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Honorable Vice-Chancellor Professor (Dr) Manikrao M. Salunkhe, Members of the various councils of the University, Fellow Teachers, dear graduating students

I am most delighted to be with you this afternoon in this Dakshin Kashi. I have an extraordinary feeling as the University is named after one of our greatest heroes the invincible Maratha Warrior Chhatrapati Shivaji. Shivaji had an uncanny knack of achieving his goals and had the foresight to develop a naval back-up for fighting. Over and above Kolhapur was blessed by the reformist leadership of Chhatrapati Shahu Maharaj.

I have spent my whole working life in the Mumbai University Institute of Chemical Technology where I was an undergraduate in Chemical Engineering and then a post-graduate student and from 1964 to 1997 as Professor of Chemical Engineering and Director from 1989-1997. I am, therefore, acutely aware of insurmountable problems we encounter in working in State Universities. Since I was trained as an engineer I was tuned to solving problems rather than being overtaken by them. I guided 71 PhDs in my lifetime, against so many difficulties. University Research is the most powerful way of opening new frontiers as the world over Universities are regarded as cradles of invention. The University Research bestows three tiers of benefits and this has no parallel. There is a definite impact on the quality of the undergraduate and postgraduate education, besides the value of the research. The research scholars work for well over 75 hours per week and do not believe in holidays. Where can you find such a band of workers that too with a measly financial compensation? It is research students who burn so to say the mid-night oil. They do not believe in taking a “no” and will somehow find a solution. No wonder the University Research is the most cost effective. It is the turnover of PhDs, besides those of undergraduates, which keeps the Universities ever young and vibrant and I am indeed pleased to see so many young faces in front of me and this surely makes me feel younger.

I should likely to warmly congratulate students who are graduating at this convocation. I wish them a bright future and cajole them to follow an ethical

way of life. Maharashtra is the most industrialized part of India and has just about every type of industry and a long coastline. Kolhapur itself has a variety of industries and sugar and dairy are quite important sectors of economy.

Science and technology have played a very decisive role in the overall development of the mankind. Scientific discoveries have played a pivotal role in our lives. Small pox has been eradicated from the earth and we will soon be free from polio. Communications have been made so easy that everyone of us takes it for granted. I am reminded of my first visit to Kolhapur in early 1977 when I had, for an emergency, great difficulties in communicating with my family in Mumbai. Just see how satellites have played a critical role. Lasers are used in backyards for cutting diamonds. Everyone knows X-rays and in the recent past MRI has become a part of our vocabulary.

Distance Education has become so much easier and powerful.

We Indians are now well known all over the world for our progress in IT. Earlier we had developed our Super Computer. We have always responded to challenges thrown at us. Now the time has come to throw a challenge at all the Universities in India to make Doctoral work as a key component of our work and graduate five times the present number of PhDs in S & T in next 12 to 15 years, duly maintaining high quality. This will catapult India into the knowledge hub of the world and even many R&D centres of world renowned companies will come-up.

It is well known that there is a direct relationship between the prosperity of a nation and the number of PhDs it produces per million of the population. No wonder that in Germany 80% of Chemists graduate as PhDs. I need to remind you that globally organized research in Industry first started in the German Chemical Industry. Even economists subscribe to the fact that the major part of economic growth comes through S & T. I am aware that a relatively young University like yours does have to its credit a reasonable numbers of PhDs every year. However, I should like to urge you to increase these numbers very substantially through pro-active manouvers. We in India need to increase our output from 6000 to 30,000 PhD's per year. You would have noticed that in last 3 years there has been a significant jump in the number of PhDs who have graduated from IIT, Sc.; Bangalore, etc. My own institute MUICT has an enviable output of PhD's and this came through

pro-active steps. Recently China has decided to spend 2.5 percent of GDP on R&D for the next 15 years; this figure was 1.23% in 2002 and 0.83% in 1999. Apart from allocation of more money, it will encourage all segments of economy, including companies, to lay emphasis on R&D. We in India have seen a very substantial rise in the expenditure on R&D in the Pharma Industry which is now employing a very large number of PhDs.

The Government of India has taken, in the recent past, very active interest in boosting research in Universities. Please take a note of Rs 100 crores to the Institute of Science, Bangalore, announced in the Budget in 2005. We now have the good news of Rs 100 crores to each of the three oldest Universities of India which are going to celebrate their 150th year of existence - Calcutta, Madras and my own Mumbai. This, I believe, is for specific research projects. The step of Swarnjayanti Fellowships has made an impact on young scientists. After the initiation of the COSIST programme in the UGC, in early 80s, at the behest of the then SAC-Cabinet, and in which I had a role to play, we now have the FIST programme of The DST to support research in Universities in an aggressive way. I had the pleasure of Chairing this FIST programme for 3 years. We will soon have a specific programme of supporting infrastructure for S&T in Universities through the UGC. This has arisen out of the specific request of the SAC-PM to the MHRD and the recommendations of a committee of the MHRD headed by me. We are very hopeful that this relatively decent input will bring out a major change in the ethos of the Universities. However, it is important to recognize that money or infrastructure alone does not guarantee quality research. Genius prefers homogeneity of an individual rather than a heterogeneous group. We need the right vibrant atmosphere, congenial ambience and high quality leadership. The Universities must gear up for this new role rather than just harp on conducting examinations, which Boards of Education do so efficiently. We need to free ourselves from shackles of unwanted bureaucracy and mediocrity. In research, we need to remind ourselves that our competition is global and not regional or national and no excuses are tolerable. We should now give a serious consideration to having universities with only departments and Universities which do affiliation. Research requires a different kind of initiative and leadership and the combo of UG, PG and Doctoral work has an unbelievable efficacy.

India has embarked on a massive expansion of education in Engineering & Technology and our intake will be 500,000 per year, can our economy absorb them? The USA graduates only about 70,000 per year. However, they have in

Chemical Engineering above 700 PhDs per year and 2200 in Chemistry. Where are we with respect to PhDs in engineering? It is really dismal. Our knowledge-based economy desperately needs a massive jump in quality PhDs. As a teacher researcher for a life time, in spite of very lucrative offers I had in India, Europe and N. America in 1964, I am deeply concerned about the absence of a pedagogy for creating a new generation of motivated teacher-researchers. It is our job, at least in part, to inspire young persons to take up the noble profession of teaching and research. I made a living through this mode and would be more than happy to do it all over again.

I, once again, congratulate the graduating students and thank the Vice Chancellor for giving this opportunity to address all of you. Professor Salunkhe is an excellent example of teacher-researcher and now also an administrator. I urge him to take this Shivaji University to great heights in doctoral work. We all must get out of our delinquency and eject ourselves from vicious circles to virtuous circles.

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