KSHITIJ

In fond memory of

Late Shri Karamshibhai J. Somaiya
1902 - 1999

ॐ पूर्णमदः पूर्णमिदं पूर्णात् पूर्णमुदच्यते ।
पूर्णस्य पूर्णमादाय पूर्णमेवावशिष्यते ॥ १ ॥

1. OM. Whole is that (Brahman), whole also is this (world). From whole comes the whole; take whole from whole; (yet) whole remains.

ॐ ईशावास्यमिदं सर्वं यत् किं च जगत्यां जगत् ।
तेन त्यक्तेन भुञ्जीथा मा गृधः कस्य स्विद्धनम् ॥ २ ॥

2. OM. Whatever exists in this world is to be enveloped by God (the Ruler). By renouncing it (the world) thou mayst enjoy. Do not covet the riches of any one.

मूकं करोती वाचालं पङ्गुं लंघयते गिरिम् ।
यत्कृपा तमहं वन्दे परमानन्दमाधवम् ॥ ३ ॥

3. I bow down to Madhava, the Bliss Eternal; to Him whose grace enables the dumb to speak (and) the lame to go across a mountain.

ॐ पृणो देवी सरस्वती वाजेभिर्वाजिनीवती
धीनामवित्र्यवतु ।
ॐ चोदयित्री सूनृतानां चेतन्ती सुमतीनाम् ।
यज्ञं दधे सरस्वती ॥ ४ ॥

4. OM. May Sarasvati, the Divine, protect us by her strength-giving favours, she who is rich in strength-giving favours, the protector of our thoughts, Sarasvati, who inspires hymns and promotes pious thoughts, brings about our sacrifice.

ॐ असतो मा सद् गमय । तमसो मा ज्योतिर्गमय ।
मृत्योर्माऽमृतं गमय ॥ ५ ॥

5 OM. From the unreal lead me to the real. From darkness lead me to light. From death lead me to immortality.

ॐ सह नाववतु सह नौ भुनक्तु सहवीर्यं करवावहै।
तेजस्विनावधीतमस्तु, मा विद्विषावहै ॥ ६ ॥

6. OM. May God protect us both at the same time; at the same time support us both; May both of us at the same time apply (our) strength. May our learning be illustrious. May there be no hatred (between us).

सर्वेऽत्र सुखिनः सन्तु सर्वे सन्तु निरामयाः ।
सर्वे भद्राणि पश्यन्तु मा कश्चिद् दुःखमाप्नुयात् ॥ ७ ॥

7 May all here be happy. May all be free from disease. May all see well-being. May nobody experience misery.

ॐ शान्तिः । शान्तिः । शान्तिः ॥

OM. Peace, Peace, Peace!

K.J. SOMAIYA COLLEGE OF ENGINEERING

The Students' Council

presents

KSHITIJ '98-99

... An Ode to the Engineer

The Magazine Section 1998-99

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EDITORIAL

This effort is not a magazine. It is a very broad character sketch of an engineer; a very sincere attempt to map his personality on paper; a tribute to the engineering profession.

As far as his interests go we have made it a point to cover the widest panorama possible. Grossly divergent topics always develop an inherent friction.

This edition has been a platform on which we have experimented hard to reduce this inherent friction by virtue of some textual lyricism. However we cannot boast of perspicacity in this task with the result that our labours might not have yielded us complete success.

We have chalked out the engineer's personality on the basis of his habits developed at birth, those cultivated with age, his intellectual engagements as well as his methods of relaxation.

We hope this nostalgic journey doesn't belie the expectations of our intelligent readers and will provide him with the true pleasures of good reading.

With deep sense of gratitude and humble dedication to our Founder

LATE SHRI KARAMSHI J. SOMAIYA
(1902 - 1999)

A Message from the Founder

My dear young Students,

Welcome to you to the Institutions of Vidyavihar !
Your finest hour is here. The future belongs to you. Let us all zealously work and dedicate ourselves to build India of our dreams.

Remember, nothing was ever achieved without HardWork. Be Bold but be not bowled over. Let Truth and Duty be your watch-words. Never Despair in the face of setbacks. Keep Courage and continue to work with Fortitude. Have faith in yourselves and in the Almighty.

Strive for your Goals and the Future is yours !

Karamshi J. Somaiya

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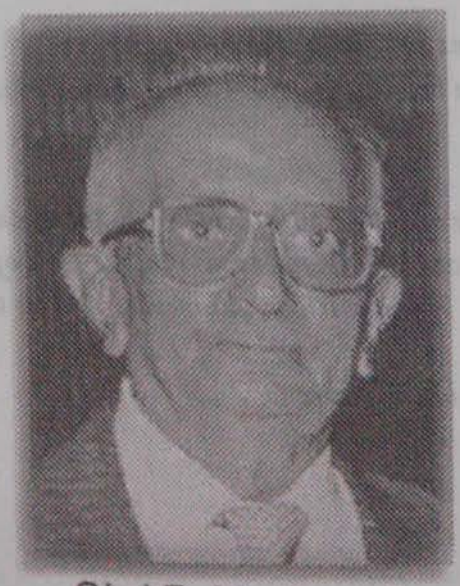

Shri P. M. Kavadia
Hon. Secretary of Somaiya Vidyavihar & Trustee

तेथे कर माझे जुळती

प्रा. सौ. नलिनी कुमठेकर

मी आणि श्री. कुमठेकर एप्रिल महिन्यात एका संध्याकाळी साडेसहा वाजता परमपूज्य करमसीभाईना भेटण्यासाठी त्यांच्या बंगल्यावर गेलो. काम माझेच होते, मी लिहिलेले **Applied Mathematics II** हे पुस्तक मी त्यांना अर्पण केले होते. श्रीमान करमसीभाई आजारी असल्यामुळे प्रत्यक्ष जावे किंवा नाही अशी द्विधा मनस्थिती होती पण डॉ. शांतिभाई आणि सौ. लिलाबेन यांना मी पुस्तका-बद्दल सांगितले तेव्हा त्यांनी मला सांगितले की तुम्ही स्वत:च त्यांना भेटा, त्यांना खूप आनंद होईल. म्हणून मी त्यांना भेटायला बंगल्यावर गेले. ते नुकतेच पहूडले होते आणि त्यांचा डोळा लागत होता. सिस्टरने विचारले की काय काम आहे ? तेव्हा त्यांना सर्व सांगितले, पण झोपले असले तर त्यांना उठवू नका. पण तरीही सिस्टरनी त्यांना आम्ही दोघे आल्याबद्दल सांगितले, त्यांनी आम्हाला जवळ बोलवले, स्वत: माझे पुस्तक आणि पत्र हातात घेतले व माझ्या दोन्ही मुलींची चौकशी केली. तसे डोळे मिटलेलेच होते. नास्ता घेतला का असे विचारले आणि सांगितले की नास्ता व चहा घेतल्याशिवाय जाउ नका. एवढया आजारीपणातसुध्दा इतकी आपुलकीने चौकशी! नंतर सिस्टरला सांगितले की पत्र वाचून दाखव. त्याप्रमाणे तिने वाचून दाखवले. त्यांचा चेहरा समाधानी दिसला.

विद्याविहारला आनंदपर्व चालू होते तेव्हापासून त्यांची तब्येत खूप खालावली होती. तशी गेली दोन वर्षे तब्येत ढासळतच होती, नऊ मे पर्यंत कमी जास्त चालूच होते. ९ मे १९९९ रोजी सकाळी एका महान व्यक्तिचा अन्त झाला. त्यांच्या बद्दल लिहाव तेवढं कमीच आहे. गेले ३८ वर्षे मी विद्याविहार मध्ये काम करित आहे. सोमैया मध्ये येण्यासही एक घटना घडली.

२४ जून १९६१ रोजी माझी एक डॉक्टर मामेबहीण अचानकपणे निवर्तली. त्यासाठी माझी आई पुण्याहून मुंबईला येत असतांना वाटेत तिला माझी एक मैत्रीण भेटली जी सोमैया मध्ये प्राध्यापिका होती. माझी चौकशी केल्यावर तिला कळले की मी नोकरीच्या शोधात आहे. तिने आई जवळ निरोप दिला कि सोमैया आर्टस व सायन्स मध्ये जागा आहे, तिला प्रिंसिपॉलना ताबडतोब भेटायला सांगा. त्याप्रमाणे २६ जून रोजी मी अर्ज घेऊन कॉलजमध्ये गेले, लगेच माझी नेमणूक झाली आणि अस्मादिक १२ जुलै १९६ (पानशेत धरण फुटले तो दिवस) रोजी कॉलेजमध्ये रुजू झाले. अशी होती माझी सोमैया कॉलेज मधील एन्ट्री.

सायन्स कॉलेज मध्ये असतांना श्रीमान करमसीभाईशी विशेष संबंध आला नाही. तिथे ५ वर्षे काम केले. वैशिष्ठ म्हणजे रोज प्रार्थनेने सुरुवात. कित्येक दिवस प्रार्थना म्हणण्यासाठी मी जात असे. मी तिकडे गेल्यावर आमचे विभाग प्रमूख स्वत: माझी डयूटी करीत.

१९६६ जुलै मध्ये सायन्स कॉलेज मधून मी पॉलिटेक्निक मध्ये गेले. अनेक दिवस प्रिन्सिपॉल मला येण्याबद्दल सांगत होते. पहिल्याच वर्षाच्या वार्षिक स्नेह सम्मेलनाच्यावेळी मी शेटजींना पुष्पगुच्छ दिला ती आमची पहिली मुलाखत त्यानंतर मात्र वरचेवर काही ना काही निमित्ताने त्यांची गाठ पडत असे. पूज्य करमसीभाई रोज कॅपस् मध्ये फेरी मारीत असत. त्याची नजर अगदी बारिक असे, कचरा कुठे पडला आहे काय? मुल, मुली कपडे कसे वापरतात? केस किती वाढवतात? इत्यादी अगदी बारकाईने बघत. लोक खूप चेष्टा करीत हया गोष्टीची. परंतू त्यांचा हेतू काय आहे हे समजल्यावर गप्प बसत असत. ते कधीहि कोणाच्याही अंगावर ओरडत नसत, समजावून सांगून सर्व गोष्टी करवून घेत. सर्व संस्थाच्या स्नेहसंम्मेलनाच्या वेळी आचानकपणेत्यांची फेरी असे. हेच की ज्या उद्देशाने त्यानी हया संस्था चालू केल्या तो हेतू साध्य होतो का नाही ?

६-७ वर्षे मी पुढाकार घेउन ऍथलेटिक स्पर्धा व सुगम संगीत स्पर्धा घेतल्या. चेंबूर पासून ते विक्रोळी पर्यंत सर्व शाळा (४०-४५) व ज्युनियर कालेज त्यात भाग घेत असत. बक्षिस समारंभास ते आवर्जून हजर राहात व चौकशी करीत. त्यांनी मला सांगितले की सुगम संगिताच्या स्पर्धेसाठी संस्कृत का ठेवित नाही? त्याप्रमाणे लगेच पुढील वर्षी संस्कृत सुगम संगीत चालू केले. त्यासाठी ट्रॉफी नव्हती. मी प्रमिलाबेन पारेख यांना सांगितले की शेटजींना ट्रॉफीबद्दल सांगा. त्या शेटजीबरोबर बोलल्या तेव्हा शेटजी म्हणाले की कुमठेकर बाईनाच सांगा त्या कुठूनतरी ट्रॉफी मिळवतील. खरच केवढा विश्वास होता त्यांचा माझ्यावर. अशाच एका बक्षीस समारंभाच्या वेळी माझ्याशी बोलतांना त्यानी श्री. कुमठेकर काय करतात असे विचारले. त्यांना जेव्हा कळले की श्री. कुमठेकरांचा २५ वर्षाहून अधिक काळ इंडस्ट्रीमधला अनुभव आहे, तसेच शिकवण्याचाही २० वर्षाचा अनुभव आहे, तेव्हा त्यांनी मला

सांगितले आम्हाला अशीच माणसे हवी आहेत, त्यांना मला भेटायला सांगा. मी थोडेसे दुर्लक्षच केले, पण त्यांनी मला परत श्री. कवाडीयांच्या मार्फत निरोप दिला व मला भेटायला बोलवले आणि विचारले श्री. कुमठेकर आमच्याकडे केव्हा येत आहेत. ताबडतोप आले तरी चालतील. अशाप्रकारे श्री. कुमठेकर १ सप्टेंबर १९९० मध्ये सोमैया मध्ये दाखल झाले. त्यांना पाण्याचा अतिशय उत्तम पारख होती.

पूज्य करमसीभाईंनी एवढा मोठा व्याप वाढविला तो शून्यातूनच. आज एवढ्या मोठया इंडस्ट्रीज, अनेक शिक्षण संस्था, नेरुळवाडीत हॉस्पिटल, आदिवासीसाठी शाळा, तसेच गिरीवनवासी ट्रस्ट स्थापून कित्येक वर्षे मोठे विनामूल्य वैद्यकिय कॅंपसचे आयोजन आदिवासी लोकांसाठी केले व कित्येकांना दृष्टी मिळवून दिली. प्रत्येक वर्षी पहिला पेशंट ते स्वतः ट्रॉलीवर नेत असत. एवढी महान व्यक्ति मी अगदी जवळून बघितली व त्यांच्यापासून स्फूर्ती घेतली ..... नव्हे मला ती आपोआपच मिळाली ..... हे माझे भाग्यच म्हणावे.

श्रीमान करमसीभाई ऑफिसमध्ये ८-१० तास रोज काम करीत असत तसेच विद्याविहारलाही रोज एक फेरी बहुदा असेच. त्यांना भेटण्यासाठी हेड ऑफिसला गेले तर बसवून ठेवत नसत. वैशिष्ठय म्हणजे मराठी माणसांबरोबर मराठीतच तर गुजराती माणसांबरोबर ते गुजरातीतच संभाषण करीत. पॉलिटेक्निक मधून मी १ ऑगस्ट १९९० रोजी इंजिनिअरिंग कॉलेज मध्ये प्रवेश केला तेव्हा एका महिन्यात माझ्या लक्षात आले की पिण्याचे पाणी पॉलिटेक्नीक अथवा हॉस्टेल मधून आणावे लागत असे. मला हे काही योग्य वाटले नाही. मी ताबडतोब प्रिन्सिपॉलांच्या परवांनगीने १५-२० मुलांना घेऊन शेटजींना भेटायला गेले. त्यांना या गोष्टीची कल्पना नव्हती. त्यांनी ताबडतोप श्री. धनवीना आदेश देऊन तात्पुरती पाण्याची टाकी बसवून वेगळा नळ देऊन २ दिवसांत सोय केली. तसेच कॉलेजला कॅंटीन सुरू करण्यास सांगितले आणि दोन दिवसांत ते सुरू झाले. एक ना दोन अनेक छोटया मोठया गोष्टी त्यांची आठवण करून देतात. ऑफिसमध्ये डबा घरूनच येत असे. पण आजूबाजूच्या सर्वांना देऊन मगच ते जेवत असत. गेले १९६६ पासून १९९६ पर्यंत मला त्याचा सहवास लाभला. एवढया महान व्यक्तीला जवळून बघायला मिळाले यातच मी धन्य आहे.

अत्यंत साधी राहणी, वक्तशीरपणा, उच्च विचारसरणी असलेल्या ह्या माणसाकडे केवढी मोठी दूरदृष्टी होती की त्यांनी ५० वर्षापूर्वी विद्याविहारला व १९६० साली चुनाभट्टीला प्रचंड जागा घेऊन ठेवली. कशयासाठी? एवढा मोठा शैक्षणिक प्रकल्प डोळयापुढे होता. मला एवढाच अभिमान वाटतो की विद्याविहार मधली प्रत्येक संस्था उभारली जात असतांना मी त्यांची साक्षी होते. सर्व घटना मी अगदी जवळून बघितल्या. एवढया मोठया प्रकल्पामुळेच रेल्वेने सुध्दा स्टेशनला कै. कृष्णमेनन यांच्या हस्ते नाव दिले 'विद्याविहार '. हा तर शेटजींचा मोठा सन्मानच आहे.

विद्याविहारचा हा व्याप म्हणजे एक लहान विद्यापीठच होय. K.G. पासून ते P.G. पर्यतचे सर्व शिक्षण तसेच इंजिनियरिंग मॅनेजमेंट, वैद्यकिय शिक्षण ..... सर्व काही आहे. आणखी एक आठवण मला येथे नमूद कराविशी वाटते. ७ वर्षापूर्वी मला 'भारतीय जनता पार्टी ' मार्फत महानगरपालिकेच्या निवडणुकी करता तिकीट मिळाले. परवानगी घेण्यासाठी मी शेटजींकडे गेले तेव्हा त्यांनी आशीर्वाद तर दिलाच पण श्री. कवाडीयांना सांगून सर्व मदत करा असे सांगितले, शिवाय सर्व प्रिंटिंग सोमैया प्रेस मधून करून दिले व इतरही मदत केली. मी कुठल्याही अपेक्षेने गेले नव्हते. एवढी महान व्यक्ती माझ्या आयुष्यात मला भेटली म्हणून मी धन्य झाले.

आम्हा सगळयांची खूप इच्छा होती तसेच खात्रीही होती की अजून दोन वर्षे तरी ते जगतील आणि आम्हाला त्यांची शताब्दी करण्याची संधि मिळेल. तसा योग नव्हता. इमक शुभ्र कपडयातील, तेजस्वी मुद्रेतील, प्रभावी व्यक्तिमत्व आता फक्त आठवणीतच जमा आहे. वाईट फक्त इतकच वाटत की शेटजींच्या निधनाची बातमी रात्री १० वाजता कळली आणि अंत्यदर्शन सुधा घेता आले नाही. त्यांनी घालून दिलेली सांस्कृतीक मूल्ये इतकी महत्वाची आहेत की जतन करून आपले कार्य केले तरच त्यांचा एक मोठी श्रध्दांजली दिल्यासारखी आहे. व्यक्ती जरि नसली तरी त्यांनी घालून दिलेला वारसा आपण तसाच चालू ठेवून, त्यांनी जी ज्योत लावून दिली आहे ती तेवत ठेवणे हे आपणा सर्वांचे कर्तव्य आहे.

सोमैया कुटूंबियांवर तर हा मोठा आघात झाला आहेच, परंतु त्यांचबरोबर विद्याविहारही पोरका झाला आहे.

ईश्वर मृतात्म्याला चिरशांती देवो.

Table of Contents

Home And Homage

Dr. V. M. Domkundwar
Principal and Secretary
K. J. Somaiya College of Engg.

A Message from the Principal

It is my pleasure to bring out this publication of KJSCE after a considerable gap of time. I have always believed that you, the students of this institution have tremendous technical ability and potential. The magazine is an ideal platform to exhibit your erudition before the technical fraternity.

The topics discussed in this magazine are of recent nature, and throw light on matters of present importance.

You, as students, have completed one phase of your education. However, your real education as engineers begins when you enter into the practical world, and use your knowledge for industrial development. You have to learn the art of knowing, designing and handling equipments. You must show an initiative in learning, as this is the only means to keep yourself technically sound. You must accept onerous challenges, and contribute to national growth and development. This requires hard work and honesty at its roots.

The Government incurs immense expenditure for your education, and expects your contribution to the development of this nation. In view of this, you must bring out innovative ideas to upgrade the industry at the desired speed.

You should strive to maintain values, honesty and respect for others. If this is supplemented by hard work and dedication, your efforts shall set the nation in the direction of progress. Contribute to this cause and the credit for a bright future shall be duly yours.

I am delighted to find in you a highly motivated and intelligent clique. I wish you all success in your endeavours, and hope your efforts shall equal the aspirations of teachers in trying to give a better life to the poor society of this country. Engineers are said to be nation builders. I hope and believe you will strive to earn this epithet in every right.

Principal and Head of Departments

Dr. V. M. Domkundwar, Principal - KJSCE

(L to R) :
Dr. (Mrs.) V. R. Naik (HOD - Humanities),
Dr. Munshi Srinivas (HOD - Production),
Dr. V. M. Domkundwar,
Prof. G. K. Sashte (HOD - Electronics),
Prof. B. M. Pradhan (HOD - Mechanical)

LIST OF MERIT
Result of B.E. (All Branches) May 1998

	Appeared	Distinction	I Class	II Class	Pass	Total	Pass%	University Rank
B.E. (Electronics)	69	02	29	21	05	57	82.60	Kulkarni Yashshree 6th Rank
B.E. (Mechanical)	53	01	18	19	06	44	84.62	Bandiwadekar Anup 5th Rank
B.E. (Production)	70	01	32	24	03	60	85.71	Ari Nirmodak 13th Rank

Kulkarni Yashshree

Bandiwadekar Anup

Ari Nirmodak

Student's Council for the year '98-99

Standing (L to R) : Mita Jani (Ladies Rep.), Manjari Lal (Ladies Rep.), Deepa Ray (Jt. Mag. Sec.), Vinil Komalan (JT. G. S.), Balachandran Iyer (G.S.), Rahul Soundrarajan (Jt. C. S.), Vaibhav Parikh (C. S.), Arun Iyer (Jt. Mag. Sec.)
Sitting (L to R) : Mrs. N. M. Kumthekar, Dr. V. M. Domkundwar, Prof. G. K. Sashte

Vinod Nair
(Mag. Sec.)

Karthik Madhok
(Sports Sec.)

Prashant Sangoi
(Sports Sec.)

Chetan Karani
(G.S.)

Aditya Deshmukh
(Jt. G.S.)

Sandeep Narayan
(C.S.)

Annual Report of the Students' Council

Too low they built who built below the skies - Young

Balachandran Iyer
General Secretary

The students' association for the year 1998-99 started off as a group of infants... motivated infants, but a quizzical lot nevertheless. Slowly and surely, as the events of the year unfolded, and through successful ventures like Abhiyantriki '98 and Symphony '99, we have developed from a group of naive individuals to an efficient team that carried out its responsibilities in full earnestness. We have realised the true meaning of friendship and mutual trust through a year that vacillated between seemingly insurmountable obstacles and unbelievable success. Let me brief you through a successful 1998-99:

Blood Donation Camp (2nd September 1998): Under the guidance of Mrs. N. M. Kumthekar the council organized a blood donation camp, that happened to set records of sorts, with as many as 91 individuals donating blood. It provided an ideal start to our activities, with a renewed commitment to the human aspect of the Engineer's life.

Teacher's Day (4th September 1998): The celebration of teacher's day was graced by the presence of Dr. (Mrs.) Snehalata Deshmukh, the Vice Chancellor, Mumbai University, and our honourable trustee Mr. P. M. Kavadia. As a token of its appreciation, the college took up this opportunity to felicitate Prof. A. S. Desai and Prof. (Mrs.) V. R. Naik, for their outstanding contributions to this institution.

Fresher's Evening (11th September 1998): The fresher's eve served as an occasion to welcome the students of the first year, and gave them an opportunity to display their talents. It was an ideal platform for the senior students to interact with their juniors and gave everybody a chance to enjoy themselves.

Friendship Day (2nd September 1998) and Rose Day (19 February 1998): The friendship day organized in the first half of the year, and the rose day in the second half, provided an ideal break from the rather monotonous academic schedule. As an added bonus, the amazing marketing skills of the team, came to the fore, resulting in massive sales of ribbons and roses. The proceeds from the same provided the essential liquidity for Symphony '99.

Intra-Campus Oratory and Literary activities (22nd to 25th September 1998): Continuing with its tradition of taking the lead in organising various intra–campus competitions the Students' Council coordinated with EESA, MESA and APES to stage the following events:

22nd September	Group Discussion
23rd September	Dumb Charades
24th September	Debate
25th September	Press Conference

A D Shroff Memorial Elocution: The Students Council in association with Forum of Free Enterprise organised this event to reflect on the economics of the fiscal world and tried to impress on the mind of the budding engineers the importance of financial management and its qualms.

Abhiyantriki '98 (5th to 8th October): Instead of being a student body dedicated solely to organising extracurricular activities this council took up the challenge of integrating the individual branch organisations to put forth a technical festival that in its very year of

inception, commanded the technical fraternity to stop in its tracks and pay attention. As its particular contribution to the fest, the Student's Council organized two seminars on 6th October 1998.
The first session focussed on the GRE and problems faced by Indian students studying abroad. This briefing by Madhavi Desai and her team of experts saw a packed house, with a bus strike on the day doing little to hamper the inflow of participants.
The second session, featured Mr. Kamath (B.TECH., IIT Mumbai), the co-founder of IMPAC COMBINE, who acquainted the participants with the challenges involved in starting an industry. The seminar dealt with the fundamental difficulties and inherent charms of an entrepreneurial venture.

Traditional Day: For the first time in the history of Somaiya engineering, a traditional day was celebrated, and proved to be a merry occasion, as the students romped around in their traditional apparel.

Symphony '99 (11th to 13th February): Not much to elaborate on this mega-event, beyond the fact that it was simply the best festival in Mumbai in 98-99. No other college mustered the resources or generated the fervour to put up the festivities that we did in Symphony '99. With four professional performances and a culmination of musical treatises this festival was one that shall be remembered. It also established the panel's faith in selecting an efficient student body.

