2.1997) : Wavelets.

- Sarkar, Jyotirmoy. Indiana University - Purdue University, Indianapolis, USA (25.6.1996) : The Blackwell Prediction Algorithm and Its Generalization.
- Sarkar, Jyotirmoy . Indiana University - Purdue University, Indianapolis, USA (8.7.1996) : Sequential Confidence Intervals with Fixed Proportional Accuracy.
- Sarkar, Jyotirmoy. Indiana University - Purdue University, Indianapolis, USA (19.7.1996) : An Accelerated Sequential Estimation.
- Sarkar, Sahadeb. Oklahoma State University, USA (26.6.1996) : Minimum Negative Exponential Disparity Estimation in Parametric Models.
- Sen, Jayanta. Calcutta University (10.1.1997) : Linear Logic and MV-Algebras.
- Shukla, R.P., N.E.H.U., Shillong (24.1.1997) : Alperio-Dade Conjecture.
- Sunder, V.S. Institute of Mathematical Sciences, Madras (8.10.1996 and 10.10.1996) : Hypergroups and Association Schemes and Subgroups and bi-modules.
- Swartz, C., New Mexico State University, USA (3.1.1997) : A Continuous version of the gliding hump property.
- Verma, D.N. . TIFR (21.5.1996) : Some Aspects of Representation Theory as Generalized Multilinear Algebra.
- Viswanath, K., University of Hyderabad (14.5.1996) : Dynamics of Neural Network.
- Voiculescu, D., University of California, Berkeley, USA (13.1.1997) : Free Harmonic Analysis.

Applied Statistics Division

Applied Statistics Unit

- Biswas, Atanu, University of Calcutta, India (4.3.97) : Delayed response in randomised play the winner rule for clinical test.
- Mukherjee, Rahul, IIM, Calcutta, India (27.8.96) : Second order probability matching priors.
- Perriman, Bill, Curtin University of Technology, Australia (4.2.97) : The Probabilities of O.J. Simpson.
- Sarkar, Jyotirmoy, Indiana University, USA (23.7.96) : An algorithm to construct a Bayesian factorial design
- Sarkar, Sahadeb, Oklahoma State University, USA (4.7.96) : Testing for a unit root in ARMA Models with missing data.
- Sinha, S.K., University of Manitoba, Canada (18.3.97) : Prediction interval and reliability assessment of the k th future failure time in exponential models under certain restrictions.
- Som, Ranjan K., Consultant on Population to United Nations (16.7.96) : Multi-country survey programmes.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition

Roy Chaudhuri, Somak, Inter University Centre for Astronomy and Astrophysics, Pune (10.4.1996) : Motion in the Universe.

Electronics

Bandyopadhyay, Subir, Dept. of Computer Science, Windsor University, Canada (14.1.97) : Synthesis of Multilevel Pass Transistor Logic Networks Decision Diagram Approach.

Chakrabarty, Shyam Sundar, Dept. of Electrical Engg., Helsinki University of Technology (8.11.96) : Research on Telecommunication Technology in HUT.

Ghose, Kanad, State University of New York, Binghamton (15.1.97) : Fast Message Passing in the SNOW Prototype.

Haldar, S., Theoretical Computer Science Group, TIFR, Mumbai (23.4.96) : Construction of Atomic Shared Variables.

Machine Intelligence Unit

Bhattacharya, P., Dept. of Computer Science & Engineering, Indian Institute of Technology, Bombay (24.5.1996) : Alap - A Natural Language Interface to an Object Relational Database Management System.

Chakraborty, G., Dept. of Software Engineering, University of Aizu, Japan (20.1.1997) : Hopfield Net for Solving Steiner Tree Problem.

Deb, K., Dept. of Mechanical Engg., Indian Institute of Technology, Kanpur (21.6.1996) : Introduction to Genetic Algorithm.

Mitra, M., Dept. of Computer Science, Cornell University, Ithaca, New York (12.9.1996) : Automatic Text Processing and Information Retrieval.

Physics and Earth Sciences Division

Geological Studies Unit

Morales, Michael, USA (21.3.1997) : Vertebrates from Moenkopi Formation of USA.

Wilson, Jeffrey A., USA (11.10.1996) : Cretaceous dinosaurs from Morocco.

Physics and Applied Mathematics Unit

- Bajaj, Kapil, University of California, Santa Barbara, USA (26.8.1996) : An overview of experimental activities at USCSBA on pattern formation in Rayleigh - Benard convection.
- Bhattacharyya, Budhadeb, Formaly of St. Xaviers College, Calcutta (25.2.1997) : Synergetics in Neutrino Oscillators.
- Chakrabarti, A., Department of Mathematics, Indian Institute of Science, Bangalore (18.9.1996) : Mixed interpolation formulae.
- Debnath, L., Senior Fullbright Fellow, University of Central Florida, USA (23.9.1996) : Nonlinear Dispersive Waves.
- Debnath, L., Senior Fullbright Fellow, University of Central Florida, USA (25.9.1996) : Nonlinear Instability Problems, Part I.
- Debnath, L., Senior Fullbright Fellow, University of Central Florida, USA (3.10.1996) : Solitons and the Inverse Scattering Transforms.
- Debnath, L., Senior Fullbright Fellow, University of Central Florida, USA (30.10.1996) : Nonlinear Instability Problems, Part II.
- Evans, D.V., School of Mathematics, University of Bristol, U.K. (9.12.1996) : The rotting of a thin plate in water of finite depth.
- Evans, D.V., School of Mathematics University of Bristol, U.K. (10.12.1996) : Scattering of infinite array of rectangular blocks extending throughout the water depth.
- Majumder, Sekhar, National Aeronautics Limited, Bangalore (3.3.1997) : Modelling of Near Wall Turbulent Flow's.

Biological Sciences Division

Agricultural Sciences Unit

- Jones, Richard Palmer, UEA, U.K. (May 1996) : Adaptation of GIS Technology in Resource Analysis.
- Kam, S., IRRJ (13.3.1997) : What GIS can and can not.

Anthropology and Human Genetics Unit

- Deka, Ranjan, University of Pittsburgh, USA (15.7.1996) : Tracing the origin of modern humans using microsatellites.

Biochemistry

- Bandyopadhyay, Gautam, University of South Florida, VA Medical Centre, Tampa, Florida, USA (10.10.1996) : Post-receptor signalling pathways for insulin action : Role of protein kinase-C in Insulin-stimulated glucose transport.

Social Sciences Division

Economic Research Unit

- Agarwal, Pradep, Indira Gandhi Institute of Development Research, Mumbai (31.1.1997) : On saving, investment and financial development in East-Asia and India.
- Basu, Paramap, Fordham University, USA (9.1.1997) : Monetary policy, banking and growth when seigniorage has growth enhancing effect.
- Bera, Anil, University of Illinois, Urbana-Champaign, U.S.A. (21.1.1997) : Testing constancy of correlation with an application to international equity returns.
- Bose, Deb Kumar, Pollution Control Board, West Bengal (15.1.1997) : Economics of Energy.
- Chaudhuri, Manas, Narasimha Dutta College, West Bengal (27.2.1997) : Input joint venture : some new results.
- Daripa, Arup Ratan, Birkbeck College, U.K. (22.8.1996) : Market allocation and the value of inside information.
- Datta, Madhusudan, Kalyani University (25.7.1996) : Productivity trend in the organized manufacturing sector in India : 1970-88.
- Ghatak, Subrata, University of Leicester, U.K. (20.1.1997) : Endogenous growth - case of Turkey and Malaysia.
- Ghosh Dasidhar, Krishnendu, JNU (11.7.1996) : Existence of pure strategy Bertrand equilibrium.
- Gupta, Subhashish, The University of IOWA, USA (14.5.1996) : Information transmission in joint decision making.
- Puentes, H., Hemming, R. and Kireyev, A., International Monetary Fund, Washington, U.S.A. (4.11.1996) : The role of IMF in India and the World economy.
- Ray, Saon, CSOILE, SIS, JNU (20.6.1996) : Market power and trade policy.
- Roy Choudhuri, Probal, JNU (1.8.1996) : Generalized assignment models with an application to technology transfer.
- Sarkar, Punyabrata, CMDA (26.9.1996) : On the specification and estimation of macro educational function with reference to the urban poor of Calcutta.
- Sen, Partha, Delhi School of Economics (25.6.1996) : Bubbles in a dynamically efficient economy.

Economic Analysis Unit

- Rajeev, Menezakshi, Centre for Studies in Social Sciences, Calcutta (2.7.1996) : On money as a Medium of Exchange.
- Sen, Anindya, IGIDR, Mumbai (24.7.1996) : Effects of Liberalisation on Managerial remuneration in some large Indian firms.
- Sivakumar, S., University of Madras, Chennai (13.8.1996) : The Problem of Regulating Prices and the Theory of State.

Psychology Research Unit

Fischer, Gerhard H., University of Vienna, Austria (18.2.1997) : Structural Item Response Models for Treatment effect studies.

Sociological Research Unit

Beteille, Andre, Delhi University (7.7.96 and 8.7.96) : Reproduction of inequality.

Schelesinger, Lee J., Fulbright Lecturer, USA (9.7.96 and 10.7.96) : Habitus, Dharma and everyday rituals remarks on the relevance of Pierre Bourdieu's Theory of Practice for a study of Indian village life.

Library, Documentation and Information Sciences Division

Documentation Research and Training Centre

Anudavalli, Reader, Deptt. of Lib. & Inf. Sc., Madras University (8.1.1997) : Role of Information Professionals in the Changing Environment.

Bhattacharyya, G. (29.1.1997) : Design and Development of Indexing Language.

Browne, Maricad, Deptt. of Information Studies, Faculty of Humanities and Social Science, University of Technology, Sydney (12.2.1997) : Impact of Information Technology on Library Collections and Services.

Meadelsohn, Hendry, Information Resource Officer, United States Information Services, New Delhi (28.9.1996) : Service in Automated Libraries : Challenges and Opportunities.

Neelameghan, A., visiting Honorary Professor, DRTC (6.3.1997) : Scientific communications.

Rajashekar, T.B., Head, NCSI, Indian Institute of Science, Bangalore (9.8.1996) : Internet Applications.

Reddy, Rama, University Librarian, Central University, Hyderabad (24.1.1997) : Experience in Automation in the Central University Library.

6. PUBLICATIONS

Sankhyā

Founded and edited by Professor P.C. Mahalanobis in 1933 Sankhyā, the Indian Journal of Statistics and the official organ of the Indian Statistical Institute is now published bi-monthly in two series - Ser. A on Probability and Mathematical Statistics, and Ser. B on Statistical Methodology and Applications including Sample Surveys and Quantitative Economics. Since its inception, eminent scholars all over the world have been contributing research articles for publication in Sankhyā, one of the most prestigious and internationally renowned journals.

Journal Committee :

Editors : Somesh Das Gupta, G. Kallianpur, K.R. Parthasarathy, B.L.S. Prakasa Rao and C.R. Rao.

From January 1997 : Somesh Das Gupta and J.K. Ghosh

Co-Editors : Sankhyā A : Arup Bose, Mohan Delampady, Kesar Singh, R.L. Karandikar, P.K. Bhattacharya and Bimal K. Sinha.

From January 1997 : Sujit K. Basu, P.K. Bhattacharya, Arup Bose, A. Dasgupta, Mohan Delampady, R.L. Karandikar, Hira L. Koul and Kesar Singh.

Sankhyā B : Dipankar Coondoo, S.R. Mohan, T.J. Rao and Bikas Kumar Sinha.

From January 1997 : Dipankar Coondoo, Anup Dewanji, Aloke Dey, S.R. Mohan, T.J. Rao and Bimal K. Sinha.

Managing Editors : Series A : R.L. Karandikar

Series B : T.J. Rao

From January 1997 : Series A : Arup Bose

Series B : T.J. Rao

The following publications are published during April 1996 to March 1997 :

- a) Sankhyā Ser. A : Volume 58, Parts 1, 2 and 3
Volume 59, Part 1
- b) Sankhyā Ser. B : Volume 58, Parts 1, 2 and 3

Other Publication

A biography on 'Prasanta Chandra Mahalanobis - Scientist and Renaissance man' is published.

7. SCIENTIFIC PAPERS AND PUBLICATIONS

Books Published

Theoretical Statistics and Mathematics Division

Delhi Unit

Bhatia, R. : *Matrix Analysis*, Springer-Verlag, New York, 350, 1997.

Bhatia, R. (ed.) : *Analysis, Geometry and probability*, Hindustan Book Agency, Delhi, 420, 1996.

Applied Statistics Division

Applied Statistics Unit

Mukhopadhyay, P. : *Inferential Problems in Survey Sampling*, New Age International Pvt. Ltd., New Delhi, 242, 1996.

Krishnan, T. and McLachlan, G. J. : *The EM algorithm and Extensions*, John Wiley & Sons, New York, 274, 1997.

Computer and Communication Sciences Division

Machine Intelligence Unit

Pal, S. K. and Wang, P. P. (eds.) : *Genetic Algorithms for Pattern Recognition*, CRC Press, Boca Raton, Florida, 336, ISBN NO. 0-8493-9467-8, June, 1996.

Physics and Earth Sciences Division

Physics and Applied Mathematics Unit

Mandal, B.N. (ed) : *Mathematical Techniques for Water Waves*, International Series on *Advances in Fluid Mechanics*, Computational Mechanics Publications Southampton, Vol. 8, 350, 1997.

Roy, S., Evans, M.W., Vigier, J.P. and Jeffers, S. : *The Enigmatic Photon*, Vol. III, Kluwer Academic Publishers, Netherlands, 1996.

Roy, S., Jeffers, S., Vigier, J.P. and Hunter, G. : *The Present status of the Quantum Theory of Light*, Kluwer Academic Publishers, Netherlands, 1997.

Biological Sciences Division

Anthropology and Human Genetics Unit

Bose, A., Roy, B. C., Gupta, R. (eds.) : India : Challenges and Response, Calcutta, Puzhi Pustak, 1996.

Social Sciences Division

Economic Research Unit

Chattopadhyay, M., Maiti, P. and Rakshit, M. (eds.) : *Planning and Economic Policy in India : Evaluations and Lessons for the Future*, Sage Publications India Pvt. Ltd., New Delhi, 215, 1996.

Sociological Research Unit

Ghosh, B.N. : *Rural Leadership and Development*, Mohit Publication, New Delhi, 1996.

Library, Documentation and Information Sciences Division

DRTC (Bangalore)

Seetharama, S. : *Information Consolidation and Repackaging*, Ess Ess Publication, New Delhi, 292, 1997.

Papers Published in Journals

Theoretical Statistics and Mathematics Division

Calcutta Unit

Bose, S. : Classification using splines, *Computational Statistics & Data Analysis*, 22, 505 - 525, 1996.

Bose, S., Koopesburg, C. and Stone, C.J. : Polychotomous regression, *Journal of the American Statistical Association*, 92, 117 - 127, 1997.

Bose, S. and O'sullivan, F. : A Regression Based Image Segmentation Method for Multi-channel Data, *Journal of the American Statistical Association*, 92, 92 - 106, 1997.

Chaudhuri, P. : On a Geometric Notion of Quantiles for Multivariate Data, *Journal of the American Statistical Association*, 91, 862 - 872, 1996.

Chaudhuri, P. and Chakraborty, B. : On a Transformation and Re-transformation Technique for Constructing an Affine Equivariant Multivariate Median, *Proceedings of the American Mathematical Society*, 124, 2539 - 2547, 1996.

Das, A. and Gupta, S. : Optimal Block Designs for Triallel Cross Experiments, *Commun. Statist.-Theory Meth.*, 26, 1997.

