

PAMANTASAN NG LUNGSOD NG MAYNILA

(University of the City of Manila)

Intramuros, Manila



College of Engineering and Technology

Computer Studies Department

System Analysis and Design

PLM-College of Medicine

Examination Generating and Automated Examination System

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APPROVAL SHEET

This **SYSTEM ANALYSIS AND DESIGN (SAD)** project entitled **Pamantasan ng Lungsod ng Maynila – College of Medicine (PLM-CM) Examination Generating and Automated Examination System**, prepared and submitted by **SystematiCS**, has been approved and accepted in partial fulfillment of the requirements for the degree of **Bachelor of Science in Computer Studies Major in Computer Science**.

Prof. Dan Michael A. Cortez
Adviser

PANEL OF EXAMINERS

Approved by the Committee on Oral Examination October 2015

Prof. Charito Molina, MIT

Panelist

Prof. Criselle Centeno

Panelist

Prof. Khatalyn Mata

Panelist



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RECOMMENDATION

The **SYSTEM ANALYSIS AND DESIGN (SAD)** project entitled **Pamantasan ng Lungsod ng Maynila – College of Medicine (PLM-CM) Examination Generating and Automated Examination System**, prepared and submitted by **SystematiCS**, of the requirement for the degree of Bachelor of Science in Computer Studies Major in Computer Science, has been examined and found satisfactory hereby recommended for Database Management System (DBMS).

Prof. Dan Michael A. Cortez

Adviser

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CHAPTER 1

INTRODUCTION

I. HISTORICAL BACKGROUND

COMPANY AS A WHOLE:

PAMANTASAN NG LUNGSOD NG MAYNILA

A Vision for Social Transformation

Pamantasan ng Lungsod ng Maynila's conception started during the administration of Mayor Arsenio H. Lacson, the first elective mayor of the City of Manila in 1951, when he approved Ordinance No. 4202 on 13 January 1960. The Municipal Board has allocated P1-Million to establish the University. The Board's committee that spearheaded and allocated funds for the creation of the city university, in support of Mayor Lacson's educational program, was chaired by then-Councilor Ernesto M. Maceda. Mayor Lacson suddenly passed away while in office and before the fulfillment of his dream university. His then-Vice-Mayor, Antonio Villegas, succeeded him and worked for the realization of the dream university of his predecessor. On 13 February 1963, Mayor Villegas issued Executive Order No. 7, s-1963, creating a Planning and Working Committee to draw up a plan to establish the city university. The committee was chaired by Dr. Benito F. Reyes and the members were Gabriel Formoso, Leoncio Monzon, Alfredo Morales, Vicente Albano Pacis, Jose S. Roldan, and Carlos Moran Sison, with Atty. Primitivo de Leon as its secretary.

Creation by National Legislation

In 1964, Mayor Villegas co-opted the aid of then-Congressman Justo R. Albert of the 4th congressional district of the City of Manila to sponsor a bill in the House of Representatives of the Congress of the Philippines seeking to create the city university. Filed as House Bill No. 8349 in the Lower House, the Senate version was spearheaded by Senators Gil Puyat and Camilo Osias. In his explanatory note for H.B. 8349, Congressman Albert stressed that "the establishment of this university by the City of Manila will spur other cities in the country to exert similar efforts so that the responsibility

of educating our people may be properly located." He articulated that according to a French philosopher, "next to food, education is the greatest need of the People." He likewise emphasized that "to permit the continuing control of education in the hands of big corporations is a tragic renunciation by the Government of a sacred obligation to our people. This bill envisions a partial relief of education from the grip of profit-motivated corporations and seeks a condition in which education is solely dedicated to the better instruction of our people."

The consolidation of the two bills was tackled during the Fourth Session of the Fifth Congress which began and was held in the City of Manila on 25 January 1965. The consolidated bill was thereafter passed by the joint Congress with the House of Representatives finally passing the same on 12 May 1965 while the Philippine Senate finally passed it on 07 June 1965. The final bill was signed by Senate President Ferdinand E. Marcos and House Speaker Cornelio T. Villareal with Mr. Regino S. Eustaquio, Secretary of the Senate, and Mr. Inocencio B. Pareja, Secretary of the House of Representatives.

Presidential Approval of the Congressional Act

On 19 June 1965, the final bill entitled "An Act Authorizing the City of Manila to Establish and Operate the University of the City of Manila and for Other Purposes" was signed into law by President Diosdado P. Macapacal in a signing ceremony in Malacañang Palace witnessed by Atty. Primitivo de Leon, Mayor Villegas, Congressman Ramon Mitra Jr., and its main sponsor in the House of Representatives, Congressman Albert. The law was captioned as Republic Act No. 4196 which now serves as the University Charter.

A Day of Double Significance

The birth of Pamantasan on a June 19 is made even more significant than ever by the fact that it was made to coincide with the birth of the Philippine national hero, Dr. Jose P. Rizal, who has a great aptitude for study, thereby earning several degrees and titles during his teen years with flying colors. Multi-talented as he was, Rizal's concept of the importance of education is clearly enunciated in his work entitled *Instruction*. For Rizal, the mission of education is to elevate the country to the highest seat of glory and to

develop the people's mentality. Since education is the foundation of society and a prerequisite for social progress, Rizal claimed that only through education could the country be saved from its sorry status. Rizal's philosophy of education, therefore, centers on the provision of proper motivation in order to bolster the great social forces that make education a success, to create in the youth an innate desire to cultivate his intelligence and give him life eternal.

The Seminal Direction

The University was so named "Pamantasan ng Lungsod ng Maynila" from the official English name by Mayor Villegas in 1967. The Board of Regents, which is the governing body of the University, was formally formed in the same year as Mayor Villegas appointed its members. The university regents were sworn into office on 09 January 1967 which eventually conducted its first official board meeting and the election of its officers on 23 February 1967 at the Maharnilad. The composition of the first Board of Regents were: Atty. Carlos Moran Sison, chairman; Dr. Benito F. Reyes, vice-chairman; Emilio Abello, Roman F. Lorenzo, Jose S. Roldan and Primo L. Tongko, members; while Fructuoso R. Yanson served as an ex-officio member and Jose F. Sugay as its secretary. Dr. Reyes was elected as PLM's pioneer president, endowed with a herculean task of charting the roots of excellence that was to be the Pamantasan that is known today.

On February 5, 1970, then Executive Secretary Ernesto M. Macea, by authority of then President Ferdinand Marcos, conveyed unto the City of Manila two (2) parcels of land owned by the Republic of the Philippines. Said real properties consist the area where PLM stands today. And as solemnly endeared and inscribed by every PLM member to his heart, the University formally opened the University College on Monday, 17 July 1967 with an initial enrollment of 556 outstanding and bright scholars carefully selected from the upper 10% of the various public high schools in Manila. Indeed, excellence has been a "birthright" of PLM. The PLM also established the Graduate College a year later, followed by the Institute for Extra-Mural Studies. And the rest was history in the making.

VISION (What we are)

The Pamantasan ng Lungsod ng Maynila (PLM), created by a National Charter (RA 4196, 1965), was envisioned to be Manila's premiere institution for higher learning. It provides superior standards of instructions, as well as opportunities for outstanding research in technology and other areas for the development of the intellect and to advance human knowledge.

The Pamantasan ng Lungsod ng Maynila has adopted the policy of preferential option for the poor and therefore has prioritized education for the underprivileged but talented students of Manila. Committed to the highest intellectual and ethical standards, PLM strives to produce competent graduates with integrity who will be responsible citizens who can contribute effectively to local, national and global initiatives for the progressive and sustainable development of humanity.

Guided by the values of academic excellence, integrity and social responsibility PLM endeavors to be one of the leading universities in the ASEAN.

DIVISION UNDER STUDY:***COLLEGE OF MEDICINE***

The Pamantasan ng Lungsod ng Maynila College of Medicine was established in June, 1983 with 48 medical scholars by virtue of Resolution No. 806, series 1980, passed on December 15, 1980 by the Board of Regents. It was envisioned from its conception that the College of Medicine will offer a unique, community-based medical education that will serve the health needs of the people of the city of Manila particularly those residing in depressed barangays as primary care physicians. At the start, the program was on a full scholarship basis for poor but deserving Manila residents who have finished a pre-medicine course and have met the necessary requirements.

Three years after its beginning, the College of Medicine opened its doors to qualified non-Manila residents under the socialized curriculum where their tuition fees were based on their parents' income. This marked the beginning of the classification of freshmen students having scholarships where the tuition and miscellaneous fees were either minimal or free. Eventually another category was included for those students paying the full amount.

On the fourth year of its operation, the College of Medicine opened the Community Medicine Residency Training program in line with its objective to provide medical care to the underserved of Manila. This enabled its students under the scholarship programs to render service.

After graduation, the medical graduates were assigned to Ospital ng Maynila Medical Center or other hospitals as intern (PGI). After they have passed the Medical Board Examinations and have obtained their license to practice, they were to serve the city for four years either as resident physicians at any other hospital owned and operated by the City of Manila, as faculty members at the College of Medicine or as a regular employee at the Manila Health Department (MHD).

In the following years, the community service program as a manner of giving back to the city of Manila underwent modification to suit the needs of the university and the other communities within the city of Manila including our very own university.

To further enhance the development of the students and faculty of the college with regards to training and research particularly in the field of Community Medicine, the College of Medicine became a member of the Association of Philippine Medical Colleges Foundation (APMC), International Network Community-Oriented Educational Institutions for Health Services (based in Holland), Metro Manila Health Science Community and Philippine Council for Health Research Development. It was also affiliated with the following institutions: the University of Indonesia, the Gadjah Mada University in Yogyakarta, Indonesia, the University of Nebraska at Omaha Medical Center in the USA, and the San Lazaro Hospital.

Through the years the Pamantasan ng Lungsod ng Maynila College of Medicine has gained recognition and respect as one of the premiere medical schools in the Philippines being consistently in the Professional Regulations Commission's (PRC) list of top 5 colleges in the Physician Licensure Examinations.

Because of the exemplary performance of its graduates, three years after it has produced its first batch it was given full accreditation as a medical school. The college has produced several board placers and physicians who have become noted in their respective medical specializations and service to the community. The graduates were given opportunities to give back to the College of Medicine and the city of Manila and the nation as faculty members, health service providers in the university, Manila health centers, government hospitals under the city of Manila, and the Manila Health Department and community health organizers and providers in the Count-Me-In Program.

Because of the College of Medicine's noble vision and because of the impressive performance of its graduates, it has been included in the list of schools granted scholarships for medical students namely the PCSO-DOH Pinoy MD Medical Scholarship Program and the "Bagong Doktor Para sa Bayan" from 2000-2010.

The aim of the College of Medicine has always been to produce medical graduates who strive for academic excellence and develop the passion for further training, research and community-service. With the efforts of its administration and faculty and the contributions of its graduates, the institution will continue its pursuit of being a center committed to excellence in providing quality medical education, training, research and service that is community-oriented.

The Vision & Mission of the College of Medicine

In line with the university's mission and vision, the PLM College of Medicine aims to be a professional school committed to excellence in community-oriented medical education, training, research and service; an excellent center for the education and training of medical professionals who are highly competent, globally competitive, ethical, caring and dedicated to serve the health needs of the city of Manila, the nation and the world.

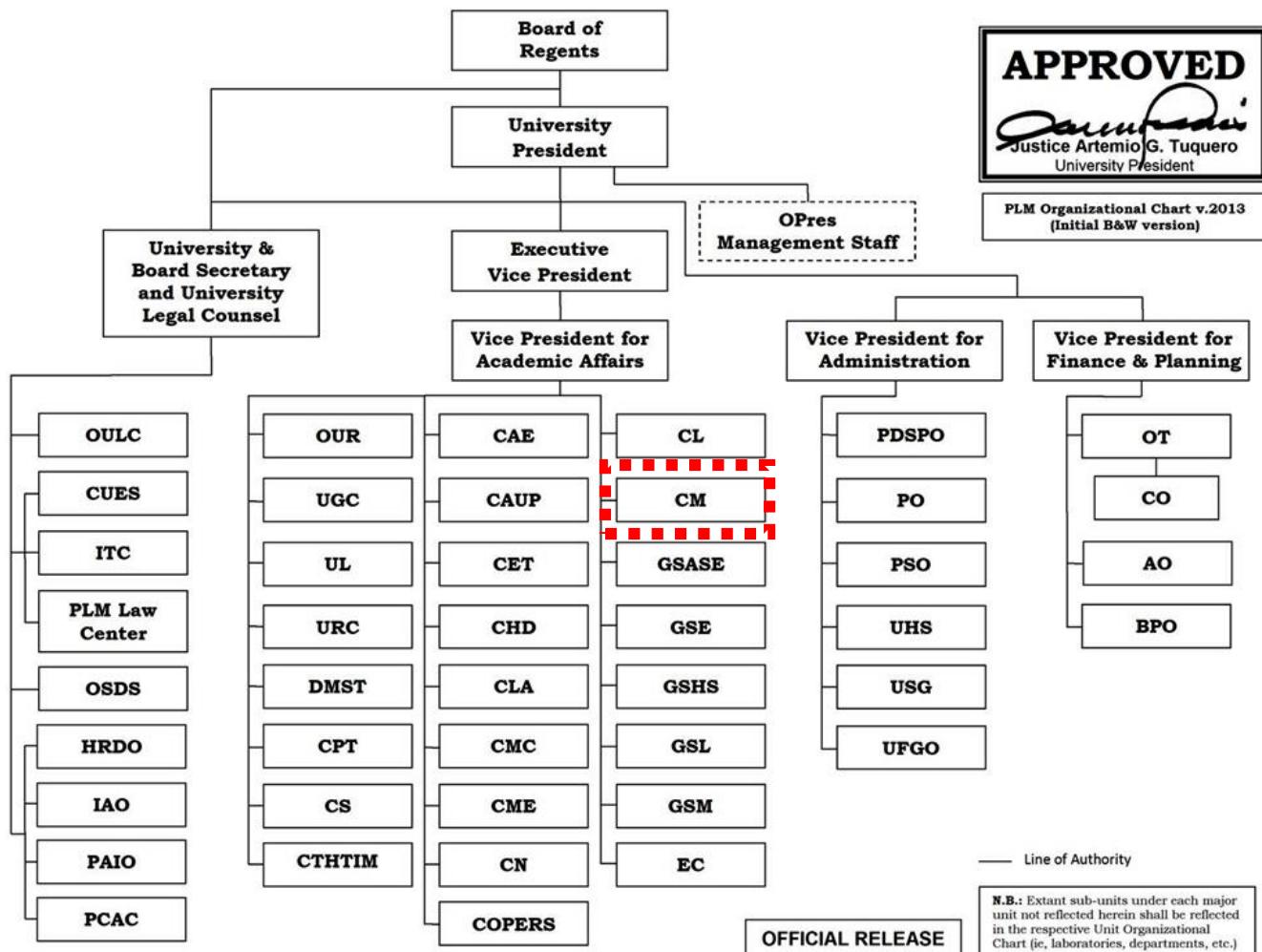
Guided by this mission, the PLM College of Medicine seeks:

- To produce excellent community-oriented medical practitioners who value human life and promote health and wellness.
- To nurture the ideals of nationalism and the values of social sensitivity and responsibility, holistic care with compassion and dedication to the medical profession.
- To create a culture of academic excellence and social responsibility among the administrators, faculty and staff.
- To provide quality and relevant researches.
- To strengthen local, national and international linkages that will contribute to quality medical education.

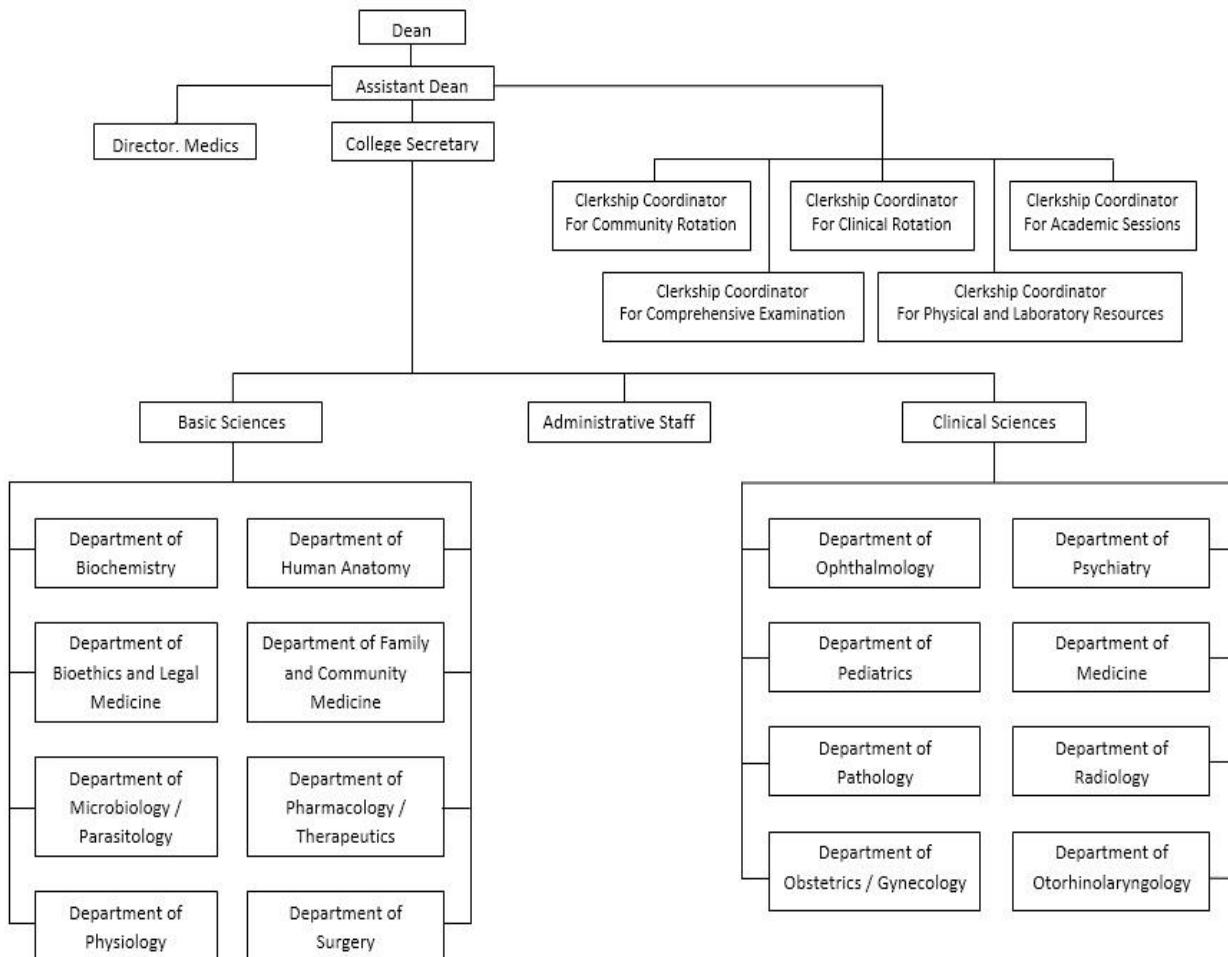
II. ORGANIZATIONAL CHART

COMPANY AS A WHOLE

PAMANTASAN NG LUNGSOD NG MAYNILA (PLM)



..... : Division under study

DIVISION UNDER STUDY**PLM - COLLEGE OF MEDICINE (PLM-CM)**

III. STATEMENT OF THE PROBLEMS

1. Time Consuming in Generating Official Questionnaire

Document(s) involved

- Blueprint Outline – guidelines in determining the type of questions whether they fall under remembering, understanding, application, analysis, evaluation or creation.
- Textbooks – official reference used on creating questions.
- Questionnaire draft - list of questions created by the faculty.
- Blueprint – constructed structure of the questionnaire draft.
- Official Questionnaire – questionnaire used for the examination.
- Item Analysis Report – result of the examination including the difficulty and discrimination of each questions.

Scenario

Every year, the College of Medicine conducts four (4) shifting exams in each department. Each department delegates three (3) to five (5) faculty members that will create a questionnaire draft. In every questions to be made, the faculty members shall start from the scratch. Questionnaire that consists of 100 to 200 questions is based on the blueprint outline given to the faculty members by the chairman. The faculty consider the comparison of each question with the previous shifting exam for verification of its existence. If the question is existing on the previous shifting exam, the faculty members have to determine its validity. If the question is valid, the question will be used, however, if it is invalid, question will be either rephrased/removed. After gathering all the questions the faculty members will determine which type the question falls into. The questionnaire draft shall be submitted to the chairman of their respective department, to evaluate and review the questions. The chairman cannot start evaluating the questions until all faculties submitted their drafts. After consolidating all questionnaire drafts from the faculty, the chairman shall determine the validity and reliability of each questions before it becomes official. If the official questionnaire finally created, it will be printed and distributed for examination proper.

Cause

- Each faculty starts from scratch every time they create a questionnaire draft.
- Each question needs to be checked if it is existing on the previous exam.
- Same process to be done between faculty and chairman.

Impact

- Time for other work was spent on generating the exams.

Quantification

Hours allotted for working	4 hours
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GENERATING QUESTIONNAIRE DRAFT

Gather possible questions and determining its type	1 min x 100 = 100 minutes or 1 hour and 40 minutes
Typing the gathered questions	2 min x 100 = 200 minutes or 3 hours and 20 minutes

Time spent on validating each questions = 254 minutes or 4 hours & 14 minutes

Time it takes to retrieve previous shifting exam	2 minutes
Time it takes to retrieve previous item analysis	2 minutes
Time it takes to search the preferred question	2 minutes
Time it takes to determine the validity of the preferred question	1 minute
Total time to retrieve the validity of the first question	2+2+2+1 = 7 minutes

Total time it takes to check the validity of 100 questions	$7+((2+1)*99) = 304$ minutes or 5 hours and 4 minutes
Total time it takes to check the validity of 100 questions but doesn't exist on the previous shifting exam	$(2+2+2)+(2*99) = 204$ minutes or 3 hours and 24 minutes
Average time of checking the validity of the existing and non-existing questions	$(304+204)/2 = 254$ minutes or 4 hours and 14 minutes

Finalizing the Questionnaire Draft = 50 minutes

Finalizing the questions and revisions	30 minutes
Satisfying the Objective of the Blueprint and revision of questions	20 minutes

Total time on Generating the Questionnaire Draft	$100 + 200 + 254 + 30 + 20 = 604$ minutes or 10 hours and 4 minutes
Days Spent on Generating the Questionnaire Draft	10 hours and 4 minutes/ 4 hours = 2.52 days (AVERAGE) 3 days
Days it take to generate official questionnaire	$604+(3*254)+30+20 = 1416$ minutes or 5.9 days (AVERAGE) 6 days

2. Inaccurate Report on the Item Analysis

Document(s) Involved

- Item analysis - result of the examination including the difficulty index, discrimination index, mean, standard deviation, reliability index and standard error.

Scenario

After the examination proper, the Chairman, Dean and MEDICS Director (Heads) shall evaluate the examination using the item analysis generated by the scantron machine. They shall review the results of the examination such as the scores, mean, standard deviation, reliability index and standard error for analyzing its efficiency. Moreover, they shall determine whether the examination satisfies the blueprint's objective or not. The heads usually don't rely on the results of the reliability index because they prefer to the results of the standard method which computed manually. However, manual computation of analysis consumes time. The acceptable index of the standard method for reliability index is .70 above. Meanwhile, the acceptable index for the existing system's reliability index range down from .60 above.

Cause

- Existing item analysis doesn't use the standard computations

Impact

- Poor evaluation of the examination

Quantification

Standard Result of the Acceptable Reliability Index	.7000 or above
Reliability Index of PHARMA 1 ST COMPRE SY 14-15	0.6025
Percentage Error of the Standard Method and the Existing System's Reliability Index	$\frac{(0.7000 - 0.6025)}{0.7000} \times 100\% = 13.93\%$

3. Incomplete Statistical Report

Document(s) Involved

- Item analysis - result of the examination including the difficulty index, discrimination index, mean, standard deviation, reliability index and standard error.

Scenario

After the examination, the scantron machine will generate the statistical analysis which includes the Discrimination index, Difficulty index and Examinee Ranking. The faculty shall submit the statistical analysis to the heads for documentation. The statistical analysis is for the benefit of the quality of the questions for the next examination. However, the system lacks the information necessary for assessing the further outcome of the future examinations and also for predicting the result of major examinations such as the passing rate of the students for board examinations.

Cause

- The system generates result which is lack in information that supposed to be a statistical report.

Impact

- Unable to track/monitor the progress of the students.
- Difficulty to assess the result of the future examinations.

4. The paper-based examination is fully exposed to the dangers of cheating

Document(s) Involved

- Official Questionnaire – questionnaire used for the examination.
- Scantron Sheet – specific paper used by the scantron machine.

Scenario

Administering a paper-based examination encourages the student to commit various forms of cheating due to lack of control. Considering that the questionnaires are identical, examinees tend to commit cheating like peeking on someone else's answer sheet, especially when the faculty suddenly attends to something else, at worst leaving the room for some extended errands.

Cause

- Using identical exam questionnaires increases the chances of cheating of examinees.

Impact

- Faculty experiences difficulty in handling examination proper.
- The progress of the student's proficiency tends to get stagnant.

5. Misprints or smudged words on the questionnaire leads to errors and disturbance on the examination proper**Document(s) Involved**

- Official Questionnaire – questionnaire use for the examination.

Scenario

The examination proper includes the generation and distribution of official questionnaires and scantron sheets to the students. Each student must have a copy of the questionnaire. Due to expensive printing services the college is dependent usually on photocopying services, because of this the reproduction stage naturally, and most likely, produces misprints or smudged copies. This smudged words or misprints are not likely seen nor checked by the faculty for necessary corrections. The distortions and misprints may lead to misinterpretation of the question and/or difficulty in understanding the question. Consequently, students tend to ask the faculty about the misprints and smudges for correction and verification to prevent mistakes.

Cause

- The production of questionnaires is dependent on photocopying services.
- The smudges and misprints on the copies are not checked by the faculty.
- Inquiring of students during examination

Impact

- Difficult to understand the smudged or misprinted questionnaires.
- Smudged words tend to lead to mistaken answers.
- Smudged words affect the student's score.
- Verification of a student related on the question adds more time

6. Wastage of paper after the examination

Document(s) Involved

- Official Questionnaire – questionnaire used for the examination.