Annual prize distribution ceremony: Somaiya Engineering continued its commitment towards being one of the premier entrepreneurs of sports by organising intercollegiate competitions such as Badminton, Table Tennis, Cricket, Football , Chess and other indoor and outdoor sports. The annual prize distribution ceremony, presided over by Smt. Leelaben Kotak, recognized the efforts of the emerging sportspersons, who participated in the various competitions.

I, would now like to mention the individual contributions of each member of the students' council in making 1998-99 the successful year it was.

Vinil Komalan (Jt. G. S.) was the perfect man for the job, as he imparted discipline to an initially disorganised team and kept everybody together when everything was going haywire. Vaibhav Parikh (C. S.) was the individual with the perfect social outlook. He took care of all the various social commitments , invitations and permissions for all the activities. Rahul Soundrarajan (Jt. C. S.) with his fortitude and aesthetic outlook was the ideal partner to Vaibhav and he was always there when we needed him. Meeta Jani (L. R.) added grit to the team and took immense responsibility carrying them out with the utmost of ease. Manjari Lal (L. R.), with her communication skills and enthusiasm added immensely to the success of the team. Karthik Madhok (Sports Sec.) was the unsung hero of the team, carrying out the requisite sports activities almost single handedly and still managing to contribute to the other activities. Prashant Sangoi (Sports Sec.) was elementary in successful organization of all the sports activities through the year. The perseverance of Vinod Nair (Mag. Sec.) has been instrumental in bringing forward our ideas to you in managing to publish this magazine after a gap of three years. It was his forthright and unceasing spirit that was hugely responsible for our successful term, especially in the lookout for sponsors. Deepa Ray (Jt. Mag. Sec.) exemplified the adage "Actions speak louder than words". Her forceful outlook to life and her positive criticism brought out the best in us. Arun Iyer (Jt. Mag. Sec.) is undoubtedly the literary giant amongst us. His simple outlook to life and his direct approach made him a person, the team couldn't do without.

On behalf of the students' council I would like to express our sincere gratitude to our principal Dr. V. M. Domkundwar, the HOD's Prof. Munshi, Prof. Sashte, Prof. Pradhan and Dr. (Mrs.) Naik, Prof. Milind Marathe and all our teachers and staff for their help and

The Blood Donation Camp held on
2nd Sept. 1998

Mr. P. M. Kavadia felicitating the
Vice Chancellor Mrs. Snehalata Deshmukh
at the Teacher's Day function

Inaugural ceremony of Abhiyantriki '98

Inauguration of the Alumini Association

Smt. Leelaben Kotak at the annual prize
distribution ceremony

Symphony '99

Devaki Pandit in concert on 11th Feb.

The Fusion nite on 12th Feb.

Hariharan at the Ghazal nite on 13th Feb.

The Street Play - Competing for a cause

A Festival and the perennial celebration

cooperation. I would also like to thank the Registrar Mr. Shetty, Office Superintendent Mr. Shivalay, Office Incharge Mr. Ashok and the office staff whose contribution was vital.

Our efforts would have been futile without the advice and guidance of Mrs. Nalini Kumthekar who was actively involved in all our projects and ventures. Her contribution made the difference between the success and failure of this council. The contribution of Mr. A. K. Chaudhary proved invaluable to the successful working of the Student's Council.

The students' council would like to thank last year's students' council especially Chetan Karani, Aditya Deshmukh, Sandeep Narayan and Priya Gandhi and all the students for their contribution and support without which it would have been impossible for us to carry out all our activities. MESA, EESA, APES, IEEE (KJSCE) also deserve a special mention for their contributions.

One of the very important functions of the Students' Council is to bridge the communication gap between the student community at large and the college management. Be it festivals, competitions or exams we hope that we have addressed ourselves to this function to everybody's satisfaction.

Balachandran Iyer
General Secretary
Students Council, KJSCE

Abhiyantriki '98: In Quest Of a Path

K. J. Somaiya College of Engineering has, over the years, added to its organizational endeavours, in that, there has been a consistent effort to impart a touch of revelry through the abecedarian approach of hosting these efforts to as large an audience as could be afforded. The 5th, 6th, 7th and 8th of October 1998 saw this institution embark upon an enterprising venture in the form of a technical festival. Christened "Abhiyantriki", this intercollegiate fest has earned itself considerable repute in its inaugural year.

This festival was an unique effort, as, the various faculties, represented by APES, MESA and EESA, joined the Students' Council in a concerted effort, to channelize the available resources of the college onto a common organizational platform. The enthusiasm of the principal and the heads of departments added to the mobilized zeal of the students towards making Abhiyantriki '98 a memorable event. The result was a successful fest that attracted participation, not only from colleges all over Mumbai, but also from as far as Pune and Delhi. The success of the fest was perhaps, best reflected in the paper presentation contest – Cosmos, held on 8th October. This contest pooled in more than 80 papers, of which 24 were presented on the final day of the fest. Reflecting over the fest, one is left musing over the last lines printed in MIDDAY, in its review of the event, which said that we could look forward to Abhiyantriki growing into one of the preeminent technical festivals in the country, in the years to follow.

SYMPHONY '99

The Event

The 11th, 12th and the 13th of February 1999 saw K. J. Somaiya college of Engg. celebrate its intercollegiate cultural festival. In a melange of multivarious competitive events and entertaining performances, Symphony '99 represented the largest and the most successful organisational endeavour of this institution in this academic year.

The fest commenced with a classic performance by Devaki Pandit, the renowned Hindustani

vocalist. This performance, which was held as an interactive instructional concert, provided the right blend of education and entertainment, that identified with the purpose of the festival itself.

The success of the fest lay in the mammoth crowd it attracted over the three days, to a host of innovative competitive events. While the musicals and performing arts remained the prime attractions, the fun sports and a series of "new and improved" literary and oratory events added novelty to the fest.

Finally, the festival was made memorable by its pro-nites. The fusion concert held on 12th Feb., that saw five maestros - Fazal Quereshi, Louis Banks, Taufeeq Quereshi, Sultan Khan and Shridhar Parthasarathy commune to create magical music, defined the moments that will fill the nostalgia of the fest. The performance by Hariharan on the 13th of Feb., provided an ideal climax, to this mega-event, that shall fill our remembrances of this institution, for all time to come.

The Retrospective

That Symphony '99 shall be remembered by its pronites is only a partially correct statement. For all the individuals who were involved in making this mega-event possible Symphony '99 was celebrated in the effort that led up to the fest,. The festival shall be remembered most in the desperate philandering in getting it started and getting sponsors involved (One should thank Colgate. Things were better after they came in.). The festival shall be remembered in the enormous effort that made the seventy odd events that happened, happen and in all the goofs that inevitably happened to happen. But, more than everything, the festival shall be remembered in its sleepless nights. Symphony '99 was the night when for the first time we had the resources to make it happen, and started contemplating three pronites; it was the nights before the fest that witnessed a frantic clamour to get the final knots tied up; and, over and above all else, Symphony '99 was the night that was spent sticking posters in colleges all over the city.

Symphony '99 was a three day festival. For all those who were involved in making it happen, the festivities lasted three months!

Thanking List

1. Makrand Agnihotri
2. Suman Chakraborti
3. Gajanan Kasbekar
4. Sandip Dass
5. Sudipta Roy

Achievements

The Event	The Accolade	The Champions
University Wrestling Championship	Gold Medal	Amol Mali (TE MECH)
Inter-University Basketball (West Zone)	First Prize	Vinod Muthukumar (FE MECH) (Represented Mumbai Univ.)
Inter-Collegiate Badminton tournament and	Second Prize	Advait Maniyar (BE MECH) Siddharth Singh (BE ETX)
Intra-Campus Badminton tournament (Team)	First Prize	Prashant Sangoi (TE EXTC) Niranjan Kanade (SE ETX) Tushar (FE MECH)

Inter-Collegiate Table Tennis tournament and	Third Prize	Anirudh Shukla (BE ETX) Omkar Dabholkar (TE MECH)
Intra-Campus Table Tennis tournament (Team)	Second Prize	Jaydeep Raje (SE PROD)
Intra-Campus Cricket tournament	Second Prize	KJSCE XI
Inter-Engineering Chess tournament (Team)	Third Prize	Rajeev Kothi (BE MECH) Vineet Bekal (SE EXTC) Romil (FE ETX) Sandeep (SE MECH)
Cosmos '98 (Paper Presentation) : Mech. and Allied fields	First Prize	Raghunandan Jagdish (SE MECH) Pramoth Adhivarahan (SE MECH)
Electronics and Allied fields	First Prize	Kedar Bhole (SE ETX) Aniket Bhat (SE ETX)
GK Quiz (Aarambh '98)	First Prize	Vinod Nair (TE EXTC) Jitish Kolanjery (TE EXTC) Lyndon Pereira (SE PROD)
Password (Aarambh '98)	Third Prize	Vinod Nair (TE EXTC) Jitish Kolanjery (TE EXTC) Rahul Soundrarajan (TE EXTC)
FM Quiz (Aarambh '98)	Third Prize	Rohit Sharma (TE ETX) Lyndon Periera (SE PROD) Kapil Kedia (TE EXTC)
Western Solo (Aasthitva '99)	First Prize	Kapil Kedia (TE EXTC)
Lie Detractor (Space '99)	Third Prize	Lyndon Periera (SE PROD)
Personality Contest (Fusion '99)	Mr. Fusion	Kaushik Lodh (TE EXTC)
Intra-Campus Debate	First Prize	Vinod Nair (TE EXTC) Rahul Soundrarajan (TE EXTC)
	Second Prize	Rohit Sharma (TE ETX) Chetan Karani (BE ETX)
Intra-Campus Press Conference	First Prize Second Prize	Rohit Sharma (TE ETX) Siddharth Singh (BE ETX)
Mock Advertising (IEEE 360 Degrees)	First Prize	Rohit Sharma (TE ETX) Vinod Nair (TE EXTC) Balachandran Iyer (TE ETX) Bhavik Joshi (SE ETX) Kapil Kedia (TE EXTC)

There are two names that have not been mentioned in the above list, because their achievements cannot be condensed to fit any piece of paper. Parag Bamne and Prashant Prabhu swept the highest awards for poster design, cartooning and the like at every college festival (including Aarambh, Mood I, Malhar ...) and all conceivable competitions in Mumbai. This academic year saw them excel at their niche, and establish themselves as true Champions!

ASSOCIATION OF PRODUCTION ENGINEERING STUDENTS (A.P.E.S.)

WORK REPORT FOR 1998-99

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REPORT 1998-99

The academic year 1998-99 was a very eventful and rewarding year for the Association of Production Engineering Students. The production engineers took it upon themselves to be on the centre stage of the extra curricular activities of K.J. Somaiya College of Engineering. Inspite of the hard academic grind of eight subjects each one with their own practicals and term work, they found the time and organized with enthusiasm the following :

ABHIYANTRIKI '98

SEMINAR ON ROBOTICS

Venue : Seminar Hall, K.J.S.C.O.E.
Date : 5th October 1998
Time : 11:30 a.m.

The annual technical festival, Abhiyantriki '98, was held between 5th and 8th of October and revolved around the theme of Robotics. The Association of Production Engineering Students (A.P.E.S.) organized the seminar on Robotics, delivered by Dr. S. S. Mantha (B.E.Mech., M.E., PhD.) Head of CAD/CAM department of V.J.T.I. The seminar, which was attended by the students and faculty members from about 15 colleges (Engineering and Management) in and around Mumbai, covered in detail the basics of Robotics, its current wide range applications and the scope and future of Robotics in India through numerous slides and audio-visual effects.

INTER-BRANCH TECHNICAL CROSSWORD QUIZ

Following the seminar on Robotics was the 'Inter-Branch Technical Crossword Quiz' designed and conducted by A.P.E.S. The finals of this contest, held after extensive elimination procedures culminated in a grand finale of wit and wisdom exhibited by the

students of K.J.S.C.E.

The crossword covered a wide-range of topics from the fundamentals of Mechanical and Electronics engineering, to the basic foundations of the HSC examination, which were fitted to a grid projected on an over head projector for the audience and each team having their own personalized grids. The contest was held over six rounds and the Electronics and Telecom branch represented by Vinod Nair and Shobit Kanaujia came out on top.

INTER-CAMPUS EVENTS

K.J Somaiya College of Engineering arranged a set of oratory and literary events contested by the students of all institutes of the Somaiya campus. During this competition the A.P.E.S. organized the "Press Conference" on the 26th of September 1998.

The contest had participants from SIMSR, the Science, Commerce and Arts colleges and of course the hosts. Each contestant had to undergo a grueling test of character and determination as a over-enthusiastic crowd fired a barrage of questions at each one. The contest judged by the communication skills professors of the Science and Commerce college declared Rohit Sharma our own candidate posing as Laloo Prasad Yadav the winner of the contest.

ONE DAY SEMINAR ON ENTERPRISE RESOURCE PLANNING AND ITS RELEVANCE TO PRODUCTION & OPERATIONS MANAGEMENT OF INDUSTRIES

The Production department and A.P.E.S. organized a complete One Day Seminar on Enterprise Resource Planning (ERP) which gave extensive details on the subject and was held in three sessions through the day and was delivered by the following dignitaries:

Dr. N. Sambandam (Professor N.I.T.I.E.) who started with a keynote address on ERP in its current stage and how it was developed and an overview of all the existent ERP models. He then gave a detailed outline of Distribution Requirements Planning (DRP) and its applications in Planning and Control Systems which was aided through a practical example of the "Warehousing" problem.

Mr. V.S. Chavan (Manager Godrej & Boyce Mfg. Co. Ltd.) delivered an extensive lecture on Materials Resource Planning (MRP) and its place in the business planning cycle. His lecture was emphasized through an MS Office presentation projected on a screen via a computer projector.

Prof. A. K. Sheikh (Associate Professor N.I.T.I.E.) further expanded on Mr. Chavan's lecture and gave us the developments on the MRP model which is now known as MRP II and its effect on Demand Management and Capacity Requirements.

Mr. Balachandran (Head, India Operations DSQ Software Ltd. Mumbai) who gave a dynamic lecture on the scope and future prospects of ERP along with its job prospects. He explained the implementation of ERP in companies in India and abroad and the demand for ERP expertise as an upcoming field.

MECHANICAL ENGINEERING STUDENTS' ASSOCIATION (M.E.S.A.)

ALWAYS IN TOP GEAR

Mechanical Engineering Students' Association (MESA) was established in 1996 and is currently in its third year.

MESA COUNCIL

Prof. N. S. Chandrashekhar is In-charge of MESA. Ever-active Prof. N. S. Chandrasekhar, with his ideological (nonetheless practical) attitude towards life, is popular among the students of Mechanical engineering.

In the elections held in the month of August students from F.E, SE, T.E and B.E (mechanical) classes were elected to the MESA council . The members of MESA council elected for the year 1998-99 are :

1)	Bro. Hemant Ramaswamy	(BE Mech.)	Chairman
2)	Bro. Gautam Nadkarni	(TE Mech.)	Secretary
3)	Bro. Arvind Balijepalli	(TE Mech.)	Treasurer
4)	Bro. Ganesh S.	(TE Mech.)	Jt.Secretary
5)	Bro. Yogesh Bhatkhande	(TE Mech.)	Jt.Treasurer
6)	Bro. Raghunandan Jagdish	(SE Mech.)	Committee member
7)	Bro. Purshottam Bhosle	(SE Mech.)	Committee member
8)	Bro. Kalpesh Mehta	(FE Mech.)	Committee member

ACTIVITIES OF MESA FOR YEAR 1998-99

Just as the caption that goes with its name, MESA started its year in top gear.

TOOL BANK

Launched in 1997-98, this is the second year of the "TOOL BANK" scheme. As expected, the response of the students to this scheme is increasing. Under this scheme, High Speed Steel (HSS) tools are bought in bulk and sold to the second year mechanical students at rates cheaper than market rates with guaranteed quality. Each set of MSS tools are shared by two students which further reduces the cost borne by each student.

INTRA CAMPUS DEBATE

An intra campus debate was organised by MESA on 24th September, 1998. The debate dealt with topics related to social, political and various other aspects of life. Both, the first and second prizes were won by students of K.J. Somaiya College of Engineering. The winners were :

1st prize	Bro. Vinod Nair	(T.E. ELTL)
	Bro. Rahul S.	(T.E. ELTL)
2nd prize	Bro. Rohit Sharma	(T.E. ETRX)
	Bro. Chetan Karani	(B.E. ETRX)

COSMOS - 98

Cosmos is an annual paper presentation contest organised by MESA. This year MESA chose to increase the scope and limits of COSMOS by making it an intercollegiate event, with an aim to

increase the knowledge & awareness and improve oratory & presentation skills of the Students. It was held on 8th October, 1998.

COSMOS - 98 had invited papers broadly classified in 3 categories, namely:

1. Mechanical and allied branches
2. Electronics and allied branches
3. Inter disciplinary

It received an overwhelming response with 84 entries from engineering and management colleges as far as Pune and Delhi. Out of these 8 papers were selected from each category. Thus, in all 24 papers were presented in COSMOS - 98 on 8th October, 1998.

The winners, one team from each category, were :

Mechanical & allied branches
Bro. Raghunandan Jagdish
Bro. Pramoth Adhivarahan
College - K.J. Somaiya College of Engineering
Topic - Cryogenics.

Electronics & allied branches
Bro. Kedar Bhole
Bro. Aniket Bhat
College - K.J. Somaiya College of Engineering
Topic - Neural Networks & Fuzzy logic

Inter -disciplinary
Bro. Mukesh Bhasin
Bro. Siddarth Kolte
College - Jamnalal Bajaj Institute of Management
Topic - Enterprise Resource Planning.

One day seminar on 'CAD/CAM'

The department of Mechanical engineering ,in association with MESA, organised a one day seminar on 'Introduction to CAD/CAM and its applications' on 27th March, 1999. The speakers invited to speak on the related topics were :

1. Dr. Vinay Kulkarni (Manager, Geometric Systems Solution Ltd.) on "Introduction to Computer Graphics and Rapid Prototyping."
2. Dr. B. S. Prabhu (IIT, Mumbai) on "Computer Aided Process Planning (CAPP)".
3. Mr. B. R. Lanka (GM, Geometric Systems Solution Ltd.) on "Computer aided manufacturing (CAM)".

This was followed by demos of some CAD/CAM related software packages by SITTAR.

The seminar organised for enlightening the participants on the latest advances in CAD/CAM and its related topics, was attended by about 120 members, including people from industry, staff members & students of various engineering colleges.

ELECTRONICS ENGINEERING STUDENTS ASSOCIATION (E.E.S.A.)

Chairman
G K Sashte

Staff In-charge
Milind S. Marathe

Student Representatives

TE-EXTC		TE-ETX	
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Jitish Kolanjery	Jt. Secretary	Sandeep Patil	Jt.Secretary
Kapil Kedia	Jt. Secretary	Amruta Kulkarni	Treasurer

A report of EESA activities for the year 1998-99

Intra-campus Group Discussion :

As a part of the intra-campus literary and oratory competitions organized by KJSCOE, EESA organized an intra-campus Group Discussion on the 22nd September 1998. Over 45 participants took part in this event.
Seven preliminary rounds were held. Each discussion was for 8 minutes. The final round consisted of two discussions of 8 minutes each.

The Judges were :
Prof. Milind Marathe K.J. Somaiya College Engg.
Mrs. Kulkarni K.J. Somaiya Polytechnic

The top honours were claimed by Manish (SIMSR).

CHANNELS

As a part of the inter collegiate technical festival Abhiyantriki '98 (5-8th October), EESA organized an Internet seminar : CHANNELS
The students from our college conducted the first half of the seminar. This interactive session covered a wide array of subjects including:

Subject	Presented by
An Introduction to Internet	Anurag Arya (BE - MECH)
Structure of Internet	Kaustub Deshpande (BE – ETX)
Email	Rohan Gupte (BE - ETX)
E-Commerce	Nikhil Kelshikar (BE - ETX)
Internet Security	Rohit Sharma (TE - ETX)

All the basics concepts and fundamentals of Internet were touched upon. It thus provided a platform for informal exchange of information between the students.
This was followed by a Seminar on 'Job Opportunities on the Internet' presented by Dr. Malekar (Aftek Computer Systems).
He gave a brief talk on the job opportunities on Internet and conducted a workshop for staff and visiting participants, explaining the various aspects of the Internet.
A Software development competition held as a part of the technical festival invited over thirteen entries.

The judges were:
Prof. Uday B. Joshi
Prof. V V S Rao

1st Prize : Anil Pathro (BE ETX) : GRE Word Power
2nd Prize: Advait Vaidya & Arun (BE MECH) : Air-ticket reservation software
3rd Prize : Kaustubh Deshpande (BE ETX) : GRE Word Power

EESA also organised a CYBER CAFE during the festival. The students of KJSCE were given the opportunity to surf the net for a very nominal fee. The participants were familiarized with Internet and concepts were explained. The idea was to spread Internet awareness: its applications and features.

A Certificate Seminar on Industrial Automation and Control

This seminar, held on 5th March 1999, was organized as a joint effort by EESA and IEEE-KJSCE chapter. Eminent speakers from Institutes and Industry, who are experts in the field of Industrial Automation presented their papers. The topic of the seminar was so chosen, as it has become imperative for every engineer to have adequate knowledge of Industrial Automation and control. The seminar essentially consisted of virtuosos in the Industrial Automation field who presented their papers.

Chairperson for the Seminar
Mr. Vijay Patwardan
Senior Manager, Drives & Automation
Industrial Systems Group,
NELCO Ltd., Mumbai.

The following papers were presented -

Prof. Dr. S. A. Patekar
Electrical Dept, VJTI Mumbai -19
Title: Fuzzy Logic - What is it and Why?

Mr. P. K. Kale
Partner, Swami Samartha Consultants, Thane
Title: Case study on Automated Hydraulic Press

Mr. A. N. Patwardhan
Senior Design Executive,
Crompton Greaves Ltd., Ambad, Nasik.
Title: Automation in Protection Systems

Mr. L. R. Subramanian
Chairman, Situ Electroinstruments Pvt.Ltd.
Mumbai - 86
Title: Automation in Electric Power Utilities

Mr. Shirish Phadke
Group Manager,
Origin Information technology (INDIA), Ltd.
SEEPZ, Andheri, Mumbai-93.
Title: ERP ++ and Industrial Automation

Each participant was given a copy of the papers given by the speakers. The seminar was participated by students and Faculty members from over 20 technical colleges from all over Mumbai.

Works And Process of Thought

"Consider a far corner in the universe where the density of alcohol is so high that it would serve the world's needs for next century altogether" said our professor.

"To tap this vast resoure will require of course a very fast spaceship. But we couldn't possibly go all out in building the spaceship with no care whatsoever about its efficiency and cost. We could end up escalating the cost to such an extent that the very gain in procurring the alcohol could be completely nullified"; He continued.

"The problem calls for an engineers approach." He concluded.

This is an excerpt from a discussion that took place in our very first lecture on the very first day of college.

What is this "engineer's approach?" It involves finding a solution to a problem, but it does not end there. The engineer has to go probing for all possible solutions to the problem and select the best one. Otherwise his solution is no solution at all.

This approach seems difficult; but then there is no other approach.

The Oxford dictionary offers a definition of the verb "Engineer" as → to bring about, or to contrive. This is what perhaps, an engineer does in the simplest sense. Engineering is the process of bringing about that which is imminent and yet not existing. It is the art of contriving that which is practical, from that which is possible.

In calling this magazine 'An Ode to the Engineer', it is apt to commence by exploring into the engineer's technical prowess. The technical section of Kshitij is a collection of papers that explore concepts related to, and expanding outward from the realm of our technical syllabii. While an obvious preference has been given to papers that are based on rigorous fact and accurate theories, we have taken care not to ignore any expression of abstract thought based on 'real' information.

The latter part of this section, therefore, deviates from the technical arena and drifts into the thoughts that occupy the engineer's moments of leisure.

Most of the papers in this section boast excellence in having been presented at various contests, and having won considerable acclaim. As an underlining statement, this section offers informative and entertaining reading to the inquisitive mind.

NEURAL NETWORKS AND FUZZY LOGIC

1st Prize - COSMOS 98

KEDAR I. BHOLE and ANIKET A. BHAT
S.E. Electronics

"There are no universal statements about the nervous system except for the universal statement that there are no universal statements."

~Arbib(1989)

We do not, as yet, have a proper insight into the functioning of the brain; and the above statement aptly epitomises the current situation. Albeit we do now that the brain is made up of billions and billions of small fiber-like structures called 'neurons', questions like where exactly is the memory stored, have yet to be answered conventionally.

WHAT ARE NEURAL NETWORKS ?

Neural networks are networks designed in an attempt to create a model of the brain based on the physical way in which neurons interact, and the connections that exist between them. Conventional computer systems work sequentially, processing one step at a time where as neural networks process data in a parallel manner i.e. multi-tasking in a coordinated and organised way. One of the major differences between the brain and a traditional computer system is that the former is not programmed.

The 3 principles of modelling of artificial neural networks (A.N.N.) are as follows :

1. A large number of highly connected simple processing units.
2. Adaptable connections.
3. Parallel processing.

Based on these principles, McCulloch and Pitts developed a simple model to represent the variable synaptic connections or weights associated with the neurons and the activity of the neurons themselves.

