A COMPUTERIZED SCIENCE AND TECHNOLOGY INFORMATION (STI) INFRASTRUCTURE FOR RESEARCH ACTIVITIES IN LAGOS STATE UNIVERSITY. A CASE STUDY OF DEPARTMENT OF CHEMISTRY, FACULTY OF SCIENCE

BY

RUFAI KAZEEM OLAYIWOLA

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CERTIFICATION.

This is to certify that this project was carried out by **MR. KAZEEM OLAYIWOLA RUFAI** in the Department of Mathematics/Computer Science, Federal University of Technology Minna, Niger State.

....

MR. R. O. BADMUS DATE

SUPERVISOR

....

DR. S.A. REJU DATE

HEAD OF DEPARTMENT

....

EXTERNAL EXAMINER. DATE

DEDICATION

This project is dedicated to Almighty Allah for His shower of blessing and guidance over me till this stage of my life.

A special dedication to my father, **MR. RAJI I. RUFAI** and my mother **MRS. S. RUFAI** for caring in her own motherly ways.

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ABSTRACT

The lack of readily available information in the sciences especially as it affects the publication of journals in Nigeria and the acquisition of same by Nigerian libraries occasioned by the prevailing economic depression has resulted not only in time wasting in information searching but duplication of research activities and dearth of valuable information in the areas of research activities among our researchers.

The present study however, tries to design a model computerised science and technology information infrastructure for an academic department in a university system for the research activities in the department on a yearly basis.

The choice of program to be used to solve this problem is the DBASE program (dbase iv).

CHAPTER ONE

1.0 INFORMATION

1.1 WHAT IS INFORMATION?

Information has been described as a commodity of great variety and considerable. Some need it, but are unaware of that need, others with problems to solve are unaware of what information file exist and how to gain access to them. There are those who are familiar with sources of information but require intermediaries to retrieve data for them and to provide regular updates. The ability to satisfy the needs of updates and current information has dwindled as SAP bites harder and libraries make drastic cuts in journals subscription and monographs purchases.

Knowledge is what I know while information is what we know. In other words, information is shared knowledge. It has often been suggested that information should be of two types; the soft, and the hard. Soft Information is what we read in newspapers and general interest magazines, hear on the Radio, see on the TV or receive from unsolicited source such as advertisers and government departments. Hard information on the other hand, is a strategic source. It is a key factor in decision-making by corporate and other executives and a vital input in the process of research, design and development.

Without efficient information services, we cannot talk of providing high technology. For a new product to be developed, information is a vital input at every stage.

Researchers need to know what has been done before, what problems were encountered and how they were solved. Researchers also need to know if there is any new relevant technique. What is true for researchers are also true for designers, production and development teams, marketing executives and member of board. The

information required by members if the board would usually be already processed. It will be speedy, accurate and relevant.

But what about the information for teaching and research, design and development? For researchers and teachers, information is next to the basic things of life in importance. A researcher operating in an information-deprived environment can have very little claims to the tag researcher. A study by Ehikilamenner (1982) on the prevailing state of science in Nigeria found that the basic constraints of scientist is lack of equipment and lack of information.

It is now generally accepted that information constitutes a crucial component in most areas of human endeavour, be it in economic development, politics, agriculture, science and technology. Many scholars have also argued that information is indispensable national resource whose impact can have far-reaching and tangible effect. Information has therefore come to be regarded as tangible resource. An adequate provision of information in any serious endevour is therefore a mere emphasis. To information scholars of Osiobe's school of thought, information is that which reduces uncertainty in a given task. No one can doubt the importance of up to date information in scientific research and the teaching and learning process. It is one thing to generate as much information as possible, it is quite another thing however to make such information accessible to others in the field and available when needed. The professional saying that, book misplaced is a book lost can usefully be applied to accessibility of information in a modify form. For it is true to say that an information that is not accessible is lost and of no consequence. No matter how authoritative an information is adjudged, unless it is made available and used, its generation serves no useful purpose. Accessibility and availability must go hand in hand with the production of information. It may appear right to say that an information that is not

accessible cannot be utilized, and an information not utilized is not productive (Tamuno, A. G. 1992).

1.2 METHODOLOGY

The following methods were used in carrying out the investigation.

i. Interviews; asking officers in charge and Library users.

ii. Going through the existing records.

iii. Studying the existing system, how it operates.

1.3 AIMS AND OBJECTIVE OF THE STUDY

The aim and objective of the study is to design a computerized science and technology information infrastructure for research activities in the Chemistry department.

1.4 SCOPE AND LIMITATION

The study is limited to chemistry department faculty of Science, Lagos State University, Ojo.

There are three major constraints that might militate against computerized science and technology information infrastructure being proposed.

i) **Funding;** One major problem that will militate against the development and effective utilization of a functional computerized ST1 will be the insensitivity of the University administrators to the value of the Science and Technology information as being essential to the growth of the university. This insensitivity will definitely lead to inadequate funding or utter neglect of the information infrastructure.

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There is need to sensitize the university administration to accept the STI as an important ingredient in achieving the purpose of the establishment of the University i.e. the advancement of knowledge and dissemination of information through research and teaching and the faculty advancement of scientific knowledge and development through same means.

(ii) **Attitude of Researchers:** The attitude of research scholars (typically Nigerians) fearfully covering up information about their research projects let their discoveries be stolen by smart Alecs and forgetting that Scientific research flourishes through constant discussion/exposure to lively minds through "invisible colleges" and ideas blossom through cross fertilization with others, errors are sifted out and promptly corrected and final output can stand rigorous x-ray by peers.

iii) **Computer Accessibility:** The fact that faculty has no computer of its own except use through the university computer centre will potend some limitation so also for the fact that most university Libraries are not computerized with a computer for access, will also create some limitation. This however can be minimized by constant production of the hard copy of the Database or regular bases after update for search purpose.

1.5 THE SCIENCE AND TECHNOLOGY INFORMATION INFRASTRUCTURE

Information has been well accepted in the industrialized countries as an important resource that is essential for national development. In most developing countries, especially Nigeria, it has not yet been accorded the importance it deserves. The nature of scientific research through experimentation from both formal (i.e. documentary) and informal (i.e. non documentary) source are therefore required.

Adequate provision of information is the soul of research, and that the importance of access to accurate, reliable and up to date information at every stage of research can not be overstressed. He concluded that without such information, there could be unnecessary duplication of research and waste of scarce resources. Here lies the need for documentation of the research activities in our institution of higher learning and this project.

The acquisition, processing and dissemination of scientific information is an essential part of the development process and different kind of users, especially administrators, researchers extension officers and students need the right scientific information in the right form and at the right time.

Science information consciousness in the developed countries of the world, particularly those of Western Europe and North America has inevitably led to a high – pressure generation and production of literature in almost every branch of knowledge. The generation and dissemination of science and technology information in these countries has become a great flood which has estranged the consumer market. Information production in the sciences, basic and applied, is today thought to have reached an epic proposition. The scientific community, describe as information-generating and consuming is therefore faced with a massive volume of information

generating and consuming is therefore faced with a massive volume of information which increases astronomically every year. Abundant evidence on the information producing pattern of scientific (Tamuno A. G. 1992), indicates that the literature generated by this group of scholars and professionals doubles itself every 10-15 years. Most literature reviewing publications in the sciences examine not less than 500,000 items every year. The selected items do not constitute the total output in any given year, they merely fall within the parameters used for selection.

1.6 THE VALUE OF INFORMATION

The tempo of information generation and literature production in the developing countries is especially much slower than in the developed ones. This has given rise in what has been variously described as information poverty, deficiency or hunger. It has also created a yawning gap between information need and provision in the less developed countries. For much needed information in all areas of knowledge but particularly in science and technology, including medicine and related disciplines, developing countries rely on what has been generated in the developed world.

According to Ajulo, the accessibility crisis, noted in the information rich countries, is acute in the information poor ones. With their low technological base, information poor countries have to search the large databases of the developed countries for information relevant to the need of their information seeking citizens. They face the problem of accessing a huge mass of information location thousands of miles away with traditional library – based mechanisms. With poor communication systems, direct access on one which has become the norm in the developing world, is quite beyond the reach of information seekers in the developing countries, hence the need to develop local documentation data bases especially of local generated

information which would be of high local value for local users. The information requires that it should be transferred at the right time and finally to be disseminated to the right people.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 BRIEF HISTORY OF THE LAGOS STATE UNIVERSITY

Lagos State, with its relatively well developed industrial and economic base, is still regarded as an educationally disadvantaged State. It was the realization of the need to address this advantage that resulted in the establishment of the Lagos State University.

The bill formally establishing the Lagos State University was passed by the then House of Assembly and assented to by the Governor on 13 June, 1983.

The goals and objectives of the University were firmly stated and established by the white paper on Tertiary Education published in July, 1984 by the Military Government of Lagos State.

2.2 PHILOSOPHY OF THE UNIVERSITY

Lagos State University was established to create opportunities for students and members of Faculty to participate in the long established and world wide tradition of academic excellence for the propagation of knowledge and the preservation of the University's commitment to the understanding of humanity with its concomitant concern for unraveling the natural phenomena which man seeks to domesticate.