Scenario

An average of 500 students enrolled in the College of Medicine, are taking the shifting examination prepared by the college every year. The questionnaire is generated to accommodate each student on the examination proper and each faculty, the chairman and the MEDICS director has the copy of the official questionnaire for further analysis and documentation. After every shifting exams, the questionnaires used by the students will be returned to the faculty. The questionnaires given to the faculty will be stored to the filing cabinet and will not be used again. The questionnaires given to the faculty, chairman and MEDICS director before the examination are the only copies needed for further evaluation and documentations.

Cause

- Copies of questionnaires from the faculty, chairman and MEDICS director are the only copies needed

Impact

- Papers that might be used for other important purposes are used.

Quantification

Average number of students	500 students
Average pages of questionnaires	3 pages
Average number of wasted papers	$500 \times 3 = 1500$ papers
Average number of wasted papers per year	$1500 \times 4 = 6000$

IV. SCOPE AND DELIMITATIONS

This study will be focusing on the Examination Generating and Automated Examination System of the Pamantasan ng Lungsod ng Maynila - College of Medicine (PLM-CM). It includes the generation of questions for an examination, recording of the scores of each student, and the retrieval of records of the students' history of examination. Furthermore, it also includes the generation of Statistical Analysis where we can see the Difficulty Index and Validity of each questions, and the Discrimination Index where we can see how many students were able to answer a certain question. The study aims to improve the quality of examination, in order to maintain academic excellence in the college. This study will not include the creating of questions for examination.

CHAPTER 2

SYSTEM ANALYSIS

I. SYSTEM NAME AND BACKGROUND

Examination Generating and Automated Examination System of College of Medicine

The existing system of the College of Medicine in Pamanatasan ng Lungsod ng Maynila as regards to the examination system, uses scantron machine which is responsible for checking the exams and generation of report regarding the examinee ranking and item analysis report. The college of medicine has requested an examination system that can comply with the specifications they desire.

In process of generating a questionnaire, faculties are asked to generate draft questionnaires to be used for the official questionnaires, as per the request of the chairman. The college of medicine conducts a total of four shifting exam annually. The faculties are tasked to create a questionnaire draft, each draft usually consists of 100-200 questions. Each questions must then be checked whether it existed at a previous existing exam. If it does, the faculty will have to check whether the question is valid.

Inaccurate system analysis report creates a possibility of mistake in evaluating the examinations. The scantron machine generates a report after the examination proper that will be evaluated by the heads. They review the results of the examination like the; scores, mean, standard deviation, reliability index and standard error for analyzing its efficiency. It determines whether the examination satisfies the blueprint's objective or not. The higher officials usually don't rely on the results of the item analysis because they prefer the results of the standard method which they will manually do.

Statistical reports are incomplete. After the examination, the scantron machine will generate the statistical analysis which includes the Discrimination index, Difficulty index and Examinee Ranking. The faculty will distribute the reports for documentation to the heads. The students will also receive theirs scores for them to determine whether they passed or failed. The statistical analysis is only for the benefit of the quality of the questions for the next examination.

In compliance to the request of the PLM-CM, the researchers are hereby proposing a system that will lessen the time consumption of generating a questionnaire for the examination. The system will follow the standard computation of reliability index as a basis for the item analysis so that any inaccuracy between the reports generated by the scantron machine and the college standard computation will be prevented and that the main basis will be the standard. Likewise, the researchers are planning to create a complete statistical report to generate more efficient data computed/consolidated which is helpful for the faculty, to analyse and monitor their student's ranking/performance.

II. SYSTEM ANALYSIS TOOLS

SYSTEM OUTLINE:

I. Official Questionnaire

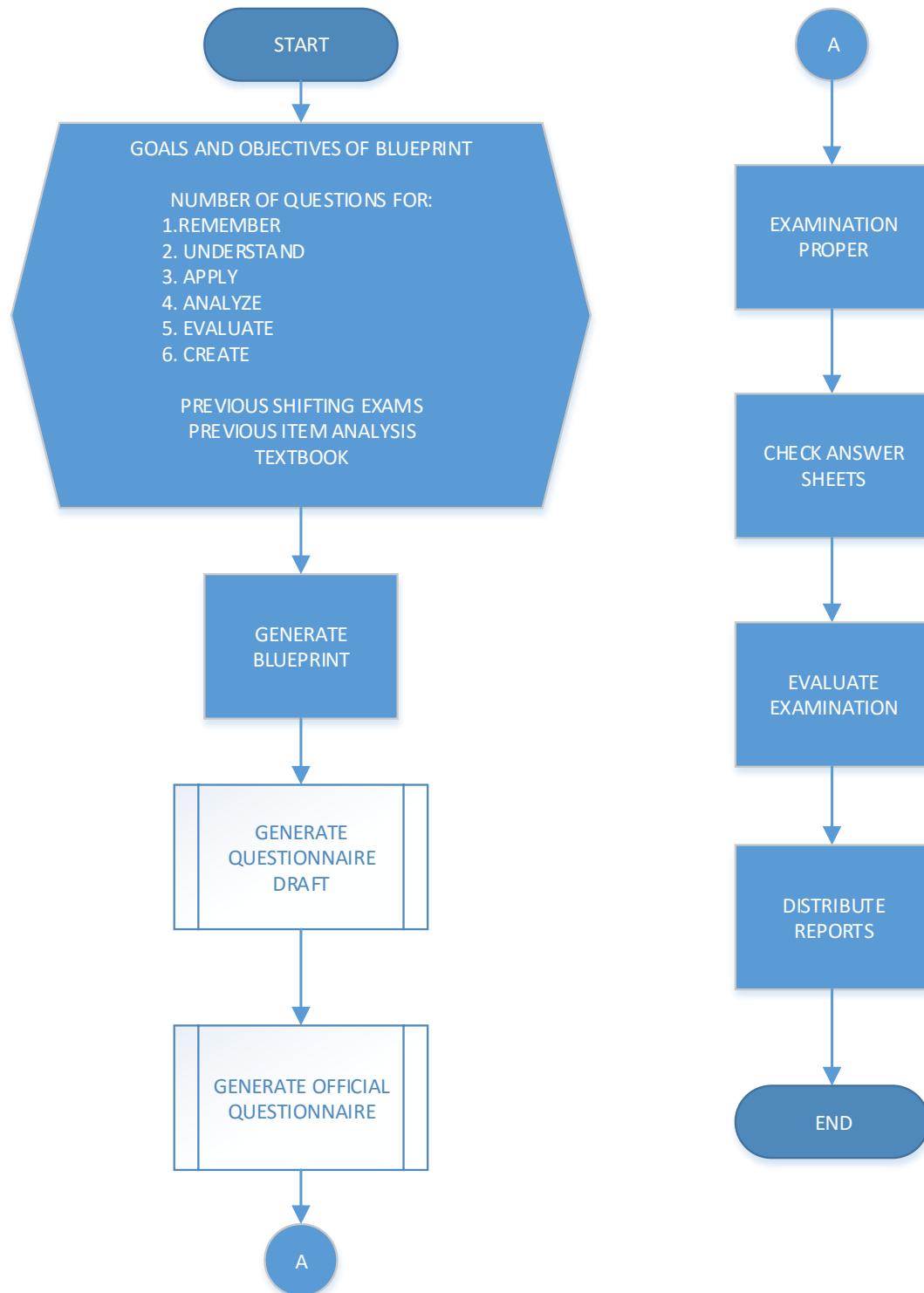
1. Faculty members will receive the blueprint from the chairman of their respective department.
2. Faculty members will then proceed to gather and create questions that will satisfy the blueprint.
3. The questionnaire drafts created by the faculty members will be submitted to the chairman of their respective department for evaluation.
4. After evaluating, the questionnaire will be given to the faculty members to be used for the examination proper.

II. Generating Reports

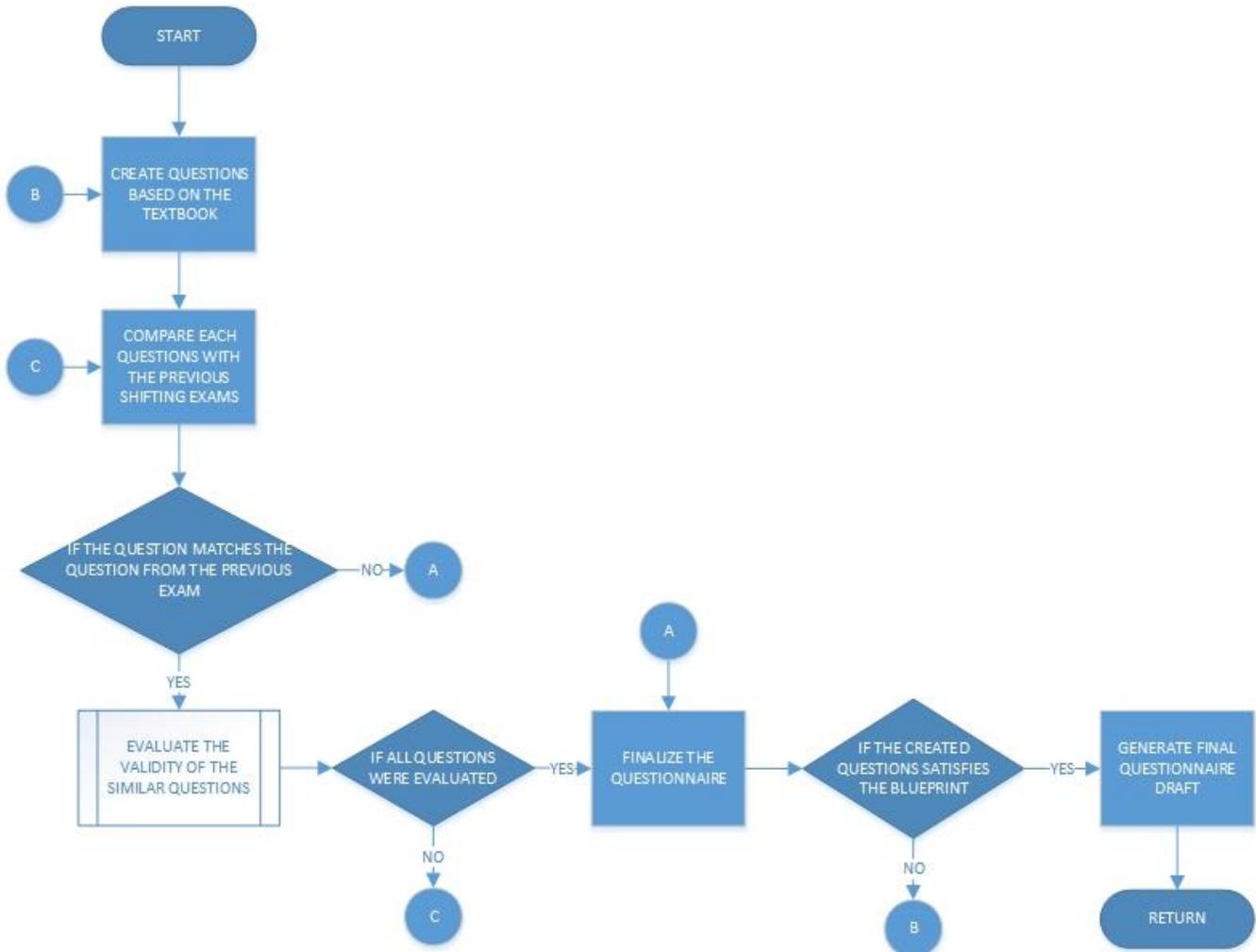
1. After examination, the scantron machine generates an item analysis report.
2. The scantron machine will generate a report of examinee ranking and item analysis.
3. Faculty members prefer to use the standard computation of item analysis than the item analysis generated by the system.
4. Faculty members and heads notice that there's an inaccuracy between the scantron machine and standard.