FRAMEWORK FOR NEURAL NETWORK MODELS :

There are many distinct forms of neural network models but the general basic characteristics can be define as follows in terms of the major features which combine to form the framework.

1. A set of processing units.
2. A state of activation for each unit.
3. An output function assigned to each unit.
4. A connectivity pattern between the units.
5. A propagation rule to determine the patterns of activity through the connections.
6. An activation rule to combine the current activation level of unit with activation inputs to produce a new activation level for the unit.
7. A learning rule in order that the connectivity patterns can be modified through experience.
8. An environment in which the system can function.
9. An input buffer to enable the model to receive input.

The processing units may be split into 3 types : input units, which receive input from some external source; hidden units, within the system itself; and output units, which send signals externally to the system. All learning rules which are currently used, are basically a variation of Hebb's learning rule Frank Rosenblatt in 1958 incorporated learning into McCulloch and Pitts model calling his class of models *"Perceptron"*. The basic principle behind Hebb's learning rule is that if a unit receives input from another, and both units are either in a highly active state, or both inactive, the weight which represents the effect that the second unit has on the first, should be strengthened. In 1982, Hopfield defined the association very well in terms of the following four simple rules:

1. If an active neuron meets a neuron which is also active there is a strength increase.
2. If an active neuron meets a neuron which is inactive there is no strength increase.
3. If an inactive neuron meets a neuron which is also active there is no strength increase.
4. If an inactive neuron meets a neuron which is also inactive there is a strength increase.

THE DELTA RULE :

This is a learning rule for a single layer perceptron type model. The estimate of the derivative is proportional to the error.

Advantages of A.N.N.s are that they are

trained and not programmed, have the ability to generalise, can modify their behavior dynamically, are a graceful degradation, and show fault tolerance.

Neural networks, however, due to their inherent structure have certain disadvantages. Justification for results of the network is difficult, the weights do not have interpretation, and the logic behind the decision is difficult to explain.

FUZZY LOGIC :

Disadvantages of A.N.N.s introduces the idea of fuzzy login for solution of typical problems. Fuzzy logic is not a technology, rather it is used as a problem solving method within a network, an expert system, or any other computing methodology.

ORIGIN :

Classical logic began with Aristotle's syllogism. A syllogism says that an expression can either be true or false. Fuzzy logic does not require total truth or total falsehood.

METHODOLOGY :

It consists of linguistic variables and associating them with membership functions. These variables takes values between 0 and 1.

The error is fed to a linear filter which generates its derivative.

FUZZIFICATION :

Fuzzification is the process of accepting error and its derivative as the input and converting it into membership functions.

DEFUZZIFICATION :

A fuzzy inference results in a control variable expressed as a linguistic variable and defined by its membership function $f_a(x)$. To apply a control signal, we must have a real variable. Thus the linguistic variable defining the control signal must be converted into a real number with the operation of defuzzification.

DEVELOPMENTS IN FUZZY LOGIC :

Fuzzy logic can be said to begin where western logic ends. There are 2 fuzzy research Centres in Japan, viz. Laboratory for International Fuzzy Engineering Research (LIFE) and Fuzzy Logic System Institute (FLSI).

NEUROFUZZY CONTROL SYSTEMS :

Artificial neural networks have made a significant impact. Neurofuzzy algorithms are finding applications in advanced transportation for collision avoidance, driver modelling/path and trajectory planning, car following, lane changing and parking. Similarly for higher degree of freedom systems such as in aerospace industries, neurofuzzy algorithms have been developed for full envelope non-linear engine and flight control for advanced vehicle. Nonlinear flights control is essential for high performance and super manouverable highly agile aircraft.

A neural network can achieve flight (or engine) control online, recognising changes in lift or load characteristics. A very recent method used by the Australian authorities at the Sydney Airport uses a neurofuzzy detector to identify criminals. The image is represented in the form of a grid in the network. This is compared with inbuilt images of criminals. The results of the comparisons are then analysed by fuzzy logic which decides the degree of similarity between the two images. Though this system is in its fledgling stages, it is insufficient to elucidate the versatility of applications of neurofuzzy systems.

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Anybody who can read through the quantum theory without feeling dizzy has not understood it.

- Niels Bohr

CRYOGENICS-SCIENCE OF THE FUTURE : A TREATISE ON CRYO-TREATMENT

1st Prize - COSMOS 98

RAGHUNANDAN JAGDISH and PRAMOTH ADIVARAHAN
S.E. Mech

INTRODUCTION

Cryogenics is a branch of physics concerned with very low temperatures-how to produce the lowest temperatures possible (below minus 300 F), and what effects these low temperatures have on organisms or materials. The prefix Cryo is derived from the Greek word kryos, meaning "cold".

Cryo-treatment implies the treatment of the material using cryogenics.

THE HISTORY OF CYROGENIC TECHNOLOGY

The use of deep cryogenics in the treatment of materials is a science seeking legitimacy. Over the past 10 to 15 years, many in the field have been freezing anything from pantyhose to golf balls claiming increased wear properties. Unfortunately, these applications have taken away from the practical usefulness of his technology, especially in the perishable tool market.

HOW IT WORKS - GENERAL EXPLANATION

In common layman terms the cryogenic treatment includes dipping a piece of treated substance into liquid nitrogen /helium cooled refrigeration units for a specified amount of time (minutes to hours to days depending on the material) after which it is removed. Tests have shown the treated substance has entirely different properties from the one used before. The percentage improvement in the properties ranges from 200% to 700%. It actually seems like black magic.

THE PROCESS OF CRYOTREATMENT

It is a system of slowly freezing then reheating a pretreated object to strengthen it and produce wear resistance.

By extending the standard heat and quench cycles of conventional metallurgical practice to the cryogenic reaches of the temperature scale, certain desirable structural changes are induced in alloys commonly used in industrial applications.

Controlled thermal cycling between +300 degrees F and -300 degrees F markedly improves the wear life of steel and cemented carbide tooling and wear parts. Cryogenic processing, performed after conventional heat treating, enhances tool life by three known mechanisms :

- The conversion of significant amounts of retained austenite to martensite.
- The formation of fine carbide particles
- The relief of residual stresses.

These ultra-cold temperatures, below -310°F, will greatly increase the strength and wear life of all types of vehicle components, castings and cutting tools. In addition, other benefits include reduced maintenance and repairs and replacement of tools and components, reduced vibrations, rapid heat dissipation, and improved conductivity.

ADVANTAGES OVER THE CONVENTIONAL TECHNOLOGIES

- Requires only one permanent treatment.
- Creates a denser molecular structure. The result is a larger contact surface area that reduces friction, heat and wear.
- Not a surface coating. Subsequent refinishing operations or re-grinds do not affect permanent improvements.
- Eliminates thermal shock through a dry controlled process.
- Transforms almost all soft retained austenite to a tougher martensite.
- Forms microfine carbide fillers to enhance large carbide structures.
- Increases durability or wear life. Longer tool life.
- Decreases brittleness.
- Increases tensile strength. Toughness and stability doubles with the release of internal stresses.
- Increased machinability.
- Less machine down time.

- Longer runs before change required.

COMPARISONS WITH REGULAR TECHNOLOGIES

The present day material strengthening technologies like deep hardening and heat treatment have restricted enhancement scopes and limitations.

An example of a standard drill bit can be given. A drill bit made of EN series with a carbide tip used by Airbus Industries could make 180 holes of depth 30mm. The same drill bit was then treated cryogenically at -315 F by Arrow cryogenics by their patented process. This then gave an amazing result of 790 holes of the same depth. The percentage improvement in the property was a phenomenal 338.8% whereas the treatment costs was $35, making the percentage increase in costs only 29.16%.

Airbus Industries were so impressed that they are now looking to cryotreat as many components of manufacture as possible.

APPLICATIONS OF CRYOGENICS

Today tools are cryo-treated as part of their manufacturing process. Drill bits, reamers, shearers, razors, knives, blades, etc. are now being cryo-treated. Engine components are cryo-treated to give a very superior vehicle; McLaren Mercedes' dominance in the Formula-1 sector is a pointer to this. Musical Instruments cryo treated give superior sound. Sports goods like aluminum bats are now treated leading to more "home runs" in the baseball games.

Thus Cryogenics is entering each and every possible field with a vengeance.

MATERIALS

Some examples of materials that are routinely cryogenically treated include All types of Steel, Titanium, Plastics, Copper, Nylon, Aluminum, Brass, Various Alloys, Glass, Complete assemblies i.e. whole chain saws, engines, motors, etc. And many others.

CONCLUSIONS

Cryogenics is slowly and surely changing from the science of the future to the science of the hour.

The tremendous response from the industry has led to further research and tests. New avenues are opening everyday and now cryo-treatment is becoming an industry norm.

The cost of Cryo-treatment is quite prohibitive as of now but mass production will lead to making the prices competitive. At present there are over seventy big companies into Cryo-treatment; even one in India (Asia Cryotech, Madras). So the technology is spreading and new and curious uses are being discovered. Even as one reads this paper, something new must have been pulled into the world of CRYOGENICS.

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Infinity

Infinity is not a number. It is a symbol, which is used to denote an unending growth of an ever increasing quantity. Infinity has got the property that by adding or subtracting a large number, however large it is, infinity is unaffected.

Infinity is where things happen that don't happen.

Anon.

BUSINESS PROCESS REENGINEERING

1ST PRIZE - COSMOS '97

KEDAR I. BHOLE
SE-ELECTRONICS

INTRODUCTION :

Eight years after it was introduced, business process reengineering, is simultaneously the most powerful and the most maligned tool today. It basically is a sharply focused practice that has delivered extraordinary benefits , but only to those who have adhered to its four fundamentals.

1. It is process-centric. The tool homes in on processes: the activities that convert inputs from suppliers into outputs for the customer, the steps that go into manufacturing, marketing, accounting, and even presentation. During re-engineering, it is these processes that must change. The processes are evaluated on the grounds of their efficiency, and are either decimated or metamorphosed.

2. It is redesign-ruled. Modification is one word that re-engineers detest. Making small improvements to your processes in the hope that they will add up to a major gain is not the route on which re-engineering travels. To re-engineer, start with a clean sheet of paper and lay out the steps of your process from the scratch, the way you would like them to be.

3. It is radical. Re-engineering will leave you with business processes that bear no resemblance to their earlier forms. The technique doesn't merely speed up processes - by computerising them, for example - but questions the very existence of each. And often eliminates them altogether instead of simply trying to execute them more efficiently.

4. It is dramatic. We don't even consider reengineering if we are trying to scrape five percent off our costs. The tool aims to burn out large chunks of expenses - a third, a half, or even more. If you are trying to achieve incremental improvement, you are not reengineering.

Thus, during reengineering, it is crucial to break away from the outdated rules and fundamental assumptions that underline operations.

WHY MUST YOU REENGINEER TODAY?

It's the best way to dismantle the creaking systems of the past.

Customers, competition and change forces companies to rethink and redesign their policies and processes. Many times, owing to a radical change in the circumstances, CEOs find themselves wishing that they could start their business afresh instead of endeavouring to eliminate the inefficiencies of the past. That contend the priests of reengineering, is just what their gospel preaches. The primary class of problems that reengineering is structured to solve is operational. That is, you know what to do, but you are not doing it so well. You then find a solution using reengineering.

WHY IS REENGINEERING BEING CRITICISED?

Blame wrong usage and half-hearted revolutions.

Reengineering forces you to transform your processes instead of merely tweaking them, and hence might cause a severe dislocation. If successful, it will deliver extraordinary gains. But if it fails, it could leave you even poorer.

WHEN MUST YOU REENGINEER?

If, and only if, a complete overhaul is essential.

Reengineering is implemented only when the CEO is convinced of the need for fundamental change in business processes. The sense of urgency and the conviction that the alternative to change is extinction, are prerequisites.

HOW DO YOU REENGINEER FOR SUCCESS?

There are many tools. But get the sequence right.

CREATE A VISION :

Before corporations reengineer, they dream up a vision of what they want to achieve. For e.g., before it began its programme of change, Elgi Equipments drew up a clear vision: become the numero uno in its business in 10 years. And the enterprise-wide reengineering that it embarked upon is driven by this vision.

PICK THE PROCESS :

Select that process for reengineering where a dramatic improvement will deliver the greatest benefits to the bottomline. Picking process is doubly critical because reengineering every one of the company's operations can be fatal. If the entire organisation starts reinventing itself, business gets disrupted. Focusing on a few processes also helps yield results quickly. The state of readiness of a process to go the whole hog is also important.

HOW DRASTIC SHOULD REENGINEERING BE?

There are no half measures. Go all the way. Corporates that try to tinker with the individual tasks which add up to a process end up mis-engineering. Real reengineering involves finding a brand new way of accomplishing the outcome. Hence Corporates ask themselves not what their processes can do for the customer, but what the customer wants from their processes. They then redesign the processes so as to deliver just what the customer wants.

CONCLUSIONS :

Faced by younger, nimbler competitors who are unsaddled with cumbersome systems from the past, you may have no choice but to reengineer. However, whether you reengineer in pockets or across your organisation will depend on how strong you want your medicine to be.

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Time: A Definition

Time is merely a concept that emerges out of the evolution of any system whatsoever. If there are no phenomenal changes in the state of a system including the universe as a whole, the concept of time is bound to lose its meaning. In nature we find systems evolving spontaneously and we characterize their evolution in an abstract parameter called time. Keeping pace with such self-induced manifestations, this parameter runs without a stop, while the concept of 'present' remains eternally present. Each instant that elapses moves the present a bit ahead, engulfs the future and merges with the past. In course of such an evolution, a system passes through a sequence of states. The connecting threads, ensured by causal relations lead to the apparent flow of time in a particular direction, namely from the present to the future.

An extract from
Isaac Newton's 'Principia Mathematicia'

Contributed by
Amit G Limaye (TE Telecomm.)

THE GREENHOUSE EFFECT - Half Knowledge Is Dangerous

VINOD NAIR and RAHUL S.
T.E. TeleComm.

The Greenhouse Effect - What, Why and How?

Light from the sun reaches the Earth in 510 seconds. Reflected from the surface, the same light would be radiated back into space, but for the Earth's atmosphere. About half the radiant energy reaching the Earth from the sun, because of its short wavelengths, can pass through the atmosphere to the Earth's surface. But the longer wavelengths of heat that radiate back towards space are absorbed and reradiated by water vapour, CO_2, clouds and other gases, and the atmosphere warms. This life-sustaining phenomenon is referred to as the ***greenhouse effect***. In modern times the greenhouse effect has been classified into two types based on the atmospheric components responsible for it, as follows :

Natural greenhouse effect :

This is a natural phenomenon that has been occurring for millions of year, on the Earth as well as the other planets in the solar system. Contrary to popular belief the natural greenhouse effect is not a harmful phenomenon. In fact, it is a phenomenon that leads to natural warming of the Earth, without which the temperature required to sustain life would not have been produced. On a global level, water in the atmosphere produces about 97% of the Earth's total greenhouse warming. Only 3% of the warming is accounted for, by the other gases, chief among them being CO_2, CFC's, methane, nitrous oxides and ozone.

Anthropogenic greenhouse effect :

Ever since the industrial revolution, there has been an increase in the atmospheric concentration of certain greenhouse gases such as CO_2, leading to an increased greenhouse effect. This phenomenon is referred to as the anthropogenic greenhouse effect. The entire debate regarding the harmful effects of the greenhouse effect, actually refers to the anthropogenic greenhouse effect. No conclusive evidence, however, of the anthropogenic greenhouse effect contributing significantly to global warming has yet been provided.

Global Warming - What, Why and How?

The Earth has often been described as Goldilocks planet, for it is neither too hot, nor too cold, but just right for its inhabitants. This optimum warmth has been maintained due to the natural global warming through mechanisms such as the greenhouse effect. Over the recent decades, global temperatures have exhibited an increasing trend, indicating that global warming is overshooting its "natural" limits. An immediate finger was pointed at the greenhouse effect, making it a topic of global debate over the past twenty years. Natural greenhouse effect has never been a topic of controversy, as the concentration of water in the atmosphere has remained more or less constant. Hence, focus shifted towards the anthropogenic greenhouse effect, thus making CO_2 the immediate villain.

Who framed CO_2?

About 130 years ago, at the beginning of the industrial revolution, the atmospheric concentration of CO_2 was approx. 280 ppm, a level that had remained constant for the past 700 years. Since the industrial revolution, which began in about 1860, the concentration of CO_2 in the atmosphere has risen exponentially. Today the concentration of CO_2 in the atmosphere is approx. 350 ppm, and if the present rise of 0.5% per year continues, the level will reach as high as 450 ppm in 2050. However it has been interesting to note that even as the concentration of CO_2 increases, the global temperature has not always followed the same trend. Temperature increased from 1880 to 1940, then decreased till 1970 and has been increasing ever since.

So if CO_2 has been vindicated, who is the real villain?

Sun - The Big Boss

In recent times, the theory regarding global warming, being related to the CO_2 concentration in the atmosphere has been further weakened by the fact that temperature has been found to be changing with the changes in activities of the sun's surface.

Sunspots, which appear as small dots when viewed through a solar telescope, are created when strong solar magnetic fields protrude through the sun's surface. Over the past 130 years, a startling co-relation has been observed between the Earth's northern hemisphere temperature and the changes in length of the sunspot cycle, which is the time interval between the peaks in sunspot abundance. It has been observed that, as the cycle length decreased, the Earth's temperature increased; conversely when the sunspot cycle increased, temperature dropped.

The solar maximum mission experimental satellite (SMM) launched in 1980, to study the sunspot cycles, revealed the sunspot activity to be minimum in 1986, and predicted peak sunspot activity in 1990-91. Although this peak could not be studied in detail due to the unforeseen collapse of the SMM, it is noteworthy to observe that the year 1990 has been the hottest year to record. A similar phenomenon has been recorded between 1645 and 1715, a period referred to as the Maunder minimum, during which low sunspot activities coincided with the "Little Ice Age", a particularly cold period that gripped Europe.

A thought to ponder :

A 100% increase in the atmospheric CO_2 would lead to an increase of 2-4 °C in the global temperature, due to increased anthropogenic greenhouse effect.

A 2% change in the sun's surface activity could freeze the Earth, or char its surface completely.

Global effects :

The obvious global impact of the greenhouse effect is warming. However no direct links have been established between the greenhouse effect and the excessive global warming, observed in the recent decades. Although anthropogenic greenhouse effect is acknowledged to be an undesirable phenomenon, its magnitude in terms of contribution to global warming in the present times is not particularly frightening.

In the 21st century, a combination of the anthropogenic greenhouse effect and a blazing sun, which is inching towards its peak activity period, could witness a 3-9 °C increase in global temperature. If this happens, then in addition to the Earth's surface temperature scaling unbearable levels, the melting of the polar ice-caps could cause the sea level to rise by as much as twenty feet. Here, we have two aspects to consider :

- The oceans rose more than 300 feet after the last ice-age - all in only a few thousand years.
- If the present studies were to be believed, then the role of the sun in any such extreme climatic change, would totally override the impact of any Earthly phenomenon. (such as the anthropogenic greenhouse effect.)

A thought to ponder :

Global warming and temperature variations are not new phenomenon for the Earth. Over the last 30,000 years there has been a fairly steady rise in the Earth's surface temperature. On a few occasions, there has been a sudden temperature rise of the order of 4 °C followed by a drop of the order of 2°C, within a short span of time. (Average temperature of the Earth is approx. 15°C)

Conclusions - A Global Problem Calls For A Global Solution :

The impact of the sun may outweigh the role of pollution in global warming; but, pollution itself is a global problem, and must be controlled. Maintaining our forest reserves is probably the best solution to this problem. The developed countries all over the world have exclusively exhausted their forest reserves. The developing countries on the other hand, still have forest covers, but need them most for the very cause of development. It is imperative therefore that a global strategy be evolved, by considering the existing forest reserves as global reserves, and evolving a formula through which the cost of maintaining these reserves is shared globally. Therefore the countries that have preserved their forests, and hence, are losing their share of the raw material for development, must be provided with alternative resources aiding their development.

In addition to this, each individual must be a part of the concept - *"Think globally and act locally"*, for, every tree planted on our own backyard adds to a healthier and more beautiful environment for us, and for the generations to come.

A thought to ponder :

Global warming is probably only the first of the global problems faced by mankind. With the ever increasing trend of pollution, and depleting natural resources, man, if he survives long enough, might have to deal with the ultimate challenge of finding another Earth that could sustain him.

Finally, it is worthwhile to ponder over the line of thought, which suggests that the global warming that we are experiencing holds its key in causes that are beyond man's capability to understand or counter. In fact, in all possibilities these climatic changes could be a part of evolution, and the Earth and its unique beings might learn to live with it.

At the end of this paper, we are left reflecting over the words of Samuel Mattews, who said *"For more than four billion years, the sun and the Earth itself have been the driving forces in our planet's changing climate. Now, we puny humans, in all our billions, can we force a decisive change in the decades ahead?"*

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THIS... IS THE K.J. SOMAIYA COLLEGE OF ENGG...
" CELEBRATING ITS 8th YEAR OF
"UNDER CONSTRUCTION "

ADVANCES IN DIGITAL SIGNAL PROCESSING

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INTRODUCTION

A major milestone for DSP came in 1979 with the announcement of the first commercial programmable device from Intel- the 2920. This device contained on-board analog converter but was limited in not containing a single cycle multiplier. The credit for the first true DSP microprocessor device goies to AMI with 52811. In 1980 NEC launched NPD7720, the first commercial available DSP device with a dedicated multiplier. This product is still being upgraded making it the most durable DSP device.

In this section we will discuss important concepts like Systolic arrays and Wavefront arrays. Macrocell technology and Gate arrays will also be enumerated.

SECTION 1

In this section we discuss advanced versions of VLSI like VHPIC and VHSIC which were instrumental in the development of the DSP microprocessor.

VHPIC (Very High Performance Integrated Circuit)

The methodology reduces component sizes from the present size of 2.5 microns to 1.25 microns. Smaller components improve circuit speed and reduce power dissipation. The throughput data rate provided is two orders of magnitude superior to current capabilities. It can provide complexities of more than a lac gates. Due to high cost and design time being very long. It is used only in the military to provide smart light and efficient weapons. The high accuracy standard for DSP circuits are compelling designers to use it for civilian purposes. The self testing and self repair capabilities of this system is sure to bring down maintenance costs.

VHSIC (Very High Speed Integrated Circuits)

Primarily initiated in 1979 for defence purposes by USA DOD. Specific goals of this project were

i) Increase in functional throughput
ii) Ease of technology insertion in weapon systems
iii) High tolerance in radiation environments
iv) Improved reliability testability
v) Minimum life cycle cost

The project was planned to be completed in four phases : 0-3

Phase 0 :
Conducted in 1980 as a planning exercise to define Phase 1.

Phase 1 :
Involved the design and fabrication of ICs with a maximum feature size of 1.25 micrometers and a demonstration of their applicability through signal processing brassboards. It began in 1981.

Phase 2 :
Aimed towards realisation of submicrometer technology and develop pilot production capabilities.

Phase 3 :
Efforts were in parallel with Phase 1. It was meant for feeding up-to-date ideas into the VHSIC effort in starting materials lithography, packaging, testing, built-in-test and fault tolerance algorithms.

The VHSIC, being very complex, advances in its architecture can be made only with help of advance software. Hence the IDAS program was initiated.

IDAS (Integrated Design Automation Systems)

Its main aims are :

(i) Reduce time to develop or modify complex IC designs.
(ii) Produce more advanced computer aided design(CAD)

The long term objectives included developing a fully integrate hierarchical design system encompassing all levels from system partitioning to mask generation and developing a high level language for all VHSIC chips.

These goals were to be achieved through the three part program :

i) IDAS 1 : Existing CAD tools will be identified and evaluated.
ii) IDAS 2 : These will be integrated under VHDL(VHSIC hardware description language) and common data base.
iii) IDAS 3 : CAD tools will be upgraded by advanced user interface, fully integrated data base, expert systems and artificial intelligence.

SECTION 2

Though VHSIC phase-2 would provide two orders of magnitude speed-power improvement over VLSI, the technology would still fall short of the projected Gallium Arsenide field effect transistor technology(GaAs) or GaAs Technology.

Current offerings of GaAs are :

Less than one micron gate geometry
Less than two micron metal pitch
Up to four layer metal
'On' and 'Off' devised
Four inch diameter wafer
Suitability for clock rates in range 1-2 Ghz

The salient features or advantages of GaAs include :

- Faster electronic circuit times as electron mobility of six to seven times that of silicon.
- Saturated drift velocity same as silicon but GaAs saturation occurs at lower threshold voltage.
- Large energy bandgao provides for bulk semi-insulation substrate which minimises parasitic capacitances leading to easy isolation of multiple devices in a single chip.
- Wider operating temperature with fluctuation possible over range of -200 o 200°C

Cryogenic and Hybrid Signal processing

The principle advantages of superconductive technology in signal processing is their high switching speed (hence high bandwidth), low propagation loss and low power dissipation. The latter translates into a potential advantage in circuit density. The applications include wide band signals, matched filtering and integrated focal plane processing. These require high processing bandwidths which can be met by analog devices. Super conductive technology provides all the elemental analog functions and all the digital functions required for signal processing thus capable of an entire hybrid signal processing microprocessor. Bandwidths of 10ghz and considerably high computational rates are available using array processors.

