PREFACE

Large numbers of photocopiers are widely available because of high capability of output copies with automatic feed and sorting facilities, which results in making them an opportune source for criminal activities. Copiers are used in various types of transactions that later become the focus of a criminal investigation. Accordingly, photocopied documents are often associated with a variety of crimes, such as, counterfeiting various types of documents, currency notes, cheques, threatening letters, wills, financial deeds etc. The frequent use of photocopiers in day to day work has made necessary for forensic document examiners to find specific, sensitive analytical method for linking questioned documents to a specific photocopier. So, present study has been carried out to determine, whether this is photocopied documents or not (both in black and coloured), the source of photocopied documents (both in black and coloured) and to determine the authenticity of photocopied documents (both in black and coloured).

The examination of photocopied documents for the determination of their nature and source includes physical and chemical analyses of the photocopies. The physical analysis includes examination of toner type, toner fusion, splattering effect of toner and defect marks in black photocopy samples. Various physical characteristics such as Counterfiet Protection System (CPS) code and Toner Deposit Patterns have been examined for coloured photocopy samples. The chemical examination referred to analyses of toners (both raw and processed) for their chemical characteristics with analytical techniques. Present study has been undertaken to examine sixty two black toners (both raw and processed) and twenty eight processed and ten raw coloured photocopy toners under stereomicroscope for their physical characteristics and with analytical techniques such as TLC, UV and FTIR for their chemical analysis. Determination of authenticity of photocopied documents has been done by collecting black and coloured photocopies samples and examined them for the identification
of alteration in typed and printed materials, handwritten material and signatures of photocopied documents. They have also been examined for the determination of their generation.

Present study is proved to be very significant and useful for discrimination between the samples. Sixty two black photocopies have been classified into fifty two groups on the basis of physical analyses and into thirty four groups on the basis of their chemical analyses based on the combination of TLC, UV and FTIR techniques. Twenty five out of twenty eight coloured processed samples have been differentiated from each other on the basis of CPS code present on their surface. However, they have been fully differentiated from each other from their printing characteristics that is, toner deposit pattern. Almost all the processed coloured samples (except two) have been discriminated from each other with combination of TLC, UV and FTIR. Alterations have been detected in 37% black and 40% coloured samples, when all the features have been considered collectively. However, when the generations of photocopies are increased, the detection of the alterations becomes difficult because recopying of the altered copy hide most of the characteristics of alteration. Thus, duplication of the trash marks and the degree (percentage) of expansion of the strokes of the letter and baseline of printing have found to be useful for determination of generation of the photocopied documents. The direction and extent of expansion has also been used to differentiate photocopiers. The results of the present study are encouraging and they can be further used in future research.

All the required precautions have been taken throughout the research work, yet some errors may creep in, for these I am responsible alone.