- Ghosh, J.K., Ghosal, S. and Samanta, T. : On the convergence of the posterior, *Annals of Statistics*, 23, 2145 - 2152, 1995.
- Ghosh, J.K. and Clarke, B. : Convergence of posterior given sample mean, *Annals of Statistics*, 23, 2116 - 2144, 1995.
- Ghosh, J.K., Mukherjee, R. and Sen, P.K. : Second order Pitman Admissibility and Pitman Closeness : the multiparameter case and Stein-rule estimators, *Jour. Mult. Anal.*, 57, 52 - 68, 1996.
- Mukherjee, A. and Mukherjee, G. : Bredon - Illman cohomology with local coefficients, *Quart. J. Math., Oxford*, 47, 199 - 219, 1996.
- Mukherjee, G. : Hopfian and Co-Hopfian G-cw complexes, *Proc. AMS*, 1997.
- Mukherjee, G. and Naolekar, A.C. : Bredon Cohomology of Cyclic geometric realization of G-Cyclic Sets, *Proc. I.A.Sc.*, 106, 1996.
- Raha, A.B. and Kundu, S. : The bounded open topology and its relatives, *Rendiconti Dell'Istituto Di Matematica Dell'Universita' Di Trieste*, 27, 1995.
- Raha, A.B. and Kundu, S. : The Dual of $C_c(X)$, *Mathematica Japonica*, 46, 3, 1996.
- Rao, A.R., Jana, R. and Bandyopadhyay, S. : A Markov Chain Monte Carlo method for generating random (0,1) - matrices with given marginals, *Sankhya, Ser. A*, 58(Part 2), 225 - 242, 1996.
- Rao, T.J. and Bedi, P.K. : Probability Proportional to revised sizes with replacement scheme, *Metrov, LV(1-2)*, 67 - 82, 1996.
- Saha, G.M., Sinha, K. and Mitra, R.K. : Nested BIB designs, Balanced Bipartite Weighing Designs and Rectangular Designs, *Utilitas Mathematica*, 49, 216 - 222, 1996.
- Sinha, B.K., Liski, E.P. and Arto, L. : Optimal Designs in Random Coefficient Linear Regression Models, *Calcutta Statistical Association Bulletin*, 46, 211 - 229, 1996.
- Sinha, B.K., Mandal, N. K., Liski, E.P. and Arto, L. : Optimal Designs for Inverse Prediction in Random Coefficient Linear Regression Models, *Golden Jubilee Volume of the Journal of Indian Society of Agricultural Statistics (JISAS)*, 277 - 288, 1996-97.
- Srivastava, S.M. : Transfinite Numbers, what is Infinity ? (An expository article for college Teachers and Students), *Resonance*, 2, 1997.

Delhi Unit

- Balasubramanian, K., Bapat, R.B. and Beg, M.I. : An identity for the joint distribution of order statistics and its applications, *Journal of Statistical Planning and Inference*, 55, 13 - 21, 1996.
- Balasubramanian, K. and Beg, M.I. : Concomitant of order statistics in the bivariate exponential distributions of Marshall and Olkin, *Statistical Association Bulletin*, 46, 109 - 115, 1996.
- Balasubramanian, K. and Dey, Aloke. : Distributions characterized through conditional expectations, *Metrika*, 45, 189 - 196, 1997.
- Balasubramanian, K. and Balakrishnan, N. : Characterization of uniform distribution, *Journal Ind. Soc. Ag. Statistics*, 49 (Golden Jub. No.), 259 - 266, 1996-97.

- Bhatia, R. and Li, R.C. : On perturbations of matrix pencils with real spectra II, *Mathematics of Computation*, 65, 637 - 645, 1996.
- Bhatia, R. and Elsner, L. : On joint eigenvalues of commuting matrices, *Canadian Mathematical Bulletin*, 39, 164 - 168, 1996.
- Bhatia, R. and Semrl, P. : Distance between Hermitian operators in Schatten classes, *Proceedings of the Edinburgh Mathematical Society*, 39, 377 - 380, 1996.
- Bhatia, R. and Rosenthal, P. : How and why to solve the operator equation $AX - XB = I$, *Bulletin of the long Mathematical society*, 29, 1 - 21, 1997.
- Bhatia, R. and Kittaneh, F. : Some inequalities for norms of commutators, *SIAM Journal on Matrix Analysis and its Applications*, 18, 258 - 263, 1997.
- Bhatt, Abhay G and Borkar, V.S. : Occupation measures for controlled markov processes : characterization and optimality, *The Annals of Probability*, 24, 1531 - 1562, 1996.
- Dej, Aloke and Balasubramanian, K. : D-optimal designs with minimal and nearly minimal number of units, *J. Statist. Plann. Inference*, 52, 255 - 262, 1996.
- Dej, Aloke and Midha, C. K. : Optimal block designs for diallel crosses, *Biometrika*, 83, 484 - 489, 1996.
- Dej, Aloke and Midha, C. K. : Construction of some asymmetrical orthogonal arrays, *Statist. Probab. Lett.*, 28, 211 - 217, 1996.
- Dej, Aloke, Buchthal, D.C. and Midha, C.K. : Efficiency of the residual design under the loss of observations in a block, *Golden Jubilee issue of the J. Indian Soc. Agric. Statist.*, 237 - 248
- Dej, Aloke and Midha, C. K. : A note on resolvable incomplete block designs, *J. Indian Statist. Assoc.*, 1996.
- Kochar, S. : Dispersive ordering of order statistics, *Stats. & Prob. Letters*, 27, 271 - 274, 1996.
- Kochar, S. : Some results on interarrival times of nonhomogeneous Poisson Processes, *Prob. Engg. Inf. Sci.*, 10, 75 - 85, 1996.
- Kochar, S. : A note on dispersive ordering of record values, *Calcutta Statistical Association Bulletin*, 46, 63 - 67, 1996.
- Kochar, S., Boland, P.J., Hollander, M. and Joag-dev, K. : Bivariate dependence properties of order statistics, *J. Mult. Anal.*, 56, 75 - 89, 1996.
- Kochar, S., Dykstra, R. and Robertson, T. : Testing whether one risk progresses faster than the other in a competing risk problem, *Statistics and Decisions*, 14, 209 - 222, 1996.
- Kochar, S. and Korwar, R. : Stochastic orders for spacings of heterogeneous exponential random variables, *J. Mult. Anal.*, 57, 69 - 83, 1996.
- Kochar, S. and Rojo, J. : Some new results on stochastic comparisons of spacings from heterogeneous exponential distributions, *J. Mult. Anal.*, 59, 272 - 281, 1996.
- Parthasarathy, K.R. : A group-theoretic approach to generalized Bahadur expansion for joint probability densities, *J. Ind. Soc. Ag. Stat.*, 49 (Golden Jub. No.), 157 - 166, 1996-97.
- Parthasarathy, T., Murthy, G.S.R. and Sabatini, M. : Lipschitzian Q-matrices are P-matrices, *Math. Prog.*, 74, 55 - 58, 1996.

- Parthasarathy, T., Murthy, G.S.R. and Sripama, B. : Constructive characterization of Lipschitzian Q -matrices, *Lin. Alg. and its Appl.*, 252, 323 - 337, 1997.
- Prakasa Rao, B.L.S. and Bhat, B.R. : Nonparametric approach to time series analysis, *Stochastic Processes and Statistical Inference*, New Age International, New Delhi, 73 - 89, 1996.
- Prakasa Rao, B.L.S. : Remarks on Cramer-Rao type integral inequalities for randomly censored data, *Analysis of Censored Data*, IMS Lecture Notes, 27, IMS California 163 - 176, 1996.
- Prakasa Rao, B.L.S. : Optimal asymptotic tests of composite hypotheses for continuous time stochastic processes, *Sanhya Ser. A*, 58, 8 - 24, 1996.
- Prakasa Rao, B.L.S. : Nonparametric estimation of the derivatives of a density by the method of wavelets, *Bull. Inform. C'yb.*, 28, 91 - 100, 1996.
- Sinha, K.B. and Mohapatra, A. : Spectral shift function and trace formula for unitaries - a new proof, *Integral Equations and Operator theory*, 24, 285 - 297, 1996.
- Sinha, K.B., Bhat, B.V.R. and Fagnola, F. : Confining one-dimensional brownian motion, *Russian Jour of Math. Phys.*, John Wiley N.Y., 4, 13 - 28, 1996.
- Sinha, K.B. Representations of q -CR. *Analysis, Geometry and Probability*, Ed. R. Bhatia, TRIM series, Hindustan Delhi, 1996.
- Sinha, K.B. : On Nelson's stochastic mechanics, *Lecture Notes in Physics, Springer-Verlag*, 1997.

Bangalore Unit

- Bagchi, Bhaskar and Misra, G. : Constant Characteristic Functions and Homogeneous Operators, *J. Operators Theory*, 37, 51 - 65, 1997.
- Bagchi, Bhaskar : Customers in book exhibition, *Resonance*, 7, 75 - 78, 1996.
- Bagchi, Bhaskar : Bachel's Problem, *Resonance*, 11, 88 - 91, 1996.
- Bagchi, Sunanda : Two infinite series of E-optimal nested row-column designs, *J. Statist. Plann. Inference*, 52, 353 - 357, 1996.
- Bagchi, Sunanda : An infinite series of adjusted orthogonal designs with replication two, *Statistica Sinica*, 6, 975 - 987, 1996.
- Balaji, S. and Ramasubramanian, S. : Recurrence and transience of diffusions in a half space, *Bernoulli*, 3, 97 - 119, 1997.
- Ghosh, J. K., Joshi, S.N. and Mukhopadhyay, C. : Asymptotics of Bayesian Approach to estimation of Change-Point in a Hazard Rate, *Comm. Statist.* 25, 3147, 1996.
- Padmawar, V.R. : Rao-Hartley-Cochran strategy in the survey sampling of continuous populations, *Sanhya (B)*, Vol. 58, 90 - 104, 1996.
- Pati, V., Sitaram, A., Sundari, M. and Thangavelu, S. : An uncertainty principle for eigenfunction expansions, *J. Fourier Analysis and applications*, 2, 427 - 433, 1996.
- Peetre, Jaak, Thangavelu, S. and Wallin, Nils-Olof : Generalized Fock spaces, interpolation multipliers, circle geometry, *Revista Mathematica Iberoamericana*, 12, 63 - 110, 1996.

- Rajarama Bhat, B.V., Fagnola, F. and Sinha, K.B. : On quantum extensions of semigroups of Brownian motion on a half-line, *Russian Journal of Math. Phys.*, 4, 13 - 28, 1996.
- Rajarama Bhat, B.V. : An index theory for quantum dynamical semigroups, *Trans. of Amer. Math. Soc.*, 348, 561 - 583, 1996.
- Ramasubramanian, S. : Transition densities of reflecting diffusions, *Sankhya, Ser. A*, 58, 347 - 381, 1996.
- Rao, T. S. S. R. K. : On a new geometric property for Banach spaces, *Proc. Indian Acad. Sci. (Math. Sci)*, 107, 35 - 42, 1997.

Applied Statistics Division

Applied Statistics Unit

- Adhikary, A.K. : On non-negativity of the nearest proportional to size sampling design, *Communications in Statistics - Theory and methods*, 25, 1757-1768, 1996.
- Basu, A., Harris, I. R. and Basu, S. : Tests of hypotheses in discrete models based on the penalized hellinger distance, *Statistics and Probability Letters*, 27, 367 - 373, 1996.
- Basu, A., Shin, D.W. and Sarkar, S. : Small sample comparisons for the blended weight chi-square goodness-of-fit tests', *Communications in Statistics: Theory and Methods*, 25, 211 - 226, 1996.
- Basu, A. and Bhattacharya, B. : Robust estimates of ordered means in normal models, *Journal of Statistical Computation and Simulation*, 54, 165 - 175, 1996.
- Basu, A. and Basu, S. : Estimation of the population attributable risk for longitudinal data - a quasi-likelihood approach, *Calcutta Statistical Association Bulletin*, 46, 253 - 262, 1996.
- Basu, A., Markatou and Lindsay, B.G. : Weighted likelihood estimating equations: the discrete case with applications to logistic regression', *Journal of Statistical Planning and Inference*, 57, 215 - 232, 1997.
- Chaudhuri, A. and Mitra, Joydip : Setting confidence intervals by ratio estimator, *Comm. Stat. Theo. Meth.*, 25, 1135 - 48, 1996.
- Chaudhuri, A. : Estimation of total and variance estimation in a version of unequal probability sampling in three stages, *Pak. Jour. Stat.*, 12, 1 - 7, 1996.
- Chaudhuri, A. and Adhikary, A.K. : On generalized regression estimators of small domain totals - an evaluation study', *Pak. Jour. Stat.*, 11, 173 - 189, 1995.
- Chaudhuri, A., Maiti, T. and Roy, D. : A note on competing variance estimators in randomized response survey, *Aust. Jour. Stat.*, 38, 35 - 39, 1996.
- Chaudhuri, A. and Maiti, T. : Estimating regression coefficients from survey data by asymptotic design-cum-model based approach, *Metrika*, 43, 123 - 133, 1996.
- Chaudhuri, A. and Maiti, T. : Asymptotic design-cum-model based estimator of variances of estimated linear regression coefficients in survey sampling with unequal probabilities, *Statistische Hefte*, 37, 79 - 84, 1996.

- Chaudhuri, A. and Maiti, T. : Estimating small domain means on borrowing strength across time and similar domains - a case study. *Jour. Ind. Soc. Agri. Stat.*, 49, 131 - 138, 1996-97.
- Devanji, A. and Luebeck, EG and Moolgavkar, SH. : A biologically based model for the analysis of premalignant foci of arbitrary shape. *Mathematical Biosciences*, 135, 55 - 68, 1996.
- Mukhopadhyay, P. and Vijayan, K. : On controlled sampling designs. *Journal of Statistical Planning and Inference*, 52, 375 - 378, 1996.
- Mukhopadhyay, P. : Bayes estimation of small area totals under measurement error models. *Journal of Applied Statistical Sciences*, 591, 105 - 111, 1997.
- Mukhopadhyay, P. and Vijayan, K. : Estimating functions in response dependent sampling from finite populations. *Metron*, LIII n. 3 - 4, 143 - 150, 1996.
- Mukhopadhyay, P. and Vijayan, K. : Estimating functions in survey sampling using randomised response model. *Journal of Indian Statistical Association* 34, 1 - 9, 1996.
- Pal Chaudhury, P., Khan Raouf, A. and Dihadar. Kajal : VLSI Architecture of a Cellular Automata machine. *Computers and Mathematics with Applications*, 33, 79 - 94, 1997.
- Sengupta, D. and Bhattacharjee, A. : On the coefficient of variation for the L-class of life distributions. *Statistics and Probability Letters*, 7, 177 - 180, 1996.
- Sengupta, D. and Bhimasankaram, P. : The linear zero functions to linear models. *Sankhya Series B*, 58, 338 - 351, 1996.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

- Chaudhuri, B. B. and Pal, U. : Skew angle estimation of digitized Indian script. *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 19, 182 - 186, 1997.
- Chaudhuri, B. B. and Rosenfeld, A. : On a metric distance between fuzzy sets. *Pattern Recognition Letters*, 17, 1157 - 1160, 1996.
- Chaudhuri, D., Murthy, C. A. and Chaudhuri, B. B. : A data driven procedure for density estimation with some applications. *Pattern Recognition*, 29, 1719 - 1736, 1996.
- Dutta, A., Pal, T. and Parui, S. K. : A modified self-organizing neural net for shape extraction. *Neurocomputing*, 14, 3 - 14, 1997.
- Dutta, A. and Parui, S. K. : A dynamic neural net to compute convex hull. *Neurocomputing*, 10, 375 - 384, 1996.
- Mukherjee, S., Bhattacharya, U., Parui, S. K., Gupta, R. and Gupti, R. K. : A multi-layered backpropagation ANN algorithm for spectral classification of UV data. *Astrophysics and Space Science*, 239, 361 - 373, 1996.
- Pal, U. and Chaudhuri, B. B. : An improved document skew angle estimation technique. *Pattern Recognition Letters*, 17, 896 - 901, 1996.

Saha, P. K. and Chaudhuri, B. B. : 3-D topology under binary transformation with applications, *Computer Vision and Image Understanding*, 63, 418 - 429, 1996.