Its principle disadvantage is the high total power requirement for providing a cryogenic environment.

Having explored the complexities of the DSP microprocessor to this extent we now go on to see its role in neural networks.

Neural Networks

The Multilayer Perceptron (MLP) which incorporates the back propagation algorithm is the most popular neural network in existence today. Instead of going into the intricate details of MLP which can be found in a standard treatise on neural networks we discuss a simple form of the above algorithm. It requires an error signal to be propagated back through the layers from the output layer. Let for the jth node in output layer an error δ_j formed be given by

$$\delta_j = (e_j - y_j)\, y_j\, (1-y_j) \qquad ...(1)$$

where
y_j = output of node j
e_j = desired output of node j

The weight connecting the jth node in the layer below to the jth node in the output layer is modified as follows:

$$w_{ij}(n+1) = w_{ij}(n) + v.\delta_j.y_i \qquad ...(2)$$

where
v = learning rate

For hidden layers it is not intuitively obvious what the desired output of a hidden node should be. For the jth node in the hidden layer δ_j is given by

$$\delta_j = y_j(1-y_j)\sum \delta_k w_k \qquad ...(3)$$

where the summation is over all the nodes in the layer above. This calculation is performed first in the layer below the output layer, and then in the succeeding hidden layers until the input layer is reached.

The calculation of the first equation 3 requires distributed information. What is worse, the summation in equation 2 is the exact opposite of the summation required in the calculation of the output of the net.

If hardware consists of simple digital node processors with a single processor dedicated to each neuron, then each of the weight values required to evaluate equation 3 will reside in a different processor.

Here is where the infinite complexities of the DSP microprocessor can be efficiently exploited. Thus further advancements in digital signal processing is through this neural network integrated DSP providing unlimited possibilities in the near future.

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DOES INTERNET NEED THESE "HACKERS"?

VINAY MAHADIK
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Hacking and cracking are activities that generate intense public interest. Stories of hacked servers and downed Internet providers appear regularly in national news. This leads to the debatable question - does Internet really need these hackers?

In order to be able to answer this question, it is necessary to understand the definitions of and distinguish between a Hacker and a Cracker.

- A Hacker is someone, mostly a programmer, who is immensely interested in the arcane and lesser known aspects of computers and networks. They have an insatiable desire to obtain advanced knowledge of operating systems and programming languages, security holes within these and the reasons for their existence. Most importantly, Hackers freely share their knowledge and never, ever indulge in any sort of intentional damage to precious data, machine or a network.

- In contrast, a Cracker is a person who breaks into remote machines with unauthorized access and a malicious intent. Unlike hackers, he destroys data, denies services to legitimate users and in general disrupts/destroys the target machines data, security or privileges.

Earlier hackers were usually University Students or professional programmers who had a complete knowledge of computer languages, hardware, networks and their vulnerabilities which they gained through long periods of dedication and hardwork. These are the real hackers , who started out by finding newer and sophisticated ways to exploit those vulnerabilities and more importantly to develop patches or solutions for them. These hackers gained satisfaction by spotting/scanning for unseen holes/bugs and repairing/reporting them.

The hackers scenario today is truly miserable. "Kids" get fascinated by the thought of getting such a "control" over remote machines or users. Today's hackers are mostly crackers who have little or average knowledge of the Internet and set out to destroy and exploit. These kids are usually college drop-outs and start this conventional hacking from as early as 13 years of age. They form virtual Teams or Groups or Fraternities aimed entirely against the Internet Society and are a nuisance to us all. They usually can not write their own exploits and merely beg, borrow or steal utilities or tools for this purpose. Most of the crackers are known to -

- Access and crack unshadowed UNIX password files using standard password-cracker programs.
- Wait for the occurrence of a new security hole and search for an exploit.
- Copy and implement simple ways to deny services to innocent and unsuspecting users/systems.
- Write or acquire simple malicious code and spread it to the masses through the Internet.
- Spoof the IP address for some trusted hosts/servers and get Super user privileges.
- Use simple 5-10 line shell scripts or C programs to generate and fire an Email Bomb - an act so simple, stupid and unsophisticated that the real hackers find it too demeaning to be called a hack and always look down upon such crackers.

All of the these activities produce resentment against the hacker community. But blaming all this on the hackers in general is a kind of disservice to the real hackers - the truly talented and non- destructive ones.

I, for one, have grown to hate Crackers. In my attempts to read the minds of some crackers by communicating with them (through chats, mails etc., I have found that they are usually fundamentally dumb and mentally sick. They feel insecure and wish to be noticed and appreciated. This forces them to get their message out by destroying which they find much too simpler than creating. I feel they lack the important aspects of value education that we get through a formal schooling procedure. It is there that we learn to appreciate science and technology and, more importantly, to respect its limitations.

True, big corporations(Intel, IBM, Sun Microsystems - for example) actually employ hackers to test their networks security. Also, hackers may report bugs or holes found from time to time, and that proves their usefulness; but that is exactly what I wish to state. The true essence of a hacker is to constantly seek knowledge, share what he discovers, inform administrators about flaws or holes in their networks, and never to use his skills for destructive purposes and to have a pure heart. In this aspect he becomes more like a researching scientist. Hackers, knowingly or unknowingly are working together in full-proofing the future of the Internet.

Unfortunately, it is in our nature to do evil once in a while. The evil intent of crackers is aptly referred to by the term *mens rea* which in Latin means *The Guilty Mind*. And it is these guilty minds that will lead to a large number of crackers in the future. The role of the Hackers is now to make the present Internet more robust and to fortify it against any attacks from the crackers.

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We can get in touch with another person only by an attitude of unprejudiced objectivity. This may sound like a scientific precept, and may be confused with a purely intellectual and detached attitude of mind. But what I mean to convey is something quite different. It is a human quality - a kind of deep respect for facts events and for the person who suffers from them - a respect for the secrets of such a human life. The truly religious person has this attitude. He knows that God has brought all sorts of strange and inconceivable things to pass, and seeks in the most curious ways to enter a man's heart. He therefore senses in everything the unseen presence of the divine will. This is what I mean by "unprejudiced objectivity". It is a moral achievement on the part of the doctor., who ought not to let himself be repelled by illness and corruption, We cannot change anything unless we accept it. Condemnation does not liberate, it oppresses. Am the oppressor of the person I condemn, not his friend and fellow-sufferer. I do not in the least mean to say that we must never pass judgement in the cases of persons whom we desire to help and improve. But if the doctor wishes to help a human being he must be able to accept him as he is. And he can do this in reality only when he has already accepted himself as he is.

C. G. Jung : Modern Man in Search of a Soul

SURFACE ENGINEERING AND ITS APPLICATIONS TO THE IMPROVEMENT OF CORROSION BEHAVIOR

2nd Prize COSMOS '99

ANIMESH SHAH
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INTRODUCTION

Surface engineering is the design of a surface-substrate system to give a cost effective performance enhancement, which the substrate is incapable of achieving. It is thus the strengthening of the solid surface which acts as the barrier between the underlying material and its immediate environment.

It might sound surprising that the underlying concepts of this comparatively new field are ancient. In 850 BC newly made swords were treated superficially by dipping the red hot weapons in the lake. A popular reference to this idea is made in the book "Moby Dick" by Hermann Melville in which Caption Ahab's specially made harpoon is quenched by dipping it in the blood of his whalers.

Surface Engineering : An Exhaustive definition.

Surface Engineering can be defined as the design of a composite system (substrate plus coating), performance of which is not possible to attain by the coating or the substrate individually. In other words, it seeks to induce certain novel properties in the material which cannot be replicated by coating the substrate.

Technique used for surface engineering

Various techniques have been employed in this field :

- Chemical deposition
- Physical vapour deposition
- Electrodeposition
- Plasma coating are some of the available techniques.

However we will devote our energies to the discussion of direct energy techniques (e.g. ion beam, electron beam, laser beam). This technique has inherent advantages in the form of sharp thermal gradient, non contact processing etc.; which significantly improves surface quality. Lasers, in particular, which produce a thick surface coating with a varied chemical composition are unachievable by other methods.

Lasers as a tool of surface modification :

Being coherent and monochromatic, lasers have a high degree of spatial resolution which allows us to focus them on a small area (in Å). The energy delivered in a narrow band wavelength makes it very precise. Moreover it is delivered only to the first few atomic layers which makes them a truly surface modification tool.

Also by merely varying parameters such as beam diameter, power density and mode of transmission they can be used to perform a variety of surface modifications.

Laser Surface Alloying (LSA)

It is a material processing technique utilising the services of the high power density of a focused laser source to melt the coating and thin underlying substrate to form a thin homogeneous alloyed surface.
It is carried out in two ways.

Predeposition technique :
This is a step method. In the first step the surface is precoated with alloying species. In the next step a laser beam is used to melt the alloying species and homogenise it with the substrate to form a uniform surface alloy.

Direct Injection Technique :
this is a one step method. The laser melts a thin layer of the substrate. The desired alloying species is simultaneously injected in the powered form into the melt. The subsequent homogenisation of the melt results in a uniform surface alloy.

A principle difference in the two methods lies in the dependence of the surface on the alloy on the properties of the substrate or the coating.

In case of the direct injection it depends upon the properties of the substrate while the Predeposition method depends upon the properties of the coated species.

Mechanism of LSA

The interaction between the laser and the materials has a very small time frame (1-100ms).

Consider a preplaced alloy coating powder on the substrate. When laser beam is incident on the surface the energy absorbed is transferred instantaneously to the film and substrate. The surface melts and so does the powdered coating to form a molten region, the depth of which depends upon the laser power and interaction time. Interdiffusion mixing occurs by a convective flow mechanism. The liquid/solid interface remains stationary for a while and resolidifcation occurs rapidly. Interdiffusion rate and solidification rate are inversely proportional.

Applications of LSA in Corrosion behaviour :

Corrosion is regarded as a scourge on us by nature. It is a material phenomenon where gradual transition of a thermodynamically unstable species to its stable form resulting in a marked deterioration of physical properties.

At room temperature corrosion is in the form of uniform, localised, intergrannular corrosion. Steels being widely used materials in this environment, have been extremely researched upon. In aqueous medium steels do not form a passive layer to protect further corrosion.

Laser surface alloying of low carbon steels with Cr have shown a low critical current density (i_{crit}) and also decreased current density for passivation. Laser surface alloying of 9Cr-1Mo steels has resulted in increased corrosion resistance comparable to pure Cr metal. A large number of other works using Al_2O_3 chromium borides on Fe-based substrate in various media have resulted in similar increased aqueous corrosion resistance.

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THE BUSIEST PLACE ON 'PLANET SOMAIYA'.

ARUN IYER
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If we try to chalk down human scientific and technology development we find that it has been only a handful of enlighten individuals, namely scientists and mathematicians who have provided the genuine pathbreakers.

As a personal hobby I have been studying the various artistic developments of our century and the centuries gone by.

But there has been this one particular movement which has caught my imagination more than anything I have ever assimilated before. Called "Surrealist Art" it deals with the powers of the subconscious mind and is concerned with consciously evoking the subconscious.

The surrealists persevered for progress in art. The scientists persevered for progress in science, progress in technology.

When both these genres defined progress they defined it for their respective fields. But only progress in the later has had some impact in our standard of living.

Let us analyse the term "progress". What do we mean by progress? By progress do we mean progress of art, progress of science? By progress we certainly mean progress of humankind to be more specific progress of the human mind. We have to conclude that both the "progresses" mean the same underlining the basic need for advancement in thought, word and action.

The surrealists had ways in which they could invoke the subconscious mind and their works were certainly not terrestrial by the look of them. The works of artists like Salvador Dali and Roberto Matta appear to be illustration of alien civilizations, to think very crudely. But then consistent study reveal that these are mental maps which when decoded may certainly give us gold!

When the artist forcibly inculcates paranoia, he is in a trance, he is open to his subconscious mind, but he is physically conscious of the fact . His physical body is just a camera which photographs the subconscious mental map in colour by hand. This was what Salvador Dali invented.

The surrealists has their own ideological base for progress. In their endeavor to unearth the mystics of the mind they always tended to portray the following complexities.

1. **Convulsive beauty :** the beauty that emerges from a conflict between extreme movement and complete immobility.
2. **Objective chance :** the sum total of the coincidences that control a destiny.
3. **Black humour :** the form of humour, which because of its tragic undertone, constitutes a poetic terrorism.
4. **Extravagant love :** this resulted in each surrealist work portraying the female as a guardian goddess.

The first two concepts appear to be closely related to scientific and mathematical preambles. It appears great minds tend to speak a language quite similar to each other. It is evident that these concepts are creations of a highly analytical minds; of someone who may have developed to the level of say, Albert Einstein, but in a completely different field, if the reader can grasp the inner idea.

The mental make-up of brilliant minds, working for different goals may appear different. But are the mental make-ups different? Are the goals different? if we were able to interpret them in a common language, the language of the mind they may be one and the same, the secret to the formation of a sublime human civilisation.

What do we mean by "language of the mind"? In a very crude sense it may mean an understandable pattern of sublime consciousness which may also include the subconscious. What do we mean by consciousness? We define consciousness to include the intelligence of highly analytical lungs, namely the "geniuses" of the different fields. The understandable pattern could be something like an EEG, as we have already discussed, a mental map.

As of now the progress of humankind has been triggered only by the scientific community. Geniuses from other fields like art, sports and literature have had very little or no part to play in this effort. So we have received only part of the secret. Will the integration of superior human intelligence under the "common language" yield us the entire secret? The answer to his question certainly lies with us.

DE 'VOID' OF CULTURE

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It has been a few days since Girish Karnad, the renowned playwright and actor inscribed his name in Indian literary history by claiming the Gyanpeeth award. I watched one of his interviews on TV last night. When asked why he preferred to write in his native language (Kannada), he said something wonderful. He admitted that during his days at Oxford (he was a Rhodes scholar), he dreamt of joining the ranks of English literary giants and thereby basking in international limelight. However, when his first play poured out onto paper, it happened to speak Kannada.

The message Karnad tried to deliver was simple. When you try to express yourself, the truth behind the expression is more important than the content itself. A storyteller can best narrate a story that he himself has been a part of, or atleast one that he has witnessed close at hand. Now, I dream of writing and being read too. In that respect, this interview disheartened me. Watching that interview, I felt completely 'devoid' of the 'ethnicity' and 'culture' that Karnad referred to! Now, I come from a Malayali family, a traditional Malayali family at that. However, here I am, in crossbred cosmopolis, where, the closest I get to my roots is that I speak 'mallu' and wear a 'waishty' at home. And frankly, even the 'waisthy' came in only because dad forced me to wear it, a few years ago (though the fact that I wear it even today, is influenced by the extreme comfort I experience in wearing it). So the fact is, if I wanted to write a story today, I would be very confused about the kind of people who would be a part of that story. There is no unadulterated 'culture' or 'ambiance' that I can describe, because I know none. Let me clarify at this point, that I am not trying to accuse Mumbai of lacking culture in the true sense. What I refer to as culture, here, is a narrow definition of the term, that would encompass a melange of faith, and more importantly, of ritual, that could be used to identify a particular community of people. That I should write about ritual is ironic, as I am rather indifferent and sometimes supercilious to ritual. However, the fact is, whenever I have read stories that referred to communities, and to civilizations, that "communed" because their people shared certain practices, and certain methods of worship, I have been attracted to the succinct beauty of such ritual. The "culture" described in a story is often more enticing than the story itself.

Let me outline my predicament more correctly here. It is linked to the fact that, even though I have spent all my life in Bombay, my answer to the oft asked question "What is your native place?", happens to be Kerala. The answer itself may be a force habit, but, the fact that I take pride in the answer, reflects at the exotism that is associated with Kerala. Infact, every monolingual state and city in India, and every 'closet' civilization exudes an exotism in its 'ethnic' ambiance. You might identify with my predicament better if you have read about civilizations and cultures - the Aryans, the Vikings or even the early mafia. Each culture or ethnic community boasts of a tradition of well-guarded faith and ritual, often made more exotic by preserving an element of secrecy. This is where, the cosmopolis we live in, where ethnicity is conspicuous by its absence, seems to be deficient as a community or more correctly as a culture.

No! I don't really believe all that I have written. It was just a flow of thoughts, that was significant, but definitively not conclusive, atleast in the aspect of cultural 'devoidness'. We do live in a cross-bred community, but more than that we live in an 'open' culture. Our culture, its traditions and rituals have been built from the combining hues of various magnificent and exotic cultures. The seeming lack of ethnic influence arises from obstructed influence by multivarious ethnicities that combine into this cosmopolis. What language should you use to express yourself in Mumbai is not a difficult question - it is not a question at all. Every language would draw its own audience here, and every audience retains its own language. Civilization is best defined as a process of refinement and education. Then, what better educated a civilization, that is influenced by many a civilization, and yet, is constrained by the influence of none! If one were to write about the community of Mumbai, its uniqueness would not be lost in the diversity of its people. Every culture, every civilization and even every profession (a profession defines its culture and fits the definition of the term), is unique in itself, and by virtue of this fact, exudes exotism. This city is made unique not just by the diversity of its influences. It is made unique by the fact that inspite of, and on account of the diversity, the city 'works'.

THE INDIAN NULEAR SCENARIO : FROM PARA TO VERSE
NUKES FOR THE THIRD WORLD ?

BALAJI IYENGER S.
S.E.ETRX

Pokharan-II ushers us into an age where in we can boast of technological breakthroughs & advancements in the nuclear arena, which for long has been the domain of the super powers.

After an year of the test the curtains have been drawn and now what appears in the proscenium is a very faint picture of what lies in the backdrop.

Behind the curtains we can find the candid picture. Today, India is beset by a whole plexus of problems which, needless to mention, have had the most corrosive affect on the economy as well as our ethos.

Many pro-nukers may say that some amount of the skepticism is bound to follow any major decision such as this, but is this skepticism justified is the real question. Is the averdity shown by our politicians in preempting the nukes justified?

How politic have our demagogues (sorry to say) been in tracking such as decision. Were they au fait enough and was it pragmatic enough to carry out the nuclear tests and incur the wrath of the superpowers in the form of economic sanctions? Indian economy though insular is bound to suffer due to these sanctions.

It could have been a more wise & perspicacious action on the part of our politicians had we continued building our own conventional military strength & the IRBM instead of acquiring the ultimate weapon, since after the world war II nukes have never been used and have only served as show of power & dominance. This is because every country has cognizance of the fact that use of a nuclear weapon showdown which would result in nothing but a holocaust.

However there is no denying of the fact that we would have had to conduct these test sometime or the other. In this decade we have had global treaties like the CTBT & the NPT & the superpowers have also agreed to cut down their arsenal of nukes over a period of time. But these treaties have their technical loop holes which allow the superpowers to slip through and maintain their dominance. Or else, how do the Americans account the fact that they have the ability to realise twelve nuclear missiles in just 10 minutes every day.

What we need today is a firm policy & the conviction to implement it to eradicate the main problems which engulf our country. May be after 10 years of such crisis management programmes, we will be in a better state, economy wise & infrastructurally to conduct such tests. In the meanwhile we should try and improve our conventional abilities which will serve us more in the long run.

AND SO THE BUDDHA SMILED AGAIN ... !!!

ANUSHA IYER
S.E.ETRX.

"Enough!" Said Mr. Atal,
Of India being pushed into the muddle
We must teach this west a lesson
With a reply that's strong and subtle.

So set he in the direction of nuclearisation
Followed by imminent weaponisation
To show that we were a nation
with strong principles and an even stronger foundation.

Led by h'ble Kalam
and the omnipotent Chidambaram
Scientists shed their sweat in the scorching sun
for one month in the sands of Pokhran.

And then finally arrived the D-Day
ushering in a whole new wave
Self-reliance, confidence, triumph it gave;
Replacing the smile on the Buddha's face.

"Deplorable!" cried Bill,
Impose sanctions on India we will,
Promise to us does it until
That it's nuclear ambitions it shall kill.

But Indians all over the world rejoiced,
Economic help promised by NRIs;
And so the cries of rebuke and criticism
Were drowned by the shenanigans of patriotism!

THE JOURNEY

ARCHANA SRIDHARAN
F.E. Electronics

There is a popular Hindi song, which when roughly translated goes thus -

"Oh! The journey of life,
What a unique journey it is,
A journey that no one could really decipher,
One that was a deep secret to many."

Sure, the journey of life is tough and enmeshed with several perils and a few triumphs. But surprisingly, equally daunting - or may be even more - and I am not exaggerating here, is the journey by our red coloured monster, the local BEST bus. What a total anticlimax, you may begin saying in through disdain. But mind my words, for they are the words of a veteran - one who has waited long and grueling hours (either at the bus-stop or within the bus) and shed a million tears in remembrance of good old home, when the waiting got unbearable.

It's Monday morning, and you arrive as fresh as sunshine at the bus-stop. There's a smile on your lips, a swing in your stride and you know that given a chance, you would conquer the whole world today. There are a good many Samaritans standing at the bus-stop, but they are all waiting for the other bus - the one with the utterly despicable frequency. They all have an expression of melancholy on their faces - who wouldn't, waiting for such a bus? It's been about fifteen minutes since you arrived at the bus-stop, but a delay is perfectly alright. After all, nobody in this world is made entirely perfect.

Another ten minutes go by and you are fully struck by the realization that many of the other people at the bus- stop are waiting for the same bus as you. The light In your eyes has faded a bit - but, despair not for these are thorough civilians, gentlemen and ladies who have your well-being foremost on their minds. Moreover, your bus has arrived! You confidently move towards the door only to realise that a kind of war dance is taking place near the entrance, with people yelling and stamping their feet in unison. Now the primitive in you completely takes over and you join in with full gusto. By the time you're inside you have done everything short of giving a war cry - gnashed your teeth, pulled others hair and made threatening noises.

What do we see here? The sweet smile on your face has been thoroughly wiped out by a venomous look and you're sporting a new hair style - one that could be termed as bold and unconventional in the party circuit. The conductor makes his appearance and you're suddenly transformed into a meek rabbit. You give him a ten rupee note and he looks at you malevolently, sending a chill down your spine. Like an obedient child, you take back the tenner and handover the exact change in response to which the ticket is rudely pressed into your hands. It seems an eternity before you finally see your destination approaching and your heart wells up with gratitude and a supreme longing to free yourself form this boiling cauldron.

There ensues a small battle as you make your way to the exit and finally get down, which certainly would have been impossible without divine intervention. A feeling of elation sweeps you as you realise all your limbs are intact but you are already quite late for the lecture and start walking purposefully towards the college only to see the professor walking beside you. One look at each other and the same question arises on both your lips, "Been traveling by bus, haven't you?"

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Childhood is a time when the heaven lies above you.
The earth starts lying about you soon after.

William Wordsworth

CAN INDIA BECOME A WORLD CLASS SPORTS NATION?

RAMAKRISHNAN SUBRAMANIAN

INTRODUCTION :

"Efforts never go waste". If we make a sincere effort, then certainly India will become a formidable challenger to other countries in the area of sports. But for any improvement it is necessary to analyse the ills that currently plague Indian sports and chalk out the path of progress and vision for the future.

Present status of sports in India :

If the amount of participation in games and medals won is a criteria for determining the standards of sports in any country, then for the past 3 decades the picture presented by India is sad and dismal. India, country with 900 million citizens has to satisfy itself with a solitary Bronze Medal in the Olympics, that too largely because of the heroic efforts of Leander Peas, while countries as small as Ireland, NewZealand had won a few Golds. It is a few devoted Indian players whose hardwork, grit and determination still keeps the Indian Flag fying in International sport events. There is an urgent need to acknowledge this problem and take remedial measures.

Necessity of Sports :

Always good sporting events and the healthy compitetion provided by them, are very important for the cultural, development of any country or society. Victory in these acts as morale boosters for the entire nation, raises confidence level, and creates happiness in out hearts. They provide us the constant urge, to excel and get fame and recognition for ourselves and our motherland. It cements firmly the bond of unity already existing among the people of India. Sports alone is an excellent way of building friendship with other nations.

What troubles Indian sports?

India's deteriorating standards in the field of sports causes concern.

The reasons are :

The lack of interest in sports shown by children. There is non-existence of active sports activities in majority of primary schools. These are exactly the places which can create the best talents.

The budgetary allocations by the government is measly. Also there is apathy towards sports in the main decision making level. The government does not support even prodigies like Jaspal Rana who has to hunt for scholarships. The money spent by sports boards members on their jaunts to foreign countries can instead be used to produce talented people, capable for winning.

There is lack of support from public to use sports as a medium developing healthy youngsters. The young generation does not consider sports as a lucrative career option. The various boards managing the affairs of sports in our country are deeply entrenched in Utopian ideals and orthodox training methods and their failure to change along the world has also contributed to the present story of India sports.

Solutions :

Make sports education and participation compulsory in primary schools. The students must be made to realise that a body houses a wealthy and satisfied mind. Give the best facilities to the athletes. Provide them the best training equipment's and methods. Support them sincerely. Players must be proud to play for their country. Develop this feeling by giving them the best, the country can offer. They will surely reciprocate by performing to the best of their abilities with determination and dedication.

Obtain the best talents in the nation by scouting and relentless conduction of games to identify potential sportsman and train them. Use the NGO's and schools, educational institutions for creating the necessary awareness. Invite them to become partners in the fulfillment of this

vision of creating an India strong and formidable in sports.

