

Preface

It is more than two decades since the subject of Power Electronics has entered the curriculum of undergraduate electrical engineering. In the past decade several universities had introduced postgraduate degrees with specialization in Power Electronics. A number of Indian industries have been introducing into the market place an ever increasing number of Power Electronic products. The growth of academic research, and industrial development in this area has been substantial. The objective of this special issue is to present in one place the diverse development and research work that is going on at several academic institutions in the country.

In the earlier era, the work in the area of power electronics centered around the Silicon Controlled Rectifier (SCR), which was the work horse of the power converters of that era. Three main features are characteristic of the developments in the area of power electronics in the past ten years. These are (i) the availability of fully controlled power devices capable of switching faster in the tens of kHz region under hard switching and in hundreds of kHz region under soft switching, (ii) developments in soft switching enabling high power densities for converters and high operating efficiency (iii) application of modern control methods on account of the availability of low cost digital control hardware. The papers published in this issue reflect these trends.

The first paper entitled "Cycloconverters and Cycloconverter-fed drives" by Prof A. K. Chattopadhyay, is a review of the mature technology of the SCR era. The second paper by Dr. V. R. Kanetkar et al., entitled "Performance Characteristics of Artificially Commutated HVDC Converter" covers the performance of HVDC converters under artificial commutation and compares the same with the earlier generation of naturally commutated HVDC converters.

The other three papers reflect the influence of the modern developments. The paper entitled "Switch Mode Rectifiers-A Status Review" by Dr. M. S. Dawande et al., gives the evolution of the circuit topologies of switch mode rectifiers and their performance comparison. It is expected that the future rectifiers will belong to this class because of their positive features in relation to power quality. The fourth paper is on the circuit topology of "Quasi Resonant Converter" by Mr. A. K. Jain and Dr. Vivek Agarwal. These converters have become enormously popular in the commercial scene on account of their high power density. The last paper in this issue covers the "Design of Robust Optimal PI Controller for PMSM Servo Drives" by Ms Mary Lourde et al. With the advent of digital control hardware, such applications of modern control methods in power electronic converters is becoming the norm. It is hoped that these papers indicate the trend of the things to come in the area of Power Electronics.

I thank Prof. M. S. Shaila and Prof. V. S. Borkar for giving us an opportunity to guest-edit this issue. I thank Prof. K. R. Padiyar and Prof. V. T. Ranganathan for being co-guest editors and for sharing the work on this special issue. Thanks are due to Mr. N. M. Malwad,

Mr. K. Sreenivasa Rao and Ms. R. Geetha for their help in processing the manuscripts, co-ordinating the reviews, editing and printing process.

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