Sengupta, P. and Chaudhuri, B. B. : Morphological Processing of Indian Language for lexical Interaction with Application to Spelling Error Correction, *SADHANA*, 21, 363 - 380, 1996.

Electronics Unit

Das N. and Datta Gupta, J. : Fault identification and routing in Benes networks, *Journal of Systems Architecture (Elsevier)*, 42, 67 - 81, 1996.

Das. N. and Datta Gupta, J. . Two-pass rearrangeability in faulty Benes network, *Journal of Parallel and Distributed Computing. (Academic Press)*, 35, 191 - 198, 1996.

Das. R. K. and Sinha, B. P. : A new topology with odd degree for multiprocessor systems, *Journal of Parallel and Distributed Computing. (Academic Press)*, 39, 87 - 94, November 1996.

Mitra, P. and Nandy, S. C. : Efficient computation of rectilinear geodesic Voronoi neighbor in presence of obstacles. FSTTCS - 16. Lecture Notes in Computer Science (LNCS-1180). Springer Verlag. 76 - 87, 1996.

Sen Gupta, S., Das, R. K., Mukhopadhyay, K. and Sinha, B. P. : A family of network topologies with multiple loops and logarithmic diameter, *Parallel Computing. (Elsevier)*, 22, 2047 - 2064, 1997.

Electronic and Communication Sciences Unit

Banerjee, S., Mukherjee, Dipati Prasad and Datta Majumder, D. . Fuzzy c-means approach to tissue classification in multimodal imaging, *Information Science*, February 1997.

Chanda, A., De, A. K. and Das, J. : Diffusion of scalar in non-steady homogeneous turbulence. *News Bulletin of Calcutta Mathematical Society*, 19, 6 - 14, 1996.

Chanda, A., Das, J. and Sarkar, S. K. : Some statistical studies of semidiurnal radio refractivity variation in coastal atmosphere. *Indian Journal of Radio and Space physics*, 25, 245 - 248.

Chanda, B. and Harallick, R.M. : Mathematical morphology and geometrical properties of digital objects. *Mathematical Morphology : Theory and Applications*, R.M. Haralich, (ed.), Oxford University Press, N.Y. (In Press), 1996.

De, Arun, K., Mukherjee, Dipati Prasad, Pal, P. and Das, J. : SODARPRETER: A Novel Approach Towards Automatic Interpretation of SODAR Data. *International J. of Remote Sensing* (In press), July, 1996.

Das, A.K. and Chanda, B. : Text segmentation from document images : A morphological approach. *J. Inst. of Engineers (India)*, 77, 50 - 56, 1996.

Das, A.K. and Chanda, B. : Adjacency matrix generation from the image of graphs : A morphological approach, *J. Machine Vision and Applications*, 1996.

Mazumder, H. P., Islam, N. and Chanda, A. : A mathematical model for turbulent bubble plume, *physica scripta (Sweden)*, 53, 575 - 581, 1996.

Mukherjee, Dipati Prasad and Brady, Michael : Symmetry Analysis Through Wave Propagation, *International Journal of Pattern Recognition and Artificial Intelligence*, 10, 291 - 301, 1996.

- Mukherjee, Dipi Prasad and Brady, Michael : Symmetry Analysis Through Wave Propagation, *International Journal of Pattern Recognition and Artificial Intelligence*, 10, 291 - 301, 1996.
- Mukherjee, Dipti Prasad, Pal, P. and Das, J. : Segmentation of Sodar Images using Fuzzy c-means. *In Signal Processing*, 54, 295-301, 1996.
- Mukherjee, Dipi Prasad and Dutta Majumder, D. : On Shape from Symmetry, *Proceeding of INSA, Part A*, 62, September, 1996.
- Mukherjee, D. P., Tripathy, S. K., Chanda, A., De, A. K., Pal, P. and Das, J. : Mask Design for Enhancement of Atmospheric Images. *Image Processing and Communications*.

Machine Intelligence Unit

- Bandyopadhyay, S. and Pal, S. K. : Pattern classification with genetic algorithms : incorporating of chromosome differentiation, *Pat. Recog. Lett.*, 18, 119 - 131, 1997.
- Banerjee, M. and Pal, S. K. : Roughness of a Fuzzy Set, *Inform. Sciences*, 93, 235 - 246, 1996.
- Basak, J., Murthy, C. A. and Pal, S. K. : A self-organizing network for mixed category perception. *Neurocomputing*, 10, 341 - 358, 1996.
- Basak, J., Pal, N. R. and Patel, P. S. : Thinning in binary and gray images. *J. Inst. Electron. Telecom Engrs. (Spl. Issue on Neural Networks)*, 42, 305 - 313, 1996.
- Bhandari, D., Murthy, C. A. and Pal, S. K. : Genetic algorithm with elitist model and its convergence. *Int. J. Patt. Recog. Art. Intell.*, 10, 731 - 747, 1996.
- Biswas, S. N., Pal, N. R. and Pal, S. K. : Smoothing of digital images using the concept of diffusion process. *Pat. Recog.*, 29, 497 - 510, 1996.
- Ghosh, A., Tsutsui, S. and Tanaka, H. : Genetic search with aging of individuals, *Int. J. Knowledge Based Intell. Engg. Systems*, 1, 86 - 103, 1997.
- Karayannis, K., Bezdek, J. C., Pal, N. R., Hathaway, R. J. and Pai, P. I. : Repairs to GLWQ a new family of competitive learning schemes. *IEEE Trans. Neural Networks*, 7, 1062 - 1071, 1996.
- Mandal, D. P. : An MLP based approach for computing the shape of a pattern class. *J. Inst. Electron. Telecom. Engrs. (Spl. Issue on Neural Networks)*, 42, 293 - 305, 1996.
- Mandal, D. P., Murthy, C. A. and Pal, S. K. : Analysis of IRS imagery for detecting man-made objects with a multivalued recognition system, *IEEE Trans. System, Man, Cyberns., Part A: Systems and Humans*, 26, 241 - 247, 1996.
- Mandal, M. K., Asthana, H. S., Pandey, R. and Sarbadhikari, S. : Cerebral laterality in affect and affective illness : A review, *J. Psychology*, 130, 447 - 459, 1996.
- Mitra, S. and Pal, S. K. : Fuzzy self organization, inferencing and rule generation, *IEEE Trans. Systems Man, Cyberns., Part A: Systems and Humans*, 26, 608 - 620, 1996.
- Mitra, S. and Pal, S. K. : Neuro-fuzzy expert systems : Relevance, features and methodologies. *J. Inst. Electron. Telecom. Engrs. (Spl. Issue on Neural Networks)*, 42, 335 - 347, 1996.
- Mitra, S., Sarbadhikari, S. N. and Pal, S. K. : An MLP-based model for identifying qEEG in depression. *Int. J. Biomed. Comput.*, 43, 179 - 187, 1996.

- Murthy, C. A. and Chowdhury, N.: In search of optimal clusters using genetic algorithms, *Pat. Recog. Lett.*, 17, 825 - 832, 1996.
- Pal, N. R., Bezdek, J. C. and Hathaway, R. J.: Sequential competitive learning and the fuzzy c-means clustering algorithms, *Neural Networks*, 9, 787 - 796, 1996.
- Pal, N. R., Chakraborty, S. and Bagchi, A.: RID3: An ID3 like algorithm for real data, *Information Sciences - Application*, 96, 271 - 290, 1997.
- Pal, N. R. and George, T.: Metric structures on possibility distributions, *Int. J. General Systems*, 25, 389 - 398, 1997.
- Pal, S. K. and Ghosh, A.: Neuro-fuzzy computing for image processing and pattern recognition, *Int. J. Systems Science*, 27, 1779 - 1193, 1996.
- Pal, S. K. and Mitra, S.: Noisy fingerprint classification using multilayer perceptron with fuzzy geometrical and textural features, *Fuzzy Sets & Systems*, 80, 121 - 132, 1996.
- Pal, S. K. and Pal, N. R.: Soft computing: Goals, tools and feasibility, *J. Inst. Electron. Telecom. Engrs. (Spl. Issue on Neural Networks)*, 42, 195 - 204, 1996.
- Roy, S., Kundu, M. K. and Granlund, G. H.: Uncertainty relation and time frequency distribution for unsharp observables, *Inform. Sciences*, 89, 193 - 209, 1996.
- Sarbadhikan, S. N.: Will the aging computer technology comfort the aging human?, *Speculations in Science and Technology (Spl. Issue on Computers in the Fight Against Aging)*, 19, 131 - 136, 1996.
- Sinha, S.: Chaos control in an oscillatory neural network model, *J. Inst. Electron. Telecom. Engrs. (Spl. Issue on Neural Networks)*, 42, 205 - 213, 1996.

Physics and Earth Sciences Division

Geological Studies Unit

- Bandyopadhyay, S. and Roy Chowdhury, T.: Beginning of the continental Jurassic in India, *Bull. Museum of Northern Arizona*, 60, 371 - 378, 1996.
- Bhattacharya, S.: Eastern Ghats granulite terrain of India: an overview, *Jour. Southeast Asian Earth Science*, 14, 3 - 4, 165 - 174, 1996.
- Chakraborty, T., Sarkar, S.N. and Chaudhuri, A.K.: Depositional environment of Vindhyan and other Purana basins: a reappraisal in the light of recent findings: in *Recent Advances in Vindhyan Geology, Mem. Geol. Soc. India*, 36, 101 - 126, 1996.
- Chatterjee, S. and Rudra, D.K.: KT events in India: rifting, volcanism and dinosaur extinction, *Mem. Queensland Museum*, 39, 489 - 532, 1996.
- Ghosh, P.S.: Sequence stratigraphic perspective of a fluvial deposit in continental interior: Abs. vols. 1 - 2, 12, *30th Intern. Geol. Cong.*, Beijing, 1996.
- Jain, S.L.: Aspects of Vertebrate fossils from Pranhita-Godavari Valley with emphasis on dinosaur discoveries, *Jour. Palaeont. Soc. India*, 41, 1 - 16, 1996.

- Joy, S. and Saha, D. : Influence of micaceous impurity on quartz c-axis fabric in L-S tectonites : *Abs. Vol. 2, 264, 30th Intern. Geology Cong.*, Beijing, 1996.
- Mukhopadhyay, J., Chaudhuri, A.K. and Chanda, S.K.: Deep water dolomite from Proterozoic Penganga Group, Adilabad, Andhra Pradesh, India : *Jour. Sedim. Res.* 66, 233 - 230, 1996.
- Paul, B.K., Mukherjee, D.C. and Mouluk, S.P. : Charge-transfer and fluorescence behaviour of hexylamine and 7,7,8,8 - tetracyanoquinodimethane in compartmentalized (reverse micelles and microemulsion) and nonaqueous solvents. *Jour. Photochem. Photobiol.*, 4 : Chemistry, 94, 53 - 62, 1996.
- Roychowdhury, T.K. and Ray, S. : Evolution of herbivorous feeding system in land vatebrates : *National Botanical Society*, 49, 1996.
- Saha, D. : Overall volume consiarcy vs local loss volume during crenulation cleavage development : a test based on χ^2 statistics : *Abs. Vol. 3, 494, 30th Intern. Geol. Cong.*, Beijing, 1996.

Physics and Applied Mathematics Unit

- Andersson, H. I., Aarseth, J. B., Brand, N. and Dandapat, B.S. : Flow of power law fluid film on an unsteady Stretching surface, *Journal of Non-Newtonian Fluid Mechanics*, 62, 1, 1996.
- Bagchi, B. and Roychowdhury, R. : New phase Equivalent partners to Eckart and Bergmann Potentials. *Mod. Phys. Lett.*, 12, 65, 1997.
- Banerjee, Sudeshna, Dolai, D.P. and Mandal, B.N. : On waves due to rolling of a ship in water of finite depth. *Archive of Applied Mechanics*, 67, 35 - 43, 1996.
- Banerjee, Sudeshna, Dolai, D.P. and Mandal, B.N. : On waves due to rolling of a plate submerged in finite depth water. *Applied Mechanics and Engineering*, 2, 1997.
- Basu, Banasri : Topological Aspects of a Fermion and Physics of the Hall Fluid. *IL Nuovo Cimento*, 8, 5, 361, 1996.
- Basu, Uma and Mandal, B.N. : Free surface flow over a small geometrical disturbance at the bottom. *Bulletin of Calcutta Mathematical Society*, 88, 355 - 362, 1996.
- Chakrabarti, A., Mandal, B.N., Basu, U. and Banerjee, S. : Solution of a class of hypersingular integral equations of second kind. *Z. Angew. Math. Mech.*, 77, 1997.
- Chakrabarti, A. and Mandal, Nanigopal : On some dual integral equations, *Z. Angew. Math. Mech.* 71, 1997.
- Chatterjee, P. and Roychowdhury, R. : Ion Acoustic Solution in an Electron beam Plasma. *Z. Naturforsch.* 1002, 519, 1996.
- Dolai, D.P. and Banerjee, S. : On gravity capillary waves due to interface disturbance. *International J. Mathematical Education in Science and Technology*, 27, 1997.
- Dolai, D.P. and Mandal, B.N. : Interface wave diffraction by a plate submerged in lower fluid. *Bulletin of Calcutta Mathematical Society*, 88, 409 - 425, 1996.
- Dolai, D.P. : Waves produced by disturbances at the interface between two superposed fluids. *Proceedings of Indian National Science Academy, A*, 62, 137 - 147, 1996.

- Kanoria, Mrdula and Mandal, B.N. : Oblique wave diffraction by two parallel vertical barriers with submerged gaps in water of uniform finite depth, *J. Technical Physics*, 37, 187 - 204, 1996.
- Kanoria, Mrdula and Mondal, B.N. : On waves due to rolling oscillations of a submerged plate, *J. Technical Physics*, 38, 107 - 116, 1997.
- Kumar, Krishna : Linear Theory of Faraday instability in viscous liquids - Proc. Royal Soc. Lond, A, 452, 1113 - 1126, 1996.
- Kumar, K. Fauve, S., Thuat, O. : Critical selftuning : Example of Zero Prandtl number convection, *J. Phys. (France) II*, 6, 945 - 951, 1996.
- Mandal, B.N. and Das, Pulak : Oblique diffraction of surface waves by a submerged vertical plate, *J. Engineering Mathematics*, 30, 459 - 470, 1996.
- Mandal, B.N. and Ghosh, A.K. : Ordering policy for decaying inventory under shortages with price-dependent demand, *International J. Management and Systems*, 12, 1 - 10, 1996.
- Mandal, N., Chakrabarti, A and Mandal, B.N. : Solution of a system of generalized Abel integral equations using fractional calculus, *Applied Mathematics Letters*, 9, 1 - 4, 1996.
- Mazumdar, H.P., Ganguly, U.N. (Habishyasi) and Venkatesan, S.K. : Some effects of a magnetic field on the flow of a Newtonian fluid through a circular tube, *Indian J. Pure. Appl. Math.*, 27, 519 - 524, 1996.
- Mazumdar, H.P., Ganguly, U.N. (Habishyasi), Ghorai, S. and Dalal, D.C. : On the distributions of axial velocity and pressure gradient in a pulsatile flow of blood through a constricted artery, *Indian J. Pure Appl. Math.*, 27, 1137 - 1150, 1996.
- Mukherjee, Soma : Effect of magnetic field induced torsion on neutrinos and Supernova collapse, *Nuovo Cimento C*, 19, 237 - 244, 1996.
- Mukherjee, Soma, Bhattacharya, U., Panji, S.K., Gupta, R. and Gulati, R. : A multi-layered back propagation ANN algorithm for spectral classification of U V data, *Astrophysics and Space Sciences*, 239, 361 - 373, 1996.
- Nag, N. and Roychoudhury, R. : Exact bound states for the potential, $V(r) = r^{\beta} + B/r^{\alpha} + \lambda/r^{\mu}$, using partial algebraization technique - *Czech. J. Phys.*, 46, 343, 1996.
- Panchanan, S., Roychoudhury, R. and Varshni, Y.P. : Modified shifted 1/N expansion method for relativistic Yukawa and Hulthen Potentials, *Canadian J. Phys.* 74, 136, 1996.
- Roy, P. : q-deformed algebras and the two anyon problem, *Mod. Phys. Lett. A*, 11, 1489, 1996.
- Roy, P. and Roychoudhury, R. : Remarks on quantum deformation of quasi exactly solvable problems, *Phys. Lett. A*, 214, 266, 1996.
- Roy, S. and Duttamajumdar, D. : Uncertainty Relation and Unsharp Observables, *National Science Academy*, 1996.
- Roychoudhury, R. and Sinha, A. : Modified Airy Function Method and its Application to the Schrodinger problem $V(x) = x^{\beta} - 3x^{\alpha}$, *Canadian J. Phys.* 74, 39, 1996.
- Sen, Krishna and Basu, Banasri : Geometric Approach to non-Abelian Gauge Theory, *Communications in Theoretical Physics*, 5, I, 45, 1996.