Government's rule :

If the government wants to use sports as a medium to boost national pride and prestige, it should also be ready to improve the budgetary allocations and ensure that sports does not suffer from financial constraints.

Frame guidelines such that selection is only by merit for the sportsmen. Immediately form a "National Sports Council" containing PM, sports minister, and members chosen from various walks of life of Indian mainstream but having interest and expertise in sports. The members should be paid for their services while taking up their posts and the members should state categorically what they will do to improve Indian sports standard during their tenure. Form the constitution of council in such a way that inability to perform this obligation will result in automatic disqualification from the council. This should reduce the dilly-dallying tendency that prevail among members of various committees of sports, that brings out the incompetence of the selection committee members regarding the selection of players in different sports.

Conclusion :

The youth must demand better sports standards in the country from the authorities. It is heartening to see Jaspal Rana, Pandiyan, Aparna Popat, Rupa Unnikrishnan and other India athletes winning medals at common wealth games 98. We should acknowledge and thank them for their yeoman service to the nation. But the Olympics and Asiads provide competition between the best in the world, to win there, we have to be the "best". It is time that government wakes up to this reality and chalk out a practical and innovative program to ensure that by atleast 2010, India becomes a "world class" sports nation. India does deserve this title.

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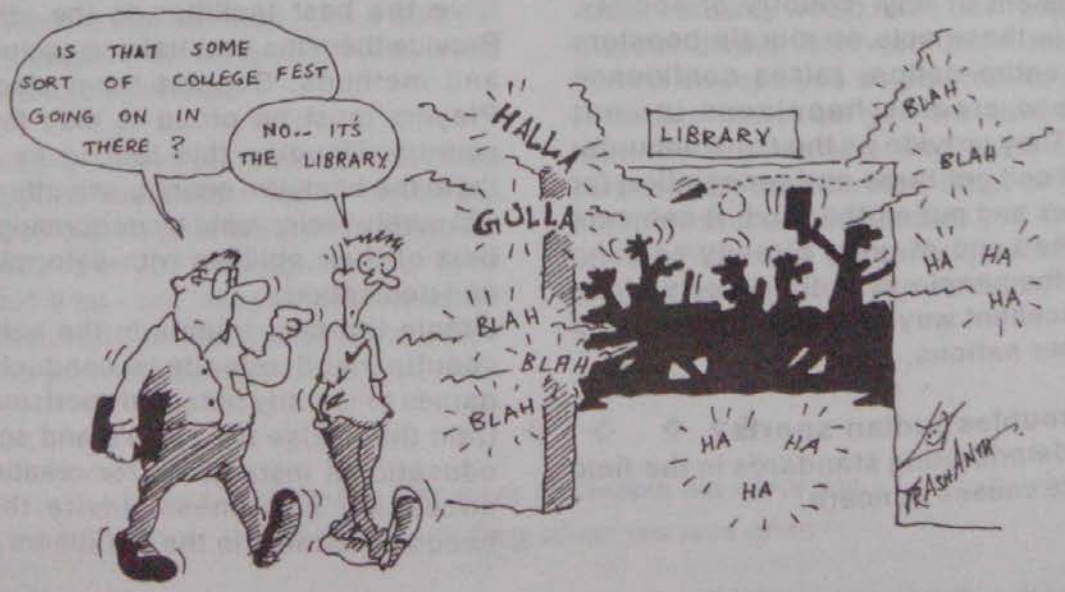

LATERAL THINKING EXERCISES

RAGHUNANDAN JAGDISH
S.E. Mech.

Lateral thinking puzzles are often strange situations which require an explanation. They are solved though a dialogue between the quizmaster who sets the puzzle and the solver or solvers who try to figure out the answer. The puzzles as stated generally do not contain sufficient information for the solver to uncover the solution. So a key part of the process is the asking of questions. The questions can receive one of only three possible answers - yes, no or irrelevant.

When one line of enquiry reaches an end then another approach is needed, often from a completely new direction. This is where the lateral thinking comes in.

Some people find it frustrating that for any puzzle it is possible to construct various answers which fit the initial statement of the puzzle.

However, for a good lateral thinking puzzle, the proper answer will be the best in the sense, the most apt and satisfying. When you hear the right answer to a good puzzle of this type you should want to kick yourself for not working it out!

This kind of puzzle teaches you to check your assumptions about any situation. You need to be open-minded, flexible and creative in your questioning and able to put lots of different clues and piece of information together. Once you reach a viable solution you keep going, in order to refine it or replace it with a better solution. This is lateral thinking!

This list contains some of the most renowned and representative lateral thinking puzzles I have ever seen.

The Puzzles

1. A man lives on the tenth floor of a building. Every day he takes the elevator to go down to the ground floor to go to work or to go shopping. When he returns he takes the elevator to the seventh floor and walks up the stairs to reach his apartment on the tenth floor. He hates walking. So why does he do it?

   This is probably the best known and the most celebrated of all lateral thinking puzzles. It is a true classic. Although there are many possible solutions which fit the initial conditions, only the canonical answer is truly satisfying.

2. A man walks into a bar and asks the barman for a glass of water. The barman pulls out a gun and points it at the man. The man says, "thank you", and walks out.

   This puzzle claims to be the best of the genre. It is simple in its statement, absolutely baffling and yet with a completely satisfying solution. Most people struggle very hard to solve this one yet they like the answer when they hear it or have the satisfaction of figuring it out.

3. Not far from Madrid, there is a large wooden barn. The barn is completely empty except for a dead man hanging from the middle of the central rafter. The rope around his neck is ten feet long and his feet are three feet off the ground. The nearest wall if 20 feet away from the man. It is not possible to climb up the walls or along the rafters. The man hanged himself. How did he do it?

4. A man is lying dead in a field. Next to him is an unopened package. There is no other creature in the field. how did he die?

5. Anthony and Cleopatra are lying dead on the floor of a villa in Egypt. Nearby is a broken bowl. There is no mark on either of their bodies and they were not poisoned. How did they die?

6. Five pieces of coal, a carrot and a scarf are lying on the lawn. Nobody put them on the lawn but there is a perfectly logical reason why they should be there. What is it?

7. A women had two sons who were born on the same hour of the same day of the same year. But they are not twins. How could this be so?

8. A man pushed his car. He stopped when he reached a hotel at which point he knew he was bankrupt. Why?

9. One day a man received a parcel in the post. Carefully packed inside was a human arm. He examined it, repacked it and then sent it on to another man. The second man also carefully examined the arm before taking it to the woods and burying it. Why did they do this?
This one probably has more variations than any other. A great one to puzzle out. It requires plenty of good questions.

10. A man died and went to Heaven. There were thousands of other people there. They all were naked and all looked as they did at the age of 21. He looked around to see if there was anyone he recognised. He saw a couple and he knew immediately that they were Adam and Eve. How did he know?

11. A man rode into town on Friday. He stayed for three nights and then left on Friday. How come?
A silly one - but it is surprisingly popular.

12. Why is it better to have round manhole covers than square one?
This is logical rather than lateral, but it is a good puzzle which can be solved by lateral thinking techniques. It supposedly used by a very well known software company as an interview question for prospective employees.

13. A man went to party and drank some of the punch. He then left early. Everyone else at the party who drank the punch subsequently died of poisoning. Why did the man not die?

14. Two men went into a restaurant. They both ordered the same dish from the menu. After they tasted it, one of the men went outside the restaurant and shot himself. Why?

15. A man was walking downstairs in a building when he suddenly realised that his wife had just died. How?

16. A blind beggar had a brother who died. What relation was the blind beggar to the brother who died? (Brother is not the answer).

17. A man is found dead in a field. He is clutching a broken match. What happened?

18. The music stopped. She died. Explain.

19. Deep in the forest was found the body of a man who was wearing only swimming trunks, snorkel and facemask. The nearest lake was 8 miles away and the sea was 100 miles away. How had he died?
This is supposedly based on a true incident. Does this make it an urban legend? Many urban legends can be restated as lateral thinking puzzles. This is a very good one of this type.

20. One day Kerry celebrated her birthday. Two days later her older twin brother, Terry, celebrated his birthday. How come?

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THE MAN WITHOUT A HEART

ROHIT KHATUA
T.E. Mech

I walk along the sea, beneath thunder
Its waves rising thick and loud.
This is my life, it is my world, yet
I feel ... alone in the crowd.

The waters burst forth ever
So eager to lap the shore
I have seen this spectacle many
Times, and I'll surely once more.

I see the constant stars again
As I will the sun of 'morrow.
Before I take leave of my joy
Or 'ere I die of my sorrow.

Towering gray structures form
A gray collage against the heavens.
I live at the top...
Far from the earth, above all men.

I should be happy, I ponder.
I've got wealth and its many graces
But... what is it that ails me?
I look beyond, beyond the faces.

And I see the colours and hues
Of that wonderful feeling called love.
The love of a child, the love of a mother
The love of a friend, of someone you love.

I stop right there in my tracks
I tell myself, this can't be.
Love leads to bondage, to a myriad pains
Detachment was always my policy.

Have I ever laughed so loud?
Have I ever been loved or loved so?
Have I ever cried at leaving or being left?
How does it feel, will I ever know?

As the storm brews in my skies
I realize the passage of Father Time.
I must hasten to a place
With a far more peaceful clime.

My feet reach me to my car.
I look in the mirror, as I embark.
Is that the man, my mind quries
The Man Without A Heart.

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As a Tribute to Amartya Sen, the nobel laurete, we present a reproduction of the citation that accompanied his award.

The Royal Swedish Academy of Sciences has decided to award the 1998 Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel to Professor *Amartya Sen*, Trinity College, Cambridge, U.K. (citizen of India) for his contributions to Welfare Economics, Social Choice, Welfare Distributions, and Poverty. Amartya Sen has made several key contributions to the research on fundamental problems in welfare economics. His contributions range from axiomatic theory of social choice, over definitions of welfare and poverty indexes, to empirical studies of famine. They are tied closely together by a general interest in distributional issues and a particular interest in the most impoverished members of society. Sen has clarified the conditions which permit aggregation of individual values into collective decisions, and the conditions which permit rules for collective decision making that are consistent with a sphere of rights for the individual. By analyzing the available information about different individuals' welfare when collective decisions are made, he has improved the theoretical foundation for comparing different distributions of society's welfare and defined new, and more satisfactory, indexes of poverty. In empirical studies, Sen's applications of his theoretical approach have enhanced our understanding of the economic mechanisms underlying famines.

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Royal Swedish Academy Of Sciences

ANSWERS

1. The man is (of course) a dwarf. Variants of this puzzle include the clue that on rainy days he goes up in the elevator to the tenth floor (he uses his umbrella.
2. The man had hiccups. The barman recognised this form his speech and drew the gun in order to give him a shock. It worked and cured the hiccups - so the man no longer needed the water.
   There is simple puzzle to state but a difficult one to solve. It is a perfect example of a seemingly irrational and incongruous situation having a simple and complete explanation. Amazingly this classic puzzle seems to work in different cultures and languages.
3. He climbed on a block of ice which has since melted.
   This one is often stated with the clue of a puddle of water, but surely this is too much assistance. It is one of several problems which depend on the change of state of water (snow or ice to water or steam).
4. The man had jumped from a plane but his parachute had failed to open. It is the unopened package.
   This is something given with the following rather elegant clue - as he approached the centre of the field he knew he was going to die. This is another of the top classics which is right up there with "The Man in the Bar". If the solver is thinking along the wrong lines (i.e. in the two dimensions of the ground) then the lateral jump to the third dimension can be tough to make.
5. Anthony and Cleopatra were goldfish whose bowl was knocked over by a clumsy dog.
   This is one set of puzzles which deceive by using human names for animals. This is not a very satisfactory basis for a good puzzle but despite that, the puzzle has enduring popularity.
6. They were used by children who made as snowman. The snow has now melted.
   Another change of state puzzle. After this you should be on the look-out for them!
7. The were two of a set of triplets (or quadruplets etc.)
   This simple little puzzle stumps many people. They try outlandish solutions involving test-tube babies or surrogate mothers. Why does the brain search for complex solutions when there is a much simpler one available.
8. He was playing Monopoly.
9. The three men had been stranded on a desert island. Desperate for food, they had agreed to amputate their left arms in order to eat them. They swore an oath that each would have his left arm cut off. One of them was a doctor and he cut the arms of his companions. They were then rescued. But his oath was still binding so, he later had to have his arm amputated and sent to his colleagues.
   This is often told with a further twist whereby a doctor pays a tramp a large sum in order to amputate the tramp's arm which the doctor then sends to another man who inspects it etc. This variation can make for a long night of questioning!
10. He recognised Adam and Eve as the only people without navels. Because they were nor born of women, they had never had umbilical cords and therefore they never had navels.
    This one seems perfectly logical but it can sometimes spark fierce theological arguments !
11. The man's horse was called Friday.
    OK, so this is really a schoolboy riddle but people keep asking it!
12. A square manhole can be turned and dropped down the diagonal of the manhole. A round manhole cannot be dropped down the manhole. So for safety and practicality, all manhole covers should be round.
13. The poison in the punch came from the ice cubes. When the man drank the punch the ice was fully frozen. Gradually it melted, poisoning the punch. You were warned to be on the look-out for these ice puzzles.
14. The dish that the two men ordered was albatross. They had been stranded many years earlier on a desert island. When the man tasted albatross he realised that he had never tasted it before. This meant that the meat he had been given on the island was not albatross as he had been told. He correctly deduced that he had eaten the flesh of his son who died when they first reached the island.
    This is something in common with No. 9 above but is in my opinion even better. It is difficult to figure out from a standing start. A beautiful aspect of this problem is the subtle fact that he shot himself because he did not recognise the taste of the dish!
15. The man had visited his wife in hospital. She was on a life-support machine. As he was walking down the stairs all the lights went out. There had been a power cut and the emergency back-up systems had failed. He knew that she had died.
16. The blind beggar was the sister of her brother who died.
    This puzzle is one of a type that depends on the listerner making implicit assumptions about gender - in this case that a blind beggar is a man. Similar puzzles involve surgeons who refuse to operate on their sons etc. This is probably the best of the class because it is very simply stated and yet which has the power to baffle those who have not heard it before.
17. He and a number of other passengers were making a balloon trip in a desperate attempt to flee a country. The balloon had to lose weight to stop from crashing. He drew the short match and had to jump.
18. She was a circus tight-rope walker who walked blindfolded over a high wire. The band played as she crossed and when the music stopped it was the signal that she had reached the end of the walk and could safely alight. One day the conductor was taken ill and the stand-in conductor ended the piece of music early. She stepped off to her death.
19. During a forest fire, a fire-fighting plane had scooped up some water from the lake to drop on the fire. The plane had accidentally picked up the unfortunate swimmer.
20. At the time she went into labor, the mother of the twins was traveling by boat. The older twin, Terry, was born first early on March 1st. The boat then crossed the International Date Line (or any time zone line) and Kerry, the younger twin, was born on February the 28th. In a leap year the younger twin celebrates her birthday two days before her older brother.

This puzzle was submitted to Games Magazine's "How Come" Competition in 1992 by Judy Dean. It won.

Inspiration

The Engineer has to be endowed with creative instincts. Creative instincts, which fuel his power to envisage, his power to visualise. These instincts however need to be honed and what better way to do this than by reading the words of "Engineers" themselves.

An Engineer creates new channels for his fellowmen to work on, this pathbreaker, who may go to the extents of driving our destiny towards newer, greener frontiers.

With this in mind we are prowd to present before you the works of the greats. We have Montaigne's essay "On Age" and Socrates' discussion with Crito to name a few.

Our salutation to these noblemen who were "Engineers" in their own right.

REMEMBERING MONTAIGNE - PIONEER OF ESSAYS

Michel Eyquem Seigneur de Montaigne was born on the twenty eight of February 1533. His father entrusted him to a German tutor, who knew no French. Under strict order from his father, he became that last man on earth to grow up speaking Latin as his native tongue.

In the year 1571, Montaigne retired to his chateau, he shut himself up in his library and wrote. He wrote for a period of nine years. Finally in the year 1580; the book was published and has been a constant companion of the reading.

Why did Montaigne write this book? In an age when all Europe was excited by the voyages of discovery and exploration, Montaigne decided to embark on his great voyage of discovery, in the solitude of his library. But the terra incognita that he wished to explore was his own self, and the end he sought to chart was the nature of man. That is why he used the word essais, which in French signifies trials, attempts or probings. Thus at the same time he created a literary genre and gave it a name and its archetype of perfection.

The translation by John Florio appeared in 1603, only eight years after the publication of the completed text by Mme Le Gournay. According to Cabeen's "Critical Biography of French Literature", Florio's translation "is still the best rendering of Essais into another idiom and remains a master in its own right".

The only book owned by Shakespeare, because it bears his signature, is a copy of the Essays in the same translation by Florio which we now set before the reader. There is a passage in "The Tempest" that is almost a paraphrase of line from the essay "On Cannibals".

The works of Francis Bacon, Voltaire and Emerson have left us with a clear account of the influence of this book and the importance in the history of our culture.

This introduction has been taken from the 1959 edition by Pocket Books, Inc., 630 Fifth Avenue, New York, N.Y.

As a window to his world, we are proud to present before you the essay "Of Age" from Montaigne's First Book.

OF AGE

I cannot receive that manner whereby we establish the continuance of our life. I see that some of the wiser sort do greatly shorten the same in respect of the common opinion. What *Cato Junior* said to those who sought to hinder him from killing himself? *Do I now live the age wherein I may justly be reproved to leave my life too soon?* Yet was he but eight & forty years old. He thought that age very ripe, yea, & well advanced, considering how few men come unto it. And such as entertain themselves with I wot not what kind of course, which they call natural, promiseth some few years beyond, might do it had they a privilege that could exempt them from so great a number of accidents unto which each one of us stands subject by a natural subjection, & which may interrupt the said course they propose unto themselves. What fondness is it for a man to think he shall die for & through a failing & defect of strength which extreme age draweth with it, & to propose that term unto our life, seeing it is the rarest kind of all deaths & least in use? We only call it natural - as if it were against nature to see a man break his neck with a fall, to be drowned by shipwreck, to be surprised with a pestilence or pleurisy, & as if our ordinary condition did not present these inconveniences unto us all.

Let us not flatter ourselves with these fond godly words. A man may preadventure rather call that natural which is general, common, & universal. To die of age is a rare singular, & extraordinary death, & so much less natural than others. It is the last & extremest kind of dying. The further it is from us, so much the less it is to be hoped for. Indeed it is the limit beyond which we shall not pass & which the law of nature hath prescribed unto us as that which should not be outgone by any. But it is a rare privilege peculiar unto herself to make us continue unto it. It is an exemption which through some particular favor she bestoweth on one man in the space of two or three ages, discharging him from the crosses, troubles, & difficulties she hath interposed between both in this long career & pilgrimage. Therefore my opinion is to consider that the age unto which we are come is an age whereto few arrive. Since men are very forward. And since we have passed the accustomed bounds, which is the true measure of our life, we must not hope that we shall go much further. Having escaped so many occasions of death wherein we see the world to fall, we must acknowledge that such an extraordinary fortune as that is which maintaineth us & is beyond the common use, is not likely to continue long.

It is a fault of the very laws to have this false imagination. They allow not a man to be capable & of discretion, to manage & dispose of his goods, until he be five & twenty years old; yet shall he hardly preserve that state of his life so long. *Augustus* abridged five years of the ancient Roman Laws, & declared that for any man that should take upon him the charge of judgement, it sufficed to be thirty years old. *Servius Tullius* dispensed with the Knights who were seven & forty years of age from all voluntary services of war. *Augustus* brought them to forth & five. To send men to their place of sojourning before they be five & fifty or threescore years of age, meseemeth, carrieth no great apparency with it. My advice would be that our vocation & employment should be extended as far as might be for the public commodity; but I blame some & condemn most that we begin not soon enough to employ ourselves. The same *Augustus* had been universal & supreme judge of the world when he was but nineteen years old, & would leave another to be thirty before he shall be made a competent Judge of a cottage or farm.

As of my part, I think our minds are as full grown & perfectly jointed at twenty years as they should be, & promise as much as they can. A mind which at that age hath not given some evident token or earnest of her sufficiency, shall hardly give it

afterward, put her to what trial you list. Natural qualities & virtues, if they have any vigorous or beauteous thing in them, will produce & show the same within that time, or never. They say in Dauphine,

Si l'espine nou picque quand nai,
A peine que picque jamai.

A thorn, unless at first it prick,
Will hardly ever pierce to the quick.

French prov.

Of all human honorable & glorious actions that ever came unto my knowledge, of what nature so ever they be, I am persuaded I should have a harder task to number those, which both in ancient times & in ours, have been produces & achieved before the age of thirty years, than such as were performed after, yea, often in the life of the same men. May not I boldly speak it of those of *Hannibal*, & *Scipio*, his great adversary? They lived the better part of their life with the glory which they had gotten in their youth. & though afterwards they were great men in respect of all others, yet were they but mean in regard of themselves.

As for my particular, I am verily persuaded that since that age, both my spirit & my body have more decreased than increased, more recoiled than advanced. It may be that with life, that knowledge & experience shall increase in them, together with life, that bestow their time well. But vivacity, promptitude, constancy, & other parts much more our own, more important & more essential, they droop, they languish & they faint.

When once the body by shrewd strength of years
Is shaken, & limbs drawn down from strength that wears,

Wit halts, both tongue & mind
do daily dote, we find.

LUCR. iii. 457.

It is the body which sometimes yieldeth first unto age, & other times the mind; & I have seen many that have had their brains weakened before their stomach or legs. And forasmuch as it is a disease little or nothing sensible unto him that endureth it, & maketh no great show, it is so much the more dangerous. Here I exclaim against our Laws, not because they leave us so long & late in working & employment, but that they set us awork no sooner, & it is so late before we be employed. Me thinks that considering the weakness of our life & seeing the infinite number of ordinary rocks & natural dangers it is subject unto, we should not so soon as we come into the world, allot so great a share thereof into unprofitable wantonness in youth, ill-breeding idleness, & slow learning apprenticeship.

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SOCRATES - THE ENGINEER OF SOCIAL THOUGHT

[Socrates accepts his death sentence, having been condemned by the State of Athens for subverting the morals of the young. Crito is trying to persuade him to escape.]

SOCRATES :
Then consider the matter in this way. Imagine that I am about to play truant (you may call the proceeding by any name which you like), and the laws and the government come and interrogate me : "Tell us, Socrates," they say; "What are you about? Are you not going by an act of yours to overturn us - the laws, and the whole state, as far as in your lies? Do you imagine that a state can subsist and not be overthrown, in which the decisions of law have no power, but are set aside and trampled upon by individuals?" [Shall I reply] "Yes; but the state has injured me and given an unjust sentence." Suppose I say that?

CRITO :
Very good, Socrates.

SOCRATES :
"And was that our agreement with you?" the law would answer; " or were you to abide by the sentence of the state?... Tell us - What complaint have you to make against us which justifies you in attempting to destroy us and the state?... For, having brought you into the world, and nurtured and educated you , and given you and every other citizen a share in every good which we had to give, we further proclaim to any Athenian by the liberty which we allow him, that if he does not like us when he has become of age and has seen the ways of the city... he may go where he pleases and take his gods with him. But he who has experience of the manner in which we order injustice and administer the state, and still remains, has entered into an implied contract that he will do as we command him.

"You, Socrates, are breaking the convenants and agreements which you made with us at your leisure, not in any haste or under any compulsion or deception, but after you have had seventy years to think of them, during which time you were at liberty to leave the city... you might have gone either to Lacedaemon or Crete, both of which states are often praised by you for their good government, or to some other Hellenic or foreign state. Whereas you, above all other Athenians, seemed to be so fond of the state, or in other words, of us her laws... that you never stirred out of her; the halt, the blind, the maimed were not more stationery in her than you were. And now you run away and forsake your agreements...

"Listen, then, Socrates, to us who have brought you up. Think not of life and children first, and of justice afterwards, but of justice first... for neither will you nor any that belong to you be happier or holier or juster in this life, or happier in another, if you do as Crito bids. Now you depart in innocence, a sufferer and not a doer of evil; a victim, not of laws but of men. But if you go forth, returning evil for evil, and injury, breaking the convenants and agreements which you have made with us, and wronging those whom you ought least to wrong, that is to say, yourself, your friends, your country and us, we shall be angry with you while you live, and our brethren, the laws into the other world, will receive you as an enemy; for they will know that you have done your best to destroy us. Listen, then, to us and not to Crito."

This, dear Crito, is the voice which I seem to hear murmuring in my ears like the sound of a flute in the ears of the mystic; that voice, I say, is humming in my ears, and prevents me from hearing any other. And I know that anything more which you may say will be vain. Yet speak, if you have anything to say.

CRITO :
I have nothing to say, Socrates.

SOCRATES :
Leave me then, Crito, to fulfill the will of God, and to follow whither he leads.