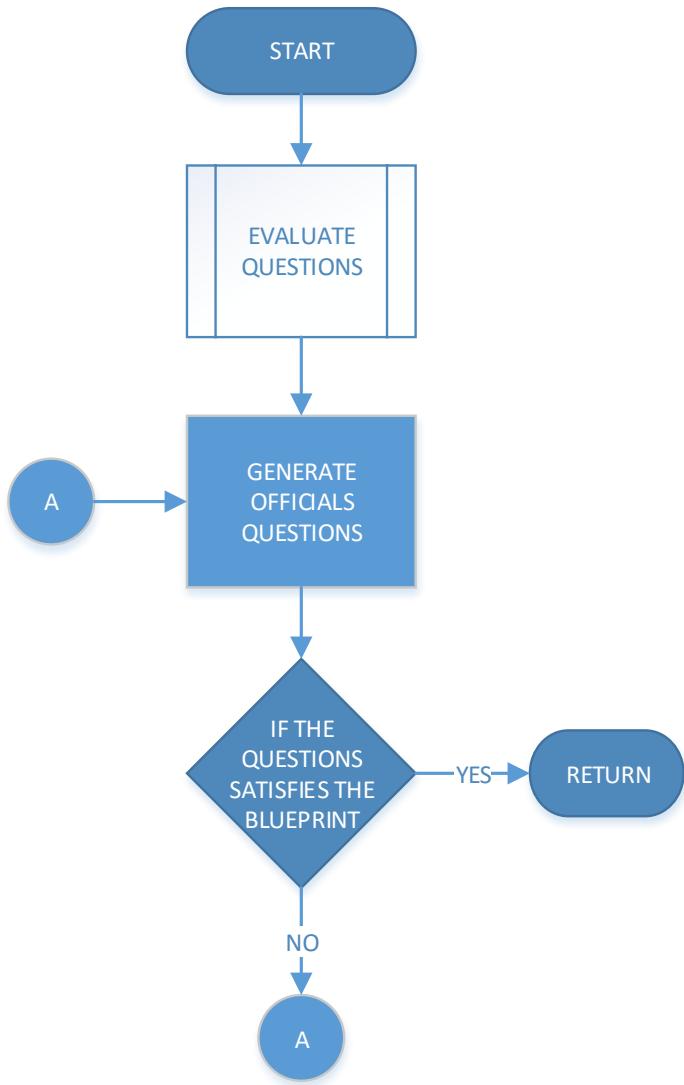
III. Completion of Statistical Report

1. The faculty members use the item analysis generated by the scantron machine as basis reference for future examinations.
2. Faculty members and heads figured that the report generated by the scantron machine lacks in information.
3. Faculty members and heads are having difficulty on predicting how many will do well, how many will pass, how many will fail, on the coming examinations.
4. The statistical report can be used to identify whether a student has a high chance of passing or not on the major examinations such as board exams.