Sinha, A. and Roychoudhury, R. : The sine - Gordon model in (1 + 1) dimensional curved space in the Schrödinger picture. *Canadian, J. Phys.*, 74, 626, 1996.

Biological Sciences Division

Agricultural Sciences Unit

Banik, P. : Evaluation of wheat (*Triticum aestivum*) and legume intercropping under 1:1 and 2:1 row-replacement series system. *Journal of Agronomy & Crop Science*, 176, 289-294, 1996.

Banik P. and Bagchi, D. K. : A proposed index for assessment of row-replacement intercropping system. *Journal of Agronomy & Crop Science*, 177, 161 - 164, 1996.

Banik, P. and Bagchi, D.K. : Productivity of winter crops after sole rice (*Oryza sativa*), blackgram (*Phaseolus mungo*), groundnut (*Arachis hypogaea*) and rice + legume intercropping systems on uplands of Bihar plateau. *Indian Journal of Agricultural Sciences*, 66, 8 - 12, 1996.

Banik, P. : Mushrooms : the cheapest source of protein. *Indian Farming*, 45, 28 - 29, 1996.

Banik P., Chakraborty, A. and Bala, B. : High intensity cropping with short duration rice crop in Bihar Plateau. *Indian Farming*, 46, 5 - 6, 1996.

Chattopadhyay, J. and Tapaswi, P.K., Banik, P. and Bagchi, D.K. : Effect of inhibitors on row-intercropping system. *Journal of Biological Systems, World Scientific Publication*, 4, 31 - 38, 1996.

Chattopadhyay, J. Sarkar, A. K., Sarkar, D., Tapaswi, P.K., Roy, A. B., Banik, P. and Bagchi, D.K. : Competition for nutrient uptake between crops during their growth - A mathematical model. *Cybernetica*, XXXIX, 201 - 211, 1996.

Das, S. and Ghose, M. : Anatomy of leaves of some mangroves and their associates of Sundarbans, West Bengal. *Phytomorphology*, 46, 139 - 150, 1996.

Das, S. and Ghose, M. : Studies on inorganic elements in the leaves of some halophytes of Sundarbans (West Bengal). *Bangladesh Journal of Botany*, 25, 233 - 235, 1996.

Ghose, M., Bhattacharya, K., Ghosh, S.S., Roychoudhury, K. and Datey, A. : Effect of foliar arrangement on the leaf epidermal structures in areca palm (*Areca catechu* Linn.). *Acta Botanica Neerlandica*, 45, 303 - 308, 1996.

Ghose, M. and Bhattacharya, K. : Leaf epidermal characteristics of some tall and dwarf cultivars of Coconut, *Cocos nucifera* L. in the Sundarbans area of West Bengal. *Mooreana*, 6, 79 - 83, 1996.

Anthropology and Human Genetics Unit

Dasgupta, I., Dasgupta, P. and Daschoudhuri, A. B. : Familial resemblance in stature and weight in an endogamous Mahisya Population of rural West Bengal. *American Journal of Human Biology*, 9, 7 - 9, 1997.

Das, K., Malhotra, K.C., Mukherjee, B.N., Walter, H., Majumder, P.P. and Papiha, S. S. : Population structure and genetic differentiation among 16 tribal populations of Central India. *Human Biology*, 68, 679 - 705, 1996.

- Deka, R., Majumder, P.P., Shriver, M.D. : Distribution and evolution of CTG repeats at the myotonin kinase gene in human populations. *Genome Research*, 6, 142 - 154, 1996.
- Ghosh Dasider, M. and Gupta, R. : Infant mortality and desire for additional children. *J. Indian Anthropol. Soc.* 31, 63 - 69, 1996.
- Karmakar, B., Vasulu, T.S., Malhotra, K.C. and Bhanu, B.V. : Variation in palmar interdigital ridge counts among the 20 Dhargar castes of Maharashtra, India. *Anthrop. Anz.*, 54, 239 - 253, 1996.
- Majumder, P.P., Nayak, S., Das, R.N., Bhattacharya, S.K. : Genetic and cultural determinants of high-density lipoprotein cholesterol and serum triglycerides among Marwans of Calcutta. *Indian Journal of Medical Research*, 103, 112 - 119, 1996.
- Majumder, P.P. : Factors influencing liability to psychoactive substance abuse disorder. *Journal of the Indian Anthropological Society*, 31, 27 - 34, 1996.
- Mukhopadhyay, B., Gupta, R., Bhattacharya, S.K. : Haematological traits, religion and rural/urban residence among the Lepchas of Kalimpong subdivision, Darjeeling district, West Bengal. *Anthropologischer Anzeiger*, 56, 35 - 43, 1996.
- Mukhopadhyay, B., Mukhopadhyay, S. and Majumder, P.P. : Blood pressure profile of Lepchas of the Sikkim Himalayas : An epidemiological study. *Human Biology*, 68, 131 - 145, 1996.
- Mukhopadhyay, S. : Transdisciplinary approach in women's health research : A study on urban middle-class women. *Collegium Antropologicum*, 21, 41 - 46, 1997.
- Taneja, R., Roy, B., Plassat, J.L., Zusi, C.F., Ostrowski, J., Reczek, P.R. and Chambon, P. : Cell-type and promoter-context dependent retinoic acid receptor (RAR) redundancies for RAR and Hoxa-1 activation in F9 and P19 cells can be artifactually generated by gene knockouts. *Proc. Natl. Acad. Sci. U.S.A.* 93, 6197 - 6202, 1996.

Biochemistry Unit

- Das Sarma, J., Duttagupta, C., Ali, E. and Dhaz, T.K. : Estimation of folic-acid in multivitamin formulation by enzyme immunoassay. *Indian Journal of Pharmacological Sciences*, 58, 32 - 36, 1996.
- Ghosh, R., Sengupta, S. and Bhattacharyya, N.P. : Induction of apoptosis by ionizing radiation in Chinese hamster V79 cells and a radioresistant cell strain derived from V79. *Indian Journal of Experimental Biology*, 34, 863 - 867, 1996.
- Podder-Sarkar, M. : The fixative lipid of tiger pheromone. *Journal of Lipid Mediators and Cell Signalling*, 15, 89 - 101, 1996.
- Poddar-Sarkar, M., and Brahmachary, R.L. : Putative semiochemicals in the African Cheetah (*Acinonyx jubatus*). *Journal of Lipid Mediators and Cell Signalling*, 15, 285 - 287, 1996.
- Sengupta, S. and Bhattacharyya, N.P. : Possible role of glutathione in resistance to heavy metals and hydrogen-peroxide in a radioresistant Chinese hamster V79 cell strain. *Indian Journal of Experimental Biology*, 34, 905 - 908, 1996.
- Sengupta, S. and Bhattacharyya, N.P. : Oxidative stress-induced Cadmium resistance in Chinese hamster V79 cells. *Biochemical and Biophysical Research Communication*, 228, 267 - 271, 1996.

Biometry Unit

- Basu, T.K. and Bhattacharyya, B. : Application of Hills' procedure for growth curve analysis of a fresh water major carp of India, Catla Catla (Ham) during their early developmental period. *Aquaculture Research*, 27, 891 - 893, 1996.
- Chattopadhyay, P.S., Gupta, S.K. and Chattopadhyay, R. : Malnutrition related diabetes mellitus (MRDM) in pre-school children. *Journal of Tropical Paediatrics*, 42, 246 - 247, 1996.
- Chattopadhyay, R.R. and Gupta, S.K. : Positive mechanism of hepato-protective activity of *Azadirachta indica* (Part II). *Ind. J. of Physiol and Allied Sc.*, 50, 163 - 167, 1996.
- Chattopadhyay, P.S., Kundu, K., Roy, S. and Gupta, S.K. : Peripheral arterial disease (PAD) is the commonest macrovascular disease of our Bengalee diabetics. Nvo Nordisk update. Kapar, A. (ed) *Health care communication*, 111 - 114, 1996.
- Sarkar, S.K., Ganguly, S., Basu, T.K. and Medda, C. : Changes of alkaline phosphatase activity during early period of development of three bundh-bred Indian major carps, *Labeo rohita* (Ham), *Catla Catla* (Ham) and *Cirrhinus mrigala* (Ham). *The Israeli Journal of Aquaculture*, 48, 40 - 46, 1996.
- Sarkar, S.K., Ganguly, S., Medda, C., Bhattacharyya, B. and Basu, T.K. : Effect of sublethal doses of organophosphate insecticides on total protein and glycogen content in the fingerlings of the Indian major carps, *Labeo rohita* and *Cirrhinus mrigala*. *Advances in Biosciences*, 15, 53 - 62, 1996.

Embryology Unit

- Chattopadhyay, J. and Sarkar, A. : A resource based three compartment model. *Journal of Biological Systems*, 4, 25 - 29, 1996.
- Chattopadhyay, J., Sarkar, A. and Tapaswi, P.K. : Effect of cross diffusion on a diffusive prey predator system - a nonlinear analysis. *Journal of Biological Systems*, 4, 159 - 169, 1996.
- Chattopadhyay, J. : Effect of toxic substance on a two species competitive system. *Ecological Modelling*, 84, 287 - 289, 1996.
- Chattopadhyay, J., Tapaswi, P.K., Banik, P. and Bagchi, D. K. : Effect of inhibitors on row intercropping system. *Journal of Biological Systems*, 4, 31 - 38, 1996.
- Chattopadhyay, J., Mukhopadhyay, A. and Tapaswi, P.K. : A resource based competitive system in a three species fishery. *Nonlinear Studies*, 3, 73 - 84, 1996.
- Chattopadhyay, J., Sarkar, A., Sarkar, D., Tapaswi, P.K., Roy, A.B., Banik, P. and Bagchi, D.K. : Competition for nutrient uptake between crops during their growth - a mathematical model. *Cybernetica*, XXXIX, 201 - 211, 1996.
- Ghosh, A.K., Chattopadhyay, J. and Tapaswi, P.K. : Immunity boosted by low level of exposure to infection in an SIRS model. *Ecological Modelling*, 87, 227 - 233, 1996.
- Roychowdhury, S., Sinha, D.K. and Chattopadhyay, J. : Effect of time varying cross diffusivity in a two species Lotka-Volterra competitive system. *Ecological Modelling*, 92, 55 - 64.
- Tapaswi, P.K. and Chattopadhyay, J. : Global stability results on a Susceptible-infective-immune-susceptible (SIRS) epidemic model. *Ecological Modelling*, 87, 223 - 226, 1996.

Plant Chemistry Unit

- Basik, M.K., Chanda, S. and Bhaduri, S.K. : Recycling of jute waste for edible mushroom production, *Industrial Crops and Products*, 5, 173 - 176, 1996.
- Chanda, S. and Chakrabarti, S. : Plant origin liquid waste : a resource for single cell protein production by yeast, *Biorresource Technology*, 57, 51 - 54, 1996.
- Devanji, A. and Matai, S. : Nutritional evaluation of leaf protein extracted from three aquatic plants, *Journal of Agricultural and Food Chemistry*, 44, 2162 - 2166, 1996.

Social Sciences Division

Economic Research Unit

- Chakravarty, S.R. and Chakravarty, S. : On employment segregation by sex, *Demography India*, 24, 265 - 274, 1995.
- Maiti, P. : A note on Zarembka's dual economy model, *Journal of Quantitative Economics*, 11, 1995.
- Majumder, A. and Chakravarty, S.R. : Achievement and improvement in living standards - an empirical analysis, *Social Indicators Research*, 37, 269 - 280, 1996.
- Majumder, A. and Chakravarty, S.R. : Achievement and improvement in living standard, *Journal of Development Economics*, 50, 189 - 195, 1996.
- Marjit, S. and Mitra, S. : Disparities in regional growth : a research agenda, *Economic and Political Weekly*, XXXI, 2239 - 2242, 1996.
- Marjit, S. : Broll, U. and Mitra, S. : Targeting sectors for foreign capital inflow in a small developing economy, *Review of International Economics*, 5, 101 - 106, 1997.
- Maumder, K. : Level of development of a country : A possible new approach, *Social Indicators Research*, 38, 245 - 278, 1996.
- Maumder, K. : An analysis of causal flow between social development and economic growth, *The American Journal of Economics and Sociology*, 55, 361 - 383, 1996.
- Sarkar, N. . Mean square error matrix comparison of some estimators in linear regressions with multicollinearity, *Statistics & Probability Letters*, 30, 133 - 138, 1996.

Economic Analysis Unit

- Krishna Kumar, T., Gore, Anil P. and Sitaramam, V. : Some Conceptual and Statistical Issues on Measurement of Poverty, *Journal of Statistical Planning and Inference*, 49, 53 -71, 1996.
- Krishna Kumar, T. : Management of Development in the Newly Emerging Global Economic Environment, *Economic and Political Weekly*, 31, 1598 - 1605, June, 1996.
- Krishna Kumar, T. : Silent Consensus Against the Washington Consensus, *Economic and Political Weekly*, 32, 657 - 662, March, 1997.

Sitararam, V., Paranjape, S.A., Krishna Kumar, T. Gore, Anil P. and Sastry, J.G. : Minimum Needs of Poor and Priorities Attached to Them, *Economic and Political Weekly*, 31, 2499 - 2505, 1996.

Linguistic Research Unit

Bandyopadhyay, Debaprasad, Debnath, S. : Mahalanobis as a Language Planner, *Indian Journal of Applied Linguistics*, 22, 49 - 57, 1996.

Bandyopadhyay, Debaprasad : Standardization : Myth or Reality, *Indian Journal of Applied Linguistics*, 22, 73 - 78, 1997.

Bandyopadhyay, Debaprasad : Mitchel Foucault : manuser abirbhab, *alocOnacOkkro*, Collection-VIII, Calcutta, 75 - 92, 1996.

Bandyopadhyay, Debaprasad : Rammohoner Gourio Vyakaran, *Poscimbango* (Govt. of West Bengal), 30, 171 - 178, October, 1996.

Planning Unit

Das, Sanghamitra and Das, Satya, P. : Dynamics of Entry and Exit of Firms in the Presence of Entry Adjustment Costs, *International Journal of Industrial Organization*, 15, 217 - 241, 1996.

Dutta, Bhaskar and Sen, Arunava : Ranking Opportunity Sets and Arrow Impossibility Theorems : Correspondence Results, *Journal of Economic Theory*, 71, 90 - 101, 1996.

Ramaswami, Bharat : Public Intervention and Private Speculation : The case of Wheat Procurement, *Journal of Quantative Economics*, 11, 59 - 83, 1995.

Ramaswami, Bharat : The Quality of Public Distribution System : Why It Matters, *Economic and Political Weekly*, 32, 162 - 165, 1997.

Sarma, Atul : Promoting Agro-Exports in European Union : In promotion of Agricultural Exports, *Role of financial Institution IIFT*, 1997.

Population Studies Unit

Data, Pranati : Inter state migration in India, *Journal of Regional Science*, 28, 1996.

Guha Roy, S. and Data, Pranati : Nepali migration to West Bengal, *Demography India*, 24, 1995.