Plato : Crito (trans. B. Jowett)

FATHER FORGETS

"Father Forgets" is one of those little pieces which dashed off in a moment of sincere feeling - strikes an echoing chord in so many readers as to become a perennial reprint favorite. Since its first appearance, some fifteen years ago, "Father Forgets" has been reproduced, writes the author, W. Livingston Larned, "in hundreds of magazines and house organs, and in newspapers the country over. It has been reprinted almost as extensively in many foreign languages. I have given personal permission to thousands who wished to read it from school, church, and lecture platforms. It has been 'on the air' on countless occasions and programs. Oddly enough, college periodicals have used it, and high-school magazines. Sometimes a little piece seems mysteriously to 'click'. This one certainly did."

Father Forgets
W. LIVINGSTON LARNED

Listen, son: I am saying this as you lie asleep, one little paw crumpled under your cheek and the blond curls stickily wet on your damp forehead. I have stolen into your room alone. Just a few minutes ago, as I sat reading my paper in the library, a stifling wave of remorse swept over me. Guiltily I came to your bedside.

These are the things I was thinking, son: I had been cross to you. I scolded you as you were dressing for school because you gave your face merely a dab with a towel. I took you to task for not cleaning your shoes. I called out angrily when you threw some of your things on the floor.

At breakfast I found fault, too. You spilled things. You gulped down your food. You put your elbows on the table. You spread butter too thick on your bread. And as you started off to play and I made for my train, you turned and waved a hand and called, "Good-bye, Daddy!" and I frowned, and said in reply, "Hold your shoulders back!"

Then it began all over again in the late afternoon. As I came up the road I spied you, down on your knees, playing marbles. There were holes in your stockings. I humiliated you before your boy friends by marching you ahead of me to the house. Stockings were expensive - and if you had to buy them you would be more careful! Imagine that, son, from a father!

Do you remember, later, when I was reading in the library, how you came in, timidly, with a sort of hurt look in your eyes? When I glanced up over my paper, impatient at the interruption, you hesitated at the door. "What is it you want?" I snapped.

You said nothing, but ran across in one tempestuous plunge, and threw your arms around my neck and kissed me, and your small arms tightened with an affection that God had set blooming in your heart and which even neglect could not wither. And then you were gone, pattering up the stairs.

Well, son, it was shortly afterwards that my paper slipped from my hands and a terrible sickening fear came over me. What has habit been doing to me? The habit of finding fault of reprimanding - this was my reward to you for being a boy. It was not that I did not love you; it was that I expected too much of you. It was measuring you by the yardstick of my own years.

And there was so much that was good and fine and true in your character. The little heart of you was as big as the dawn itself over the wide hills. This was shown by your spontaneous impulse to rush in and kiss me good-night. Nothing else in the darkness, and I have knelt there, ashamed!

It is a feeble atonement; I know you would

LYNDON CEREJO
Ex-student, Electronics, 1994/95

Lyndon Cerejo, ex-student of KJSCE and an ex-editor of Kshitij is presently a freelance journalist, who writes for Times Publications.

No, I'm not doing this while pretending to work in office (like times I used to write articles pretending to take notes in class), nor am I sitting in a canteen with oily samosas and cutting chais for inspiration. This won't be a horror murder story, like my first one in Kshitij, years ago, which got me weird glances from all the girls in my class. These are just a few memories that come to mind when I think "Somaiya Vidyavihar" - a place I feel proud to say I've been a student of. From the time I had to ask my way around to find the college just to get hold of an admission form, to the time I graduated (with honours incidentally), things changed drastically. Mostly for the better, some otherwise. While others battle for share of mind, the following ten rule the grey cells!

Exams :

Everyone wishes exams could be avoided, well excluding the batch toppers at least. But along with exams came study leave - the month or so of "chutti" to prepare for the upcoming exams. This time was inevitably used to catch up with sleep, television, fun, friends, and if time permitted, a bit of studying. Social notes for various subjects were almost always resorted to during the last few days before the exam to make up for lost time! And if someone never referred to Social Notes, his/her class notes had to be good enough to be xeroxed and used as study material!

Attendance :

Very few classmates had a perfect 100% attendance record - and they happened to crack their papers! But spot polls never proved a direct correlation between attendance and doing well in exams (could it be because these were always done in the canteen while others were attending class?). It also taught us the importance of planning and scheduling - to be able to make the 70% mark - by hook or crook!

Lectures and labs :

Sitting at the receiving end of the information with a professor looming in front, we often found it imperative to talk, scribble, solve crosswords, complete assignment, and sometimes even eat dabbas! The same activities don't seem so nice these days - specially when they're being done by the audience of seminars I'm speaking at!

Anna's chai :

You can fly by Jet Airways, or stay at a five star hotel, but you won't be able to find tea that tastes like Anna's did. But more than the tea, it was the ambience that made the difference - the rickety benches hidden from professors' eyes, friends, and the cats kittens and puppies that kept appearing out of nowhere...

Tan-Theta and Hawa Mahal :

Memories of these places are still - a nice place for a quiet chat or for a noisy game of slope cricket. Or for that matter a make do place to complete your assignment or copy a journal while other classrooms were closed or occupied. Besides, both offered a nice bird's eye view of the going on's in college.

Dress Code :

Aaah those were the days - jeans, T-shirts and sling bags with graffiti off over them, unshaven faces, unkempt hair all contributed to the creating the common unofficial dress code for guys and girls a few years ago. Today though, people say things have long since changed!

ATP Rankings :

Rankings created and updated weekly by a group of seniors (Prashant Peres, Walter Menezes, Sameer Narayan etc.) who used to rank the rest of us. I'm sure

this had nothing to do with tennis, and suspect it had something to do with Time Pass or Tapporigiri, though I'm not sure even after topping the charts for a few weeks.

Symphony :

When we joined, Symphony was hardly heard about, but each batch kept contributing to making it the big name in college festivals that it is today. More than the festival though, it was the organising that was much fun as it was hard work...And of course, the official permission for members of the organising committee to skip a few lectures here and there... for Symphony work!

Ladies Room :

I still remember the shock we went though when we saw the table-tennis tables in the LCR being used as a lunch table by our privileged classmates. This was sacrilege, considering that guys would wait hours on end to get a chance to play a game of 11 in the gym!

Professors :

Last but not definitely not the least - our lecturers and professors. We all grumble about them sometime or the other, but only later you will realise that they've contributed and helped you reach where you are today.

God! I feel like a grandfather writing this after all those years. But nostalgia is something everyone's allowed to indulge in... K.J.S.C.E. was fun!

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ALL TIME FAVOURITE SLOGAN OF THE 'SOMAIYAITES'.

The Flip-Side

The Students Council From the Students Point of View!

Balachander Iyer, (G.S.) The Totally Misguided Missile. With a purely manipulative mind and a highly headstrong attitude made all members of the council bow down to him, in grief!
Vinil Komalan (Jt. G.S.). With his disciplinary attitude earned the title of General Vinilov Komalovitsky (KGB). In front of him, 'To err is not human.' The perfect man for a crisis i.e. to create one!

Vaibhav Parikh (C.S.). Size does matter!! When required to take responsibility could single handedly eclipse the entire council, literally!
Rahul Soundrarajan (Jt. C.S.) with his fortitude and aesthetic outlook was the ideal partner to Vaibhav. He was the man behind the scenes, way behind!

Meeta Jani (L.R) the female chauvinist. According to her women are smarter, more attractive, have better brains, and all males are stupid opportunists. Her motto to life, Eat guju sleep guju, wear only jeans!
Manjari Lal (L.R), the operating in the council, on the lines of Windows 95 with the ability of multi tasking, but full of bugs and highly susceptible to crashing. With her communication skills and enthusiasm could sweet talk herself out of anything.

Karthik Madhok (Sports Sec.) was the unsung hero of the team (Chipku no. 1) carrying out the requisite sports activities almost single handedly and still managing to contribute to the other activities. If not generally in the gymkhana, sure to be found around the LCR.
Prashant Sangoi (Sports Sec.) Mr. Cupid, was elementary in successful organization of all the sports activities through the year. And I do mean elementary, highly elementary.

Vinod Nair, appointed as magazine secretary after misspelling his own name, took up the dictatorship (Hail Hitler) of Kshitij and assigned every member of his team their part in the magazine and ensured that the team was held together and everyone did their job, i.e. to take him to glory!
Deepa Ray (Jt. Mag Sec.) Durga of the council. Fights fire with fire, ahinsa is for the lame. One who shall always fight for what she feels is right. Anything is negative is always an injustice.
Arun Iyer and his satchel (Jt. Mag Sec.), undoubtedly the literary giant (in a small container). His simple outlook to life had a scientific explanation for any and everything right from seeking audiences for his top funda monologues to ensuring ingestion of portable drinking water only.

However amusing this might seem, the students council of 1998-99 was definitely one of the most enthusiastic and hard working that I have seen atleast in my years spent at KJSCE. And I am quite sure rates amongst the top the institute has seen so far and probably might see for a good many years to come.

Right from leadership, to teamwork, motivation to planning down to last the detail, this council has ensured that everything they did was done to perfection. Sure a few internal scraps are bound to take place in every organization, which do have their own advantages at times. But to the rest of the world these 11 were always united, the perfect team, standing together as an invincible force ensuring that they maneuvered through every obstacle, come what may.

The Editor

Retrospection

Leave out my name from gift if it be a burden; but keep my song.

- Rabindranath Tagore

We can still hear very dearly the noise emanating from the pandemonium. The pandemonium that existed when we went to announce the birth of "the tank". It was supposed to behold the start of notice board journalism in our college. But with a start of that sort, we certainly had doubts in our mind.

But the reader should guard against branding the students as an uncultured lot without any spirit of creativity. The fact is they did not believe that a magazine would be printed this year. They had every right to believe so. Wasn't it true that no magazine had come out for the past three years? It was true. It was absolutely true.

That was when it struck us that the magazine would have to be printed this year to instill belief in the minds of the students. Make it clear to them that a magazine was not impossible. It was very much possible.

That is what we did. We had to be content with the small co-operation we received from the interested students. And Lo! The magazine has come out at last. It is before your very eyes. You are reading it just now.

Thanks to the cooperative staff, thanks to our beloved principal, our efforts have met with success.

Hadn't someone said before "Where there is a will, there is a way". We hope it continues that way, every year, year after year.

A thought to leave you with

If we could, at this time, shrink the earth's population to a village of precisely 100 people, with all the existing ratios remaining the same, it would look like this :-

There would be 57 Asians, 21 Europeans, 14 from the Western Hemisphere (North and South), and 8 Africans.
70 would be non-white, 30 white.
70 would be non-Christian, 30 Christian.
50 per cent of the world's entire wealth would be in the hands of six persons. All six would be citizens of the U.S.A.
70 would be unable to read.
50 would suffer from malnutrition.
80 would live in sub-standard housing.
Only one would have college education.

When one considers the world from such an incredibly compressed perspective, the need for both tolerance and understanding becomes glaringly apparent. Be more tolerant, and be more understanding.

Source: Kshitij Archives.

Appendix

Le directorie ancien etudiants

1996/97	BE-ELECTRONICS (DIV. A)
Sis. Adayilamuriyil Lynette	Bldg. No. 20/304, Manisha Nagar, Kalwa, Thane - 400605.
Bro. Aggarwal Gaurav N.	B-5/26, O.N.G.C. Colony, Ghatkopar (W), Mumbai - 400066.
Bro. Ashar Kunal Deepak	77 B/3, S. V. Rd., Vileparle (W), Mumbai - 400056.
Bro. B. K. D. Prasad	12-13-830/39/2, Gokul Nagar, Tarnaka, Secunderabad - 500017.
Bro. Bari Himesh P.	Nutan Co-Op. Hsg., Sect - 2, Hanuman Nagar, Kalyan - 421306.
Bro. Bavish Jatin Ramesh	10A, Sindu Baug, 1st Floor, Tilak Rd., Ghatkopar (E), Mumbai - 400077.
Bro. Bhende Paras K.	127/C, Dadamaharaj Wadi, G.R.Khadilkar Rd., Girgaon, Mumbai - 400004.
Bro. Chapaneri Bhavesh V.	3/ Anurag Co-Op.Hsg. Soc., Bhardawadi, Andheri (W)), Mumbai - 400058.
Bro. Chatwal Jaspreet S. P.	115/B, 3957, Tilak Nagar, Chembur, Mumbai - 400089.
Bro. Dalal Arpan Shrenik	A/3, 5th Floor, Matrashish, 39, Neapensea Rd., Mumbai - 400006.
Sis. Desai Kavita Rajendra	24, Savitri Sadan, Keluskar Rd., (North) Shivaji Park, Mumbai - 400028.
Bro. Desai Keyur Bhadresh	B/6, Narendra Apts. Sarojini Rd., Vile Parle (W), Mumbai-400056.
Sis. Dhole Alpana S.	12, Kaumudi Soc. Jayanagar, Dattapada Rd., Borivli (E), Mumsbi-400066.
Bro. Fernandes Glenn K.	Silvan Shades Ground Floor, 16 S.T. Sebastian Rd., Bandra, Mumabi - 400050.
Bro. Ganagal Kedar R.	D-1, Paramsukh Soc., Gawand Path, Naupada, Thane - 400602.
Bro. Goyal Pankaj Ajay	28, Mulja Bldg, Peru Baug, Goregaon (E), Mumbai- 400063.
Sis. Hora Simmi S.	1/21, Ganesh Villa, Behind Pratap Cinema, Kolbad Rd., Thane(W) - 400601.
Sis. Jana Snigdha S.	35, Acahrya Nagar, Deonar, Mumbai - 400088.
Sis. Jathar Maya Madhav	G-397, Reserve Bank Staff Qtrs., Mumbai Central - 400008.
Bro. Kamble Ramesh P.	Bhanu Darshan A-1, Arunoday Nagar, Mulund (E), Mumbai - 400081.
Bro. Karmarkar Ranjij H.	18, Shree Sadan, 90 Feet Rd, Mulund (E), Mumbai - 400081.
Bro. Keni Sumukh Mahesh	C-31, Hari Ratan, Bangur Nagar, Goregaon (W), Mumbai - 400090.
Bro. Khatri Aejaz M.	91/93, New Kazi Street, 1st Floor, Mumbai - 400003.
Bro. Korah Prem Mathews	A-17, B.D.A Housing Complex, Palashpali, Bhubaneswar, Orissa - 751009.
Sis. Kulkarni Meghana Vijay	46, Anil Apts., Gavand Path, Gokhale Rd., Thane - 7.
Sis. Laghate Mugdha S.	204/23, Anant, Vasant Viahr, Thane (W) - 400601.
Sis. Lavanya Adhivarahan	204/B, Anubhav CHS. Opp. Raja Industrial Estate, Mulund (W) - 400080.
Bro. Marathe Nikhil S.	9, Mallika, Makarand Sahnivas, Veer Savarkar Marg, Mahim, Mumbai - 400016.
Bro. Massand Dinesh D.	A-II, Madhur Milan, Sanghani Estate, Ghatkopar (W), Mumbai - 400086.
Bro. Mathias Sudeep H.	C-7, New Shrenik, Ashok Nagar, Mahur Rd., Mulund (W), Mumbai - 400080.
Bro. Mehta Amish Bharat	9, Maheshwar Krupa, R.B. Mehta Marg, Ghatkopar (E), Mumbai - 400077.
Bro. Mohite Girish B.	Gurupushyamrut, E/18, 90 Feet Cross Rd, Mulund (E), Mumabi - 400081.
Sis. Pinto Sarita Victor	9, Emerald, St. Pius X Street, Mulund (W), Mumbai - 400080.
Sis. Purohit Archana P.	B/16, Purnima Darshan, 90 Feet D.P. Rd, Mulund (E), Mumbai - 400081.
Sis. Sathe Rashmi R.	Datta Nivas, Thakur Blocks, Gokhale Rd, Naupada, Thane - 400602.
Bro. Shah Bhavesh Ramjii	A-14, Kamal Kunj, Vallabh Baug Lane, Ghatkopar (E), Mumbai - 400077.
Sis Shettigur Sheetal Surya	44 - B/23, Brindaban Soc., Thane (W) - 400601.
Sis Shirodkar Gauri Arvind	B.K. Rd., Dist. Sindhudurg, Vengurla - 416516.
Sis Vora Hetal D.	305, A/B, Govardhan Apt., L.T. Road, Borivli (W), Mumbai - 400092.
Bro. Kadke Shashank D.	34/23 Worli B.D.D. Chawl, G. M. Bhonsale Marg, Worli, Mumbai - 400018.
Bro Ashar Kalpesh J.	3, Patel House, Tilak Road, Matunga, Mumbai - 400019.
Bro. Jain Nitish S.	A-5, Shubh Laxmi, 8th Rd, T.P.S. III, Santacruz (E), Mumbai - 400055.
Bro. Chindarkar Chetan S.	874/8, Mandar Pushpa CHS., Sant Dnyaneshwar Rd., Mulund (E) - 400081.
Bro. Kajrolkar Ashay G.	8/57, M. H. Board, Vartak Nagar, Thane (W).
Bro. Narnavre Prafull T.	A107/214, Kurla Camp, Ulhasnagar - 4, Dist - Thane.
Sis. Nair Savita B.	21, Silver Seas, Plot No. 33'C, Juhu Road, Juhu, Mumbai - 400049.
Bro. Tiwari Prashant H.	C-4, Jeevan Snalya Soc., Rambaug - 4, Kalyan.
Bro Vakharia Viany N.	5 Awkaar, Off. Marve Rd., Malad (W), Mumbai - 400064.
Bro. Rajput Rupesh K.	A/124, 4264, Tilak Nagar, Mumbai - 400089.
Bro. Gupta Kapil Dinesh.	4, ONGC Officers Flats, VileParle (E), Mumbai - 400057.

1996/97	BE-ELECTRONICS (DIV. B)
Bro. Bamburde Pravin L.	A1 45/414, R. A. Nagar, Ghatkopar (E), Mumbai - 400075.
Sis. Bhatia Latika G.	13/27 Krishna Cottage, Nath Pai Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Desai Utpal Jayendra	403, Om-Galaxy Apts., Off. T.H. Kataria Marg, Mahim, Mumbai - 400016.
Bro. Jadhav Vijay Shankar.	7/254, PMGP Colony, Mankhurd, Mumbai - 400043.
Bro. Joshi Rahul Shrikant	11/2,Yashodeep CHS, Behind Malhar Cinema, Naupada, Mumbai - 400062.
Bro. Kamble Amod Vilas	Satyam A/13, T.M.C Staff Qtrs., Manpada, Mumbai - 400602.
Bro. Korgaonkar Amit S.	11, Shatanand Soc., Babasaheb Joshi Marg, Dombivli (E), 421201.
Bro. Menezes Kenneth F.	4, Saidham, P. M. Road, Vileparle (E), Mumbai - 400057.
Bro. Mishra Anmol Ranjit	Somaiya Hostel, Room No. 412, Vidyavihar, Mumbai - 400077.
Bro. Naik Sham Mahadev	R.No. 2, R.K. Nivas Bldg., Pratap Nagar Rd., Bhandup (W), Mumbai - 400078.
Bro. Nandurdikar Milind S.	B/61, 6th Floor, Dr. R. P. Rd., Mulund (W), Mumbai - 400080.
Bro. Negandhi Prashant N.	Rohit Nivas, 3rd Rd., Rajawadi, Ghatkopar (E), Mumbai - 400077.

Bro. Padiyar Prasad P.	6 Alpana, Nahur Road, Mulund (W), Mumbai - 400080.
Bro. Pai Kiran Ratnakar	Type IV/5, Tata Housing Soc. Chembur, Mumbai - 400074.
Bro. Pardesi Manoj Baban	151/13 Swastik, 9th Service Wadala Road, Wadala, Mumbai - 400031.
Bro. Parmar Manoj Ramji	Swapneel, A-10, 3rd Floor, Navghar Rd., Mulund(E), Mumbai - 400081.
Bro. Parulkar Anand Govind	153/A, Nandadeep, Matunga, Mumbai - 400019.
Bro. Patel Dilip Maganbhai	214, Vijay Dwar Apt., Kurla Village, Malad (E), Mumbai - 400097.
Bro. Patil Alankar Gajanan	396 A. R.D. Kawli Wadi, Veer Sawarkar Marg, Pabhadevi, Mumbai - 400025.
Bro. Patil Prasad Keshav	A/202, Opp. Gauri Plywood, Bombay Pune Rd., Kalwa(W), Thane.
Bro. Pawar Aimt Arvind	21/62, Sagar Apts., Lokhandwala Complex, Andheri (W), Mumbai - 400102.
Bro. Pawar Deepak J.	C-8/51, Nabard Nagar, Thakur Complex, Kandivli (E), Mumbai - 400101.
Bro. Pereira Haresh G.	461/1, Shariana Apts.(A), F.S. Peter Pereira Rd., Kurla (W), Mumbai - 400070.
Bro. Punjabi Menghraj S.	B.K. No. 948/20,21, Section 22, Ulhasnagar-3, Dist.-Thane.
Bro. Rajiv Mohan Sambhoo	88/8 Bal-Murli CHS., Chhedanagar, Chembur, Mumbai - 400089.
Bro. Rane Samir Balkrishna	Vijay Niwas, Room No 4, Kajupada, Kurla, Mumbai - 400072.
Bro. Save Kaustubh Ashok	2/26 Om Srvodaya Soc., Bamanwada, Vileparle (E), Mumbai - 400099.
Bro. Sawant Deepak Sharad	1/23 Om Trimurti Soc., Chunabhatti, Sion, Mumbai - 400022.
Bro. Shah Rahul Jitendra	02, Gautam Park, Opp. Aradhana Cinema, Thane (W), Mumbai - 400602.
Bro. Shah Samir Suresh	23, Nanu Bldg., ¼ Gilter Lane, Mumbai - 400008.
Bro. Sheth Amit R.	4/45, D.S. Nagar, Marsing Lane, S.V.Rd., Malad (W), Mumbai - 400064.
Bro. Shirgaonkar Amit M.	A-4/03, Amol Soc., V.B.Phadke Rd., Mulund (E), Mumbai - 400081.
Bro. Singaporia Parvez C.	R/25, Nowroz Baug, Lalbaug, Mumbai - 400012.
Bro. Singh Sameer Bairam	B10, Poorva Chs, Panchpakhadi, Thane-400602.
Bro. Singhvi Ramesh M.	Singhvi Jewellers, Navalkar Chawl, Jogeshwari (E), Mumbai - 400060.
Bro. Srikanth R.	4/165 Saketh, Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Srikumar Nagaraj	No. 10, Anik Court, Shivaji Park, Road No. 5, Mumbai - 400016.
Bro. Sukhani Pradeep H.	92E, Alipore Rd., Patwari House, Calcutta - 27, W. B.
Bro. Susarla Arvind	41/28, Bldg. No.3, Iit Powai, Mumbai - 400076.
Bro. Tambhane Abhijit P.	R-32, Sudarshan Nagar, Midc Residentail Zone, Dombivli(E).
Bro. Tauro Sudhir L.	11/11 Blosoom CHS, Military Rd., Andheri(E), Mumbai - 400059.
Sis. Vispute Vaishali Dilip	A 3/5 Jai Malhar Nagar, Narayan Baug, Shivaji Chowk, Kalyan (W), 421301.
Bro. Vora Sanju R.	804 Vijay Chambers, Tribhuvan Rd., Parthana Samaj, Mumbai - 400004.
Bro Pai Govinda G.	VIII/1160, South Cherlai, Cochin 682002, Kerala.
Bro. Salian Siddharth S.	B-20, Saguna Bldg., St. Francis Rd., Vileparle (W), Mumbai - 400056.
Bro. Phadnis Rahul S.	6, Nitya Apt., Near It Powai, Mumbai - 400076.
Bro. Toprani Harsh Y.	23 Sputnik, 85 Bhulabhai Desai Rd., Mumbai - 400026.
Bro. Kulakrni Rahul M.	B/29 Abhijit Hsg. Soc., College Lane, Agar Bazar, Dadar, Mumbai - 400028.
Bro. Koli Jayesh P.	Koli Samj Hsg., Bldg. No. 6, Block No. 16, Sewri Koliwada, Mumbai - 400015.
Bro. Pai Harshad Madhav	E/153, Snehadhara, Dadabhai Cross Rd. 3, Vileparle (W), Mumbai - 400056.
Bro. Narang Girish A.	G-99, Kalpaji, New Delhi - 400019.