The curriculum was designed to achieve high academic standards in teaching and learning to enable the students develop to their full potential by being exposed to a broad base educational programme and to provide much needed high level manpower for the social and economic development of Lagos State in particular and Nigeria in general.

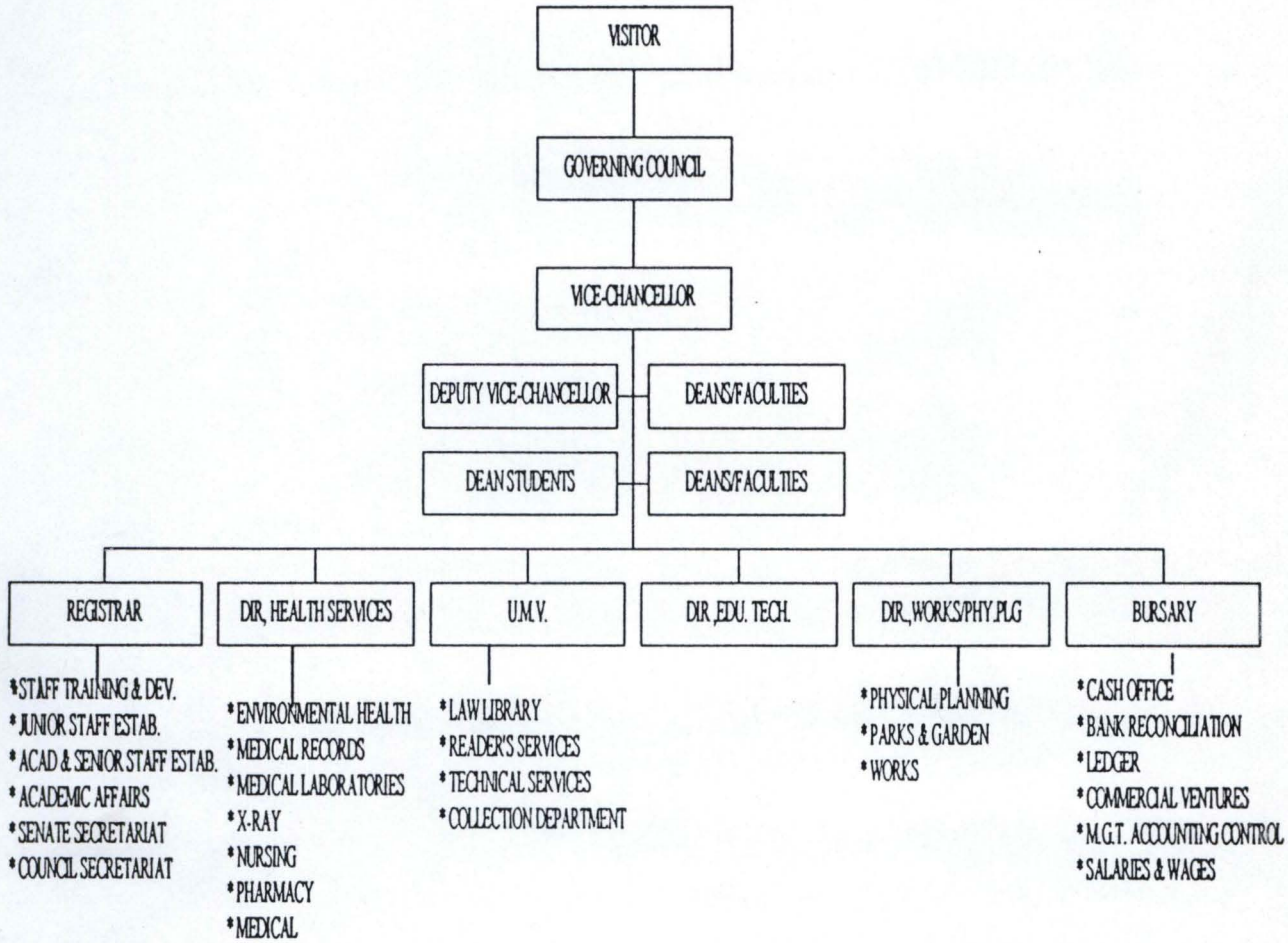
2.3 THE ORGANOGRAM OF THE UNIVERSITY

The organization and administrative structure of most conventional universities with special reference to Lagos State University, concept of "The University" is also clearly stated in most university laws and or Edicts, that organizational structure often specifies the following as the principal officers.

1. The council
2. The Senate
3. The visitor
4. The Chancellor
5. Pro-Chancellor
6. The Vice Chancellor
7. Deputy Vice Chancellor
8. Dean of Faculty
9. Head of Department/Unit
10. Lecturers
11. The Registrar.
12. The Bursar
13. The Librarian
14. Director of Works and Physical Planning
15. Director of Health Services
16. Legal Office
17. Internal Auditor
18. The External Auditor
19. The Clerical Officer
20. The Office Assistance

21. Students.

ORGANIZATION CHART OF LAGOS STATE UNIVERSITY, OJO.



IG & DEVELOPMENT

1 **<u>The Council</u>** The Council is the governing authority of Universities. It is charged with the general control and superintendence of the policy, finances and property of that particular institution including its public relations. It sees to the welfare of both the students and the staff of the institutions. It is the highest political body.

It membership is made up of people from inside and outside the institution. Some of the members at the University level are the Pro-Chancellor and Chairman, the vice-chancellor, representative of the senate, a representative of the congregation, the registrar, a representative of the National University Commission and nominated member from outside the university to represent commercial, industrial, accounting, legal, engineering and other interests.

It has a Standing Committee known as Finance and General Purpose Committee which shall exercise control over the property and expenditure of the university and perform such other functions of the council as the council may from time to time delegate it.

It hammers out all budget proposals, discussion, promotion and appointments and condition of service of staff.

2. The Senate

The highest academic policy making body at the university is known as the Senate. It organizes and control teaching by the institution, the admission and discipline of the students, promote research, make provision for the establishment, organization and control of campus, facilities, colleges, branches schools, institute, teaching or research unit of the institution etc.

It is in charge of all matters pertaining to academic duties. It controls teaching, examination, award of degree and certificates.

At the university, the member are the Vice Chancellor, all deans, all heads of departments, all professors, elected members of the academic community.

3. The Visitor

The visitor is the President of Nigeria for Federal Universities and the State Governors for the state universities. He has the authority to inspect and supervise the functioning of the university. He possesses the power to cause an inquiry relating to university affairs. He can annul any proceedings of the university contravening the act, status or ordinances. Different members on different bodies are also nominated by him.

4. The Chancellor

The Chancellor is appointed by the visitor in consultation with the council. He exercises the power of supervision and control. He performs all functions which the visitor performs. His functions shall be as prescribed by law. He can delegate his functions in writing to the Pro-chancellor provided that any such delegation shall be revocable at will and shall not preclude the chancellor from exercising any of these functions.

He may require information concerning the general conduct of the affairs of the university from the pro-chancellor of vice chancellor whose duty is to provide it.

5. Pro – Chancellor.

The Pro-chancellor who is also the Chairman of council is appointed by the Visitor. He holds office for four years and can go the second term. Whenever the Chancellor is absent, he presides over the council meetings. He performs any function delegated to him by the Chancellor other than the conferring of Degree or other Academic Title or Distinction of the universities.

6. The Vice Chancellor

The first Vice Chancellor shall be appointed by the President or the State Governor. Subsequent ones will be appointed by the Visitor on the advice of the council and senate of the university from among the three professors recommended by the council or senate. He holds office for four years and can be re-appointed for another four years. He deals with terms such as emoluments and other things specified for him to do.

He is the principal academic officer and Chief Executive of the university, ex-officio chairman of the senate, and shall confer degree and other academic titles and distinctions of the university. He perform general functions of directing the activities of the university.

He is responsible for generating the environment required for fulfilling the university objectives. He is to ensure optimum utilization of human, physical and monetary resources available in the university with the constrain of external environment.

7. Deputy Vice – Chancellor.

He shall assist the vice-chancellor in duties and shall act in the place of the vice-chancellor when that office is vacant or in his absence. He is appointed by a manner specified by the senate through subject to the approval of the visitor. He shall hold office for two years at a time. He is responsible to the vice-chancellor.

8. Dean of Faculty.

The Dean is usually a professor elected by the faculty or school board and usually held in rotation. He is the chairman of all academic meetings and he is responsible for the

academic and administrative affairs of the faculty, school, teaching and research units. He presents to convocation for the conferment of degrees, person who have qualified for degree or certificates of education.

The "Dean" is the head of the university.

9. Head of Department/Units.

Each Faculty in the University are further broken down to department and sub-units. Each of these departments have departmental heads that are accountable to the Dean of the faculty. Where the department is divided into units, there are units head that are accountable to the departmental heads. They are member of the academic board and see to the day to day running of the department or unit. They see to it that lecturers attend to their lectures and they are regular and punctual. They arrange for examinations and the typing and safety of examination questions.

10. Lecturers.

These are persons appointed as a member of staff of the university or college on full or part-time duties and shall include such person employed on research or other duties in the university as are required and also to teach. This includes at the university level Assistant Lecturers, research fellows, and other teaching and research staff. They are responsible to the head of his department.