Mukherjee, S., Bhattacharya, B.N. and Singh, K.K. : Distribution of time of first birth in presence of social customs regulating physical separation and coital frequency, *Mathematical Biosciences*, 131, 1996

Saha, A.K. : On the urban growth and prospects of West Bengal, 1981-91, *Indian Journal of Regional Science*, 27, 1995.

Saha, A.K. : Use of Widowhood data for estimating adult mortality for West Bengal, 1981, *Demography India*, 25, 71 - 81, 1996.

Psychology Research Unit

- Banerjee, S.N. : A study in developing a standardized scoring and interpretation manual for Wagner's Hand Test responses through computer, *Journal of Applied Psychological Issues*, 2, 21 - 24, 1996.
- Banerjee, S.N. : Utilitarian significance of methodological variations in ascertaining ranks of admission test candidates, *Indian Journal of Psychological Issues*, 4, 15 - 17, 1996.
- Banerjee, S.N. : A study on the Mathematical competencies of the pupils of the Primary School leaving class, *Journal of Centre for Pedagogical Studies in Mathematics*, 6, 27 - 29, 1996.
- Chakraborty, S. and Ghosh, Anjali : Estimating reliability of scoring for the Miner Sentence Completion Scale, *Journal of Psychometry*, 10, 6 - 12, 1997.
- Dutta Roy, D. and Deb, N.C. : Differential patterns of state anxiety of Scientists during Antarctic expedition, *Journal of the Indian Academy of Applied Psychology*, 22, 43 - 45, 1996.
- Dutta Roy, D. : Organizational Health Survey, *Productivity*, 37, 464 - 466, 1996.
- Dutta Roy, D. and Ghosh, Malati : Assessing the health of a hospital - A process state approach, *Management and labour studies*, 22, 6 - 12, 1997.

Sociological Research Unit

- Ghosh, B.N. : Witchcraft : Superstition is rooted among tribals, *Science Courier*, 6, 23 - 24, 1995.

Statistical Quality Control and Operations Research Division

- Asokan, M.V. and Gopalan, V. : Statistical Procedures for ISO 9000', *Indian Textiles Journal*, 106, 84 - 86.
- Asokan, M.V. : Absentecism in a Spinning Mill - An Analysis', *Asian Textile Journal*, 6, 69 - 76.
- Ghosh, D.T. : An optimum continuous sampling plan CSP-2 with $K \neq 1$ to minimise the amount of inspection when incoming quality p follows a distribution, *Sankhya*, 58, Part-I, 1996.
- Mukhopadhyay, C., Ghosh, J.K. and Joshi, S.N. : Asymptotics of a Bayesian Application to Estimating Change Point in a hazard rate, *Communications in Statistics - Theory & Methods*, 12, 3410 - 3413, 1996.
- Mukhopadhyay, C. and Basu, A.P. : Bayesian Analysis of Incomplete time and cause of Failure data, *Journal of Statistical Planning and Inference*, 59, 79 - 100.
- Murthy, G.S.R., Parthasarathy, T. and Sabatini, M. : Lipschitzian Q - Matrices Are P-Matrices, *Mathematical Programming*, 74, 55 - 58, 1996.
- Murthy, G.S.R., Parthasarathy, T. and Sripama, B. : Constructive Characterization of Lipschitzian Q - Matrices, *Linear Algebra and its Applications*, 252, 323 - 337, 1997.
- Rajendra Prasad, V. and Manna, D.K. : Minimization of Expected Variance of Completion Times on Single Machine for Stochastic Jobs, *Naval Research Logistics*, 44, 97 - 108, 1997.

Sarkar, Ashok : Statistical Process Control for Spinning Mills, *The Indian Textile Journal*, VI, 46 - 49, 1996.

Sarkar, Ashok : Study on Improvement of Blow-Room Performance, *Quality Engineering*, 9, 519 - 526, 1997.

Computer and Statistical Services Centre

Bagchi, A., Chakraborty, S. and Pal, N.R. : RID3 : an ID3 like algorithm for real data, *Information Sciences*, 96, 271 - 290, 1997.

Papers Published in Conference Proceedings

Theoretical Statistics and Mathematics Division

Calcutta Unit

Bana, R. and Sengupta, S. : Architectures for arithmetic over $GF(2^m)$, *Proc. 10th International Conference on VLSI Design, IEEE CS Press, Los Manitos*, 465 - 468, 1997.

Dasgupta, R. : Nonuniform rates of convergence to normality for some non stationary ϕ - mixing processes, *Proceedings of the ISTPA Conference*.

Rao, B.V. : Iterated random maps and Markov Processes, *Platinum Jubilee Lectures of 82nd Session of Indian Science Congress* (Eds. S.P. Mukherjee et al.), ISCA, Calcutta, 137 - 140, 1996.

Bangalore Unit

Bagchi, B. and Misra, G. : Homogeneous tuples of operators and systems of imprimitivity, *Contemporary Mathematics*, 185, 67 - 76, 1995.

Sitaram, A. : Some qualitative uncertainty principles in harmonic analysis, *Analysis, Geometry and Probability: Essays in honour of K.R. Parthasarathy*, R. BhaGtia (Ed.), Hindusthan Book House, 285 - 298, 1996.

Applied Statistics Division

Applied Statistics Unit

Pal Chaudhury, P., Sarkar, P. and Roy, B.K. : VLSI Implementation of Modulo Multiplication Using Carry Free Addition, *The 10th IEEE International Conference on VLSI design*, IEEE Computer Society Press, Los Alamitos, California, 457 - 460, 1997.

Sengupta, D. : Graphical tools for survival data, *Proceedings of the International Workshop on the Analysis of Censored Data*, IMS Lecture Notes, 27, 1996.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

- Bhattacharya, U., Chaudhuri, B. B. and Parui, S. K. : An MLP-based texture segmentation technique which does not require a feature set. *13th Int. Conf. on Pattern Recognition*, Vienna, 805 - 809, 1996.
- Chaudhuri, B. B. : Fractal dimension of a fuzzy set, *proceeding of IJZUKA*, 96, 197 - 200, 1996.
- Chaudhuri, B. B. and Pal, U. : OCR error detection and correction of an inflectional Indian language script. *13th Int. Conf. on Pattern Recognition*, Vienna, 245 - 249, 1996.
- Chaudhuri, D., Mukherjee, A., Parui, S. K., Chaudhuri, B. B. and Krishnan, R. : An efficient algorithm for detection of road-like structures in satellite images, *13th Int. Conf. on Pattern Recognition*, Vienna, 875 - 879, 1996.
- Datta, A., Parui, S. K. and Chaudhuri, B. B. : Skeletal shape extraction from dot patterns by self-organization. *13th Int. Conf. on Pattern Recognition*, Vienna, 80 - 84, 1996.
- Umsh Adiga, P. S., Chaudhuri, B. B. and Rodenacker, Karsten : Semi-automatic segmentation of tissue cells from confocal microscope images. *13th Int. Conf. on Pattern Recognition*, Vienna, 484 - 497, 1996.

Electronics Unit

- Das, D. K., Bhattacharya, U. K. and Bhattacharya, B. B. : Isomorph redundancy in sequential circuits. *Proc. of 14th IEEE VLSI Test Symposium (ITS)*. IEEE CS Press, 463 - 468, 1996.
- Das, D. K., Chakrabarty, S. and Bhattacharya, B. B. : New BIST techniques for universal and robust testing of CMOS stuck-open faults. *Proc. of International Conference on VLSI Design*, IEEE CS Press, 303 - 308, 1997.
- Das, R. K. and Das, N. : GSE : A full access multistage interconnection network of arbitrary size. *Proc. of International Conference on High Performance Computing (HiPC)*, (IEEE CS Press), Trivandrum, India, 176-181, December 19 - 22, 1996.
- Dasgupta, P. S., Sur-Kolay, S. : Slicibility of rectangular graphs and floorplan optimization. *Proc. of International Symposium on Physical Design (ISPD-97)*, Napa Valley California, 150 - 155, April, 1997.
- Nandy, S. C., Mukhopadhyay, K. and Bhattacharya, B. B. : Shooter location problems, *Proc. 8th Canadian Conference on Computational Geometry*, 93 - 98, August, 1996.
- Sengupta, S., Das, D. and Sinha, B. P. Sinha : The generalized hypercube - connected cycle - An efficient network topology. *Proc. of International Conference on High Performance Computing (HiPC)*, (IEEE CS Press), Trivandrum, India, 182 - 187, December 19 - 22, 1996.

- Bandyopadhyay, S., Murthy, C. A. and Pal, S. K. : GA-based pattern classification : theoretical and experimental studies. *Proc. Int. Conf. on Patt. Recog.*, Vienna, Austria, 758 - 762, 1996.
- Bandyopadhyay, S., Murthy, C. A. and Pal, S. K. : Genetically searched class boundaries with removal of redundancy. *Proc. Natl. Seminar on Theoretical Comp. Sciences*, Rajasthan, 345 - 356, 1996.
- Biswas, S. N. and Pal, S. K. : On the critical gradient for enhancement of digital images, *Proc. Int. Conf. on Automation, Robotics and Computer Vision (ICARCV)*, Singapore, 1996.
- Ghosh, A. : A note on making neural network based learning systems robust, *Proc. Fourth European Congress on Intell. Techniques & Soft Computing*, 2, Germany, 729 - 733, 1996.
- Ghosh, A., Tsutsui, S. and Tanaka, H. : Individual aging in genetic algorithms. *Proc. Fourth Australian & New Zealand Conf. on Intell. Inform. Systems*, Australia, 276 - 279, 1996.
- Ghosh, A., Tsutsui, S., Tanaka, H. and Corne, D. : Substitution and re-entry of individuals in genetic algorithms, *Proc. Int. Joint Conf. on Inform. Sciences*, I, USA, 43 - 46, 1997.
- Mitra, S. and Banerjee, M. : Knowledge-based neural net with rough sets. *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 213 - 216, 1996.
- Mitra, S. K. and Sarbadhikari, S. N. : EEG compression using iterated transformations and genetic algorithm. *Proc. 2nd Int. Conf. on Neural Networks & Expert Systems in Medicine & Healthcare, NNESMED'96*, Plymouth, UK, 269 - 274, 1996.
- Pal, K. and Pal, N. R. : A flexible fuzzy controller with relative importance of rules. *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 398 - 401, 1996.
- Pal, N. R. and Bose, C. : Adaptive fuzzy controllers with rule dependent inferring, *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 350 - 353, 1996.
- Pal, N. R. and Mukhopadhyay, S. : A psychovisual fuzzy reasoning edge detector. *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 201 - 204, 1996.
- Pal, S. K. : Machine intelligence, pattern recognition and future generation computing systems, *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 209 - 212, 1996.
- Pal, S. K., Basak, J. and De, R. K. : Feature selection : A neuro-fuzzy approach, *Proc. Int. Conf. on Neural Networks (ICNN'96)*, Washington, DC, 1197 - 1202, 1996.
- Sinha, S. : Chaos control in a one-dimensional system, *Proc. Int. Conf. on Dynamical Systems*, Bangalore, 61, 1997.
- Sinha, S. and Kar, S. : Competition among synchronizing elements : Implication of neural computation. *Proc. 4th Int. Conf. on Soft Computing*, Iizuka, Japan, 700 - 703, 1996.
- Tsutsui, S. and Ghosh, A. : On convergence measure for order based forking genetic algorithms. *Proc. Fourth Australian & New Zealand Conf. on Intell. Inform. Systems*, Australia, 280 - 283, 1996.
- Tsutsui, S., Ghosh, A. and Fujimoto, Y. : A robust solution searching scheme in genetic search. *Proc. Parallel Problem Solving from Nature*, Germany, 543 - 552, 1996.

Tsutsui, S., A. Ghosh, Fujimoto, Y. and Corne, D. : A bi-population scheme for real-coded GAs : The basic concept. *Proc. Int. Joint Conf. on Inform. Sciences*, 1, USA, 39 - 42, 1997.

Tsutsui, S., Ghosh, A. and Takiguchi, M. : Phenotypic forking GA with moving windows. *Proc. Int. Conf. on Neural Inform. Processing*, Hong Kong, 1335 - 1340, 1996.

Physics and Earth Sciences Division

Physics and Applied Mathematics Unit

Islam, N. and Mazumdar, H.P. : On turbulence modification in a particle - fluid simple shear flow. (Abstract) *Proceedings of the 12th International Congress of Chemical and Process Engineering (CHISA'96)*, Praha, Czech Republic, 1996.

Mandal, B.N. : Solution of hypersingular integral equation and applications to some water wave problems. *Lecture Notes in Mathematical Sciences*, COSIST Programme in Mathematics, Jadavpur University, Calcutta, 4, 1 - 58, 1996.

Social Sciences Division

Economic Research Unit

Chakrabarty, M. : A nonparametric exploratory analysis of the form of Engel curves and comparison with some parametric forms : the case of rural Maharashtra. *Proceedings of the Conference on Applications of Recent Advances in Quantitative Economic Methods to Indian Economic Problems*, Bangalore, 33 - 51, 1997.

Mazumdar, K. : Patterns of structural changes in agricultural countries of South and South-East Asia : 1960 to 1994. *Proceedings of the 29th Annual International Conference of Regional Sciences*, New Delhi, 55 - 56, 1997.

Economic Analysis Unit

Narayana, N.S.S. and Manjula Sharada, N.S. : Mean-Variancc Analysis for Cereal Crop Yields: A Study of Andhra Pradesh Districts using Error Component Approach. *Proceedings of the Conference on Applications of Recent Advances in Quantitative Economic Methods to Indian Economic Problems*, Bangalore, 99 - 138, March, 1997.

Planning Unit

Sarma, Atul : Promoting Agro-Exports in European Union : The Role of Financial Institutions, Indian Institute of Foreign Trade, New Delhi, 1997.

Psychology Research Unit

- Dutta Roy, D., Kar, Ranjana and Chakraborty, Mahua : Psychiatric personality profile similarity among splenectomy, non splenectomy beta thalassaemic and non thalassaemic children. *Social Science Abstracts*, Indian Academy of Social Sciences, Allahabad, 20, 141, 1996-97.
- Ghosh, Anjali : Attitude towards dowry in three generation of Bengalee females. *Social Science Abstracts*, Indian Academy of Social Sciences, Allahabad, 20, 143, 1996-97.
- Gupta, Rumki : Adolescents Achievement pattern in relation to economical and Emotional Deprivation, *3rd IAAP conference on Developing Human Relations and Ethnic Understanding*, Gurukul Kangri University, Haridwar, 157 - 161, 1997.

Sociological Research Unit

- Maiti, A.K. : Creativity and innovation in rural backwaters. *International Conference Volume on Creativity and innovation at grass roots and sustainable natural resource management*, IIM, Ahmedabad, January, 1997.

Statistical Quality Control and Operations Research Division

- Asokan, M.V. and George, K.C. : Prediction of milm yield for later parities based on initial parity. *56th Annual Conference of Indian Society of Agricultural Statistics*, New Delhi, 19 - 21, December, 1996.
- Asokan, M.V., Udaykumar, K. and Davidson, Bhaskar : Customer Satisfaction Survey. *International Conference on Quality Improvement through Statistical Methods*, Cochin, 29 - 31, December, 1996.
- Asokan, M.V. and Chandran, T.S. : Methodology for selection and use of Quality Improvement tools. *7th National Convention of National Institution for Quality and Reliability*, Madras, 3 - 4, January, 1997.
- Jaishankar, M.A., Asokan, M.V. and Gopalan, V. : Improving the performance of the spinning mill through Japanese 5S management concept. *National Seminar on Quality Management*, Guntur, AP, 29 - 30, January, 1997.
- Kalyanasundaram, M., Balamurali, S. and Asokan, M.V. : Construction of a generalised Taguchi capability index. *National Seminar on Quality Management*, Guntur, AP, 29 - 30, January, 1997.
- Pillai, C.S. : Improving the quality of yarn through Orthogonal Array Experimentation. *National Seminar on Quality Management*, Guntur, AP, 29 - 30, January, 1997.
- Sarkar, Ashok and Khare, Ajit K. : Optimum Lay Planning for Garment Industry. *International Conference on Operations and Quantitative Management*, Vol. II, Omprakash K. Gupta, Jaipur, India.