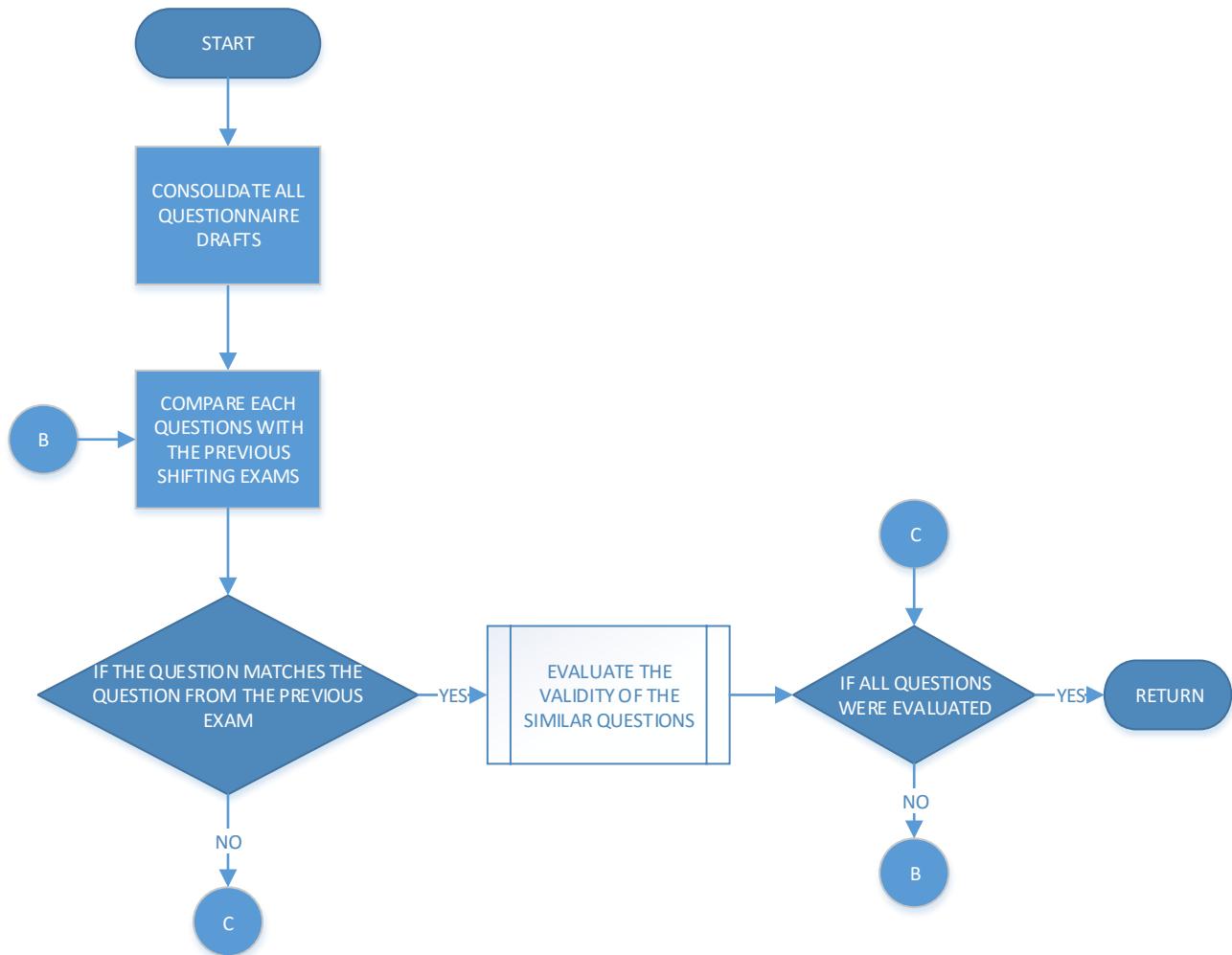
SYSTEM FLOWCHART:**MAIN FLOW**

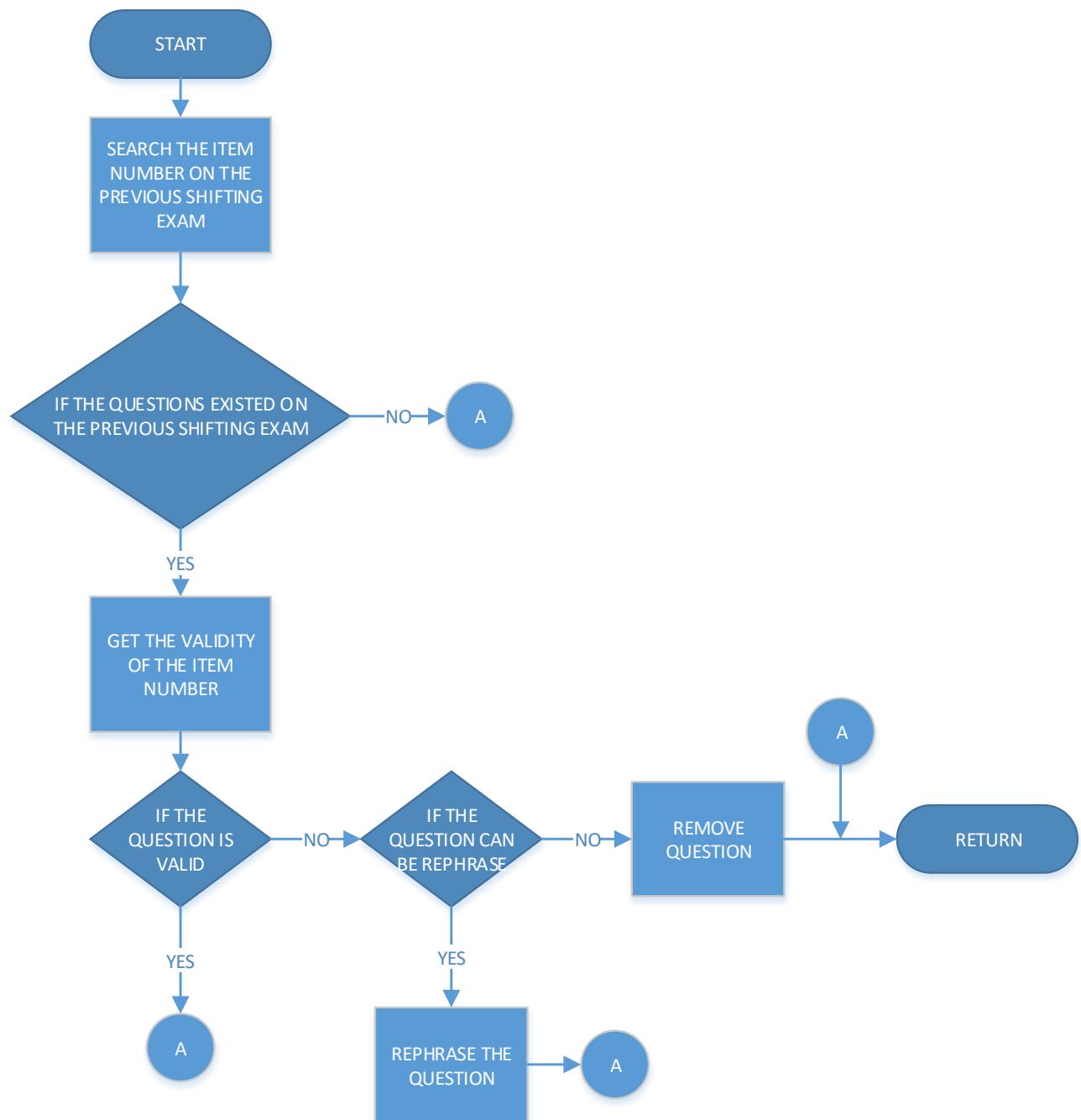
GENERATE QUESTIONNAIRE DRAFT



GENERATE OFFICIAL QUESTIONNAIRE

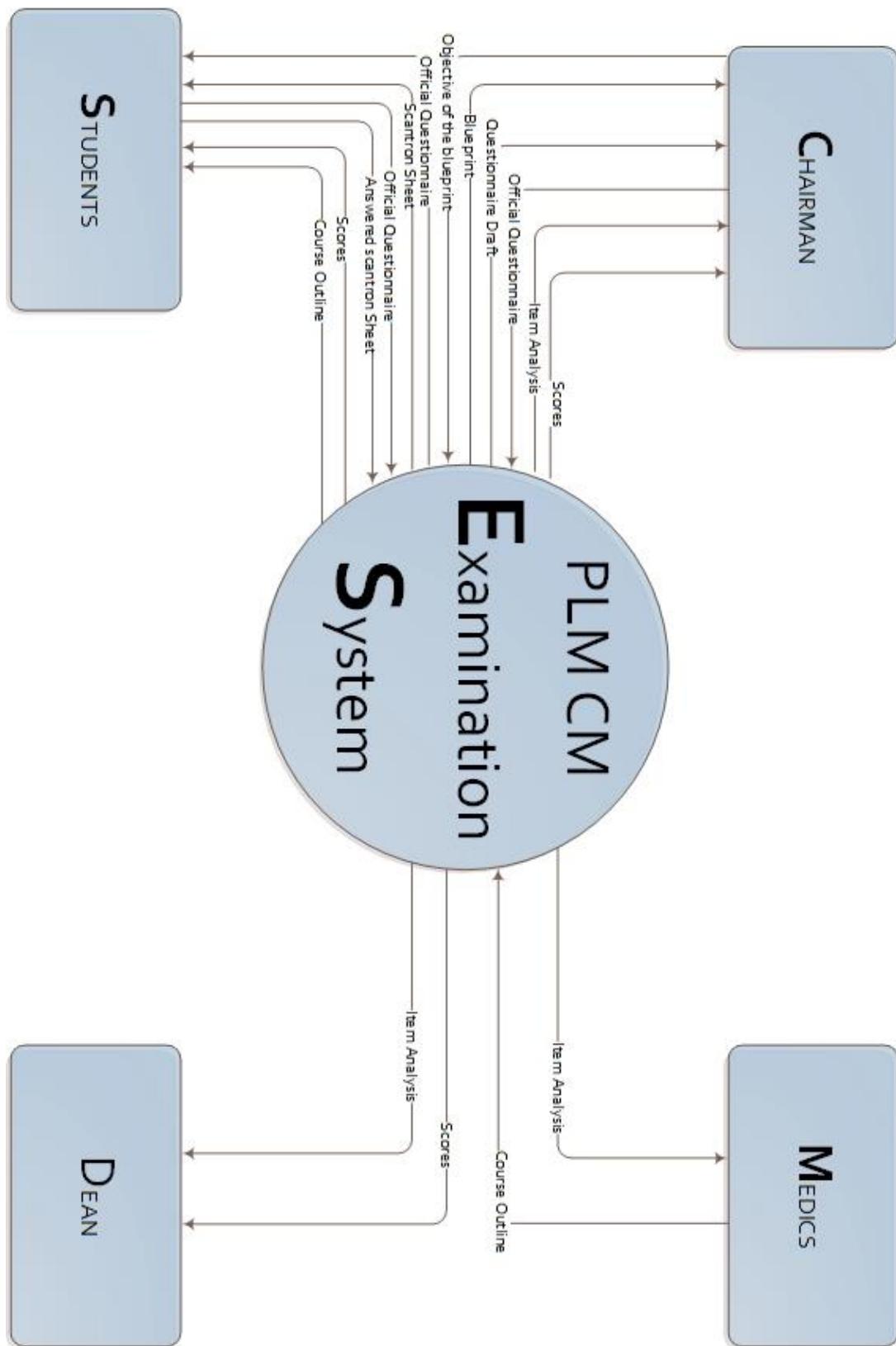
EVALUATE QUESTIONS



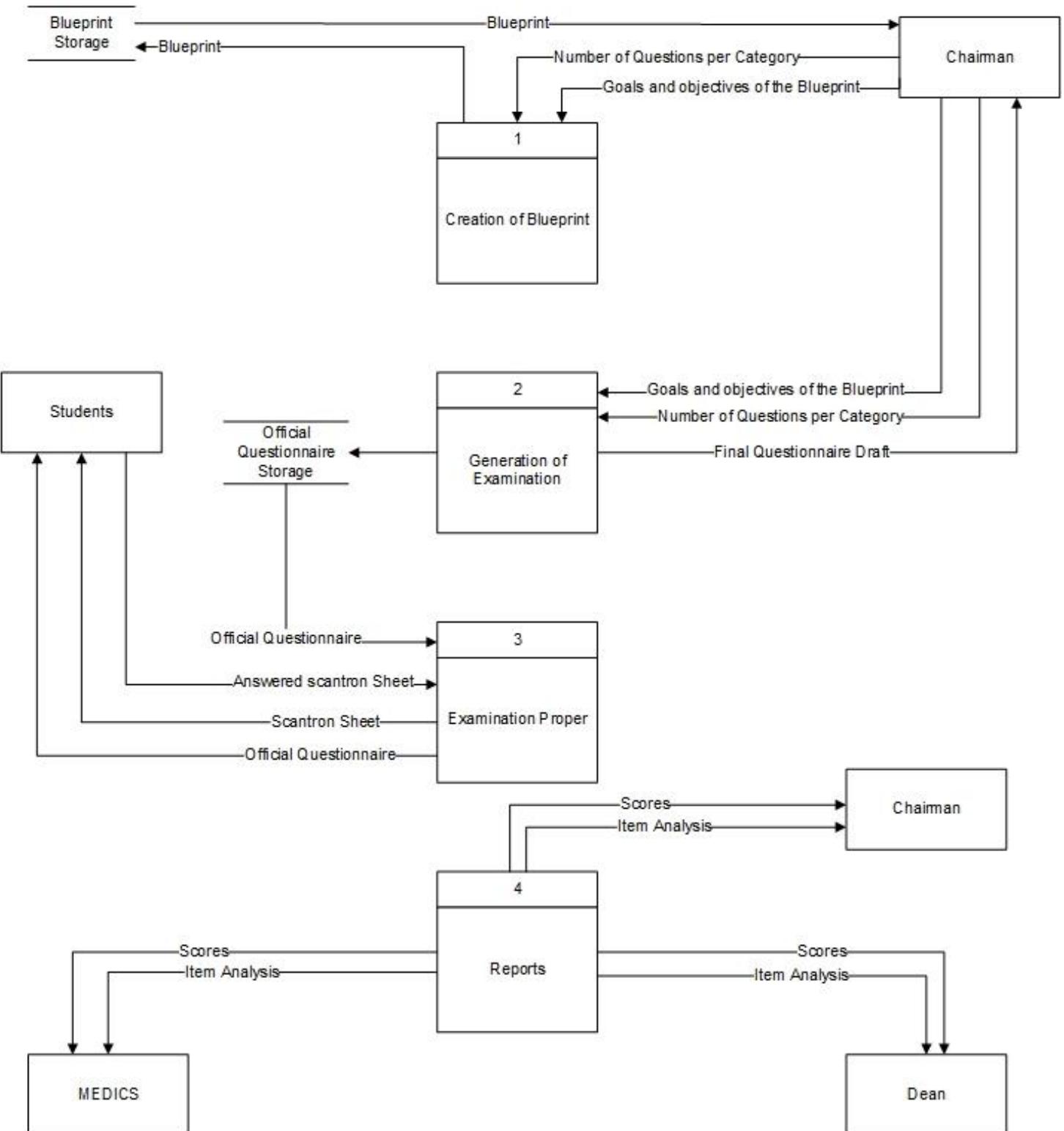
EVALUATE THE VALIDITY OF THE SAME QUESTIONS

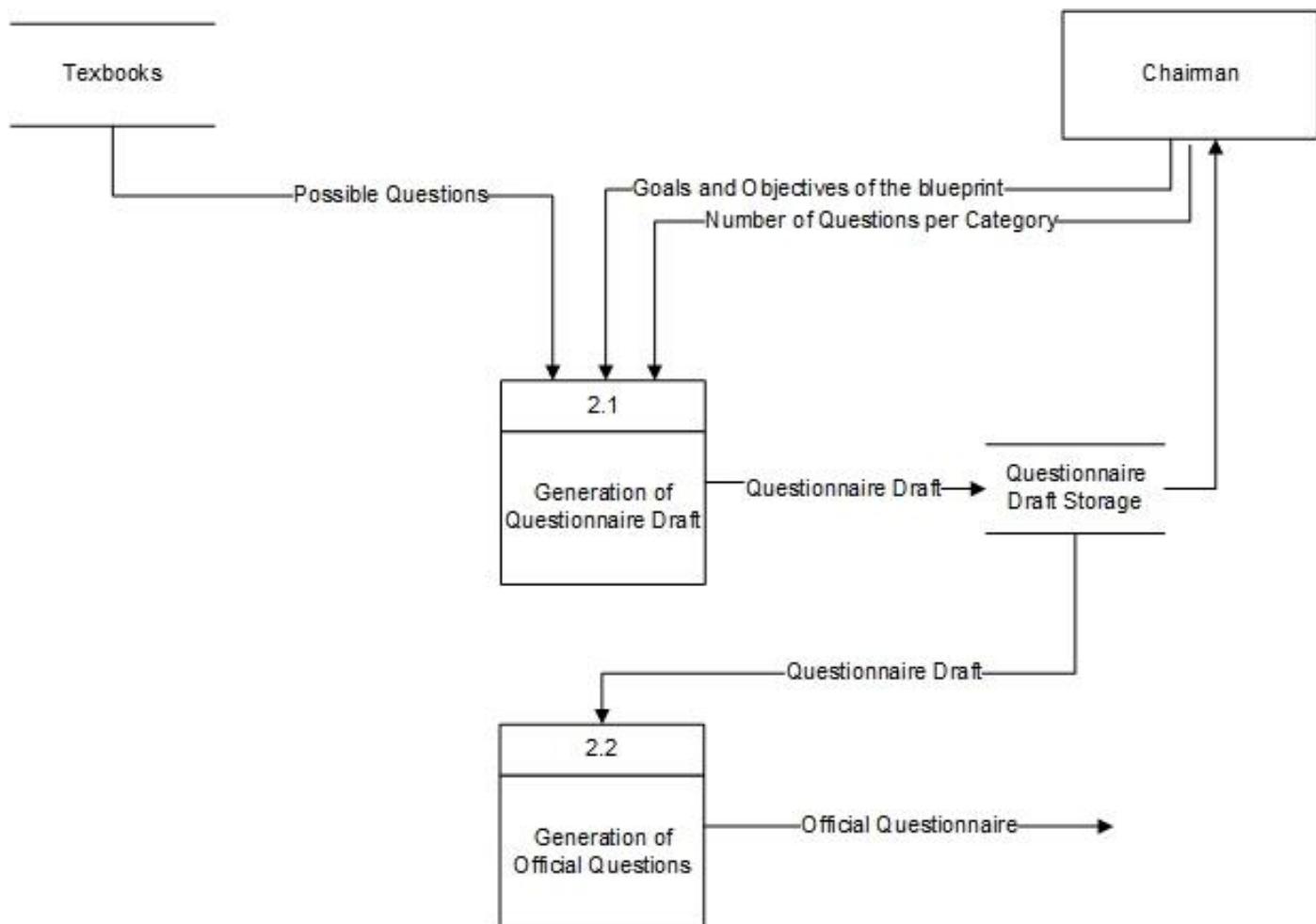
GRID CHART:

	Chairman	MEDICS	Dean	Students
Blueprint	1	16		
Questionnaire Draft	2			
Official Questionnaire	3	4		5
Answer Key	6	7		
Scantron Sheet				8
Scores	9	10	11	12
Item Analysis	13	14	15	

CONTEXT DIAGRAM:

DATA FLOW DIAGRAM: Level 0



DATA FLOW DIAGRAM: Level 1

DATA DICTIONARY:**SYLLABUS**

Field Name	Field type	Length	Description
Department	Alphabetic	50	College of Medicine Department
Course Title	Alphabetic	30	Subject Syllabus Title
Course Code	Alphanumeric	10	Subject Code
Course Rationale	Alphabetic	-	
Course Description	Alphabetic	-	Brief description of the subject
Credit	Alphanumeric	10	Number of units
Total number of hours	Alphanumeric	10	Total hours per subject
Pre-requisites	Alphanumeric	-	Subject cannot be taken after failing the subject
Terms	Alphanumeric	20	Semester and Year level
Faculty Members	Alphabetic	-	Faculty Names
Course Objectives	Alphabetic	-	Weekly objectives
Specific Objectives	Alphabetic	-	Daily Objectives

BLUEPRINT

Field Name	Field type	Length	Description
Remember	Alphabetic	30	Category #1 for Cognitive Processes dimension
Understand	Alphabetic	70	Category #2 for Cognitive Processes dimension
Apply	Alphabetic	30	Category #3 for Cognitive Processes dimension
Analyze	Alphabetic	50	Category #4 for Cognitive Processes dimension
Evaluate	Alphabetic	30	Category #5 for Cognitive Processes dimension
Create	Alphabetic	30	Category #6 for Cognitive Processes dimension

QUESTIONNAIRE DRAFT

Field Name	Field type	Length	Description
Department	Alphabetic	50	College of Medicine Department
Course Title	Alphabetic	30	Subject Title
Course Code	Alphanumeric	10	Subject Code
Exam	Alphanumeric	30	Type of Shifting or Comprehensive Examination
Deadline	Numeric	10	Date of the Last Submission of Draft
Question	Alphabetic	200	Questions that satisfies the Blueprint
Professor Name	Alphabetic	30	Professor's Name

Chairman Name	Alphabetic	30	Chairman's Name
Date submitted	Alphanumeric	10	Date of the Submitted draft

OFFICIAL QUESTIONNAIRE

Field Name	Field type	Length	Description
Department	Alphabetic	50	College of Medicine Department
Course Title	Alphabetic	30	Subject Title
Course Code	Alphanumeric	10	Subject Code
Exam	Alphabetic	30	Shifting or Comprehensive Examination
Batch	Alphanumeric	30	Course, Batch number, type of exam, school year
Module	Alphabetic	30	Course, Batch number, type of exam, school year
Student Name	Alphabetic	30	Student's Name
Course	Alphabetic	10	Course code
Year	Alphanumeric	3	Year level
Block	Numeric	1	Block Section
Date	Alphanumeric	10	Date of the examination proper
Score	Numeric	3	Number of Right Answer
Question	Alphanumeric	200	Questions that passed the evaluation of the chairman

EXAMINEE RANKING

Field Name	Field type	Length	Description
Department	Alphabetic	50	College of Medicine Department
Batch Title	Alphanumeric	30	Course, Batch number, type of exam, school year
Batch	Alphanumeric	30	Course, Batch number, type of exam, school year
Module	Alphanumeric	30	Course, Batch number, type of exam, school year
Rank	Numeric	2	Ranking of scores of the students from highest to lowest
Student Name	Alphabetic	30	Student's Name
Code	Numeric	10	Code of the Scantron Sheet
SN	Numeric	6	Serial number of the Scantron Sheet
Score	Numeric	3	Number of Right Answer
Grade	Numeric	3	Number of Right Answer
Date	Alphanumeric	30	Day, Date(Month, Day, Year)

ITEM ANALYSIS

Field Name	Field type	Length	Description
Department	Alphabetic	50	College of Medicine Department
Batch Title	Alphanumeric	30	Course, Batch number, type of exam, school year
Batch	Alphanumeric	30	Course, Batch number, type of exam, school year
Module	Alphanumeric	30	Course, Batch number, type of exam, school year
Item	Numeric	3	Question Number
Answer	Alphabetic	1	Answer key
Difficulty	Alphabetic	20	Difficulty Status
Difficulty index	Numeric	5	Difficulty Value
Discrimination	Alphabetic	20	Discrimination Status
Discrimination Index	Numeric	5	Discrimination Value
Mean (P)	Numeric	10	Mean Percentage Value
Standard Deviation (P)	Numeric	10	Standard Deviation Percentage Value
Mean	Numeric	10	Mean Value
Standard Deviation	Numeric	10	Standard Deviation Value
Reliability index	Numeric	10	Reliability index Value
Standard Error	Numeric	10	Standard Error Value
Date	Alphanumeric	20	Day, Date(Month, Day, Year)

USER REQUIREMENTS:**A. Selection of scope for examination**

The chairman and faculty will decide for the selection of scope for the examination. In this form the two of them have the access on the system.

B. Generation of exam form

The chairman has the only access on this part, he/she is the one who will decide on what are the questions will be included on the official questionnaire.

C. Item analysis

It determines the discrimination and difficulty index of a question item.

D. Statistical analysis

It creates the general information needed for the monitoring of college progress, competitiveness and medical student performance.

E. Question management

The user, is allowed to add, delete, rephrase or revise the questions. Depending on how the question index varies.