11. The Registrar.

He is the Chief Administrative Officer of the University and is responsible to the vice-chancellor for the day to day administrative work. He is the Secretary to the council, the senate, congregation and convocation. He is the custodian of all staff and

student records. He is in charge of different departments that take care of recruitment, senior and junior staff welfare, admission, examination and record of students. Other matters such as student affairs/welfare/union/accommodation, sport, staff training, siwes and development matters. He is responsible directly to the Vice Chancellor at the University.

12. <u>The Bursar.</u>

He is the Chief Financial Officer of the University. The visitor has to approve his appointment. He is responsible to the Vice Chancellor of the university for the day-to-day administration and control of the financial affairs of the institutions. He is in charge of different departments that pay salaries and wages, cash office, preparation of final accounts, and budget/control, bank reconciliation and commercial venture, that is payment of bills from contractors or suppliers. He provide fund for project being handled by the institution and advice the Vice Chancellor on fiscal management.

13. <u>The Librarian.</u>

He is appointed base on the approval of the visitor. He performs both academic and non academic functions. He is responsible to the Vice Chancellor, for the administration of the library and the co-ordination of all library services in the institution. He recommends books to be bought based on the recommendation of the heads of various departments and units on books that could be bought for the various courses/subjects in their departments and units. He belongs to some committees that are relevant to his line of operation. For example at Lagos State University Ojo, he supervises various sections under him such as collection development, Technical services, Readers services e.t.c.

As an academic staff he is expected to write and publish research works but as a non-academic staff, his promotion is not based solely on it. He is responsible to the Vice Chancellor.

14. Director of Works and Physical Planning.

He is responsible for the general works and maintenance function in the areas of mechanical, electrical, civil engineering functions. He is also responsible for the physical planning and Garden of the institution. He is responsible to the Vice Chancellor.

15. Director of Health Service.

The university provide health services to both the students and their staff. The Director of Health services oversees all the various units in the department. These include medical section, pharmacy, nursing, x-ray, medical records and environmental health. When there are serious cases, he refers patient to general hospital.

16. Legal Office.

The services of a legal practitioner is usually retained. He provides legal advice. He is known as the university solicitor. The number of references for advice increases as the university or college ventures into new fields. He is directly responsible to the Vice Chancellor.

17. The Internal Auditor.

At the University, there is an internal auditor who is appointed by the council for a particular period. He is a full-time office. He is responsible to the Chancellor.

18. The External Auditor.

The council usually appoints the External Auditor. He is to audits the Annual or other statement of income and expenditure, the balance sheet and other account of the university. He makes report to the Finance and General Purpose Committee or to the Vice Chancellor. He accesses books, records, accounts and vouchers of the institution and extract information or explanations from office or members of staff. He is also responsible to the Vice Chancellor.

19. The Clerical Officer.

The Clerical function is performed in various subdivisions of the organization. They are needed in the Vice Chancellor's office. They are needed in the faculties, registry and even departments. They perform various clerical function as assigned by their superior officers.

20. The Office Assistance.

The Office Assistance are those that perform menial jobs which they are instructed to carry out.

21. Students.

This means person who has been registered as a student of the university for a first degree, diploma, certificate or such other qualification of the university as may be approved by the senate. They relate with all section that deals with students and especially their lecturers.

2.4 DEVELOPMENT PLAN

The University was established to fulfil the following objectives;

a) to form apex of the educational system of Lagos State:

to provide facilities for learning:

to give instruction and training in such branches of knowledge as the university may desire:

to enable students obtain the advantage of liberal education;

b) to promote, by research and other means, the advancement of knowledge and its practical application to social, cultural, economic, scientific and technological problems;

c) to encourage the advancement of learning and to provide the opportunity for acquiring higher and liberal education;

d) to act as a vehicle of national development in general and in particular to act as instrument to effectively stimulate the development of the state through continuing education, applied research, technical assistance, direct constitution, informational services and internship programmes;

e) to provide innovative educational programmes of high standard, regardless of the nature of the degree being pursued, as long as this has importance and relevance for state and national development.

f) To provide ready access for citizens of the State in particular to higher education regardless of social origin or income;

g) To meet specific manpower needs of the State;

h) To serve as a creative custodian, promoter and propagator of the State's social and cultural heritage and resources;

i) To undertake any other activity appropriate for a university of the highest standard, especially such would enhance the greatest good of the greatest number of the people of the State.

For the purpose of implementing the above stated objectives, the university has recruited qualified staff in the academic, administrative and technical fields into the various segments of the university.

The university has acquired about 500 hectares of land at Ojo which is being planned to have a total land area of 1,000 hectares.

2.5 THE FACULTY OF SCIENCE.

Basically the essence of the establishment of any university is for its purpose of disseminating intellectual knowledge through teaching, research and scholarly publications.

It is therefore expected that the basic aim of the science faculty of the Lagos State University as in other universities world wide is to further the advancement of scientific technology and science related knowledge of relevance to the Nigerian and international community through teaching, research activities and scholarly publications.

In fact this has been the aim of the existing department through its numerous academic and technology staff spanning different research areas and interest. One thing however evident. There seems to be no coordinated effort at not only linking these research activities among individual researchers, but documenting research teams and unit/departments. The only effort at doing this was the establishment of an annual faculty conference and faculty journal which apart from having poor response

can only attend to completed research activities if only the team find it suitable to represent result of such research findings at these forum .

2.6 RESEARCH ACTIVITIES IN THE FACULTY OF SCIENCE.

There seems to be no avenue for the documentation of ongoing research activities, completed research , published or unpublished, information base on research areas of individual, so also an insight into who is involved in which research.

Hence the need for an information data base system to cater for these needs so as to serve the following functions among others:

i. Provide information on the personal data of academic/research staff faculty.

ii. Provide information on the research capabilities of individual researcher/group, the faculty, the departments/units and the student too.

iii. Control of wasteful duplicated research programmes among researchers units/departments.

iv. Facilitate cooperative research activities between departments/units within the faculty.

v. Assist management in independent decision taking on research activities in the faculty.

vi. Afford entrepreneurs and interested individual/researchers and supportive organization assess to the research activities of the faculty.

vii. Provide data base management system for the university library and the faculty staff as well as other university library and staff.

The importance of this information database as evident from its functions would be inevitable and multidimensional as it would afford the university administration an easy opportunity to provide information through searching of the

database on what and where research activities are going on, is been conducted or is been proposed in the faculty of Science so as to;

- Be able to project on the research needs of the faculty at a search through the database.
- Be able to access the progress and development of the faculty vis-à-vis its research activities and contribution to knowledge.
- Be able to ascertain the net utilization of research grants and facilities available in the faculty.
- Be able to identify which research areas the university could promote for industrial/cooperate sponsorship.

It would also afford the faculty to be able to:

- Know and access the research capability of individual researchers and publicize same for sponsorship.
- To promote and market its ability to carry out novel researchers.
- To control wasteful duplicated research programmes among researchers, units/departments.

It would also afford individual researchers to;

- Prove their proficiency and ability to carry out research if research grant is available.
- Establish their outstanding in their research area.
- Learn from other researchers in related areas information of use to their research areas.
- Encourage joint research effort.

It also afford students and individuals the opportunity to know:

- What's going on in the faculty.

- Who is into what specialty.
- The research area of lecturers.
- Who to contact for what information in which research area.
- Prevent time wasting on information searching in the library, i.e. easy access to specialist advice.
- Prevent them from venturing into wasteful duplicated research programmes.
- And afford industries, corporate organization and industrialist etc.
- Complete research programmes for industrial development.
- Research area for corporate or industrial sponsorship or collaboration/cooperation.
- Researchers working in their areas of need for consultation.

These and many more as would be discussed in the body of these project are just few of the advantages of a Science and Technology in formation infrastructure for research activities in the faculty of science vis-a-vis other faculties in the university will portend

CHAPTER THREE

3.0 SYSTEM ANALYSIS AND DESIGN

3.1 DEVELOPING SCIENCE AND TECHNOLOGY INFORMATION INFRASCRUCTURE.

Strategy: To develop STI for the faculty of Science of the Lagos State University using the Chemistry Department as a case study requires the cooperation of all members of staff involved in the use, generation and dissemination of science and technology information in the departments.

A detail structure of the faculty vis-a-vis the department need be understood and a comprehensive list and information on all people/staff involve in research activities collated. Also there is need for a manpower training or provision for the use and accessibility of the database to be created.

Having identified the potential users, generators and disseminators of the propose STI infrastructure, there would then be need to collate this generated information into a structured database management system for the purpose of creating a reliable and efficient information service point with the following properties.

i **Resource Availability**: Have the relevant resources. In other words, it must have the collection which are appropriate and relevant to the infrastructure. These collection should contain documents and other formats covering the range of divisions and subdivisions within the disciplines available in the Faculty/Department.

ii **Storage capability:** Ensure that adequate storage is provided for the collection.

iii **Accessibility:** Provide access to the collections through classification and or any other arrangements that will facilitate this process.

iv Develop Strategies for access to documents and other formats not available in its collection.

v **Retrieval:** Facilitate retrieval of the information available in the collection. This may be achieved through self help by research/information seeker or through assistance by an intermediary who may be librarian or other information expert.

vi Having trained staff (information experts) to organize the service in the widest possible sense.

vii **Evaluation:** Put in place strategies and process for evaluation of the services. Understanding of users behaviors and need is vital here.