Library, Documentation and Information Science Division

DRTC (Bangalore)

- Aptagiri, Devika V. and Akkamahadevi, P.H. : Internet Protocols and Applications. *DRTC Annual Seminar*, Bangalore, 28 - 30, October, 1996.

- Aptagiri, Devika V. : Media Components for Multimedia Systems, *DRTC Annual Seminar*, Bangalore, 28 - 30. October, 1996.
- Prasad, A.R.D. and Aptagiri, Devika V. : Multimedia Technology : An overview of Hardware Aspects, *DRTC Annual Seminar*, Bangalore, 28 - 30. October, 1996.
- Prasad, A.R.D. : Prometheus : An Automatic Indexing System, . *4th International Conference of the ISKO*, Washington, DC, 15 - 18, July, 1996.
- Prasad, A.R.D. : Some reflections on the Impact of Information Technology on Library Science Profession, *DRTC workshop on Advances in Information Technology*, 28 - 30, October, 1996.
- Prasad, A.R.D. and Aptagiri, Devika V. : Media Components of Multimedia Systems, *DRTC workshop on Advances in Information Technology*, Bangalore, 28 - 30. October, 1996.
- Ravichandra Rao, I.K. : Advance Information Technologies for Libraries in India : Status and Problems, *DRTC workshop on Advances in Information Technology : Impact on Library and Information Field*, DRTC, Bangalore, 28 - 30, October, 1996.
- Ravichandra Rao, I.K. : Automation of Academic Libraries in India : Status, Problems and Future, *CALIBER 1997*, Patila, 6 - 7, March, 1997.
- Ravichandra Rao, I.K. : Information Technology : Impact on Higher Education, *Annual Convention of Indian Pharmacology*, IIT, Madras, December, 1996.
- Seetharama, S. and Rath, D.S. : Use of Software Packages for Information Repackaging, *DRTC workshop on Advances in Information Technology : Impact on Library and Information Field*, DRTC, Bangalore, 28 - 30. October, 1996.
- Seetharama, S. : Health Information Services and Products : A Marketing Approach, *National Convention of Medical Library Association of India (MLAI 1996)*, Secunderabad, 10 - 13, November 1996.
- Seetharama, S. : Management of Information Services in an Information Technology-based environment, *XIV National Seminar of IATLIS*, Osmania University, Hyderabad, 25 - 27, November, 1996.
- Seetharama, S. : Information and Communication, *National Symposium on Generation of Information Services and Products in Libraries*, Marathwada University, Aurangabad, 27 - 29, January, 1997.
- Seetharama, S. : Library and Information Services in Academic Libraries, *National Symposium on Generation of Information Services and Products in Libraries*, Marathwada University, Aurangabad, 27 - 29, January, 1997.
- Seetharama, S. : Towards a methodology for Information Consolidation, *National Symposium on Generation of Information Services and Products in Libraries*, Marathwada University, Aurangabad, 27 - 29, January, 1997.
- Seetharama, S. : Guidelines for Marketing of Information Services and Products, *National Symposium on Generation of Information Services and Products in Libraries*, Marathwada University, Aurangabad, 27 - 29 January, 1997.
- Srishaitha, Smitha and Prasad, A.R.D. : An Overview of Multimedia File Formats, *DRTC workshop on advances in Information Technology*, Bangalore, 28 - 30, October, 1996.

Papers Published in Books

Theoretical Statistics and Mathematics Division

Calcutta Unit

- Rao, B.V. and Bhattacharya, R. : Asymptotics of iterations of i.i.d. symmetric stable processes, *Madras Festchrift*, (eds.) Brunner, E. & Denker, M., 3 - 10, V.S.P. Netherlands, 1996.
- Rao, T.J. : Book Review on 'American Housing Survey : A Quality Profile' by Rameswar P. Chakraborty assisted by Georgina Torres, U.S. Dept. Housing and Urban Development and U.S. Dept. of Commerce, *Sankhya*, 440 - 444, 1996.

Delhi Unit

- Bapat, R.B. : Matrices, matchings and matroids, *Applied Abstract Algebra*, 70-77, (ed.) S.K. Jain, Centre for Professional Development in Higher Education, University of Delhi, Delhi, 1996.
- Bhatia, R. : Commentaries on two papers of Helmut Wielandt, in *Helmut Wielandt's Mathematical Works*, Vol. 2 (ed.) B. Hupert and H. Schneider, W. de Gruyter, Berlin, 121, 177 - 179, 1996.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

- Pal, U. and Chaudhuri, B. B. : Printed Devnagari script OCR system, *Knowledge Based Computer System, Research and Development*, K. S. R. Anjaneyulu, M. Sasikumar and S. Ramani, (eds.) Narosa Publishing House, New-Delhi, 359 - 370, 1996.

Machine Intelligence Unit

- De, S., Ghosh, A. and Pal, S. K. : Fitness evaluation in genetic algorithms with ancestors' influence, *Genetic Algorithms for Pattern Recognition*, Pal, S. K. and Wang, P. P. (eds.), CRC Press, Boca Raton, U.S.A., 1 - 23, 1996.
- Murthy, C. A., Bandyopadhyay, S. and Pal, S. K. : Genetic algorithm based pattern classification : relationship with Bayes classifier, *Genetic Algorithms for Pattern Recognition*, Pal, S. K. and Wang, P. P. (eds.), CRC Press, Boca Raton, U.S.A., 127 - 144, 1996.

Physics and Earth Sciences Division

Geological Studies Unit

- Bhattacharya, A., Roy, S., Dutta, P.M. and Maulik, P.K. : Fossil charophyta from the Kota Formation of the Pranhita-Godavari Valley : *Gondwana Nine*, 1, 471-478, *9th Intern. Gondwana Symp.*, Hyderabad, India, 1994, Oxford and IBH Printing Publishing Co. Pvt. Ltd., New Delhi - Calcutta, 1996.

Ghosh, P.S. and Rudra, D.K. : The Jabalpur-Lameta stratigraphy at Jabalpur, India - a suggested revision : *Gondwana Nine*, 1, 21-30. *9th Intern. Gondwana Symp.*, Hyderabad, India, 1994. Oxford and IBH Printing Publishing Co. Pvt. Ltd., New Delhi, Calcutta, 1996.

Mukhopadhyay, Joydeep, Chaudhuri, Asru, K. and Chanda, S.K. : Deepwater manganese deposits in the mid- to late Proterozoic Penganga Group of the Pranhita-Godavari Valley, South India : in *Manganese Mineralization : Geochemistry and Mineralogy of Terrestrial and Marine Deposits*, K. Nicholson (ed.), Geol. Soc. London, Sp. Publ., 119, 105 - 115, 1997.

Physics and Applied Mathematics Unit

Mandal, B.N. and Banerjee, S. : On a singular integral equation and its use to some barrier problems, *Mathematical Techniques for Water Waves, International Series on Advances in Fluid Mechanics*, Mandal, B.N. (ed.), Computational Mechanics Publications, Southampton, 255 - 258, 1997.

Biological Sciences Division

Anthropology and Human Genetics Unit

Das, M., Basu, A. : Retirement planning and adjustment : Posting some relevant questions, In : S. Sengupta (ed.), *Studies in Anthropology : Recent Perspectives*, (Commemoration volume in honour of Professor B.M. Das), New Delhi : Inter-India Publications, 1997.

Mukhopadhyay, B. : Morbidity experience and health care use among the Lepchas : A micro-level study of two religious groups. *Studies in Anthropology : Recent Perspectives* (Commemoration Volume in Honour of Professor B.M. Das) (S. Sengupta, ed.) Inter-India Publications, New Delhi, 86 - 100, 1997.

Reddy, B.M., Nirmala, A. and Reddy, P.C. : Population affinities based on environmentally sensitive anthropometric variables : A study among socioeconomically contrasting populations of Andhra Pradesh. *Studies in Anthropology : Recent Perspectives*, Sarthak Sengupta (ed.), New Delhi : Inter India, 101 - 126, 1997.

Roy, S.K., Basu, A. : A framework for studying the health problems of the tribes : The Oraon case. In : R.S. Mann (ed.), *Tribes of India : Ongoing Challenges*, New Delhi : MD Publications, 1996.

Roy, S.K., Basu, A. : A framework for studying the health problems of the tribes : the Oraon case. In : Mann RS (ed.), *Tribes of India : Ongoing Challenges*, M.D. Publications Pvt. Ltd. New Delhi, 193 - 206, 1996.

Social Sciences Division

Economic Research Unit

Chakravarty, S.R. : Welfare loss from rent seeking for budgetary allocation, *Economic Theory, Trade and Quantitative Economics : Essays in Honour of Professor P.N. Roy, Banerjee, A. and Chatterjee, B.* (eds.), Calcutta University Press, 75 - 82, 1996.

- Chattopadhyay, M., Maiti, P. and Rakshit, M. : Planning and liberalization in India. *Planning and Economic Policy in India : Evolution and Lessons for the Future*, Chattopadhyay, M., Maiti, P. and Rakshit, M. (eds.), Sage Publications India Pvt. Ltd. 12 - 29, New Delhi, 1996.
- Coondoo, D., Neogi, C. and Ghosh, B. : Technological characteristics of Indian industries in recent years. *Socio-Economic Transformation in India*, Roy, B. (ed.), Kanishka Publishers and Distributors, New Delhi, 1996.
- Maiti, P. and Rao, K.K. : Explaining India's industrial growth : 1951-90. *Planning and Economic Policy in India : Evolution and Lessons for the Future*, Chattopadhyay, M., Maiti, P. and Rakshit, M. (eds.), Sage Publications, New Delhi, 1996.
- Mazumdar, K. : Behaviour of services sector in India : 1960 to 1990. *Socio-Economic Transformation in India*, Roy, B. (ed.), Kanishka Publishers and Distributors, New Delhi, 1996.
- Mitra, S. : Intellectual property rights and the GATT. *Socio Economic Transformation in India*, Roy, B. (ed.), Kanishka Publishers and Distributors, New Delhi, 1996.

Linguistic Research Unit

- Bandyopadhyay, Debaprasad : Kolkata Dialects and the Aspects of Standardization : Preliminary observations. *Standardization and Modernization*, Bahari Publication, Delhi, 191 - 202, 1996.
- Gangopadhyay, Subhasree, : Standardizing Doordarshan Language. *Standardization and Modernization*, Bahari Publication, Delhi.

Planning Unit

- Sarna, Atul and Mehta, P.K. : External Sector Reforms in India : Exporters' Perception and Strategy. *Professor Brahma-nanda Festschrift Volume*, D.M. Nachane, A. Vasudevan and A.V. Karnik.

Population Studies Unit

- Deb Roy, Rama : A note on the records of micro-regional statistical surveys in India, 1800-1850 and their Archival Preservation. *Fonti Archivistice E Ricerca Demografica*, Rome, September, 1996.
- Majumdar, P.K. and Datta, Saswati : Economic activities and females in India : 1961-91. *Socio-economic Transformation in India*, Biswanath Roy (ed.), Kanishka Publishers and Distributors, New Delhi, 1996.
- Majumdar, P.K. and Ray, Biswanath : An appraisal of child labourers in India : Some facts and figures. *Socio-Economic Transformation in India*, Biswanath Ray (ed.), Kanishka Publishers and Distributors, New Delhi, 1996.
- Mukhopadhyay, B.K. : Trend and developments in maternal mortality vis-a-vis a differential health socio-economic-infrastructure transformation among the major states in India. *Socio-Economic Transformation in India*, Biswanath Ray (ed.), Kanishka Publishers & Distributors, New Delhi, 1996.
- Nath, D.C. and Bhattacharya B.N. : Variations in Maternal age at last birth in Uttar Pradesh. *Population and Development in Uttar Pradesh*, Kamla Gupta and Arvind Pandey (eds.), B. R. Publishing corporation, Delhi, 1997.

Banerjee, S.N. : Impact of certain socio-economic factors on Primary education, *Socio-economic Transformation in India*, Roy, Biswanath (ed.), *Kanshka Publishers*, New Delhi, 169 - 200, 1996.

Dutta Roy, D. and Deb, N.C. : A study of state anxiety during different periods of Eleventh Antartic expedition, *Eleventh Indian Expedition to Antartica*, Mukherjee, S. (ed.), Publications & Information Directorate, Council of Scientific & Industrial Research, New Delhi, 329 - 335, 1995.

Sociological Research Unit

Chakrabarti, P. : Problems of the Senior Citizens in India - An Overview, *Socio-economic Transformation in India*, Ray, Biswanath (ed.), *Kanishka Publisher*, New Delhi, 147 - 167, 1996.

Chatterjee, Arun K. : On Tribal Transformation : A Critical Response, *Socio-economic Transformation in India*, Ray, Biswanath (ed.), *Kanishka Publisher*, New Delhi, 1996.

Dasgupta, Alis : The role of INA in the battlefields of Arakan and Imphal, Special Number of *West Bangal*, Government of West Bangal, February, 1997.

Library, Documentation and Information Science Division

DRTC (Bangalore)

Seetharama, S. : Types of Information Resources, Selection Principles including Communication Media, Course Material on Information Resources Development, Indira Gandhi National Open University, New Delhi, 1996.

Seetharama, S. : Different Types of Selection tools and their importance, Course Material on Information Resources Development, Indira Gandhi National Open University, New Delhi, 1996.

Seetharama, S. : Acquisition Procedure : Books and Non-Print material, Course Material on Information Resources Development, Indira Gandhi National Open University, New Delhi, 1996.

Seetharama, S. : Acquisition of periodicals and serials, Course Material on Information Resources Development, Indira Gandhi National Open University, New Delhi, 1996.

Seetharama, S. : Technical Processing, Course Material on Information Resources Development, Indira Gandhi National Open University, New Delhi, 1996.

Seetharama, S. : Postulational and System Approaches, Course Material on Library Classification Theory, Indira Gandhi National Open University, New Delhi, 1997.

Seetharama, S. : Fundamental Categories, Facet Analysis and Facet Sequence, Course Material on Library Classification Theory, Indira Gandhi National Open University, New Delhi, 1997.

Seetharama, S. : Phase relation and Common Isolates, Course Material on Library Classification Theory, Indira Gandhi National Open University, New Delhi, 1997.

Seetharama, S. : Devices in Library Classification, Course Material on Library Classification Theory, Indira Gandhi National Open University, New Delhi, 1997.

Books Accepted for Publication

Theoretical Statistics and Mathematics Division

Calcutta Unit

Srivastava, S.M. : *A course on BOREL SETS*. GTM, Springer-Verlag.

Applied Statistics Division

Applied Statistics Unit

Mukhopadhyay, P. : *Theory and Methods of Survey Sampling*. Prentice of India Pvt. Ltd. New Delhi.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

Sengupta, P. and Chaudhuri, B. B. : *Object oriented programming: Fundamentals and applications*. Prentice Hall of India, New Delhi.

Machine Intelligence Unit

Pal, S. K. and Skowron, A. (eds) *Rough Sets, Fuzzy Sets and Decision Making Processes*. Springer Verlag.

Physics and Earth Sciences Division

Physics and Applied Mathematics Unit

Mandal, B.N. and Mandal Nanigopal : *Integral Expansions related to Mehler-Fock type transforms*, *Pramana Research Notes in Mathematics Series*, 367. Addison Wesley Longman, London.

Roy, S. : *Statistical Geometry and its Applications to Microphysics and Cosmology*. Kluwer Academic Publishers, The Netherlands. in Press. 1997.

Roy, S., Evans, M.W., Vigier, J.P. and Hunter, G. : *The Enigmatic Photon, IV*. Kluwer Academic Publishers, The Netherlands. in Press. 1997.

Roy, S. and Lehnert, Bo. : *Electromagnetic theory with space-charges in vacuo and nonzero photon mass*. World Scientific Publishers, Singapore. 1997.