F. History Report

This report must have a bank of previous examinations

CHAPTER 3

GENERAL DESIGN

3.1 General Objectives

The objectives of this study are: (1) to implement a newly structured examination system of College of Medicine; (2) apply the principle and concepts to provide a solution to the existing problems on their generation of examination; (3) provide an automated examination system for the students of College of Medicine.

3.2 Specific Objectives

The specific objectives of the study based on the problems stated are:

1. To reduce time consumption in generating official questionnaire by providing a test bank which consist all the questions of exam.
2. To have an accurate report on their item analysis by following the standards of the general process of generating an item analysis.
3. To create a specific statistical report that will provide an information necessary for the enhancement of the competency of the students.
4. To prevent the chance of the students from cheating by creating different sets for the examination.
5. To avoid misprints and smudged words by automating the examination proper.
6. To promote paperless examination.

3.3 Presentation of Alternatives

3.3.1 Alternative 1: Stand Alone Set-up

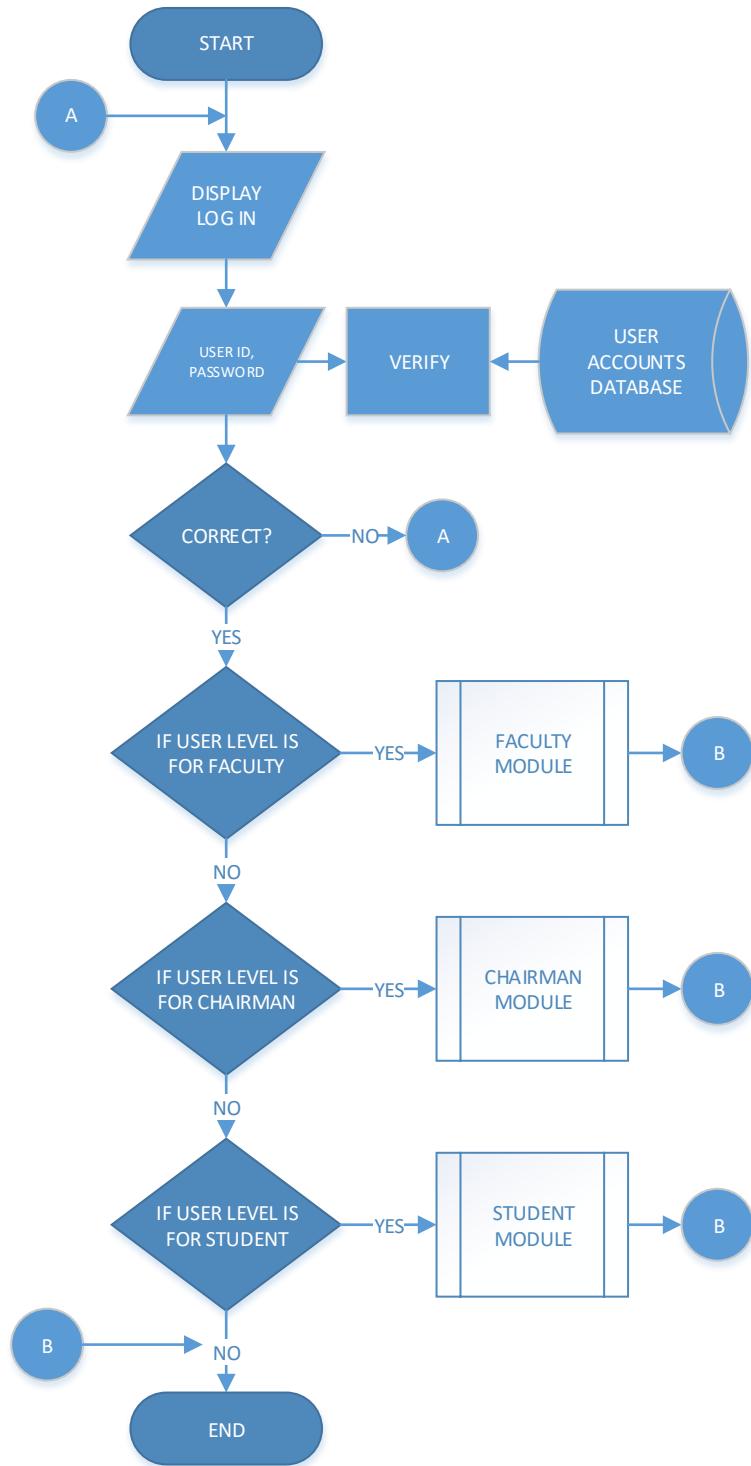
Stand alone is a kind of set-up wherein all terminals are independent from each other and the terminals itself holds all the data. The accessing level and capabilities of a user will be determined by its account level. This proposed set-up will request that each department will have their own terminal to achieve the most efficient time to access, view and edit the data from the system but still the system has the capability to run through one terminal if the college wanted to have it installed to a specific terminal only. The proposed alternative will have the following advantages:

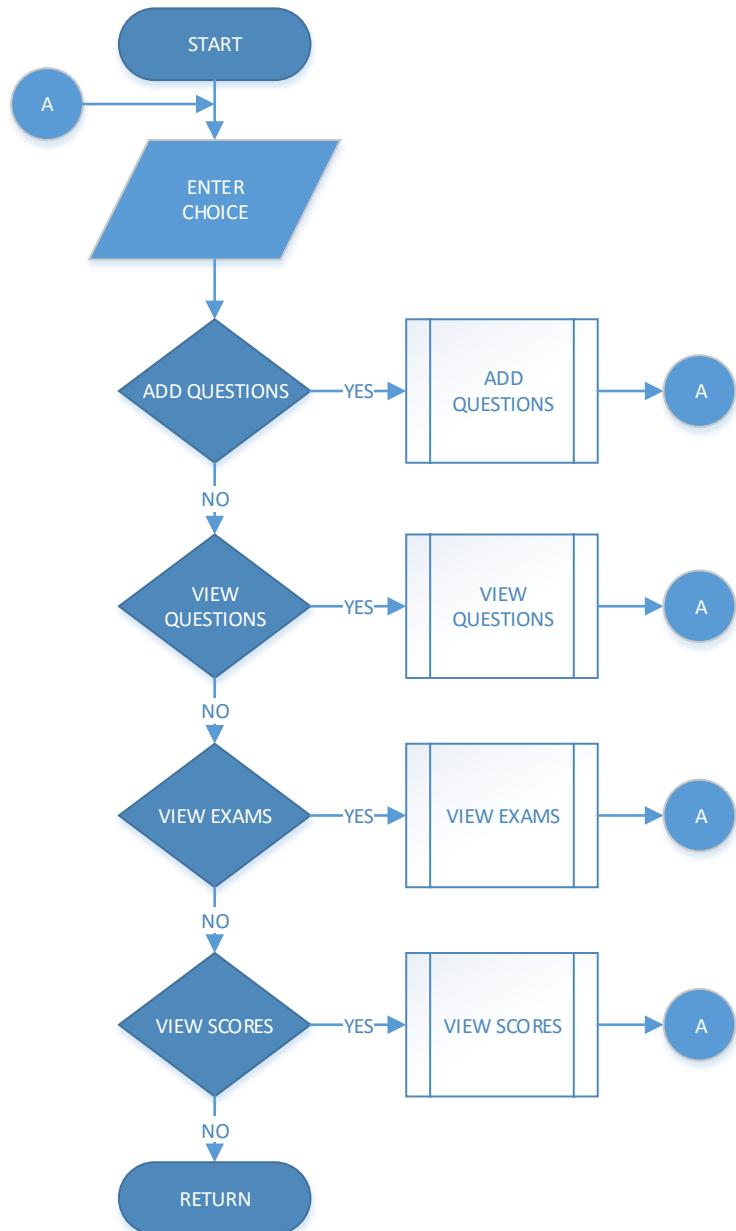
- **Easy access of data needed:** Data collected will be held by each database, thus, retrieving of one data will be independent from others.
- **Less expensive:** stand-alone system will be less expensive when compare to the type of set-up Local Area Network (LAN) or Wide Area Network (WAN).
- **Data security:** Data held by each terminal through their databases will not be accessed by other terminal.

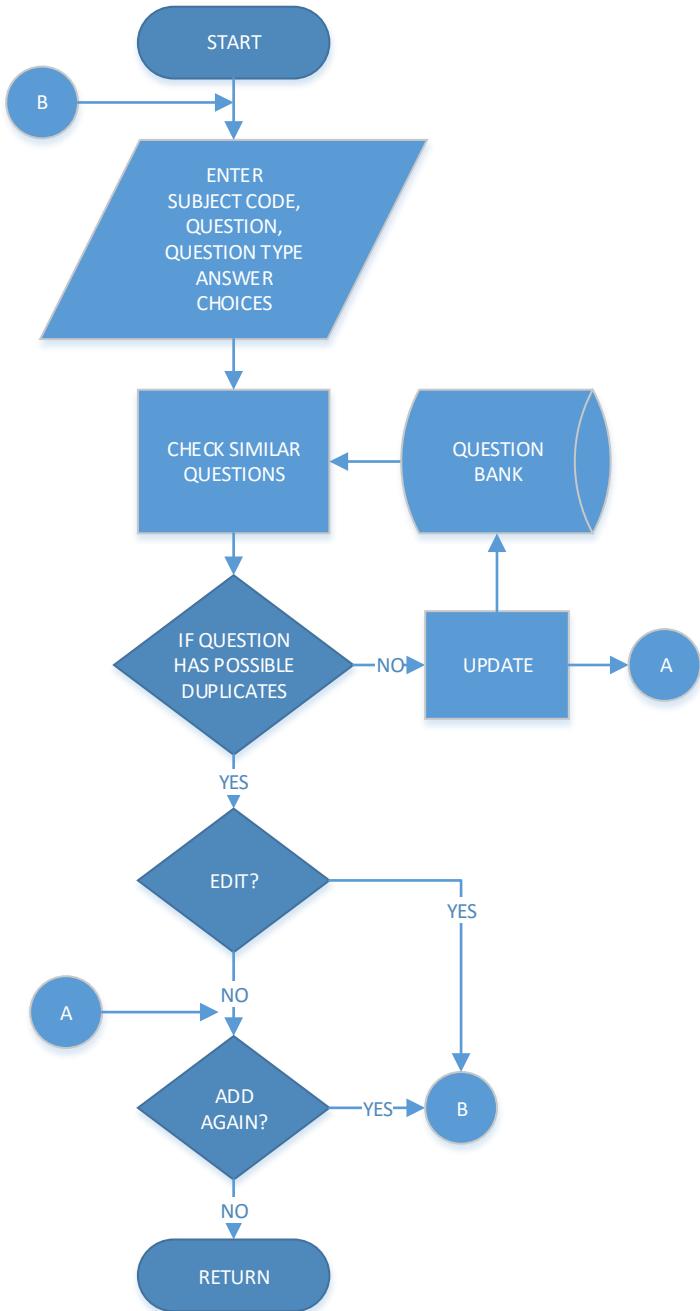
In this proposed alternative, the faculty and chairman respective department can access the system using their log-in username and log-in password. For example, the faculty from Pharmacology Department can access his/her appropriate module in the system after he/she logs-in. The faculty can check the list of records of the students under his/her classes, while the chairman from Pharmacology Department can access all the records of the students under its department.