While creating the STI service, its efficiency with regards to users and others systems in term of standard and standardization should be of paramount strategy. Standardization of every records especially authority names as established by this country, as well as the adoption of national and international standards for bibliographic records to facilitate exchange of records nationally and internationally.

There is also the need to identify other Science and Technology resources in Nigeria and also earnest the possibility of maintaining exchange links for material so generated. This will be tried to the need to provide adequate back up systems for the production of bind copies of the generated STI databases for users, generator and disseminators.

3.2 THE PROPOSED STI INFRASCRUCTURE SYSTEM.

Due to recent development in the management information systems most especially in the library and information document centres world wide and considering the large volume of data to be utilized and the size of information to be generated and

of easy access to its users, there seems to be no argument or why the system should be a computerized one.

The need and importance of the system if computerized had earlier been listed, however, there is the computerization one with a fairly sophisticated level of automation not only for managing the information need of the faculty/department but also considering the low level of computer literacy among the expected users and at the same time not only match that available in similar centres but capable of upgrading in future to meet recent trends in information processing using computer technology.

3.3 INPUT SPECIFICATION

The design of the input will take the following into consideration:

i The Researcher in focus.

ii Mode of data entry.

iii Preparation input data.

iv Editing modes.

The Researcher in focus: This involves the personal information on the researcher in Focus:

i Name

ii Year of employment

iii The year in focus

iv Areas of specialization/interest

v Post

vi Research activities during the year in focus

vii Situation of research activities

a. Stage: Completed (C), in progress (IP)

b. Finance: Sponsored(S), not sponsored (NS), collaborative (C)

c. Publication: Published (P), Not published (NP)

d. Journal if published among others to be identified with time

Mode of Entry:

Data entry is to be through terminal PC are expected to be used and storage medium to be floppy diskette 3.5 inches

Preparation of Input data:

Input data are to be prepared to meet up with a standard procedure acceptable to users i.e. scientist e.g. the use of IUPAC naming and acceptable abbreviation to maximum space.

Editing Modes:

Data Editing is to be performed before every processing using the visibility checking technique and accessory software such as DATA vet for error detection and subsequent correction.

3.4 OUTPUT SPECIFICATION

In the design of the output structure in this system. The user's expectation is of paramount concern. The users in this case however include the researchers, students, industrialist, industries, the University administrators, the library among others. Thus the output should be relational as much as possible and should also be interpretable with assistance. Hence output structure should be in the input design.

3.5 COST AND BENEFIT ANALYSIS

COST

OPERATING COST	
Hardware cost	₦70,000.00
Personnel package	₦ 20,000.00
System software	₦ 10,000.00
Installation cost	₦ 10,000.00
Implementation cost	₦ 10,000.00
DEVELOPMENT COST	
Stabilizer (1,500 volts)	₦ 10,000.00
UPS (500 volt)	₦ 25,000.00
Air conditioners	₦ 50,000.00
Operator (3) at ₦ 5,000 per month	
For 6 months	₦ 30,000.00
System Analysis and Design	
For 4 weeks at ₦ 5,000.00 per week	₦ 20,000.00
Maintenance	₦ 50,000.00
Total	**₦ 495,000.00**

Benefit

Most of the benefit may be of such nature that is difficult to attach a monetary figure to them are;

i. Better management information

ii More effective department

iii Elimination of high error rate in output

iv Easy retrieval and access to data

v Reduction in duplication and time wasting

vi Accommodation of rate of staff growth.

CHAPTER FOUR

4.0 PROGRAM DEVELOPMENT AND IMPLEMENTATION

4.1 INTRODUCTION:

This chapter deals with the development of the new software being explained in chapter three above. It will basically focus on implementation which involve language used for the development and the module operandii of the system in general.

4.2 CHOICE OF LANGUAGE:

The choice of software for this proposed Science and Technology Information Infrastructure would obviously be a data management software that can be used on IBM PC or compatible and or Apple Macintosh. There is also the need for the software to be one that has the capability of converting records created in it to the ASCII (American Standard Code for Information Interchange) format: a format most computer program can read and convert as necessary.

For the above reason the software that met this requirement and is in common use is DBASE IV language.

4.3 FEATURE OF LANGUAGE CHOSEN:

i The choice of DBASE IV language is influenced by the fact that it is a simple language that enables the user to manage the massive amounts of information.

ii The choice of Dbase iv language is not only because that is a language very much understood but one that offers all kinds of facilities to handle large amount of data.

iii Using Dbase IV, one can create a database file structure and store one information.

iv There are also many possibilities to rearrange and update information that is already stored in a database file.

v Data can be easily stored in a database file, and also I information retrieved to give answers to very complicated questions.

vi Not only one can produce all sort of printed reports on different aspects of data contain in the database file, one can also use the Dbase IV programming language to create once own menu. This will enable people having any knowledge of Dbase IV to work with the database files so created.

vii The program is also interpretative i.e. it reads each command and interprets, this allowing users to set up pieces or sections of a program directing from the keyboard.

4.4 REQUIREMENT:

Personal computer with the following features are required:

Hardware Requirements

i. IBM compatible

ii. Memory: 640 MB

iii. Disk drive: Two floppy disk drive

iv. Hard Disk: 100 MB

v. display: monochrome/colour graphic

vi. Printer: Laser Jet

vii. Stabilizer: 150 volt

viii. UPS: 500 volt

Software Requirements

i. Disk operating system: MS DOS 6.0 and above

ii. Data Base Management System package: Dbase (IV)

iii. Window 98 version.

4.5 STARTING THE PROGRAM

The new software can only be put to work only when Dbase (IV) environment is activated i.e. after your PC have been booted. The prompt sign C:/> will be visible on the screen.

This C:/ > shows that you are currently working on drive C and the sign > indicate that computer is ready for your command.

Since the Dbase IV package have been installed on the system with name Dbase under subdirectory Dbase IV, then type CD Dbase IV to get into this subdirectory i.e.

C:/> Dbase IV/>

To get into dBase IV environment then type dBase i.e.

C:/> dBase IV/dBase..

Now you are at the dot prompt of dBase environment.

To gain access into the new software use the command DO i.e. type SET DEFAULT TO A so as to change the default drive to A. Then type DO main in, you will then be taken to the main menu where you can make any option of your choice.

4.6 MAIN MENU

This is a program which contain all the programs that can be use in the software.

The following program exist within the menu design program.

Add Record Program: This is activated when you intend to enter new record into the file, the program is run, and data are supply which is automatically stored in the file.

Modify Record Program: This program is activated in order to modify any entry which already exist in the file.

Delete Record Program: If there is any need to delete certain record you can run this program by entering the key name of the record which will be displayed on the screen for deletion.

Report Program: This program prepare necessary report i.e. it will generate require report when activated.

View Program: In case you will need to just view any record.

Quit/Exist: This is to exist from the software. The moment you select Quit.

You will be taken out of the soft environment.

All the programs can be activated by entering the number that match them such as 0, 1, 2, 3, 4, 5.

Then you follow the instruction as you will be prompted by the program.

CHAPTER FIVE

5.1 RECOMMENDATION;

Considering the envisage volume of a database management system on Science and Technology information infrastructure for the faculty of Science, vis-a-vis other faculties in the university, one would recommend that the Database system should be done on diskettes on an annual basis and financed by the university under Research vote.

It is also recommended as a link up with the modern and ever improving information technology world. The university should look up to the possibility of computerizing some activities of the university library database system and same time see to the possibility of providing one PC reach in the faculties or at least a terminal linked to the university computer centre and library for information searching.

Lastly, as earlier envisaged, there might be a need for the university to prepare a university list of research activities annually.

5.2 CONCLUSION;

This designed database management system for research activities in the Chemistry Department of the faculty of Science in the Lagos State University has been done taking into consideration only ten fields not because these were just the field that could be used but of necessity at the design stage. It could also be discovered that with this kind of system in place, the time spent in attending to students need on once research activities, providing link up advises and searching the index and periodicals in the library to know about research activities of staff of the department faculty and the university would be reduced. So also will the opportunity of knowing who has done or who is doing what provided.

The designed DBMS will also be the university's publicity and promotional blitz to the outside world (entrepreneurs, government, supportive organizations and other universities) on its capabilities. As it clearly shows in an organized and structured firm not only research activities and capabilities but also strength and calibre of staff the university could boast of.

It is envisage that there would be the need for an orientation program for staff of the university users, disseminators and generators of this Science and Technology Information to be trained on simple Data processing Retrieval Searching techniques using the electronic media.