Economic Research Unit

Chattopadhyay, M., Maiti, P. and Rakshit, M. (eds.) : *Essays in Public Intervention, Institutional Arrangements and Economic Efficiency*, K.P. Bagchi & Co., Calcutta.

Maiti, Pulakesh : *Some Aspects of Complex Design*, HSRC, Pretoria, South Africa.

Maiti, Pulakesh and Styen, H.S. : *Sampling and Estimation Procedures for Inverse Multinomial Sampling Associated with Single, Multiple and Joint Events*, HSRC, Pretoria, South Africa.

Mazumdar, K. : *Patterns of Social-Economic Development : 1960-1994*, Inter-India Publications, New Delhi.

Planning Unit

Sarma, Atul, Faberr, Gerrit and Mehta, P.K. : *Meeting the Challenges of the European Union : Prospects of the Indian Exports*, Sage Publications, New Delhi.

Library, Documentation and Information Science Division

DRTC (Bangalore)

Seeharama, S. (ed.) : *Libraries and Information Centres as Profit-making institutions*, ESS Publications, New Delhi, 1997.

Papers Accepted for Publication in Journals

Theoretical Statistics and Mathematics Division

Calcutta Unit

Chaudhuri, P. and Chakraborty, B. : On an adaptive Transformation Re-transformation Estimate of Multivariate Location, *Jour. of the Royal Statistical Society, Ser. B*.

Chaudhuri, P., Chakraborty, B. and Oja, Hannu : Operating Transformation Re-transformation On spatial Median and Angle Test, *Statistica Sinica*.

Das, A., Dean, A.M. and Notz, W.I. : Designs with Nearly Minimal Number of observations and Flexible Blocking, *Jour. Statist. Planning Infer.*

Das, A., Dey, A. and Dean, A.M. : Optimal Block Designs for Diallel Crossing Experiments, *Statist. Probab. Letters*.

Dutta, A.K. and Bhatwadekar, S.M. : Kernel of Locally Nilpotent R-Derivations of $R[X,Y]$, *Transactions of the American Mathematical Society*.

Ghosh, J.K., Joshi, S.N. and Mukhopadhyay, C. : Asymptotics of a Bayesian approach to estimating change point in a hazard rate, *Communications In Statistics*.

- Mukherjee, A. and Naolekar, A.C. : Equivariant acyclic maps, *Proc. Amer. Math. Soc.*
- Mukherjee, A. and Datta, M. : Parametric homotopy principle of some partial differential relations, *Math. Slovaca.*
- Mukherjee, A. and Naolekar, A.C. : A note on equivariant Euler characteristic, *Proc. Math. Sci., Indian Academy of Sciences.*
- Mukherjee, G. and Sankaran, P. : Elementary abelian 2-group actions on flag manifolds and applications, *Proc. AMS.*
- Raha, A.B. and Kundu, S. : The Dual of $C_r(X)$, *Mathematica Japonica.*
- Raha, A.B. and Sarbadhikari, H. : Test Spaces for covering properties, *Questions and Answers in General Topology.*
- Rao, B.V. and Gangopadhyay, S. : Some finitely additive probability : Random walks, *Journal of Theoretical probability.*
- Rao, B.V. and Gangopadhyay, S. : Strategic purely nonatomic random walks. *Journal of Theoretical probability.*
- Rajeev, B. : From Tanako's formula to Ito's formula : the fundamental theorem of stochastic calculus, *Proceedings (Mathematical Sciences) of the Indian Academy of Sciences.*
- Saha Ray, R. and Bhimasankaram, P. : On a partitioned linear model and some associated reduced models, *Linear Algebra and Its Applications.*
- Saha Ray, R., Bhimasankaram, P. and Shah, K.R. : On a singular partitioned linear model and some associated reduced models. *Journal of Combinatorics and Information System Science.*
- Sinha, B.K., Mandal, N.K., Liski, E.P. and Arto, L. : Optimal Designs for Prediction in Random Coefficient Linear Regression Models, *Professor J N Srivastava Felicitation Volume of the Journal of Combinatorics, Informatics and Systems Sciences (JCIS).*
- Sinha, B.K. and Zielinski, R. : Estimating $\Pr\{X>Y\}$ in an Exponential Model Revisited, *Statistics.*
- Sinha, B.K. and Mukhopadhyay, A.C. : Two stage designs for locating the optimum of second order response function and related results, *Professor J N Srivastava Felicitation Volume of the Journal of Combinatorics, Informatics and Systems Sciences.*

Delhi Unit

- Bapat, R.B., Jain, S.K. and Snyder, L. : Nonnegative idempotent matrices and the minus partial order. *Linear Algebra and Its Applications.*
- Bapat, R.B. : Moore-Penrose inverse of the incidence matrix of a tree, *Linear and Multilinear Algebra.*
- Bapat, R.B. : Structure of a nonnegative regular matrix and its generalized inverses, *Linear Algebra and Its Applications.*
- Bhatia, R. : A note on the Lyapunov equation, *Linear Algebra and Its Applications.*
- Bhatia, R. : The norm and the spectral radius of the inverse of a Hermitian element in a Banach algebra, *Studia Mathematica.*

- Bhatia, R. and Semrl, P. : Approximate isometries on euclidean spaces, *American Mathematical Monthly*.
- Bhatia, R., Kittaneh, F. and Li, R.C. : Some inequalities for commutators and an application to spectral variation II. *Linear and Multilinear Algebra*.
- Devan. Isha and Prakasa Rao, B.L.S. : Remarks on the strong law of large numbers for double sequences of associated random variables, *Metrika*.
- Devan. Isha and Prakasa Rao, B.L.S. : Remarks on Berry-Esseen type bound for stationary associated random variables, *Gujrat Statistical Review*.
- Dej. Aloke and Mukherjee, R. : Techniques for constructing asymmetric orthogonal arrays, *J. Combin. Inf. System Sc.*, (JN Srivastava Dedication Volume).
- Dej. Aloke, Das, A. and Dean, A.M. : Optimal designs for diallel cross experiments. *Statist. Probab. Lett.*
- Kochar, S. and Hawkins, D.L. : Inference about the transition-point in a NBUE-NWUE model. in *Sankhya*.
- Kochar, S. and Aly, E.E.A. : Change point tests based on U -statistics with applications in reliability. *Metrika*.
- Kochar, S., Dykstra, R. and Robertson, T. : Restricted tests for testing independence of time to failure and cause of failure in a competing risks model. *Canadian J. Statist.*
- Kochar, S. and Joag-Dev, K. : A positive dependence paradox and aging distributions. *J. Ind. Statist. Assoc.*
- Kochar, S. and Korwar, R. : Stochastic properties of order statistics from finite populations, *Sankhya*.
- Kochar, S., Fernandez-Ponce, and Munoz-Perez : Partial ordering of distributions based on right-spread functions. *J. Appl. Probab.*
- Kochar, S., Dykstra, R. and Rojo, J. : Stochastic comparisons of parallel systems of heterogeneous exponential components. *J. Stat. Plan. Inf.*
- Kochar, S. and Carriere, K.C. : Connections among various variability orderings. *Stats. & Prob. Letters*.
- Kochar, S. : Stochastic comparisons of spacings and order statistics. *Frontiers in Reliability* ed. by A.P. Basu, S.K. Basu and S.P. Mukherjee.
- Panhasarathy, K.R. : New Lie Super algebra representations arising from quantum stochastic calculus. *J. Inf. Dim. Anal. & Quantum Prob.*
- Prakasa Rao, B.L.S. and Sreehari M. : Chernoff-type inequality and variance bounds. *J. Stat. Plan. Inf.*
- Prakasa Rao, B.L.S. and Dewan. Isha. : Remarks on the strong law of large numbers for double sequences of associated random variables, *Metrika*.
- Prakasa Rao, B.L.S. and Dewan. Isha. : Remarks on Berry-Esseen type bound for stationary associated random variables, *Gujrat Statistical Review*.
- Prakasa Rao, B.L.S. : On distributions with periodic failure rate and related inference problems, *Advances in Statistical Decision Theory*, ed. N. Bala Krishnan and S. Panchapakesan, Birkhauser, Boston. .

- Prakasa Rao, B.L.S. : Estimation of Integral of square of density by wavelets, *Publ. Inst. Stat. Univ. de Paris*.
- Prakasa Rao, B.L.S. : Nonparametric functional estimation : An Overview, *Asymptotics, Nonparametric and Time Series*, (ed. Subir Ghosh), Marcel Dekker, Inc.
- Prakasa Rao, B.L.S. : Bernstein-von Mises theorem, *Encyclopaedia of Mathematics*, vol. II, (ed. M. Hazenwinkel) Kluwer, Dordrecht.
- Sinha, K.B. and Lindsay, J.M. : Feynman-Kac representation of some non-commutative elliptic operators, *Jour. Funct. Anal.*
- Sinha, K.B. and Parthasarathy, K.R. : Quantum Markov processes with a Christensen-Evans generator in a von Neumann algebra, *Jour. Lond. Math. Soc.*

Bangalore Unit

- Bagchi, Bhaskar : How to stay away from each other in a spherical universe, *Resonance*.
- Bagchi, Sunanda : On two-way design, *Graphs and Combinatorics*.
- Bhat, B.V. Rajarama : Product systems of one dimensional Evans-Hudson flows, *Communications in Quantum Probability*.
- Bhat, B.V. Rajarama and Fagnola, F. : On minimality of Evans-Hudson flows, *Bollettino dell'Unione Math. Ital.*
- Basu, S. and Rao, T.S.S.R.K. : Some stability results for asymptotic norming properties of Banach spaces, *Colloq. Math.*
- Emmanuele, G. and Rao, T.S.S.R.K. : Spaces of Bochner integrable functions and spaces of representable operators as U -ideals, *Quarterly J. Math. Oxford*.
- Folland, G. B. and Sitarum, A. : The uncertainty principle : a mathematical survey, *J. Fourier analysis and applications*.
- Nevo, Amos and Thangavelu, S. : Pointwise Ergodic Theorems for Radial Averages on the Heisenberg Group, *Advances in Mathematics*.
- Rainakumar, P.K. and Thangavelu, S. : Spherical means, wave equations and Hermite-Laguerre expansions, *J. Funct. Analysis*.
- Rao, T.S.S.R.K. : There are no denting points in the unit ball of $WC(K, X)$, *Proc. Amer. Math. Soc.*
- Sitarum, A. and Sundari, M. : An Analogue of Hardy's theorem for very rapidly decreasing functions on semi-simple Lie groups, *Pacific J. Math*.

Applied Statistics Division

Applied Statistics Unit

- Adhikary, A.K., Chaudhuri, A. and Seal, A.K. : Small Domain Estimation by empirical bayes and Kalman Filtering procedures - A case study, *Communications in Statistics - Theory and methods*, 1997.

- Basu, A., Basu, S. and Sarkar, S. : Robust tests of hypotheses for two normal means, *Communications in Statistics: Simulation and Computation*.
- Basu, A., Park, C. S. and Harris, T. R. : Robust predictive distributions based on the penalized blended weight Hellinger distance, *Communications in Statistics: Simulation and Computation*.
- Basu, A., Sarkar, S. and Vidyashankar, A. N. : Minimum negative exponential disparity estimation in parametric models, *Journal of Statistical Planning and Inference*.
- Basu, A., Barmí, H. El and Harris, T. R. : Statistical inference concerning weighted Poisson rates under some natural order restrictions, *Journal of Applied Statistics*.
- Basu, A. and Sarkar, S. : Robust estimation in the errors-in-variables model via weighted likelihood estimating equations, *Test*.
- Basu, A., Basu, S. and Chaudhuri, G. : Robust minimum divergence procedures for count data models, *Sankhya B*.
- Chaudhuri, A. and Roy, D. : Optimal variance estimation for generalized regression predictor, *Jour. Stat. Plan. Inf.*
- Chaudhuri, A. and Roy, D. : Model assisted survey sampling strategies with randomized response, *Jour. Stat. Plan. Inf.*
- Chaudhuri, A. and Maiti, T. : Interval estimation of correlation in survey sampling, *Pak Jour. Stat.*
- Chaudhuri, A. and Maiti, T. : Small domain estimation by borrowing strength across time and domain - a case study, *Comm. Stat. Simul. Comp.*
- Chaudhuri, A., Adhikary, A.K. and Seal, Arup : Small domain estimation by empirical bayes and Kalman filtering procedure - a case study, *Comm. Stat. Theo. Meth.*
- Chaudhuri, A. : On a pragmatic modification of survey sampling in three stages, *Comm. Stat. Theo. Meth.*
- Mukhopadhyay, P. and Vijayan, K. : Estimating functions in survey sampling using randomized response model, *Journal of Indian Statistical Association*.
- Mukhopadhyay, P. : A note on UMVU-estimation under randomized response model, *Communications in Statistics, Theory and Methods*.
- Mukhopadhyay, P. : Hierarchical and empirical bayes estimation of a finite population total under measurement error models, *Journal of Applied Statistical Sciences*.
- Sengupta, D. and Bhimasankaram P. : On the roles of observations in collinearity in the linear model, *Journal of the American Statistical Association*.

Computer and Communication Sciences Division

Computer Vision and Pattern Recognition Unit

- Bhattacharya, U., Parui, S. K. and Chaudhuri, B. B. : An MLP-based texture segmentation method without selecting a feature set, *Image and Vision Computing*.

- Bhattacharya, U. and Parui, S. K. : An improved backpropagation neural networks for detection of road-like features in satellite imagery, *International Journal of Remote Sensing*.
- Chaudhuri, D. and Chaudhuri, B. B. : A novel multi-seed non-hierarchical data clustering technique, *IEEE Trans. on Sys. Man Cybernet*, 1997.
- Dutta, A. and Parui, S. K. : Skeletons from dot pattern: a neural network approach, *Pattern Recognition Letters*.
- Kundu, P. and Chaudhuri, B. B. : Texture synthesis by a neural network model, *Neural Computing and Application*.
- Pal, U. and Chaudhuri, B. B. : Printed Devnagari script OCR system, *Vivek*.
- Roy Chaudhuri, A., Parui, S. K. and Chaudhuri, B. B. : A Novel approach to computation of the shape of dot pattern and extraction of its perceptual border, *Computer Vision and Image Understanding*.
- Sengupta, P. and Chaudhuri, B. B. : A Delayed syntactic encoding based LFG parsing strategy for an Indian language - Bangla, *Computational Linguistics*, 23, 1997.

Electronics Unit

- Das, R. K. and Das, N. : GSE : A full access multistage interconnection network of arbitrary size. *International Journal of Systems Science*, (Taylor & Francis).
- De, M., Das, D., Ghosh, M. and Sinha, B. P. : An efficient sorting algorithm on the Multi-Mesh network, *IEEE Trans. Computers*.
- De, M. and Sinha, B. P. : Fast parallel multiplication using quaternary redundant number system, *Parallel Processing Letters*.
- Jana, P. K. and Sinha, B. P. : Fast parallel algorithms for forecasting, *Computers and Mathematics with Applications*, (Pergamon-Elsevier).
- Jana, P. K. and Sinha, B. P. : Efficient parallel algorithms for Lagrange and Hermite interpolation, *Journal of Applied Science and Computations*.
- Nandy, S. C., Nandakumar, G. N. and Bhattacharya, B. B. : Efficient algorithms for single and two-layer linear placement of parallel graphs, *Computers and Mathematics with Applications*, (Pergamon-Elsevier).