1996/97 **BE-PRODUCTION**

Bro. Baindoor Anish V.	34 Hira Apt. S. V. Road, Goregaon (W), Mumbai - 400062.
Bro. Bandekar C. S.	Vinayraj Tejpal Sch. Rd. No. 5, Vileparle(E), Mumbai - 400057.
Bro. Bapat Adwait Vasant	B-8, Ramdarshan, Subhash Rd., Vileparle (E), Mumbai - 400057.
Bro. Bhave Aditya A.	D-164, 8 Prakash Co-Op. Soc., Shastri Nagar, Dombivli (W).
Bro. Boparai Prabhjoj Singh	705/706, Beverly Hills, Bldg. Bo. 5-A, Yogi Hills, Mulund(W), Mumbai - 400080.
Bro. Damniwala Mihir P.	Prabhat 72, Shivaji Park, Dadar, Mumbai - 400028.
Bro. Deshpande Amol M.	7, Shree Omkar Soc., Rajaji Rd., Ramnagar, Dombivli (E), Pin - 421201.
Bro. Duarte Brett M.	18, Shiv Sadan, B-Block, Jamshedjee X Rd. No. 2, Mahim, Mumbai - 400016.
Bro. Fernandes Alan G.	A/17, Arsha Bharat, 29, Shri Nagar Estate, Goregaon (W), Mumbai - 400062.
Bro. Fernandes Royston B.	Steveland, Flat No. 4, 267 St. Anthony's Rd., Chembur, Mumbai - 400071.
Bro. Ganeshprasad R.	34, Juhu Asanta, Gulmohar Rd., Jvpd Scheme, Mumbai 400049.
Bro. Gokhale Ravindra S.	1 Arun Villa, Subhash Rd., Vileparle (E), Mumbai - 400057.
Bro. Gund Santosh Prakash	Dattachya Soc. 12, Shree Nagar, Wagle Estate, Thane - 400604.
Bro. Gupta Mukeshkumar	146/2, Sindhi Soc. Rd. No. 1, Chembur, Mumbai - 400071.
Bro. Gupta Vikram Deepak	151, Shantivan, Mhada, New Link Rd. Extn., Lokhandwala, Mumbai.
Bro. Hiray Sachin Sudhakar	R.C.F. Colony, Type-B, 3/23, Chembur, Mumbai - 400074.
Bro. Iyer Vijay S.	C-37, Om Uma CHS, Shastri Nagar, Kopar Cross Rd., Dombivli(W), 421201.
Bro. Jain Jayesh Mangilal	11, Sangeeta Apts., 7th Rd., Prabhat Colony, Santacruz (E), Mumbai - 400055.
Bro. Kapadia Mehul Pratap	3-F/8, Magithianagar, S. V. Rd., Kandivli (W), Mumbai - 400067.
Bro. Khetan Shashank C.	170, Raval Sea View, Dr. M. B. Raut Rd., Shivaji Park, Mumbai - 400028.
Bro. Lolanguda Dilip K.	Ayemaria, A-12, Diwanman Ambadi Rd., Vasai (W).
Bro. Kulkarni Parag Anil	3-A/21, Sahyadri Co-Op.Hsg. Soc., Panch Phakadi, Thane - 400 602.
Bro. Laungani Manoj Shiv	82, Sea Lord-B, 117, Cuffe Parade, Mumbai - 400005.
Bro. Lopez Kemneth Savid	7a Namiella, 34 Dadabhai Rd., Vileparle (W), Mumbai - 400056.
Bro. Mahadkar Yogesh S.	3/24, Asavari, Gokhale Rd. (S), Dadar, Mumbai - 400028.
Bro. Marcus Neville Sydney	C1/4, Godrej Hill Side Qtrs., Vikhroli (W), Mumbai - 400079.
Bro. Menon Rishi V.	B-2/65, Snehadhara Soc., Parle (W), Mumbai - 400056.
Bro. Mhatre Vaibhav Sudhir	3/3a, Sindur Chs, Panduranjwadi, Goregaon (E), Mumbai - 400063.
Bro. Modi Raj Prabhakar	Vaikunth Dham, Chaitanya Nagar, Powai, Mumbai - 400076.
Bro. Naik Kishor Shivdas	A2/39, Sahyadri, Nath Pai Nagar, Ghatkopar (E), Mumbai - 400077.

Bro. Mahajan Amit K.	Ambika 11, Vallabh Baug Lane, Ghatkopar (E), Mumbai - 400077.
Bro. Naik Srijit U.	908, Mahavir Tower, L. B. S. Marg, Mulund (W), Mumbai - 400080.
Bro. Nikhar Anand Prakash	B/18, Kumud Nagar, S. V. Rd., Goregaon (W), Mumbai - 400104.
Bro. Padmanabh K.	C-201, Niranjan, Hira Nagar, Mulund (W), Mumbai - 400080.
Bro. Pandit Ketan Mohan	5/7, B.S.C.I. Railway Colony, Vileparle (W), Mumbai - 400056.
Bro. Parab Nitin Vinayak	C20, Chitralekha, Navghar Rd., Mulund (E), Mumbai - 400081.
Bro. Patel Gaurav Vinod	15/16 Sangam, Old Prabhadevi Rd., Worli, Mumbai - 400025.
Bro. Patil Ashwin Vijay	12 B/31 Takshila, Mahakali, Andheri (E), Mumbai - 400093.
Bro. Patil Chandrahas A.	Rajdhan Bldg., Ganesh Nagar, Near Church, Dombivli (W) - 421202.
Bro. Patil Paresh Ganesh	Anand Bldg., R. No. 1, Sitaladevi Rd., Mahim, Mumbai - 400016.
Bro. Pereira Formoso M.	B/7, Sharon Rose, Tank Rd., Orlem, Malad (W), Mumbai - 400064.
Bro. Prabhudesai Uday L.	192/5319, Geetanjali, Pant Nagar, Ghatkopar (E), Mumbai - 400075.
Bro. Rajadhav Satish S.	102, Shivaji Nagar, N. M. Joshi Marg, Mumbai 400013.
Bro. Rajput Sunil N.	18, Ganesh Apt., Shimpoli Rd., Borivali (W), Mumbai - 400092.
Bro. Rao Kiran Subha	190/5289 Sanmati, Pant Nagar, Ghatkopar (E), Mumbai - 400075.
Bro. Sangam Prakash V.	A/11 Shobhana Rifle Range, Ghatkopar (W), Mumbai - 400086.
Bro. Shah Alpesh C.	22/ Kailash Darshan, Mulund (W), Mumbai - 400080.
Bro. Shah Hemant P.	10, Oomed Sadan, 58, Sion (W), Mumbai - 400022.
Bro. Shah Vaibhav D.	302/A, Gopal Bhuvan 28, Azad Lane, Andheri (E), Mumbai - 400093.
Bro. Shettigar Bharat G.	B-302, White House, Mumbai Pune Rd., Kalwa, Thane-400605.
Bro. Shetty Yeshwant J.	304, Imur Soc., Dhake Colony, Andheri (W), Mumbai - 400053.
Sis. Thatte Archana S.	8/140, Shri Parleshwar CHS, Vileparle (E), Mumbai - 400057.
Bro. Vaidya Jayraj Shrikant	2, Laxmi Niwas, Gaokari Path, Dombivli (E) - 421201.
Bro. Vengurlekar Yogesh S.	133/A, Ramkrishna Sadan, Sion (W), Mumbai - 400022.
Bro. Vira Amit Ramesh	B-3, Kesarban, 3rd, T.P.S. III, Santacruz (E), Mumbai - 400055.
Bro. Vishnupurkar Pankaj V.	5/19, Govt. Colony, Haji Ali Park, Mumbai - 400034.
Bro. Paharia Vishal I.	95 Jawahar Nagar, Khetan Kutir, Goregaon (W), Mumbai - 400062.
Bro. Gandhi Nimish C.	2-69/6, Shantiniwas Deodhar Rd., Matunga, Mumbai -400019.
Bro. Kotecha Dipesh Motilal	1003, Gyneshwar Apt., Prabhadevi, Mumbai -400026.
Bro. Ghorpade Abhay V.	203, Kashi Bhuvan Soc., Vileparle (E), Mumbai - 400057.
Bro. Viras Kiran Manuji	A/43, Jijamata Nagar, Dr. E. Moses Rd., Worli, Mumbai -400018.
Bro. Nikalje Ajit Sham	B-193/7440, Kannmvar Nagar 0 2, Vikhroli (E), Mumbai - 400083.
Bro. Fernandes Shalil J.	62, Massabielle Pali Rd., Bandra, Mumbai - 400050.
Bro. Gupta Samit Pramod	34 Diwan Villa, Behind Arora Cinema, Matunga, Mumbai. - 400019.
Bro. Sawe Samir P.	E/12, Shanti Soc., Mogal Lane, Mahim, Mumbai -400016.
Bro. Soparkar Shardul S.	Soparkar Sadan, 507, M. G. Rd., Naupada, Thane - 400602.
Bro. Pillai Deepak V.	304/80, Panchavati, Vasantvihar, Majiwada, Thane - 400601.

1996/97 **BE (MACHINE TOOLS)**

Bro. Ajay Jayaraman	B/14, New Shrenik, Ashok Nagar, Mulund, (W), Mumbai - 400080.
Bro. Rishikesh V. Andhari	Seeta Sadan 1, Hanuman Nagar, Dombivli (E), Pin - 421201.
Bro. Bagwe Mahendra M.	A-2/27, Dnyaneshwar Nagar, Sewri, Wadala - 400031.
Bro. Balajapalli Vinayak S.	19/194, Shripad, Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Bhagat Mayank Yogesh	A3-03/302, Flower Valley, Near Cadbury's Junction, Thane - 400601.
Bro. Daga Abhishek Manik	A43 Gladhurst, Phirozshah Rd., Santacruz (W), Mumbai - 400054.
Bro. Desai Mitul Jagdish	10, Gananiwas, Tilak Rd., Ghatkopar (E), Mumbai - 400077.
Bro. Dubey Jayprakash N.	1/28, Vrindavan Bhuvan, Ghatkopar (W), Mumbai - 400084.
Bro. Ghosalkar Ravindra P.	A/13, Gurupushyamrut Hsg. Soc., Mulund (E), Mumbai - 400081.
Bro. Gothoskar Bharat S.	3/46, Nawsarvodaya Soc., Vileparle (E), Mumbai - 400057.
Bro. Hegde Santosh R.	D-48, Matru-Prerana, Subhash Rd., Dombivli (W), Pin - 421202.
Bro. Hussain Juneedasif I.	Fakih Apt., 4th Floor, Dr. Ansari Rd., 1st Raboli, Thane (W), 400601.
Bro. Iyenger Nikhil S.	11, Vighaneshwar Soc., Phule Rd., Vileparle (E), Mumbai - 400057.
Bro. Kale Kaushik Prakash	22, Madhudeep Soc., Panchpakhadi, Thane - 400603.
Bro. Kapse Prashnat S.	7/31, Indranil Reclamation, Bandra, Mumbai - 400050.
Bro. Karmarkar Aniruddha	2/15, Rai Ashirwad Bldg., Ambika Nagar, Dombivli (E) - 421201.
Bro. Kaulgud Vinod V.	16/128, Unnat Nagar III, Goregaon (W), Mumbai - 400062.
Bro. Kulkarni Milind B.	15 Minal Apt., Near Nitin Casting, Almeida Rd., Thane - 400601.
Bro. Lokhande Kushal C.	24, Rohini ITI H. C. S., Ambernath (E) - 421501.
Bro. Narang Mahesh M.	A-13, Bhagwati Soc., Santacruz (W), Mumbai - 400054.
Bro. Pandya Vaibhav Kirit	2, Acharya Villa, Shraddhanand Rd., Vileparle (E), Mumbai - 400057.
Bro. Parekh Kaushik C.	29, Shree Niwas, Flat No. 102, Vileparle (E), Mumbai - 400057.
Bro. Patel Bhavesh Nalin	1/102, Varma Nagar, Andheri (E), Mumbai - 400060.
Bro. Pednekar Abhijit M.	Shivkrupa, B/17, Kulupwadi, Borivli (E), Mumbai - 400066.
Bro. Phendre Prakash S.	11/A, Satyasheel CHS, Eksar Rd., Borivli (W), Mumbai - 400091.
Bro. Prabhu Arvind G.	A-14 Sudama, Shiv-Srushti, P.O. Nehru Nagar, Mumbai - 400024.
Bro. Rastogi Yoshit Suresh	4/D Crystal, 36 Actomount Rd., Mumbai - 400026.
Bro. Sanghvi Ashish Anant	12/4 Laxmi Sadam, Rd. No. 10, Vileparle (W), Mumbai - 400049.
Bro. Sarnaik Mahesh B.	Plot No. A/22, MIDC, PH-II, Manpada Rd., Dombivli (E) - 421204.
Bro. Selvan Karthik D.	B/2/33, Shiv Parvati, Sector 21, Nerul, New Mumbai - 400706.
Bro. Shah Kinjal Jawant	52, Vaikunth Soc., Andheri (W), Mumbai - 400058.
Bro. Shinde Abhijeet S.	31, Shant Smruti, Veera Dasi Rd., Andheri (W), Mumbai - 400053.

Bro. Shikre Prakash S.	Siddhi Vinayak Apts., R. 51, Sudarshan Nagar, MIDC, Borivali (E).
Bro. Soman Kedar Govind	A/3, Nirdhar Soc., Kastur Park, Borivali (W), Mumbai - 400092.
Bro. Taylor Vishal D.	31, Abdulla Terrace, K.E.M. Rd., Parel, Mumbai - 400014.
Bro. Ubhayakar Ameet G.	A-3, Stella Maris, Sitaladevi Temple Rd., Mahim, Mumbai - 400016.

BE-MECHANICAL

1997/98

Bro. Bandivdekar Anup P.	193, Ruia College Hostel Rd., Sion-Koliwada, Mumbai - 400022.
Bro. Belligundu Sunil R.	21, Siddhivinayak Chs, Nehru Rd., Mulund (W), Mumbai - 400080.
Bro. Bhosale Prasad D.	Govt. Coloby, Bl. No. 13, Alibag, Dist. Raigad, Pin - 402201.
Bro. Bohra Rajesh R.	24, Vasundhara Apt., Kalyan (W), Pin - 421301.
Bro. Bulsara Nilesh S.	B-2/38, Nirmal Apt., Shanker Lane, Kandivli (W), Mumbai - 400067.
Bro. Damle Santosh Ashok	D-1, Indravadan Soc., Thakkar Rd., Mahim, Mumbai - 400016.
Bro. Dhoke Manoj V.	B.J.Wadia Hospital Staff Qtrs., Bl. No. 4, Parel, Mumbai - 400012.
Bro. Dikshit Vaibhav Vijay	Tanpure House, 1st Floor, Old Mumbai Rd., Thane (W), 400601.
Bro. Gandhi Kunal Prakash	Sector-5, E-3/12, Near Gas Godown, Vashi, New Bombay.
Bro. George Abraham	Kranti Kiran, 1st Floor, L.J.Rd., Mahim, Mumbai - 400016.
Bro. Ghevde Prashant S.	A-6/11, Sawant Sadan, Lic, Borivli (W), Mumbai - 400103.
Bro. Gite Mangesh Mohan	Sontoor Rd. No. 1, Goregaon (E), Mumbai - 400063.
Bro. Gokhale Kaustubh G.	205, Sonal Niketan, Near Samaj Mandir Hall, Dombivli (E) - 421201.
Bro. Iyer Ravi Ramanathan	O-101, Vardhman Nagar, R.P. Rd., Mulund (W), Mumbai - 400080.
Bro. Jadhav Hrushikesh R.	Ganesh Kuti, 3rd Floor, Opp. Pancharatna Soc., Thane (W), Charai.
Bro. Kadam Prashant Y.	Shanta Durga, Shivaji Nagar, Naupada, Thane (W).
Bro. Keshkamat Nilesh A.	"Jpsit", Jai Ram Krishna CHS, Mulund (E), Mumbai - 400081
Bro. Khaswala Zahir Abbas	R.No. 15, ISE Fir Shehri House, Sir J. J. Rd., Mumbai - 400008.
Bro. Kulkarni Pradyumna P.	B-13, Maker Kundan Gardens, Juhu Rd., Mumbai - 400047.
Bro. Mengle Swapnil S.	9, Ahilya Soc., Ghanianli Devi Rd., Naupada, Thane (W).
Bro. Mistry Amitkumar B.	5/C, Suhil Sadan, L.J.X. Rd. No. 1, Mahim, Mumbai - 400016.
Bro. Mitra Kaushik Pradip	A-1, Neel Gagan, Tarun Bharat Soc., Andheri (E), Mumbai - 400099.
Bro. Modi Hemal G.	3/44, Kailas Nagar, 658, Tardea Rd, Mumbai - 400007.
Bro. Mukesh Prasad	1/50, Pushpa Kunj, Sion Main Rd., Sion (W), Mumbai - 400022.
Bro. Nalawde Vivek Vasant	9A/101, Alica Nagar, Lokhandwala Complex, Mumbai - 400101.
Bro. Natu Harshad P.	A-1, Nav-Dadar Hsg. Soc., 71, Lt.Dilip Gupte Rd., Mumbai - 400016.
Bro. Panchal D.	11, Gulmohar CH, Koliwada Mith Bunder Rd., Thane (E) - 400603.
Bro. Parikh Kaushal S.	122/B, Kika Street, 4th Floor, R.No.43, Mumbai - 400004.
Mro Patil Yogesh Suresh	Galwankar Wadi, Near Wagh High School, Vasai, Thane - 401201.
Bro. Ratankar Dwarkesh P.	C-30, 'Safalya', Veera Desai Rd., Andheri (W), Mumbai - 400058.
Bro. S. Krishnakumar	32, Sanchar Telecom Officer's Flats, Dadar (W), Mumbai - 400028.
Bro. Sayani Pravin Vijay	35/4, Guru Nivas, Rd. No. 2, Sion, Mumbai - 400022.
Sis. Shah Minal M.	N/401, Vardhman Nagar, R.P.Rd., Mulund (W), Mumbai - 400080.
Bro. Shete Abhay Arvind	Vijayshri Soc., Bl.-11, 3rd Floor, Vishnunagar, Naupada, Thane (W).
Bro. Shettry Sandeep V.	Abhiman-B/203, Kastur Park, Borivli (W), Mumbai - 400092.
Bro. Singh Abhishek Kishor	202, Akshay Aprt., Aarey Rd., Goregaon (E), Mumbai - 400063.
Bro. Singh Milind A.	83/14, Mistry Bldg., Dr. B.A. Rd., Kalachowki, , Mumbai - 400033.
Bro. Teli Vishal Suryakant	6, Meera Ibi, D-Rupartel Marg, Mumbai - 400006.
Bro. Thampi Pawan R.	11, Umang, 16th Rd., Santacruz (W), Mumbai - 400054.
Bro. Puthiyapurayl Sudish	13/52, Manjula, Pestom Sagar, Chembur, Mumbai - 400089.
Bro.Velankar Shreekantha	15, Iondira Niwas, A.G. Street, Girgaon, Mumbai - 400004.
Bro. Dhole Anand C.	28, Jonfikar StreeT, Mandvi, Koliwada, R.No.36, Mumbai - 400003.
Bro. Kamat Prashant S.	Plot No. 82, Kanshai Section, Manorama Bldg., Ambarnath - 421501.
Bro. Sule Satyajit C.	201, Hicohland Horizon, M.G. Rd.,Kandivli, Mumbai - 400067.
Bro. Sharma Rahul C.	5-Trimurti, Mukand Ltd., Belapur Rd., Kalwe, Thane - 400605.
Sis. Shenoy Shobha S.	Chandan Wadi, R. No. 54, Village Rd., Bhandup, Mumbai - 400078.
Bro. Shinde Rahul B.	2/23, Jawahar Jyoti Soc., Luis Stret, Thane (W) - 400 \604.
Bro. Surve Abhijeet M.	3/16, Ganesh Cinema, Charai, Thane (W) - 400601.
Bro. Teli Mangesh M	C-31/41, New Shastri Nagar, Goregaon (W), Mumbai - 400104.
Bro. Tiwari Arvind Kumar B.	3/15, Ganesh Niwas, Jondhali Baug Rd., Thane (W) - 400601.
Bro. Vaidya Parag P.	75, Airawat, Dr. Ambedkar Rd., , Mumbai - 400033.
Bro. Vohra Shalabh	45721 Bldg. No. 129, New Tilak Nagar, Chembur, Mumbai - 400089.
Bro. Vora Tanmay Mayur	A/8, Om Vasudev, Mandapeshwar Rd., Borivli, Mumbai - 400103
Bro. Vyas Kunal Chitranjan	B/11, Nimesh Apt., S.V.P. Rd., Borivli (W), Mumbai - 400092.
Sis. Waghe Kavita Shankar	8, Meghmalhar CHS, Rammaruti Cross Rd. 4, Naupada, Thane - 2.
Sis. Doiphode Bharati S.	A/12, Om Shantidham, Shreenagar Wagle Estate, Thane (W).
Sis. Solankar Meena Bali	Pl-5b/13/1, Sector-9, Khanda Colony, New Panvel.
Sis. Mugdha Padmakar	32, Panchsheel, 48/B, Gokhale Rd., Dadar, Mumbai - 400028.
Bro. Gorashia Dipesh J.	A/502, Mahavihus, Kandivli (W), Mumbai - 400067.
Sis. Sharma Garima K.	39, Ag/5, Shanti Ashram, Borivli (W), Mumbai - 400103.
Bro. Ajit Manohar	Bldg./29/1556, Khar Nagar, Bandra (E), Mumbai - 400051.
Bro. Nathan Ramesh R.	14, Safalya, Nathpai Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Mishra Ashish I.	Meghwadi A/26, Dr. S.S. Rao Rd., Lalbaug, Mumbai - 400012.
Bro. Ghate Aniket Sunil	Geeta 1097/C-25, Shivram Soc., Mulund (W), Mumbai - 400080.
Bro. Subhedar Sunit V.	B/12, Kamalpushpa, Reclamation, Bandra (W), Mumbai - 400050.

Bro. Wadhane Sameer M.	117/3993, Tilka Nagar, Chembur, Mumbai - 400089.
Bro. Gaware Rakesh C.	Ms/RB. III-11/5, Kurla Railway Qtrs., Kurla (E), Mumbai - 400024.
Bro. Shinde Avinash H.	76/2612, Nehru Nagar, Kurla (E), Mumbai - 400024.
Bro. Patel Ashwin Kalidas	B/8, Gold Cion Apts. Vakola, Santacruz (E), Mumbai - 400055.
Bro. Saigal Mayur. J.	305 Seetal Soc., New Link Rd., Andheri (W), Mumbai - 400058.
Bro Rajput Rupesh K.	124-A/R264, Tilak Nagar, Chembur, Mumbai - 400089.
Bro. Nagpal Pawandeep P.	42, Resham Apts., Hilltop, Marol, Andheri (E), Mumbai - 400059.
Bro. Punekar Narayan V.	4/5, Sahajeevan CHS, Bhatwadi, Ghatkopar (W), Mumbai - 400084.
Bro. Gomes Leon Nicholas	B/207, Rajdeep Apts., L.B.S. Marg, Kurla, Mumbai - 400070.
Bro. Tambe Shailesh T.	B-10/2, P & T Colony, Mulund (W), Mumbai - 400080.
Bro. Hambarde Akash S.	Shastri Nagar, Vasinaka, Chembur, Mumbai - 400074.
Bro. Kukde Prashant P.	1a, Saudamini, Haji Ali, Mseb Colony, Mumbai.
Bro. Dave Keshav Protish	4-Bileshwar Darshan, Dixit Rd., Parle (E), Mumbai - 400057.
Bro. Patel Jitendra R. Bhai	S.V. Road, Mumbai - 400064.