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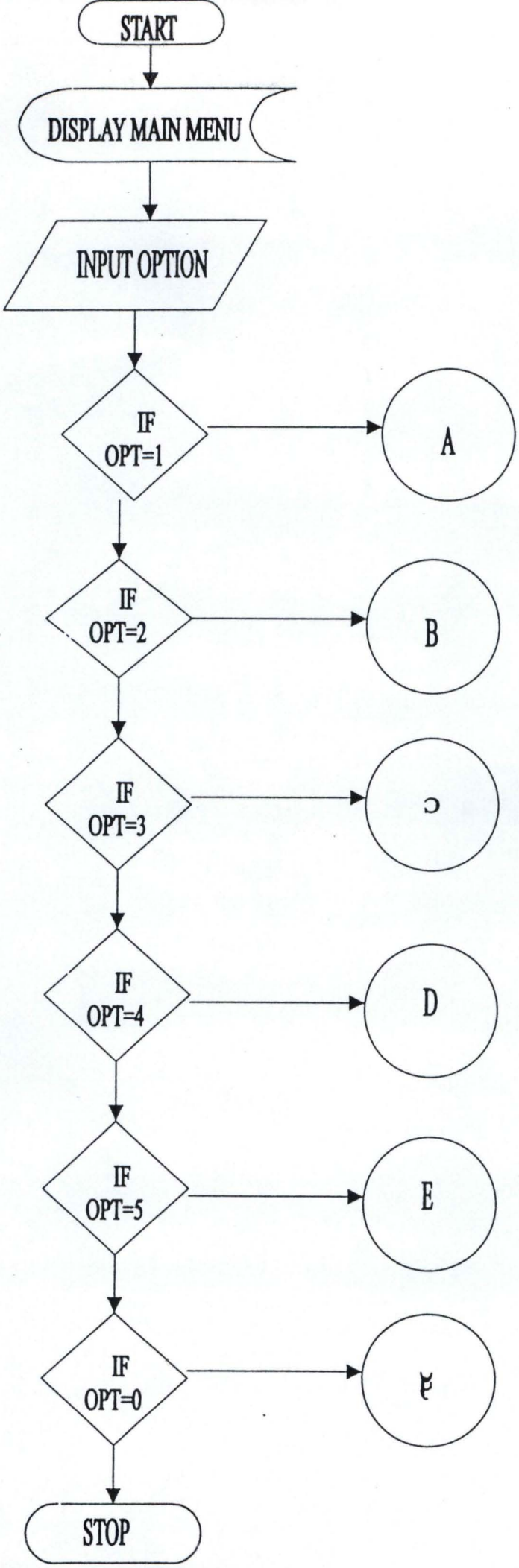
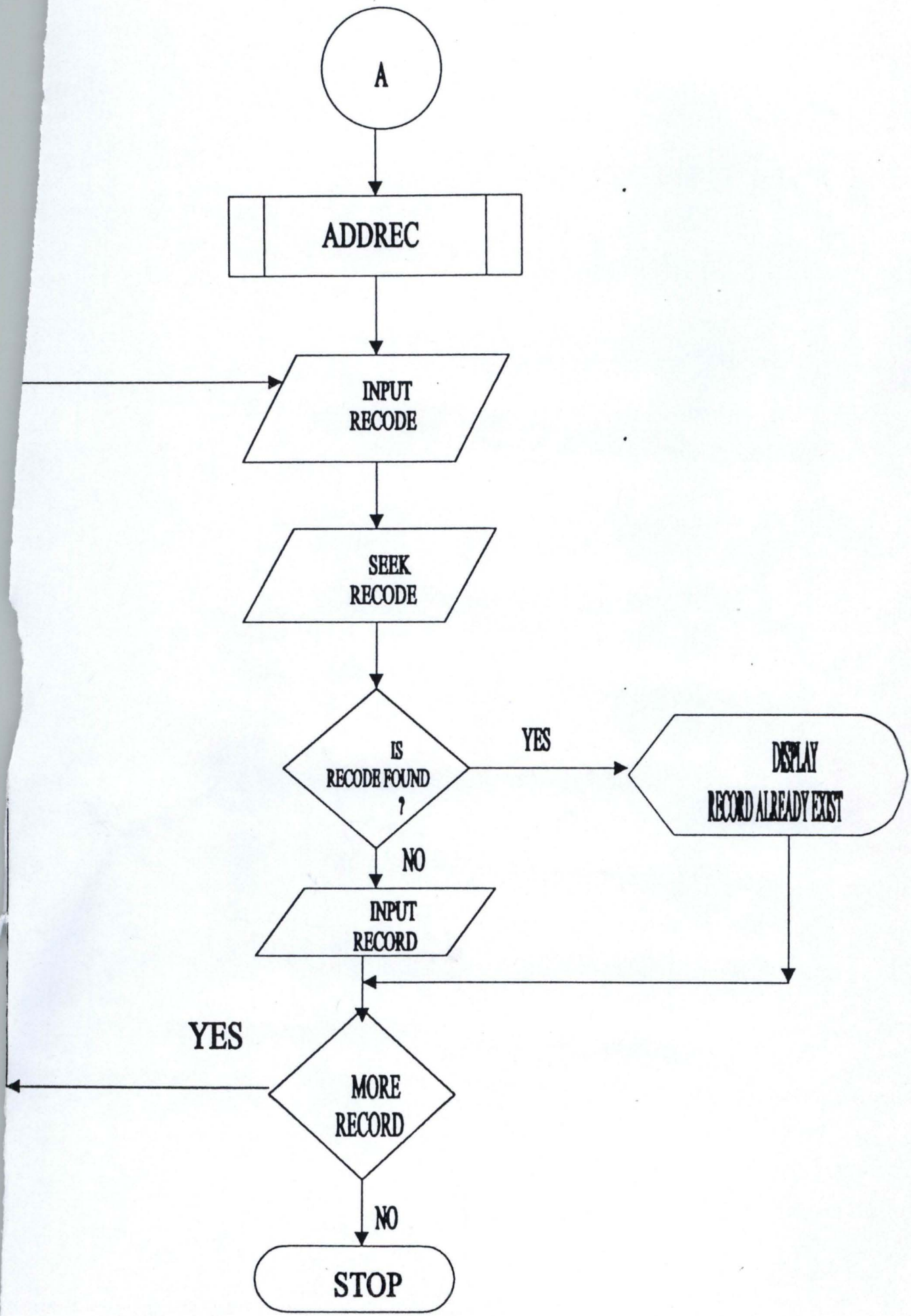
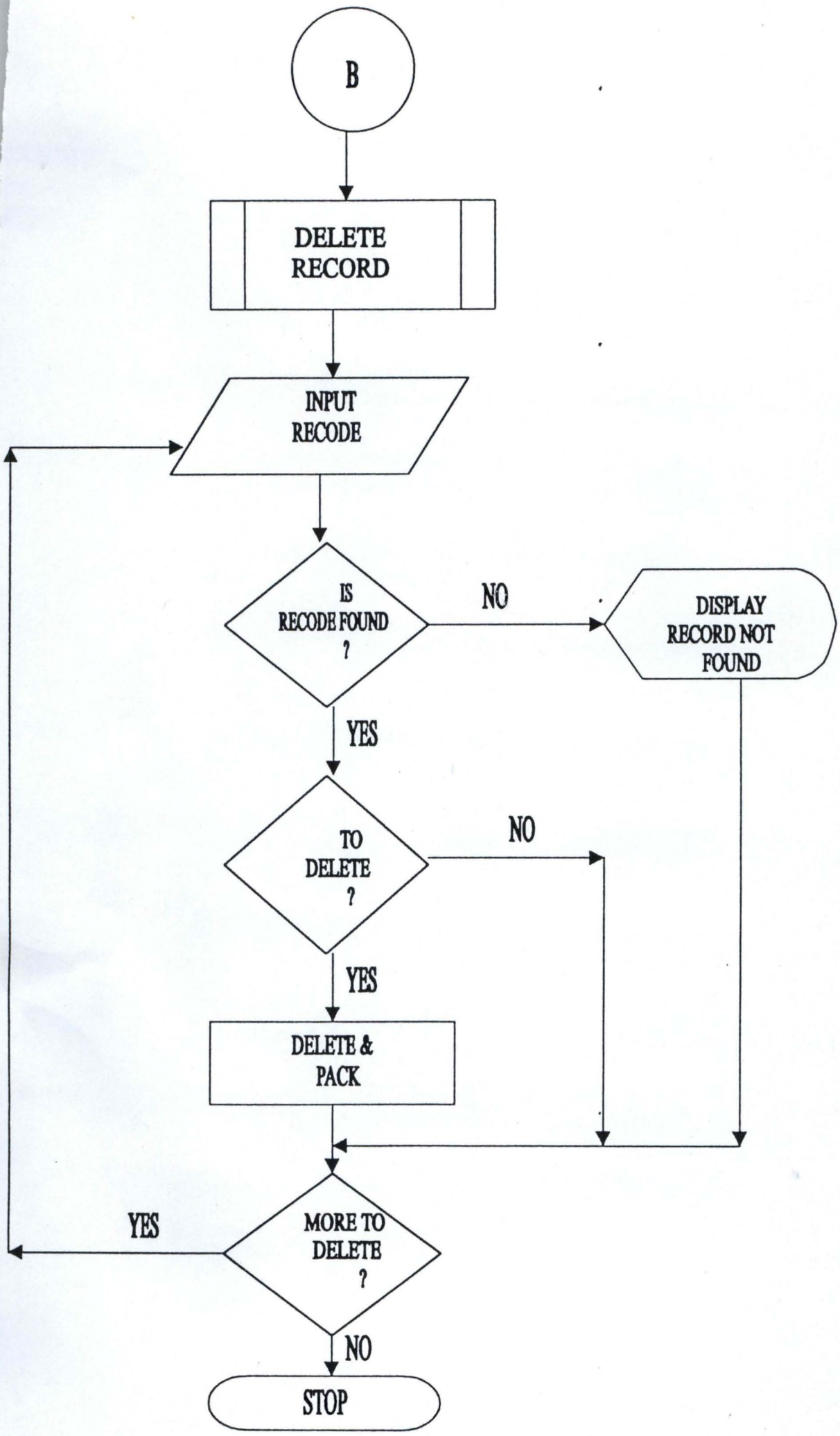
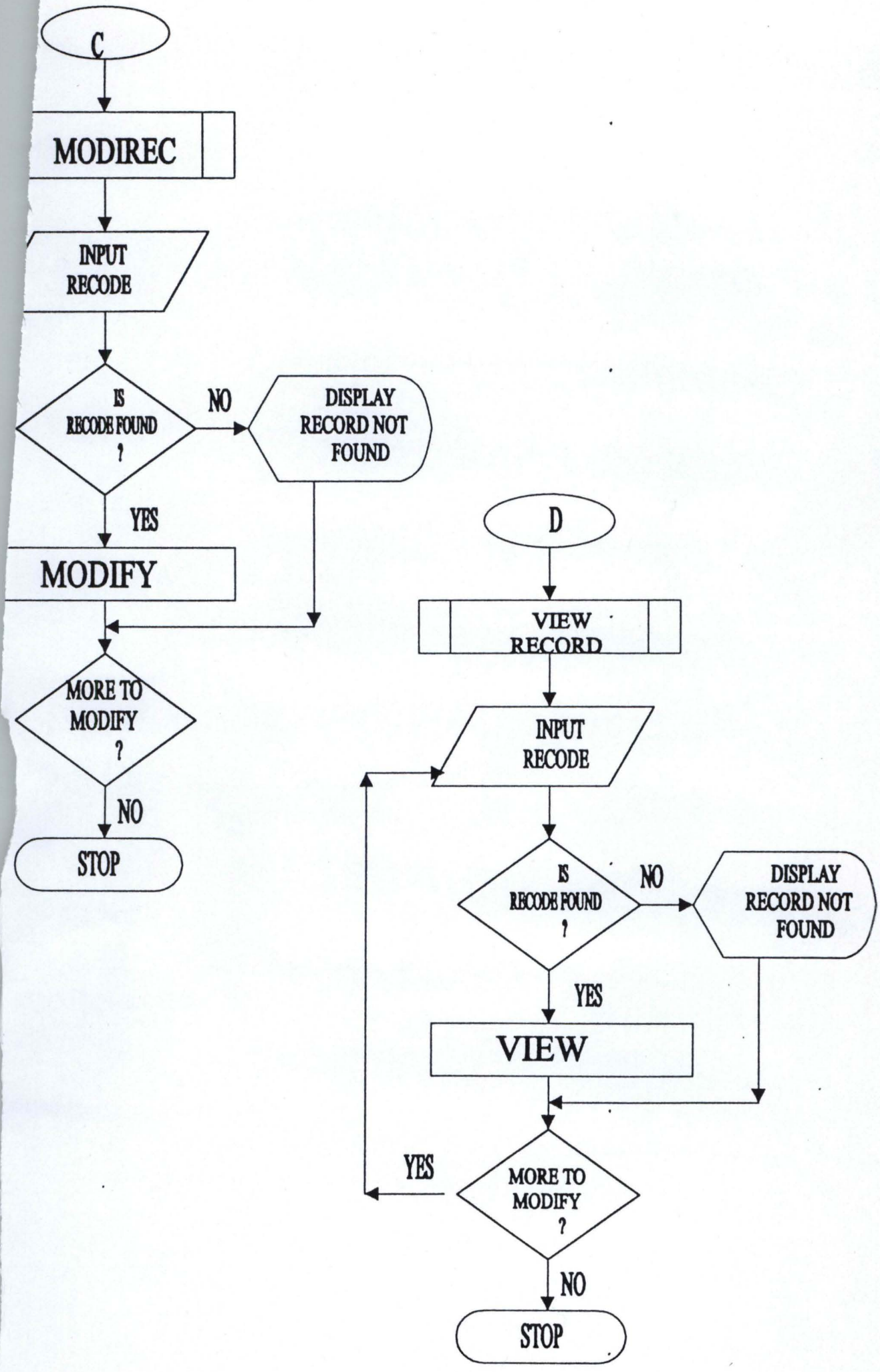
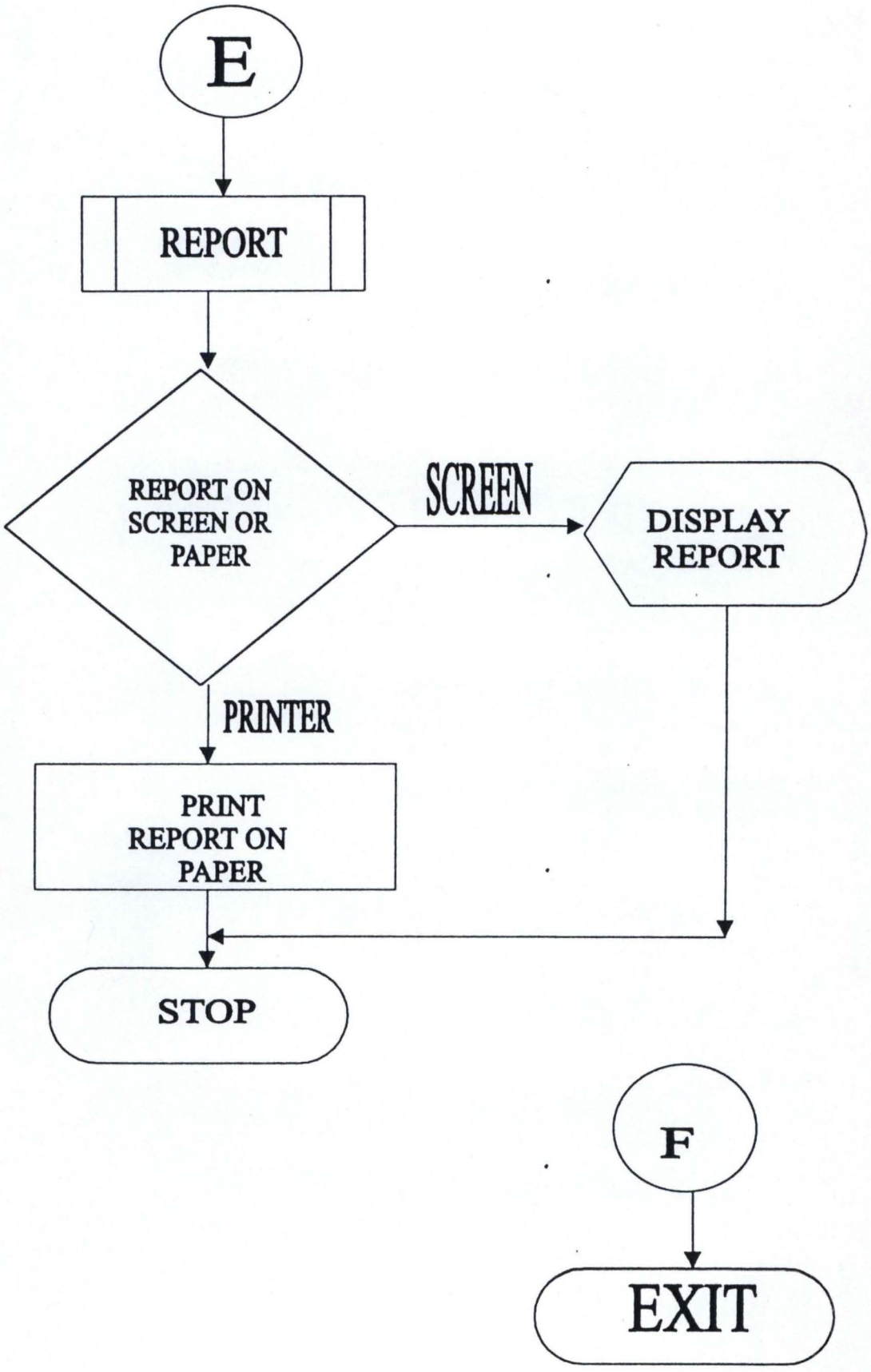
LOWCHART