Machine Intelligence Unit

- Bandyopadhyay, S., Pal, S. K. and Maulik, U. : Incorporating chromosome differentiation in genetic algorithms, *Inform. Sciences*.
- Bezdek, J. C. and Pal, N. R. : Some new indices of cluster validity, *IEEE Trans. System, Man, Cyberns*
- De, R. K., Pal, N. R. and Pal, S. K. : Feature analysis : Neural network and fuzzy set theoretic approaches. *Patt. Recog.*

- Hemasingha, R., Pal, N. R. and Bezdek, J. C. : The determinant of a fuzzy matrix with respect to T-norms and T-conorms. *Fuzzy Sets & Systems*.
- Mandal, D. P. : Partitioning of feature space for pattern classification, *Pattern recognition*.
- Mandal, D. P. and Murthy, C. A. : Selection of alpha for alpha-hull. *Patt. Recog*.
- Mandal, D. P., Murthy, C. A. and Pal, S. K. : Determining the shape of a pattern class : Extension to R^n , *Int. J. General Systems*.
- Mitra, S. K., Murthy, C. A. and Kundu, M. K. : Image compression using genetic algorithms, *IEEE Trans. Image Processing*.
- Mitra, S. K. and Sarbadhikari, S. N. : Iterative function system and genetic algorithm based EEG compression, *Med. Eng. Phys.*
- Pal, K. : Synthesis, characterization and dehydriding behavior of the intermetallic compound $LaMg_{12}$, *Int. J. Hydrogen Energy*.
- Pal, K. : The composite material $LaMg_{11} - x$ wt. % $MmNi_{14}Al_3$; Synthesis, characterization and hydriding behavior, *Int. J. Hydrogen Energy*.
- Pal, K. : A note on the hysteresis effect of $LaMg_{11}$ -based composite materials, *Int. J. Hydrogen Energy*.
- Pal, N. R. and Chintalapudi, K. : A connectionist system for feature selection, *Neural, Parallel and Scientific Computation*.
- Pal, N. R. and Biswas, J. : Cluster validation using graph theoretic concepts, *Patt. Recog*.
- Pal, S. K., Bandyopadhyay, S. and Murthy, C. A. : Genetic algorithms for generation of class boundaries, *IEEE Trans. System, Man, Cyberns*.
- Pal, S. K., Basak, J. and De, R. K. : Fuzzy feature evaluation index and connectionist realization, *Inform. Sciences*.
- Pal, S. K., De, S. and Ghosh, A. : Designing Hopfield type networks using genetic algorithms and its comparison with simulated annealing, *Int. J. Patt. Recog. Art. Intell*.
- Pal, S. K. and Sarbadhikari, S. N. : Classification of distorted overlapping fingerprints with fuzzy geometrical features, *Int. J. Knowledge Intell. Engg. Systems*.
- Saha, A. K. and Sarbadhikari, S. N. Immune system functions : A simple mathematical approach, *Cybernetica*.
- Sarbadhikari, S. N. : Let your dreams come true through virtual reality, *J. Indian Medical Assoc.*
- Sinha, S. : Adaptive walks in fitness landscapes, *Indian J. Theo. Physics*.
- Tsutsui, S., Fujimoto, Y. and Ghosh, A. : Forking GAs: GAs with search space division schemes, *Evolutionary Computation*.

Physics and Earth Sciences Division

Geological Studies Unit

- Dutta, Basudeb : Stratigraphic and sedimentologic evolution the Proterozoic siliciclastics in the southern part of Chhattisgarh and Khariar, Central India : *Jour. Geol. Soc. India*.
- Ghosh, P.S. : Geomorphology and palaeoclimatology of some Upper Cretaceous palaeosols in Central India : *Sedim Geol.*
- Jain, S.L. and Bandyopadhyay, S. : New titanosaurid (Dinosauria : Sauropoda) from late Cretaceous, Central India : *Jour. Vert. Paleont.*
- Kutty, T.S. and Joy, Sojen : Sternet - a computer program for stereographic projection : with a new algorithm for computing : *Jour. Geol. Soc. India*.
- Naha, K., Srinivasan, R. and Deb, G. : Structural geometry of the early Precambrian terrane, South of Coimbatore in the "Palghat Gap", Southern India : *Jour. Geol. Soc. India*.
- Paul, Bidyut and Moulik, S.P. : Microemulsions : an overview : *Jour. Dispersion Sci. and Tech.* (Marcel Dekker Inc. USA).
- Roy, S. : Some contribution to the Lower Gondwana Stratigraphy of the Pranhita-Godavari Valley, Deccan, India : *Jour. Geol. Soc. India*.
- Saha, D. : Flow laws in polycrystalline aggregates deformed by a combination of diffusion creep and dislocation creep : *Proc. Indian Acad. Sci. (Earth & Planetary Sciences)*.
- Saha, D. and Ghosh, G. : Lithostratigraphy of deformed Proterozoic rocks from around the confluence of Godavari and Indravati rivers, South India : *Ind. Jour. Geol.*

Physics and Applied Mathematics Unit

- Banerjee, Sudeshna and Mandal, B.N. : Scattering of water waves by a submerged thin vertical wall with a gap, *J. Australian Mathematical Society, Ser. B.*, 1997.
- Banerjee, Sudeshna, Kanoria, Mridula, Dolai, D.P. and Mandal, B.N. : Oblique wave scattering by submerged thin wall with gap in finite depth water, *Applied Ocean Research*.
- Bhattacharyya, S. and Roy, D. and Bhowmik, R. : Antibaryon yields in ultrahigh energy collisions and the astroparticle implications, *Il Nuovo Cimento C*.
- Bhattacharyya, S., Chakraborty, A., De, Sudeshna and Roy, D. : Intermittency index in high energy collisions and the role of some multiple production models, *Hadronic Journal*, 1997.
- Chakraborti, A., Banerjee, S., Mandal B.N. and Sahoo, T. : A unified approach to problems of scattering of surface waves by vertical barriers, *J. Australian Mathematical Society, Ser. B.*, 1997.
- Chatterjee, P. and Roychoudhury, R. : Effect of finite ion-temperature on ion-acoustic solitary waves in a two-temperature electron plasma system, *Canad. J. Phys.*
- Dandapat, B.S. and Gupta, Anadi Shankar : Solitary waves on the surface of a viscoelastic fluid running down an inclined plane, *Rheological Acta*.

- Das, Pulak, Banerjee, Sudeshna and Mandal, B.N. : Scattering of oblique waves by thin vertical wall with a submerged gap. *Archive of Mechanics*.
- Das, Pulak, Dolai, D.P. and Mandal, B.N. : Oblique water wave diffractions by two parallel thin barriers with gaps. *J. Waterway, Port, Coastal and Ocean Engineering*.
- Hajra, K and Goswami, G : Stochastic Quantization in Minkowski space and Time-Energy uncertainty relation.
- Mandal, B.N. and Kanoria, M. : The rolling ship problem – Revisited. *Mathematical and Computer Modelling*, 1997.
- Roy, P and Junker, G. : Construction of (1 + 1) dimensional field models with exactly solvable fluctuation. *Annals of Physics*.
- Roy, B : Even and odd q-coherent states in a finite dimensional basis and their squeezing properties. *International Journal of Theoretical Physics*.
- Roy, S and Lehnert, Bo : Extended Electromagnetic Theory, Angular momentum and $\hat{B}^{(D)}$ field. *Apeiron special issue*, 1997.
- Roychoudhury, R. and Mukherjee, S : Large Amplitude Solitary Waves in Finite Temperature Dusty Plasma. *Physics of Plasmas*.

Biological Sciences Division

Agricultural Sciences Unit

- Mandal, S., Tapaswi, P.K., Banerjee, R.N. and Brahmachary, R.L. : Inhibitory and stimulatory effects of root exudates in two varieties of rice. *Annals of Tropical Research*, 1996.

Anthropology and Human Genetics Unit

- Bharati, S and Bharati, P. : Relationship between menarcheal age and nutritional anthropometry in urban girls of Howrah district, West Bengal, India. *Anthropologischer Anzeiger*, 1996.
- Dasgupta, P. and Das, S. R. : Growth in trunk and limb segments of the Bengali boys. *Annals of Human Biology*, 1997.
- Dasgupta, P. : Cross-sectional growth of seven cephalofacial dimensions in the urban Bengali boys of Calcutta. *Journal of Human Ecology*, 1997.
- Ghosh Dasider, M. and Gupta, R. : Demographic profile of the slum dwellers of Calcutta city. *Demography India*, 1997.
- Roy, S.K. : Smoking status and its effect on cardiorespiratory system, body dimension and plucking performance of Oraon tea garden labourers. *Anthropologischer Anzeiger*, 1996.
- Roy, S.K. and Pal, B. : Comparison of somatotype of two Oraon occupational groups of Jalpaiguri district, Northern West Bengal. *Journal of Human Ecology*.

INDIAN STATISTICAL INSTITUTE

SCHEDULE V

EXCESS OF RECEIPTS OVER EXPENDITURE (+) AND EXCESS OF EXPENDITURE OVER RECEIPTS (-) IN RESPECT OF MISCELLANEOUS PROJECTS AND ACTIVITIES OF BUREAU OF GOVT. OF INDIA AND OTHER BODIES AS ON 31st MARCH 1997

Project and Activities	EXCESS OF RECEIPTS (+) EXPENDITURE (-)					
	Upto 31st March 1996		for the Year		Upto 31st March 1997	
	Rs.	P.	Rs.	P.	Rs.	P.
A. OTHER BODIES:						
(See note below)						
1. Regula Model for Agriculture (Delhi) As per last account	—	64,619.27	—	—	—	64,619.27
2. Computer Spare Project sponsored by C. S. I. R. Govt. of India As per last account (Appendix-C1)	+	22,608.10	+	25,597.55	+	68,205.65
3. Study on the evaluation of Fish Yield rate Fish Farmers' Development Agency As per last account	+	1,347.73	—	—	+	1,347.73
4. National Nodal Centre for Fifth Generation Computer System Development FGCS, Funded by Govt. of India As per last account	+	10,890.28	+	—	+	10,890.28
6. Study on the determination of Survival Growth of Seeds As per last account	—	33,690.73	—	—	—	33,690.73
6. Hindusthan Fertiliser Corporation 'Evaluation of Rainfed Farming-IST RTPCL' Sponsored by Overseas Development Authority (Appendix P1)	+	90,090.41	—	38,638.45	+	51,370.00
7. Conservancy Study of Calcutta Municipal Corporation	+	10,295.00	—	—	+	10,295.00
8. Project of 'Estimation of Revenue' earned and volume of Postal traffic handled by Post Office, Delhi (Appendix Q1)	+	37,376.58	+	68,000.00	+	93,376.58
9. Perception, performance and potential of Development in USRI Watershed Area (Sponsored by CSIR)	+	1,405.53	—	—	+	1,405.53
10. Studies on Tropical Boundary Layer Meteorology at Boreas, ICSSR	+	1,693.75	—	—	+	1,693.75
11. Book Grant from National Board of Higher Mathematics (NBRM) Funded by National Board of Higher Mathematics, DEA (Appendix G)	+	1,88,801.89	—	1,68,932.00	+	19,869.89
12. Administration of Guidance and Consultancy Service in Data Processing, on behalf of Indian Council of Social Science Research	+	5,089.10	—	—	+	5,089.10
13. ICSSR Fellowship Dr. L. S. Bhat	+	4,981.05	—	—	+	4,981.05
14. The Incidence of the Child Mortality among Tribe in Madhya Pradesh, Delhi	+	12,399.81	—	—	+	12,399.81
16. Sickness and Exit in Indian Industry (New Delhi, Appendix-R1)	—	31,053.14	+	1,60,000.00	+	1,18,946.86
16. Matrix Spectral Theory, Delhi-Atomic Energy	+	12,118.80	—	—	+	12,118.80
17. C. S. I. R. Under Special Research Programme EMR, On Generalised inverse on Materials and application, funded by CSIR (Appendix V1)	+	45,107.75	+	57,869.00	+	1,02,976.75
18. Malaise Cauterary Calibration	+	9,948.80	—	9,948.80	—	—
19. IST—Advance Data Processing Research Institute, Hyderabad, funded by Advance Data Processing Research Institute (Appendix G1)	+	40,688.78	—	43,851.00	—	3,164.22
20. Central Silk Board (CSU, Calcutta, As per last a/o)	+	1,50,905.20	—	—	+	1,50,905.20
21. Emergent Scientist Scheme, CSIR—Prof. D. Dutta Majumdar, funded by CSIR (Extra Mural Research Projects Appendix-B)	+	7,012.80	+	92,912.70	+	39,925.60

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SCHEDULE V—Contd.

EXCESS OF RECEIPTS OVER EXPENDITURE (+) AND EXCESS OF EXPENDITURE OVER RECEIPTS (-) IN RESPECT OF MISCELLANEOUS PROJECTS AND ACTIVITIES OF BUREAU OF GOVT. OF INDIA AND OTHER BODIES AS ON 31st MARCH 1997

Project and Activities	Excess of receipts (+)/Expenditure (-)					
	Upto 31st March 1996		Upto 31st March 1997			
	Rs.	P.	Rs.	P.		
23. Total Literacy Campaign Programme	+	11,408.50	—	+	11,408.50	
22. Evaluation of Attainment Level of Primary School Children at the end of Class IV, Sponsored by State Council of Educational Research and Training, Govt. of West Bengal as last a/c	+	11,391.48	—	—	+	11,391.48
24. Project-Procedures for spectral characterization as per last a/c	+	16,421.48	—	—	+	16,421.48
25. Indian Report to the European Community Construction and Prospects, funded by ICSSR/IDPAD (Appendix-N)	-	17,830.77	+	85,992.00	+	48,281.52
26. FISCAL Reforms and Structural Adjustment Micro and Macro Dimension, funded by Industrial Development Research Centre (Appendix-N1 Delhi)	+	3,82,998.36	-	2,15,537.00	+	1,17,458.36
27. INSA-SENIOR (Dr. B. Ramachandran) to work on functional equation in Probability Theory, funded by Indian National Science Academy (Appendix-S1)	+	16,200.30	-	9,881.00	+	6,278.20
28. ICSSR-Research Project-Agrarian conflict and Rural Labour pertaining to the Year 31st March 1995 As per last a/c	+	12,760.00	—	—	+	12,760.00
29. NIBM Book Grant funded by National Board of Higher Mathematics, Department of Atomic Energy (Appendix-D)	-	24,266.73	+	30,787.54	+	6,500.81
30. Preparation of the State of the Art Report on Optical Character Recognition—Bangalore on behalf of CSIR	+	0.50	—	—	+	0.50
31. Software Package-Gray Level Image on behalf of Ministry of Defence, Electronics applications Laboratory, Dehradun (Appendix-KI)	+	14,945.91	-	14,945.91	—	—
32. Genetics of Quantitative Traits in silkworm on behalf of Central Silk Board, Ministry of Textiles (Appendix-L)	+	1,02,444.23	-	1,03,485.78	-	39.55
33. D.S.T. Defamation, Metemorphosis-Eastern ghat, OSU funded by Ministry of Science and Technology Earth System, Science Division, Government of India, DST (Appendix-K)	+	26,800.90	-	32,925.88	-	7,064.78
34. Bayesian Non-Parametric, Inference Computing, funded by CSIR. (Appendix-E)	+	12,946.88	-	7,070.00	+	5,876.88
35. Tracer Study of ITI Certificate Holder into Labour Market on behalf of Ministry of Labour, Govt. of India, Directorate General Employment & Training Centre (Appendix-F)	+	9,788.50	-	480.10	+	9,308.40
36. Newer Fuzzy Recognition System etc. for Forensic Application (NIU) Sponsored by CSIR (Appendix-Q)	-	568.80	+	30,136.20	+	19,578.80
37. Application for Recognition and Interpretation of Acoustic Radder Imaginary, funded by Ministry of Science and Technology, Department of Science and Technology, Earth System Science Division, Government of India. (Appendix-W)	+	67,063.83	+	91,882.75	+	1,48,716.28
38. Computerised Archeological Information Funded by Directorate of Archeological, Govt. of India	+	1,99,146.00	—	—	+	1,99,146.00
39. Regression Methodology Stat.	+	9,330.80	—	—	+	9,330.80
40. A Study of Mathematical Techniques In Water Wave Problems Sponsored by CSIR (FAMU) (Appendix-U)	-	4,699.50	+	4,333.50	+	134.90
41. Computer Spare Project (Bangalore)	+	17,709.00	—	—	+	17,709.00