1997/98 **BE-PRODUCTION**

Bro. Agawral Vivek R.	Vaibhav Apts., A/404, Old Probhadevi Rd., Mumbai - 400025.
Bro. Ari Nirmolak Singh J.	7/61, Unnai Nagar No. 1 Goregaon (W), Mumbai - 400062.
Bro. Bhatra Rohit I.	A/1, Anjali Soc. 20/21, Mr-D. Marg, Panchpakhadi, Thane - 400602.
Bro. Bhora Kapil Ramesh	27-A/3, Shri Vishnu Bhawan,King's Circle, Mumbai - 400019.
Bro. Chandurkar Amit Ajit	10, Parvati Apts., Nuribaba Rd., Thane - 400601.
Bro. Chaudhari Nilesh M.	3, Navrang Soc., Ramdas Wadi, Sindigate, Kalyan - 421304.
Bro. D'silva Vivek Carsino	A/18, R.B.I. Staff Qrts., M.M. Mandir Marg, Mumbai - 400008.
Bro. Date Abhijit Maheswar	C-13, Vandana Chs, Opp. Forest Office, Naupada, Thane - 400602.
Bro. Devlekar Shailesh S.	Devlekar Wadi, Siddharth Nagar, Kolsewadi, Kalyan (E).
Bro. Desai Purav Kiran	1/8, Ahmed Mansion, Opp. Kirti Colege, Dadar, Mumbai - 400028. Bro. Deshmane
Bro.Pinak P.	154/7, Jayambe, Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Deshpande Vainateya	101/B, Deep Jyoti Apts., Naupada, Thane (W) - 400602.
Bro. Dhanraj Winston M.	2/21, Divine Express, Navghar Rd., Mulund (E), Mumbai - 400081.
Bro. Doshi Chirag Jayant	8, Hemkun J, Saver Rd., Mulund (W), Mumbai - 400080.
Bro. Fernandes Siddharth	C/7, Sahar Chs, PSahar Rd., Andheri (E), Mumbai - 400099.
Bro. Jain Sachin G.	602, Nandadevi, Neelkanth Valley, Ghatkopar (E), Mumbai - 400077.
Bro. Joshi Amit Shridhar	Flat No. 3, Alpha Apts., Vileparle (E), Mumbai - 400057.
Bro. Kadam Sanjay K.	21, Panyai, Mithanagar Rd., Mulund (E), Mumbai - 400081.
Bro. Khobare Pramod S.	212, Old Manisha Nagar, Beturkapada, Kalyan (W).
Bro. Kori Sanjaygurudin	1/2, Pansare Colony, Hanuman Nagar, Bhandup, Mumbai - 400078.
Bro. Mackwan Richard R.	4/31, Samson Apts., Umerkhadi R. Bhatt Marg, Mumbai - 400009.
Bro. Maliwal Anand K.	Rohit C/79, Lokhandwala, Andheri (W), Mumbai - 400053.
Bro. Manjaly Denny D.	No. 7, Silver Ark, 346, Vakola, Santacruz (E), Mumbai - 400055.
Bro. Manjrekar Vasudev P.	Plot No. 13, Sector 19, New Panvel, New Mumbai - 421206.
Bro. Mehta Jitendra Lahar	C/7, R. No. 3, Vikhroli Park Site Colony, Mumbai - 400079.
Bro. Mehta Vineet Vivek	401, Vasundhara Apts., Janki Kutir, Juhu, Mumbai - 400049.
Bro. Mittal Apurva A.	202/B, Cross-Gate, Lokhandwala, Andheri (E), Mumbai - 400053.
Bro. Painaik Mandar S.	D/35, Palm Acres, Phule Rd., Mulund (E), Mumbai - 400081.
Bro. Palazhi Vinod Vijayan	2-D, Panchvati, Sector 14, Vashi, New Bombay - 400703.
Bro. Palekar Ketan Anil	77, Daisy Niwas, Hindu Colony Rd., No. 2, Dadar, Mumbai - 400014.
Bro. Patange Nilesh M.	Monica B16, 90ft Cross Rd., Mulund (E), Mumbai - 400081.
Bro. Patiyan Santosh R.	73/7, Creek Side, Godrej Colony, Vikhorli (E), Mumbai - 400079.
Bro. Pavle Ketan V.	6, Arondekar Bhavan, H.F.S Rd., Jogeshwari (E), Mumbai - 400060.
Bro. Phadke Amarendra J.	3, Deodharwada, Sanewadi, Kulgaon (W), Badlapur - 421503.
Bro. Pinto Sheldon Joe	Braz Bldg., 62 N.M. Joshi Rd., Lower Parel, Mumbai - 400013.
Bro. Rane Haresh Y.	5/Vishwakarma Sadan, D.S. Marg, Bhandup (W), Mumbai - 400078.
Bro. Rao Sunil Dayanand	B-1/1, Mahavir Shikar Bldg., Mulund (W), Mumbai - 400080.
Bro. Sawant Sushil Ganesh	A-4, Monica, Vidhyalaya Marg, Mulund (E), Mumbai - 400081.
Bro. Shah Dheeraj A.	203, Balkrishna Sane Guruji, Mulund (E), Mumbai - 400081.
Bro. Shah Himanshu N.	207/11, Dr. Viegas St., Suvas Bldg., Chira Bazar, Mumbai - 400002.
Bro. Shah Vishal Anil	69, Tardeo Rd., 503, Girnar Bldg., Mumbai - 400054.
Bro. Shenavi Rahul Anant	31/3, Maratha Samaj Gruha, Guruji Lane, Parel, Mumbai - 400012.
Bro. Shinde Abhay D.	21, New Sahakar Bhuvan, Ganeshwadi, Kalyan (E) - 421306.
Bro. Singh Mikund S.	Dhruva Co-Op. Soc., Flat No. 201, Sec. 28, Vashi, Navi Mumbai.
Bro. Telang Satipotta T.	S.T. Telang Block No. A/130/260, Ulhasnagar - 421004.
Bro. Vaidya Abhijit Anil	B-21/22, Neeta Apts., Mithanagar Rd., Mulund E), Mumbai - 400081.
Bro. Vaithara Joseph S.	303, Menaka, Goshala Rd., Mulund (W), Mumbai - 400090.
Bro. Siddiqui Parvez Zahir	7/20, Mig Colony, Vinoba Bhave Nagar, Kurla (W), Mumbai - 400070.
Bro. Phadke Tapan Abhay	7, Dariya Vihar, Off. Carter Rd., Khar, Mumbai - 400062.
Bro. Bhurke Santosh D.	14/Vihangraj Soc., N. Dutta Marg, Andheri (W), Mumbai - 400053.
Bro. Pereira Jeson Carl	39, Haridwar-li, Evershine Nagar, Malad (W), Mumbai - 400064.
Bro. Mohammed Sameer M.	300/8, Kumar Bldg., LBS Marg, Kurla, Mumbai - 400070.
Bro. Prajapati Sangwwv P.	Rly. Qtrs., Ms Rbi, 110/13, Naupada, Hivaji Nagar, Thane - 400602.
Bro. Patil Umesh Gopal	9-14, Shri Sahyadri Chs, Kalwa, Thane.
Bro. Cahwan Sanjiv P.	44/B, Motiwala Bldg., Elphiston, R.No. 47, Mumbai - 400013.

Bro.	Parvekar Sagar Dinesh	11/4, Baithy Ch., Pirojsha Nagar, Vikhroli (E), Mumbai - 400079.
Bro.	Shah Bhavin Shantilal	5/41, D.L. Jain Colony, Dr. Ambedkar Rd., Mumbai - 400012.
Bro.	Pai Rajesh Narayan	37, Nibhhana, Pali Hill, Bandra (W), Mumbai - 400050.
Bro.	Nayab Nikhil P.	104, Gautam Terkale, M.G. Rd., Navpada, Thane - 400602.
Bro.	Chawdhary Abdul H.	602, Saptarshi, Mukund Ltd., Belapur Rd., Kalwa, Thane.
Bro.	Raguwanshi Neeraj U.	E-18, B/402, Yogi Nagar, Borivli (W), Mumbai - 400091.
Bro.	Pereira Vijay Savio S.	1/21, Happy House, Vakola, Santacruz (E), Mumbai - 400055.
Bro.	More Nitin R.	305, Punit Apt., H.N.P. Park, Bhayander (E), Thane - 401105.
Bro.	Chogle Shreyas M.	36/2, Ram Mandir Rd., Babhai, Borivali (W), Mumbai - 400092.
Bro.	Chavan Milind K.	B023/Simpali Darshan, Simpoli Rd., Borivli (W), Mumbai - 400092.
Bro.	Pagare Sunil Vasant	15/B/Devgandhar Navghar Rd., Mulund (E), Mumbai - 400081.
Bro.	Kambli Manojkumar S.	36.12, Miskin Mansion, Khetwadi, Girgaon, Mumbai - 400004.
Bro.	Panchmia Rajesh A.	9/18, Chandra Nivaw, Sion (W), Mumbai - 400022.

BE-ELECTRONICS

1997/98		
Bro.	Kannan Karthik	A-301, Tulip, Hiranandani Gardens, Powai, Mumbai - 400076.
Bro.	Bhabal Sandeep P.	20, Om Ganesh, Vasant Wadi, Sant Namdeo Path, Dombivli (E).
Sis.	Bhat Swapna Anand	6/3, Shridhar Niwas, Dr. R.P. Rd., Dombivli (E).
Bro.	Bhatkhande Sidharth J	A/2/30, Dnyaneshwar Nagar CHS, Wadala, Mumbai - 400031.
Sis.	Borkar Ruchira J.	Shree Mauli, Gopal Nagar, Lane No. 2, Dombivli (E).
Bro.	Gabra Himanshu M.	A/403, J.M. Darshan, Shiv Mandir Rd., Ram Nagar, Dombivli (E).
Bro.	Chaudhari Rajesh S.	Kaveri Bldg. 9, Worli Sea Face, Worli, Mumbai - 400025.
Bro.	Choure Nitin Bhimrao	3A/6, Indian Airlines Colony, Santacruz (E), Mumbai - 400029.
Bro.	Dalal Sachin S.	A/2, Bhaki Sudha, Santacruz (E), Mumbai - 400055.
Bro.	Dalvi Onkar Arun	B-14, Pragati Chs, Opp. Ses High School, Panchpakdi, Thane (E).
Bro.	Doshi Bhavin B.	C/45, Patil Prasad, G.V. Scheme, Mulund (E), Mumbai - 400081.
Bro.	Baphana Hiralal R.	10, Shukla Chawl, Devisha Rd., Palghar, Dit. Thane.
Bro.	Bhagat Narendra A.	12/463, D.N. Nagar, Andheri (W), Mumbai - 400053.
Bro.	Doshi Kunal Rajendra	217, Princess Streen, Anant Bldg., R. No. 37/38, Mumbai - 400002.
Bro.	Farooqui Iihan A. G.	Mujawar House No. 2/9, S.M. Rd., Naupada, Thane (W) - 400602.
Sis.	Gad Shephali Harihar	Pawar Cottage, Ram Maruti Td., Naupada, Thane (W) - 400602.
Sis.	Garde Meghana Gopal	29/3, Vinanyan Bhavan, Kolbad Rd., Thane (W) - 400601.
Bro.	Gokhale Ashwin R.	C/5, Vishwajeet CHS, Naupada, Thane (W) - 400602.
Bro.	Iyer Srinivasan J.	N4/2, Sunder Nagar, S.V. Rd., Malad (W), Mumbai - 400064.
Bro.	Jaiswal Vishal Rohit	S.S. Nivas, Baptista Rd., Vileparle (W), Mumbai - 400056.
Bro.	Jethwa Vishal Arvind	6-D, Ashirwad, Off. Caves Rd., Andheri (E), Mumbai - 400093.
Bro.	Kamble Nitin Narayan	15/1158, MHB. Colony, Maghthane Rd., Borivli (E), Mumbai - 400066.
Sis.	Karnik Anuja Bipin	401/E, Prashant Apt., Opp. IIT Main Gate, Powai, Mumbai - 400076.
Bro.	Kelkar Pravin Prabhakr	36 Mathura - B, Krishnadham Soc., Panchpakhadi, Thane - 400602.
Sis.	Kharpe Sudha Vijay	301, Shripati Chhaya, M.G. Rd., Naupada, Thane (W) - 400602.
Sis.	Kulkarni Yashasree B.	12, Chaitanya Godraswadi, Patharli Rd., Dombivli (E) - 421201.
Bro.	Lewis Richard Samuel	1/20, Jai Shastri Nagar CHS, Mulund Colony (W), Mumbai - 400082.
Bro.	Malik Nitin Avinash	A-203, Rajkamal, Juhu Versova Rd., Andheri (W), Mumbai - 400061.
Bro.	Mehta Bhavin P.	8/10, Kalyan Bldg., Khadilkar Rd., Girgaon, Mumbai - 400004.
Sis.	Mehta Darshana H.	5, Krishna Bhuvan HSQ. Soc., Andheri (W), Mumbai - 400058.
Bro.	Menon Kartik R.	13, Swakrit Sahakar Nagar, Andheri (W), Mumbai - 400053.
Bro.	Muchhala Aliasgar M.	45 Badani Bldg., Jwibhoy Dadabhoy Lane, Fort, Mumbai -400001.
Bro.	Naik Shailesh M.	10, Benvilla, Napiman Rd., Vileparle (E), Mumbai - 400057.
Bro.	Pandit Siddharth A.	327, Krishna Sadan, Linking Rd., Khar, Mumbai - 400052.
Bro.	Parekh Ritesh R.	Block No. 3, Saphalya, Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro.	Patil Tanmay S.	B/11-4, Govt. Colony, Bandra (E), Mumbai - 400051.
Sis.	Potdar Pradnya M.	A/7, Ganesh Krupa, R.H.B. Rd., Mulund (W), Mumbai - 400080.
Bro.	Rane Rakesh S.	C/12, Om Chamunda CHS, Santacruz (E), Mumbai - 400055.
Bro.	Rane Trimbak D.	Silver Valley-1, C-20, Vakola Bridge, Santacruz (E), Mumbai - 400055.
Bro.	Santra Pankaj A.	8, Panchali Sambhaji Path, Naupada, Vishnunagar, Thane - 400602.
Bro.	Shah Bhavin Kalyanji	304, Vrindavandham, D1, Gavanpada, Mulund (E), Mumbai - 400081.
Bro.	Vora Ashis Jayantilal	B-107, Shreenath Apt., S.M. Rd., Kandivli (W), Mumbai - 400067.
Bro.	Shah Chirajkritikumar	12, Vaishali Apt., 60 Ft. Rd., Ghatkopar (E), Mumbai - 400077.
Bro.	Shriguppi Sumeet P.	13, Shiv-Niketan, 2nd Floor, M.V. Rd., Andheri (E), Mumbai - 400069.
Bro.	Niwalkar Girish N.	82/2, Laxminarayan, Datar Colony, Bhandup (E), Mumbai - 400042.
Bro.	Nalavde Mandar M.	23/179,Unnat Nagar No. III, Goregaon (W), Mumbai - 400062.
Bro.	Mukharjee Pranob	F8/15, Hariniketan Soc., Bangur Nagar, Goregaon (W), Mumbai - 400090.
Bro.	Chakane Pravin Popat	Bhandaarwada Hill Resecciv Office Qtrs., Mazgaon, Mumbai - 400010.
Bro.	Inamdar Umar A.	H/6/2, New Deonar Municipal Colony, Govandi, Mumbai - 400043.
Bro.	Sanghavi Mitesh.	9-112, Viral Apt., Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro.	Vaidya Gajanan N.	Narsinha Shantaran-Vaidya, Vileparle (E), Mumbai - 400057.
Bro.	Rasal Sanjay Babu	IA/601, Brindavan Apt., Off. Caves Rd., Andheri (E), Mumbai - 400093.
Bro.	Pote Tushar Mahadeo	Antop Hill, B.N.48, R.N. 1882, Sec.7, Mumbai - 400037.
Bro.	Kothur Janardhan N.	286/39, Bonsingar Chawl, G.K. Marg, Lower Parel, Mumbai - 400013.
Bro.	Manocha Karan A.	38/2, New Palasia, Indore - 452001, M.P. India.
Bro.	Mhatre Abhijit R.	Mayekar Bldg., Ramdath Alibaug - 402201, Dist. Raigadh.

Bro. Gupta Kunal Jeevpal	6, Thapar Soc., Opp. Basant Cinema, Chembur, Mumbai - 400074.
Bro. Pai Kiran Krishan	504, Manisha Bldg., J.K. Gram Post, Savarkar Nagar, Thane (E).
Bro. Mukherjee Jayanto K.	D-2, Highway CHS, Shiv Shristi, Kurla (E), Mumbai - 400024.
Bro. Zantye Parshuram B.	3/4, Chandrasekhar Soc., S.N. Rd., Andheri (E), Mumbai - 400069.
Bro. Sawant Nilesh Anant	6/46, B.D.D. Chawl, N.M. Joshi Marg, Lower Parel, Mumbai - 400013.

1998-1999	B.E. ELECTRONICS
A.V. Umaparvati	A-43, Telecom Officers Transit Qtrs., P.K. Road, Mulund (W), Mumbai - 400080.
Bro. Apte Nikhil Kishor	14, Saroj Makarand Society, S.B. Road, Dadar, Mumabi - 400028.
Bro. Bansod Vivekanand V.	17/7, Government Qtrs., Near Mahalaxmi Race Course, Mumbai
Bro. Barai Bahavaniprasad	Nav Yuvak Hs. Society, A/22, Kajupada, Kurla, Mumabi - 400072.
Bro. Roshan S.	Lt 11 - 12, Vijaynagar, Maroi Marosti Road, Andheri (E), Mumabi - 400059.
Bro. Bhandary Prashanth	18, Raghunath Ashish, Gavanpada, Mulund (E), Mumbai - 400081.
Bro. Bhasin Yogendra B.	18, Shrniketan, Anushaktinagar, Mumbai - 400094.
Bro. Chaudhari Kaushik A.	Yashwant, Ram Maruti, Cross Road No. 4, Thane (W), Mumbai - 400602.
Bro. Chhadwa Dipen C.	24, Jyoti Building, 60 Feet Road, Ghatkopar (E), Mumbai - 400077.
Sis. Desai Shilpa Narayan	RI-97, Milap Nagar, Midc, Dombivli (E).
Bro. Deshpande Kaustubh	B-1, Prabhu-Chayya, Nerurkar Road, Shrikhandwadi, Dombivli (E) 421201.
Bro. Dhurke Nigod Dayal	R.N.2, Sangeeta Colony, Chawl No.1, Pune Link Road, Kalyan (E).
Sis. Gandhi Priya Rajendra	401, Shalini Apartments, Liberty Garden, Malad (E), Mumbai - 400064.
Bro. Ganpule Anand J.	A/6, Megh Mahar Society, Gawand Path, Naupada, Thane - 400062.
Bro. Gupte Rohan Vilas	7a/41, Pereira Nagar, Khopat Road, Panchpakhadi, Thane (W) 400601.
Bro. J. Ahokkumar	Y-9, Sydney, Shastri Nagar, Off. J.P. Road, Andheri (W), Mumbai - 400053.
Bro. Vinaykumar Jain	C-9/250, DGQA Residential Complex, Rifle Range, Ghatkopar (W), Mumbai -86.
Sis. Janani Sheshadri	Flat No.15, Plot No. 274, 'Vrindavan', Sion (E), Gokulharg, Mumbai - 400022.
Bro. Kamhalia Siddharth D.	6/81, Varma Nagar, Andheri (E), Mumabi - 400069.
Bro. Karani Chetan S.	13, Jayesh A.R.B. Mehta Rd, Ghatkopar (E), Mumbai - 400077.
Bro. Kelshikar Nikhil D.	1, Janardhan Dadabhai Road, Andheri (W), Mumbai - 400058.
Bro. Koli Dhiraj Madhukar	6/17, Koli Samaj Society, Sewri, Mumbai - 400015.
Sis. Lakshmi Sivaram	A/13, Gopal, Tejpal Scheme Road No.2, Vile Parle (E), Mumbai - 400057.
Sis. Mandavgane Priya A.	Flat No. 9, Abhijeet Bldg., P.O. Kulgaon Badlapur, Dist Thane 421503.
Bro. Mathai Arjun Ninan	3, Sravana Nofra, Navy Nagar, Colaba, Mumbai - 400005.
Bro. Maydeo Parag Anil	B-1/302, Mandlik Nagar, S.V. Road, Chincholi, Malad (W), Mumbai - 400064.
Bro. Mhatre Rahul Manohar	B/108, Laxman Smruti, Shrikahnde Wadi, Dombivli (E), Mumbai - 421201.
Sis. Preeti Narayanan	5/102, Om Manikanta, New Shastri Nagar, Goregaon (W), Mumbai - 400104.
Bro. Narwani Jitendar P.	Ganesh Apartment, Flat No. 201, Gandhi Nagar, Ulhasnagar, Mumabi - 421205.
Bro. Oak Parijat Ashok	23, Yojana, Tilak Nagar, Vallabhai Patel Road, Girgaon, Mumbai - 400004.
Bro. Pai Deepak Ramanath	A-77/768, M.I.G. Colony, Gandhi Nagar, Bandra (E), Mumbai - 400051.
Sis. Parkar Vaishali Gopal	A/10, Kamdhenu, Shastri Nagar, S.V. Road, Borivli (W), Mumbai - 400092.
Bro. Patangia Alok N.	23/10, Hamsika Krupa, Garodia Nagar, Ghatkopar (E), Mumabi - 400077.
Bro. Patil Prashant S.	A/302, Om Gokul Dham, Murbad Road, Kalyan (W), Mumbai - 421301.
Bro. Patro Anilkumar G.	8 Girikunj, Sameer Qrts., I.I.T. Campus, Powai, Mumbai - 400076.
Bro. Phondba Uddhav P.	2a6, Mahadevi C.H.S, Primal Nagar, Goregaon (W), Mumbai - 400062.
Sis. Pradhan Ashwini S.	Jasota Kutir, Anant Patil Road, Dadar (W), Mumbai 400028.
Bro. Prasannav Sooraj P.	A9/507, Runwal Plaza, Near Kores India Limited, Thane, Mumbai - 400606.
Bro. Purohit Vinay M.	N-5, Saklatwala House, Acc Complex, Opp. Gyan Sadhana College, Thane (W).
Sis. Radhika Narayan	A-4, Radhakrishna, Swastik Park, Chembur, Mumbai - 400071.
Sis. Rao Manjusha C.	2/28, Ganpati Villa, Kolbad Road, Thane (W), Mumbai - 400601.
Sis. Raut Sanjivni S.	A/10, Amrachhaya, Ashok Nagar, Nahur Road, Mulund (W), Mumbai - 400080.
Bro. Rawat Ashok Ganesh	20/15, Radha Nagar, Gandhare Village, Barave Rd., Kalyan (W).
Bro. Sakpal Suryakant G.	A-4/19, P&T Colony, P.K. Road, Mulund (W), Mumbai - 400080.
Bro. Samant Anuj Uday	6/A, Parivar Society, Dadabhai Rd., Andheri (W), Mumbai - 400058.
Bro. Sanghvi Kashyap T.	6, Rukshimani Krupa, M.P. Road, Dombivli (W).
Bro. Sartape Shashikant M.	16 Dhanshree Apt., 'B' Wing, Bhusar Ali, Kalwa, Thane, Mumbai - 400605.
Bro. Sathe Sachin Anil	Ganesh Mandir Road, Murud - Janjira, Raigad, Maharashtra
Bro. Savle Amal Avinash	A 14/53, Rajawadi Hsg. Soc., Vidyaviahr (E), Mumbai - 400077.
Bro. Shah Chetan D.	37, Nirmal Niwas - 2, Gowalia Tank, Mumbai - 400036.
Bro. Shah Dipesh C.	1/8 Ram Ratan Bldg., T.H. Kataria Marg, Matunga (W), Mumbai - 400016.
Bro. Shah Jimmy Virendra	75/6, Ajit Building, R.A. Kidwai Road, King's Circle, Mumbai - 400019.
Bro. Shah Kaushik Mukund	20/5501, Kanchan Ganga 'B', Ghatkopar (E), Mumbai - 400075.
Sis. Shah Nidhi K.	3, Jaygun Sagar, Garodia Nagar, Ghatkopar (E), Mumbai - 400077.
Bro. Shah Nishant K.	5, Zaver Apts., Zaver Road, Mulund (W), Mumbai - 400081.
Bro. Sheregar Nagraj R.	12/B, Sunil Apts, Kastur Park, Shimpoli Road, Borivli (W), Mumbai - 400090.
Bro.Shukla Anirudh V.	33/B, Eldida Apts., Mount Mary Road, Bandra (W), Mumbai - 40050.
Bro. Singh Gaurav Vijay	7/303, Garden Estate, Off. Pokhran Road No. 2, Thane (W).
Bro. Singh Manas M.	A/3, Shivalik Sector 16a, Vashi Navi Mumbai.
Bro. Singh Santosh B.	C/3, Anant Rai Society, Karve Road, Dombivli (W), Mumbai - 421201.
Bro. Soni Rushabh S.	3/4, Arvind Apt. No. 2, Mathura Das Road, Kandivali (W), Mumbai - 400067.
Bro. Sridhar S.	4, Anand Villa, Nahur Road, Mulund (W), Mumbai - 400080.
Sis. Tare Grishma Krishna	302-B, Jinja App, Opp. Damani Estate, Naupada, Thane (W), Mumbai - 400602.
Bro. Thacker Ankur M.	1, Neeta Apartment, Bhakti Marg, Mulund (W), Mumbai - 400080.

Bro. Tulsekar Anand C.	B/207, Matru-Sneha, Old Shahad Fatak Road, Shahad (W), Kalyan 421103.
Bro. Vaidya Parag Ramdas	B, Savita Society, N.C. Kelkar Road, Ramnagar, Dombivli (E) - 421201
Bro. Wani Rohit Mohan	E/23, Vrindavan, L.B.S. Marg, Ghatkopar (E), Mumbai -400086.
Bro. Wazir Jatinder B.L.	266, Pocket-5, Mayur Vihar-I, Delhi 110091.
Bro. Singh Siddha/tha S.	R-143, Badhwar Park, Colaba, Mumbai
Bro. Sheth Priyesh D.	2, Bhaveshwar Shikhar No. 2, 60 Feet Road Ghatkopar (E), Mumbai - 400077

B.E. PRODUCTION

1998-99

Bro. Abhang Shailesh S.	11/15, Vishwamitan, Dahanukar Wadi, Kandivali (W), Mumbai - 400067.
Bro. Agarwal Vivek V.	6/73, Pashim Apts., K.D. Marg, Opp. Kirti College, Mumbai - 400028.
Bro. Arora Devesh V.	1, Niwara Society, Agra Road, Mulund (W), Mumbai - 400080.
Bro. Belwekar Vishal V.	G-1/82, Kalpita Enclave, Sahar Road, Andheri (E), Mumbai - 400069.
Bro. Bangania Nipun R.	609, Punjab Pashim Nehru Chowk, Ulhasnagar 421002.
Bro. Chhatre Aniket M.	Amrutanubhav, B.No.3, Kesarbaug, Mulund (E), Mumbai - 400081.
Bro. D'souza Prem E.	A/31, Takshila, Anushakti Nagar, Mumbai - 400009.
Sk. Das Mandira A.	28 B/1, Takshila, Mahakali Caves Road, Andheri (E), Mumbai - 400093.
Bro. Dellawala Rikesh J.	5/Pantashraya, Ashok Nagar, Kandivali (E), Mumbai - 400101.
Bro. Desai Rahul R.	C-101, Bennur, Lokhandwala Complex, Andheri (W), Mumbai - 400053.
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