START
DISPLAY MAIN MENU
INPUT OPTION
IF OPT=1
A
IF OPT=2
B
IF OPT=3
C
IF OPT=4
D
IF OPT=5
E
IF OPT=0
F
STOP


A
ADDREC
INPUT
RECODE
SEEK
RECODE
IS
RECODE FOUND
?
YES
DISPLAY
RECORD ALREADY EXIST
NO
INPUT
RECORD
YES
MORE
RECORD
NO
STOP


B
DELETE RECORD
INPUT RECODE
IS RECODE FOUND ?
NO
DISPLAY RECORD NOT FOUND
YES
TO DELETE ?
NO
YES
DELETE & PACK
MORE TO DELETE ?
YES
NO
STOP


C
MODIREC
INPUT RECODE
IS RECODE FOUND ?
NO
DISPLAY RECORD NOT FOUND
YES
MODIFY
MORE TO MODIFY ?
NO
STOP
D
VIEW RECORD
INPUT RECODE
IS RECODE FOUND ?
NO
DISPLAY RECORD NOT FOUND
YES
VIEW
YES
MORE TO MODIFY ?
NO
STOP


E
REPORT
REPORT ON SCREEN OR PAPER
SCREEN
DISPLAY REPORT
PRINTER
PRINT REPORT ON PAPER
STOP
F
EXIT

MAIN MENU

TASK CODE	TASK
1	ADD RECORD
2	MODIFY RECORD
3	DELETE RECORD
4	REPORT
5	VIEW
0	QUIT

ENTER TASK CODE:

LAGOS STATE UNIVERSITY
FACULTY OF SCIENCE
DELETE MODE

RESEARCH CODE: 1111

NAME: QAZEEM A. STATUS: SNR. LECT.