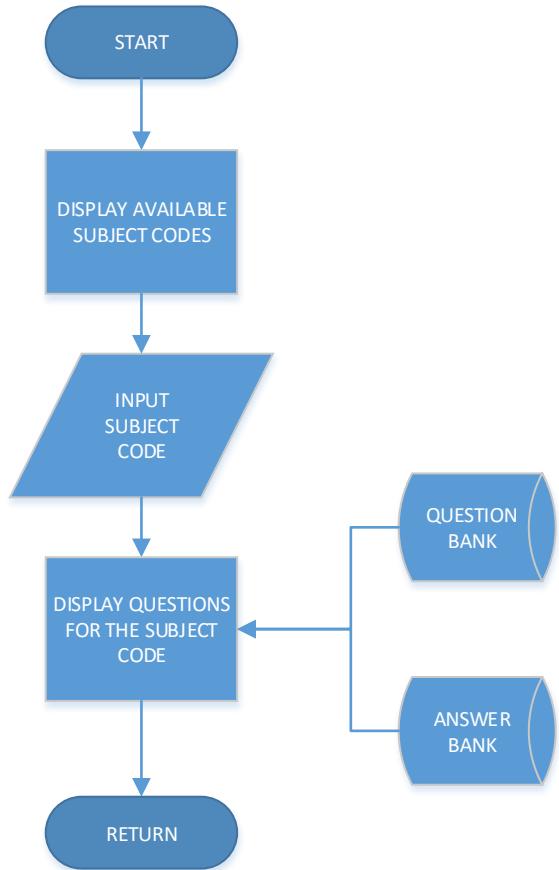
3.3.1.1 Flowchart

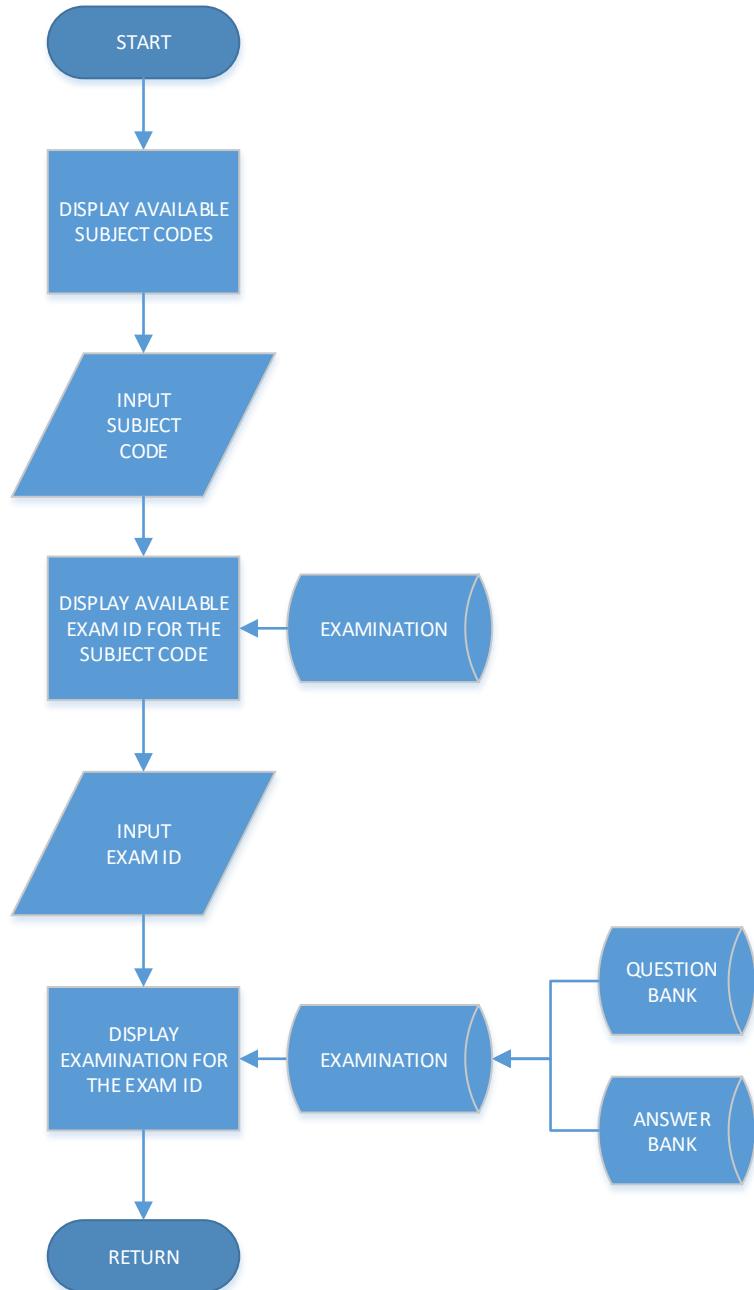
MAIN

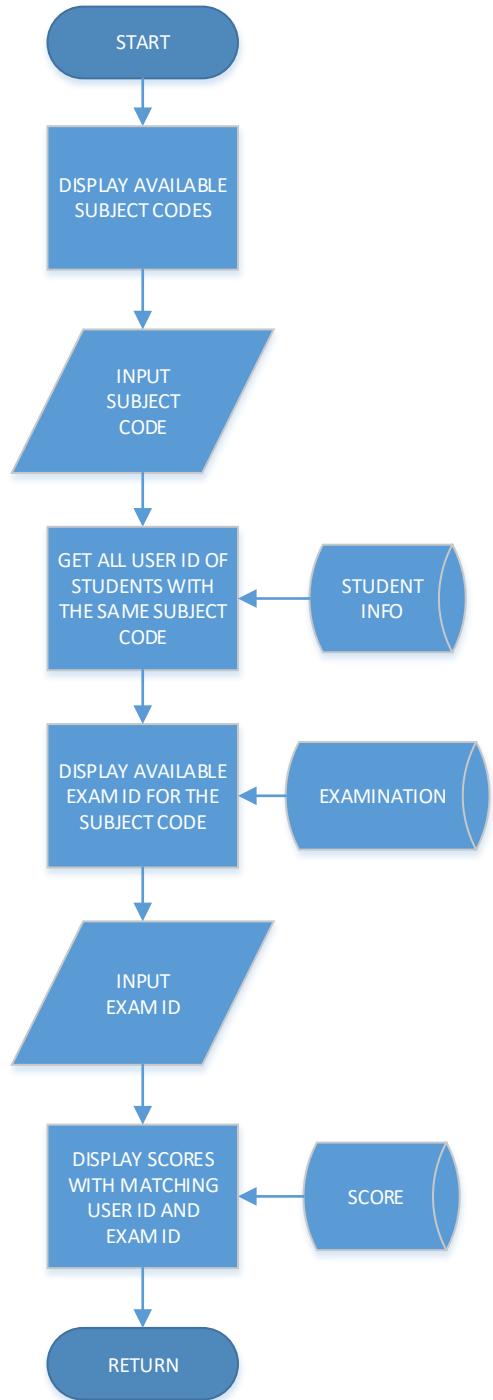


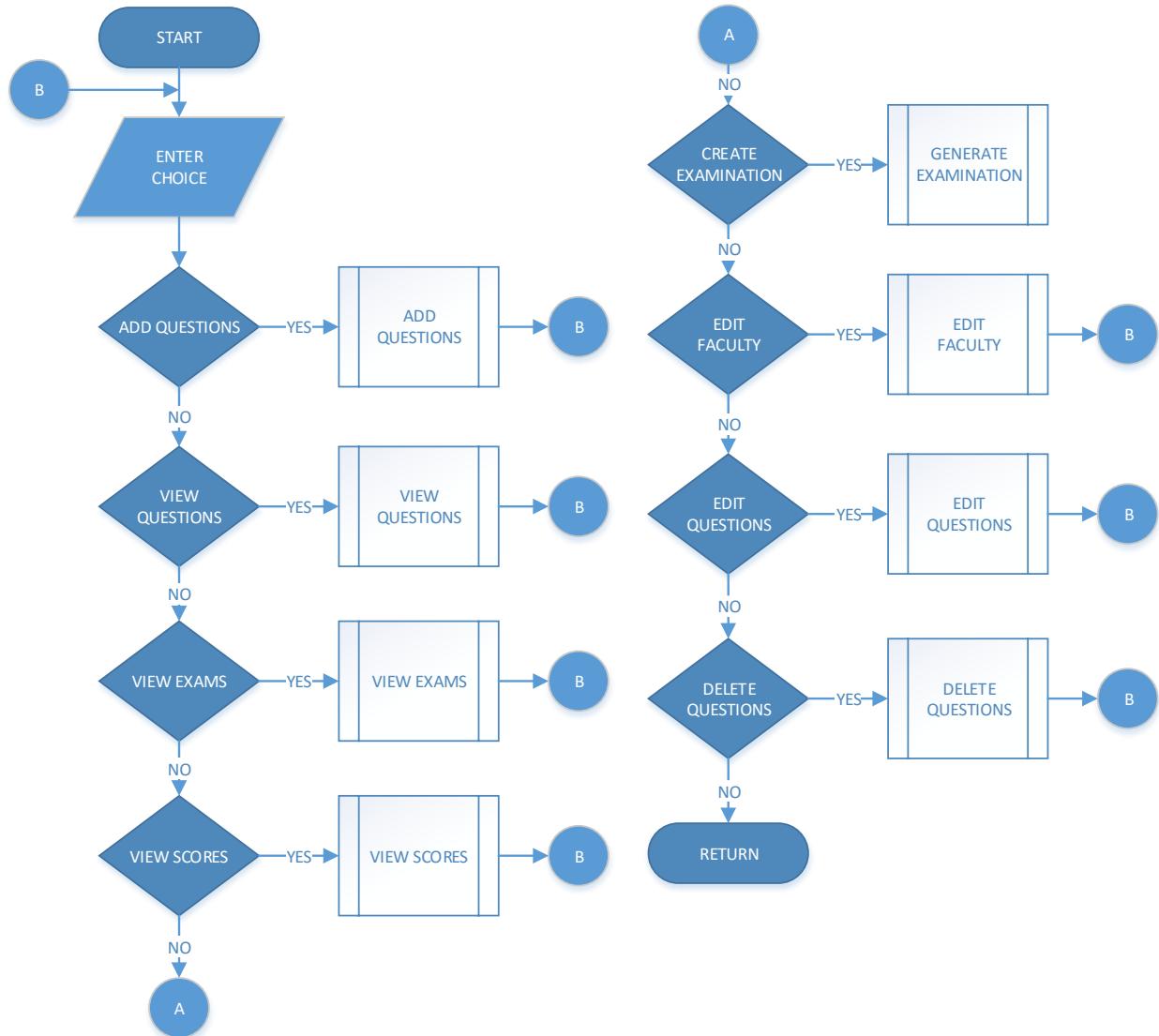
FACULTY MODULE

ADD QUESTIONS MODULE

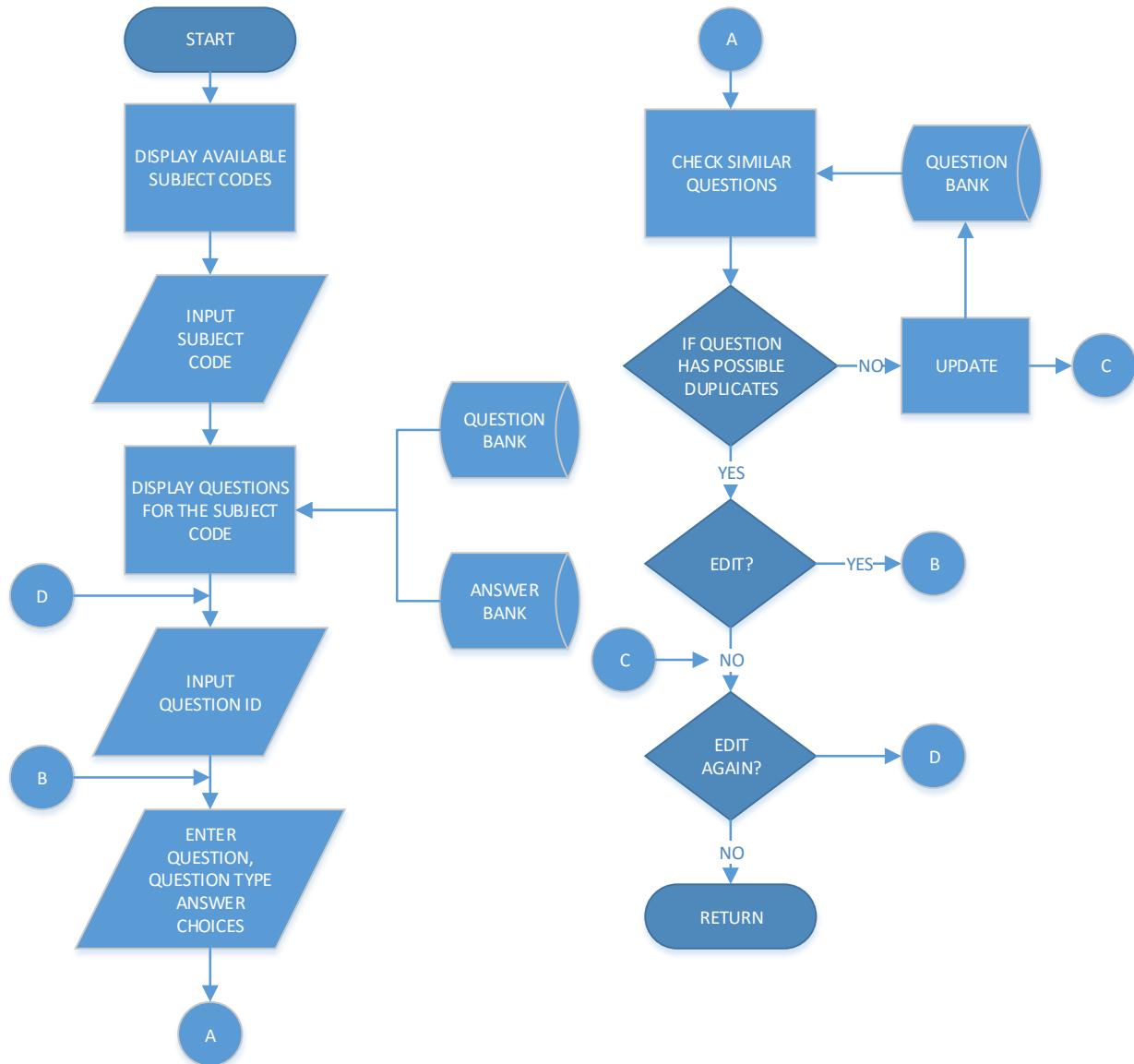
VIEW QUESTIONS MODULE

