PREFACE

The thesis describes the results of some investigations, both theoretical and experimental, on several problems of junction transistor operation carried out by the author during the years 1964-68 at the Institute of Radio Physics and Electronics, Calcutta University.

The topics discussed in the thesis include: (i) determination of equilibrium carrier concentrations and lifetime of minority carriers in the base region of a transistor, (ii) detailed studies on some aspects of the variation of lifetime of minority carriers in the base region of a transistor with the level of injection, (iii) study of abnormal capacitance-voltage characteristic of certain recently developed types of transistors, (iv) investigations on the variation of the l.f. noise figure of a junction transistor with the level of injection and (v) prediction of risetime in transistors.

Of the aforesaid topics, those mentioned in (i), (ii) and (v) above include deduction of theoretical expressions supplemented by experimental verification while in the topics mentioned in (iii) and (iv), some plausible suggestions are put forward to explain the experimental results.

A review of earlier works on these topics is also included to serve as a background.

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