YEAR OF EMPLOYMENT: 1996

RESEARCH AREA: CLINICAL BIOCHEMISTRY

RESEARCH TOPIC: TYPHOID DRUGS ON SERUM

SPONSORSHIP: YES COMPLETION: YES PUBLISHED: YES

JOURNAL: BIOCHEM JOURNAL SUPPORTIVE LAB: L.A.S.U

DO YOU WISH TO DELETE THIS RECORD (Y/N):

LAGOS STATE UNIVERSITY
FACULTY OF SCIENCE
DATA ENTRY MODE FOR RESEARCH ACTIVITIES
RESEARCH CODE: 1111

NAME: QAZEEM A. STATUS: SNR. LECT.

YEAR OF EMPLOYMENT: 1996

RESEARCH AREA: CLINICAL BIOCHEMISTRY

RESEARCH TOPIC: TYPHOID DRUGS ON SERUM

SPONSORSHIP: YES COMPLETION: YES PUBLISHED: YES

JOURNAL: BIOCHEM JOURNAL SUPPORTIVE LAB: L.A.S.U

ANY MORE DATA (Y/N):

UNIVERSITY OF LAGOS
FACULTY OF SCIENCE
MODIFICATION MODE
RESEARCH CODE: 1111

NAME: QAZEEM A. STATUS: SNR. LECT.

YEAR OF EMPLOYMENT: 1996

RESEARCH AREA: CLINICAL BIOCHEMISTRY

RESEARCH TOPIC: TYPHOID DRUGS ON SERUM

SPONSORSHIP: YES COMPLETION: YES PUBLISHED: YES

JOURNAL: BIOCHEM JOURNAL SUPPORTIVE LAB: L.A.S.U

DO YOU WISH TO MODIFY MORE RECORD (Y/N):

PROGRAM CODE

```
SET TALK OFF
SET STATUS OFF
SET SCOR OFF
DO WHILE .T.
CLEA
@ 4,24 TO 22,54 DOUBLE
@ 5,35 SAY "MAIN MENU"
@ 6,35 TO 6,43 DOUBLE
@ 8,27 SAY "TASK CODE"
@ 8,42 SAY "TASK"
@ 9,27 TO 9,35
@ 9,42 TO 9,45
@ 10,31 SAY "1"+ SPACE(7)+ "ADD RECORD"
@ 12,31  SAY "2"+SPACE(7)+ "MODIFY RECORD"
@ 14,31 SAY "3" +SPACE(7)+ "DELETE RECORD"
@ 16,31 SAY "4" +SPACE(7)+ "REPORT"
@ 18,31 SAY "5" +SPACE(7)+ "VIEW"
@ 20,31 SAY "0" +SPACE(7)+ "QUIT"
CHOICE = 0
@ 23,29 SAY "ENTER TASK CODE:"
@ 23,48 GET CHOICE PICT "9" RANGE 0,5
READ
DO CASE
CASE CHOICE=1
DO ADDIN
CASE CHOICE=2
DO MODIIN
CASE CHOICE=3
DO DELIN
CASE CHOICE=4
```

```
DO REPIN2
CASE CHOICE=5
DO VIEWIN
CASE CHOICE=0
EXIT
ENDCASE
ENDDO
SET STAT ON
SET TALK ON
SET SCOR ON
RETURN

SET TALK OFF
SET STATUS OFF
SET SCOR OFF
USE INTECH
DO WHILE .T.
CLEAR
*************DATA ENTRY PROCEDURE**************
@ 2,4 TO 23,75  DOUBLE
@ 4,25 SAY "LAGOS STATE UNIVERSITY"
@ 5,27 SAY "FACULTY OF SCIENCE"
@ 6,20 SAY "DATA ENTRY MODE FOR RESEARCH ACTIVITIES"
MCODE=0
@ 7,20 SAY "RESEARCH CODE:"GET MCODE PICT "99999"
READ
LOCATE ALL FOR MCODE=RECODE
IF FOUND()
@ 15,20 SAY "RECORD ALREADY EXIT"
@ 24,20
WAIT
ELSE
```

```
APPEND BLANK
STORE SPACE(20) TO MNAME
STORE SPACE(12) TO MSTAT
STORE 0 TO MYEAR
STORE SPACE(40) TO MRESAR
STORE SPACE(50) TO MRESTOP
STORE SPACE(3) TO MSPONS
STORE SPACE(3) TO MCOMPL
STORE SPACE(3) TO MPUBL
STORE SPACE(30) TO MJOURN
STORE SPACE(10) TO MSUPLAB
@ 7,20 SAY "RESEARCH CODE:"
@ 7,35 SAY MCODE
@ 9,7 SAY "NAME:" GET MNAME PICT "@!"
@ 9,37 SAY "STATUS:" GET MSTAT  PICT "@!"
@ 11,20 SAY "YEAR OF EMPLOYMENT:" GET MYEAR  PICT
"9999999"
@ 13,7 SAY "RESEARCH AREA:" GET MRESAR PICT "@!"
@ 15,7 SAY "RESEARCH TOPIC:" GET MRESTOP PICT "@!"
@ 17,7 SAY " SPONSORSHIP:" GET MSPONS PICT "@!"
@ 17,25 SAY "COMPLETION:" GET MCOMPL PICT "@!"
@ 17,45 SAY "PUBLISHED:" GET MPUBL PICT "@!"
@ 19,7 SAY "JOURNAL:" GET MJOURN PICT "@!"
@ 19,47 SAY "SUPPORTIVE LAB:" GET MSUPLAB PICT "@!"
READ
APPEND BLANK
REPLACE RECODE WITH MCODE,NAME WITH MNAME,STATUS WITH
MSTAT,DATE WITH MYEAR
REPLACE RESAREA WITH MRESAR,RESTOPIC WITH MRESTOP,SPONS
WITH MSPONS
REPLACE COMPL WITH MCOMPL,PUBLIS WITH MPUBL, JOURN WITH
MJOURN
```

```
REPLACE SUPLAB WITH MSUPLAB
ENDIF
CH=SPACE(1)
@ 21,15 SAY "ANY MORE DATA (Y/N):" GET CH PICT "!"
READ
IF CH= "Y"
LOOP
ELSE
EXIT
ENDIF
ENDDO
CLOSE DATABASE
SET TALK ON
SET STATUS ON
SET SCOR ON
DO MAININ
RETURN
SET TALK OFF
SET SCOR OFF
SET STAT OFF
USE INTECH
DO WHILE .T.
GO TOP
CLEAR
************MODIFICATION PROCEDURE************
MCODE=0
@ 2,4 TO 23,75 DOUBLE
@ 4,25 SAY "UNIVERSITY OF LAGOS"
@ 5,22 SAY "FACULTY OF SCIENCE"
@ 6,24 SAY "MODIFICATION MODE"
@ 7,20 SAY "RESEARCH CODE:" GET MCODE PICT "99999"
READ
```

```
LOCATE ALL FOR RECODE=MCODE
IF FOUND()
STORE NAME TO MNAME
STORE STATUS TO MSTAT
STORE DATE TO MYEAR
STORE RESAREA TO MRESAR
STORE RESTOPIC TO MRESTOP
STORE SPONS TO MSPONS
STORE COMPL TO MCOMPL
STORE PUBLIS TO MPUBL
STORE JOURN TO MJOURN
STORE SUPLAB TO MSUPLAB
@ 7,20 SAY "RESEARCH CODE:" GET MCODE PICT "99999"
@ 9,7 SAY "NAME:" GET MNAME PICT "@!"
@ 9,40 SAY "STATUS:" GET MSTAT PICT "@!"
@ 11,20 SAY "YEAR OF EMPLOYMENT:" GET MYEAR PICT "99999"
@ 13,7 SAY "RESEARCH AREA:" GET MRESAR PICT "@!"
@ 15,7 SAY "RESEARCH TOPIC:" GET MRESTOP PICT "@!"
@ 17,7 SAY " SPONSORSHIP:" GET MSPONS PICT "@!"
@ 17,25 SAY "COMPLETION:" GET MCOMPL PICT "@!"
@ 17,45 SAY "PUBLISHED:" GET MPUBL PICT "@!"
@ 19,7 SAY "JOURNAL:" GET MJOURN PICT "@!"
@ 19,47 SAY "SUPPORTIVE LAB:" GET MSUPLAB PICT "@!"
READ
REPLACE RECODE WITH MCODE,NAME WITH MNAME,STATUS WITH
MSTAT,DATE WITH MYEAR
REPLACE RESAREA WITH MRESAR,RESTOPIC WITH MRESTOP,SPONS
WITH MSPONS
REPLACE COMPL WITH MCOMPL, PUBLIS WITH MPUBL,JOURN WITH
MJOURN
REPLACE SUPLAB WITH MSUPLAB
CH=SPACE(1)
```

```
@ 21,15 SAY "DO YOU WISH TO MODIFY MORE RECORD (Y/N):"
GET CH PICT "!"
READ
IF CH= "Y"
LOOP
ELSE
EXIT
ENDIF
CH2=SPACE(1)
@ 24,20 SAY "DO YOU WISH TO TRY AGAIN (Y/N):" GET CH2
PICT "!"
READ
IF CH="Y"
LOOP
ELSE
EXIT
ENDIF
ELSE
@ 21,15 SAY " SORRY RECORD NOT FOUND "
@ 24,20
WAIT
ENDIF
ENDDO
CLOSE DATABASE
SET TALK ON
SET STAT ON
SET SCOR ON
DO MAININ
RETURN
SET TALK OFF
SET SCOR OFF
SET STAT OFF
```

```
USE INTECH
DO WHILE .T.
GO TOP
CLEAR
**********DELETION PROCEDURE******************
MCODE=0
@ 2,4 TO 23,75 DOUBLE
@ 3,25 SAY "LAGOS STATE UNIVERSITY"
@ 4,27 SAY "FACULTY OF SCIENCE"
@ 5,30 SAY "DELETE  MODE"
@ 7,20 SAY "RESEARCH CODE:" GET MCODE
READ
LOCATE FOR RECODE=MCODE
IF .NOT. FOUND ()
@ 15,20 SAY "SORRY RECORD NOT FOUND"
@ 24,20
WAIT
ELSE
STORE RECODE TO MCODE
STORE NAME TO MNAME
STORE STATUS TO MSTAT
STORE DATE TO MYEAR
STORE RESAREA TO MRESAR
STORE RESTOPIC TO MRESTOP
STORE SPONS TO MSPONS
STORE PUBLIS TO MPUBL
STORE COMPL TO MCOMPL
STORE JOURN TO MJOURN
STORE SUPLAB TO MSUPLAB
@ 7,20 SAY "RESEARCH CODE:" GET MCODE
@ 9,7 SAY "NAME:" GET MNAME
@ 9,40 SAY "STATUS:" GET MSTAT
```

```
@ 11,20 SAY "YEAR OF EMPLOYMENT:" GET MYEAR
@ 13,7 SAY "RESEARCH AREA:" GET MRESAR
@ 15,7 SAY "RESEARCH TOPIC:" GET MRESTOP
@ 17,7 SAY " SPONSORSHIP:" GET MSPONS
@ 17,25 SAY "COMPLETION:" GET MCOMPL
@ 17,45 SAY "PUBLISHED:" GET MPUBL
@ 19,7 SAY "JOURNAL:" GET MJOURN
@ 19,47 SAY "SUPPORTIVE LAB:" GET MSUPLAB
CLEAR GETS
ENDIF
CH=SPACE(1)
@ 21,15 SAY "DO YOU WISH TO DELETE THIS RECORD (Y/N):"
GET CH PICT "!"
READ
IF CH= "Y"
DELETE
PACK
@ 22,20 SAY " ONE RECORD DELETED"
@ 24,20
ELSE
ENDIF
CH2=SPACE(1)
@ 24,20 SAY " MORE RECORD TO DELETE ?:" GET CH2 PICT "!"
READ
IF CH2 = "Y"
LOOP
ELSE
EXIT
ENDIF
ENDDO
CLOSE DATABASE
SET TALK ON
```

```
SET SCOR ON
SET STAT ON
DO MAININ
RETURN
SET TALK OFF
SET STATUS OFF
SET SCOR OFF
SET BELL ON
SET ESCA ON
CLEAR
***************REPORT PROCEDURE*********************
USE INTECH
BOLA=.T.
DO WHILE BOLA
@ 13,10 SAY "DO YOU WANT REPORT ON PAPER OR ON SCREEN
(P/S) ?"
CODE=SPACE(1)
@ 13,59 GET CODE PICT "@"
READ
IF CODE $ "PS"
BOLA=.F.
ELSE
LOOP
ENDIF
ENDDO
IF CODE ="P"
SET DEVICE TO PRINTER
SET PRINTER ON
ELSE
SET DEVICE TO SCREEN
SET PRINT OFF
ENDIF
```

```
@ 10,25 SAY DD
@ 11,25 SAY EE
@ 12,16 SAY FF
@ 13,16 SAY GG
@ 14,16 SAY HH
@ 15,16 SAY II
@ 16,20 SAY JJ
SKIP
ENDDO
WAIT
SET TALK ON
SET STAT ON
SET SCOR ON
SET BELL OFF
DO MAININ
RETURN
SET TALK OFF
SET SCOR OFF
SET STAT OFF
USE INTECH
DO WHILE .T.
GO TOP
CLEAR
**********VIEWING PROCEDURE******************
MCODE=0
@ 2,4 TO 23,75 DOUBLE
@ 3,25 SAY "LAGOS STATE UNIVERSITY"
@ 4,27 SAY "FACULTY OF SCIENCE"
@ 5,30 SAY "DELETE  MODE"
@ 7,20 SAY "RESEARCH CODE:" GET MCODE
READ
LOCATE FOR RECODE=MCODE
```

```
IF .NOT. FOUND ()
@ 15,20 SAY "SORRY RECORD NOT FOUND"
@ 24,20
WAIT
ELSE
STORE RECODE TO MCODE
STORE NAME TO MNAME
STORE STATUS TO MSTAT
STORE DATE TO MYEAR
STORE RESAREA TO MRESAR
STORE RESTOPIC TO MRESTOP
STORE SPONS TO MSPONS
STORE PUBLIS TO MPUBL
STORE COMPL TO MCOMPL
STORE JOURN TO MJOURN
STORE SUPLAB TO MSUPLAB
@ 7,20 SAY "RESEARCH CODE:" GET MCODE
@ 9,7 SAY "NAME:" GET MNAME
@ 9,40 SAY "STATUS:" GET MSTAT
@ 11,20 SAY "YEAR OF EMPLOYMENT:" GET MYEAR
@ 13,7 SAY "RESEARCH AREA:" GET MRESAR
@ 15,7 SAY "RESEARCH TOPIC:" GET MRESTOP
@ 17,7 SAY " SPONSORSHIP:" GET MSPONS
@ 17,25 SAY "COMPLETION:" GET MCOMPL
@ 17,45 SAY "PUBLISHED:" GET MPUBL
@ 19,7 SAY "JOURNAL:" GET MJOURN
@ 19,47 SAY "SUPPORTIVE LAB:" GET MSUPLAB
CLEAR GETS
ENDIF
CH2=SPACE(1)
@ 24,20 SAY " MORE RECORD TO VEIW ?:" GET CH2 PICT "!"
READ
```

```
CLEAR
@ 1,20 SAY "LAGOS STATE UNIVERSITY"
@ 3,22 SAY "FACULTY OF SCIENCE"
@ 5,20 SAY "LIST OF RESEARCH ACTIVITIES"
@ 2,20 SAY REPL("~",28)
@ 4,22 SAY REPL("~",20)
GO TOP
DO WHILE .NOT. EOF()
@ 7,4 SAY "NAME:"
@ 8,4 SAY "DATE OF EMPLOYMENT:"
@ 9,4 SAY "POSITION:"
@ 10,4 SAY "RESEARCH AREA:"
@ 11,4 SAY " RESEARCH TOPIC:"
@ 12,4 SAY "COMPLITION:"
@ 13,4 SAY " SPONSORSHIP:"
@ 14,4 SAY "PUBLISHED:"
@ 15,4 SAY "JOURNAL:"
@ 16,4 SAY "SUPPORTIVE LAB:"
STORE RECODE TO AA
STORE NAME TO BB
STORE DATE TO CC
STORE STATUS TO DD
STORE RESAREA TO EE
STORE RESTOPIC TO FF
STORE COMPL TO GG
STORE SPONS TO HH
STORE PUBLIS TO II
STORE JOURN TO JJ
STORE SUPLAB TO KK
@ 7,12 SAY AA
@ 8,25 SAY BB
@ 9,15 SAY CC
```

```
IF CH2 = "Y"
LOOP
ELSE
EXIT
ENDIF
ENDDO
CLOSE DATABASE
SET TALK ON
SET SCOR ON
SET STAT ON
DO MAININ
RETURN
```