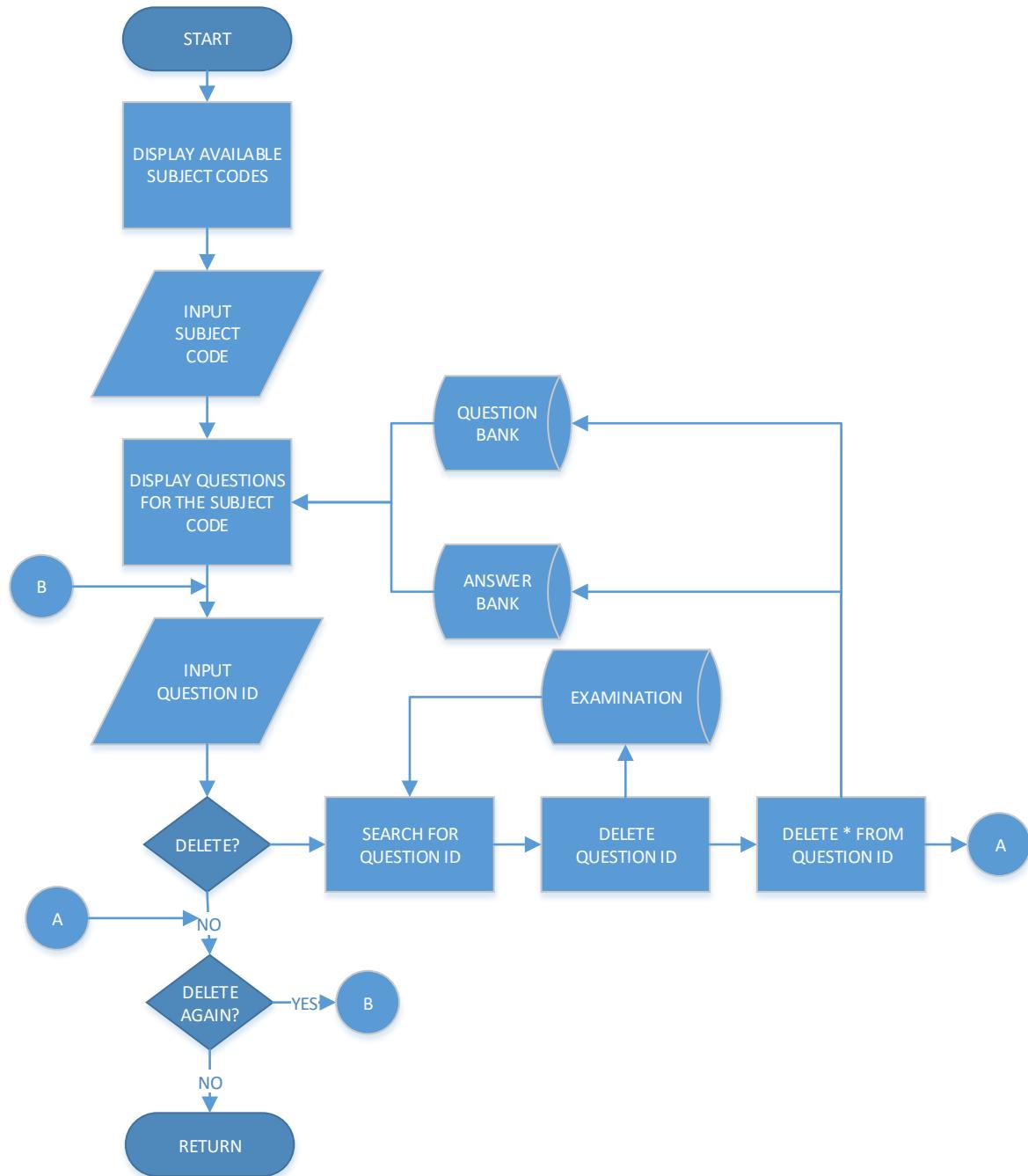
VIEW EXAMS MODULE

VIEW SCORES MODULE

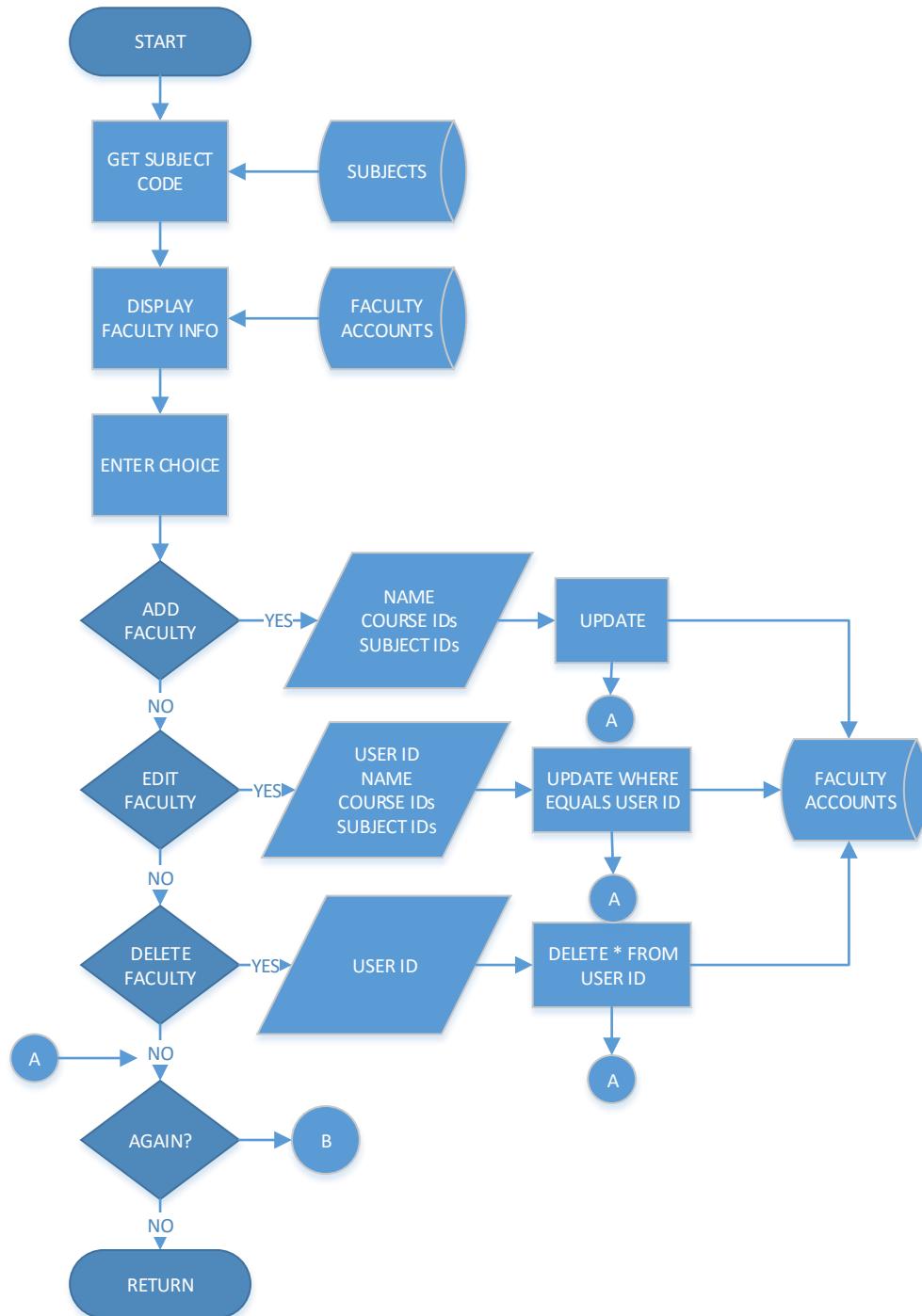
CHAIRMAN MODULE

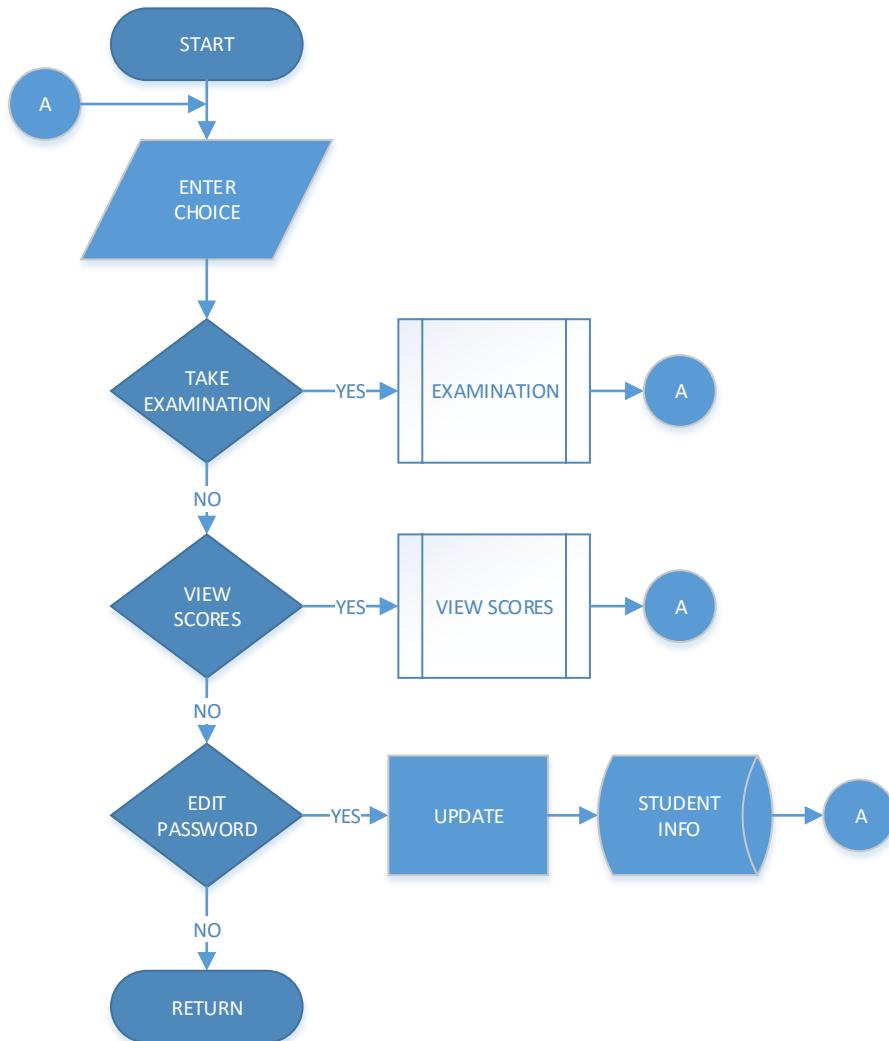
EDIT QUESTIONS MODULE



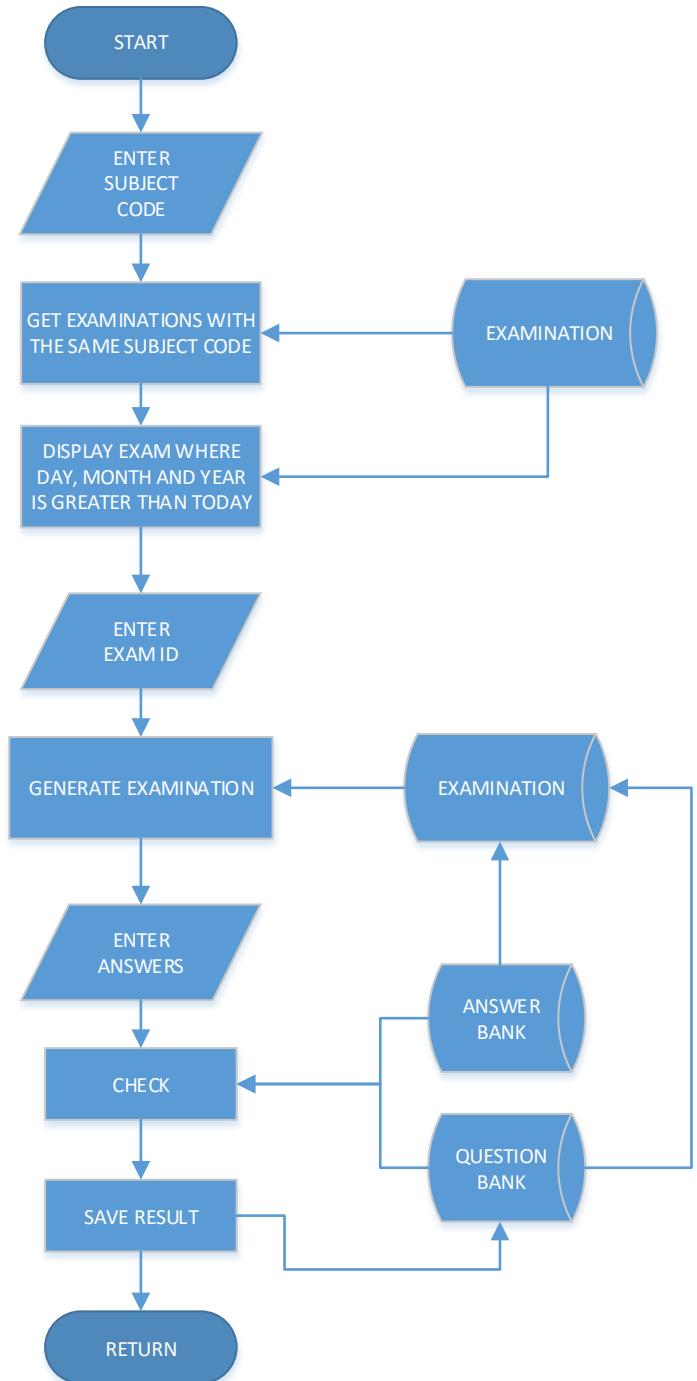
DELETE QUESTION MODULE

EDIT FACULTY MODULE

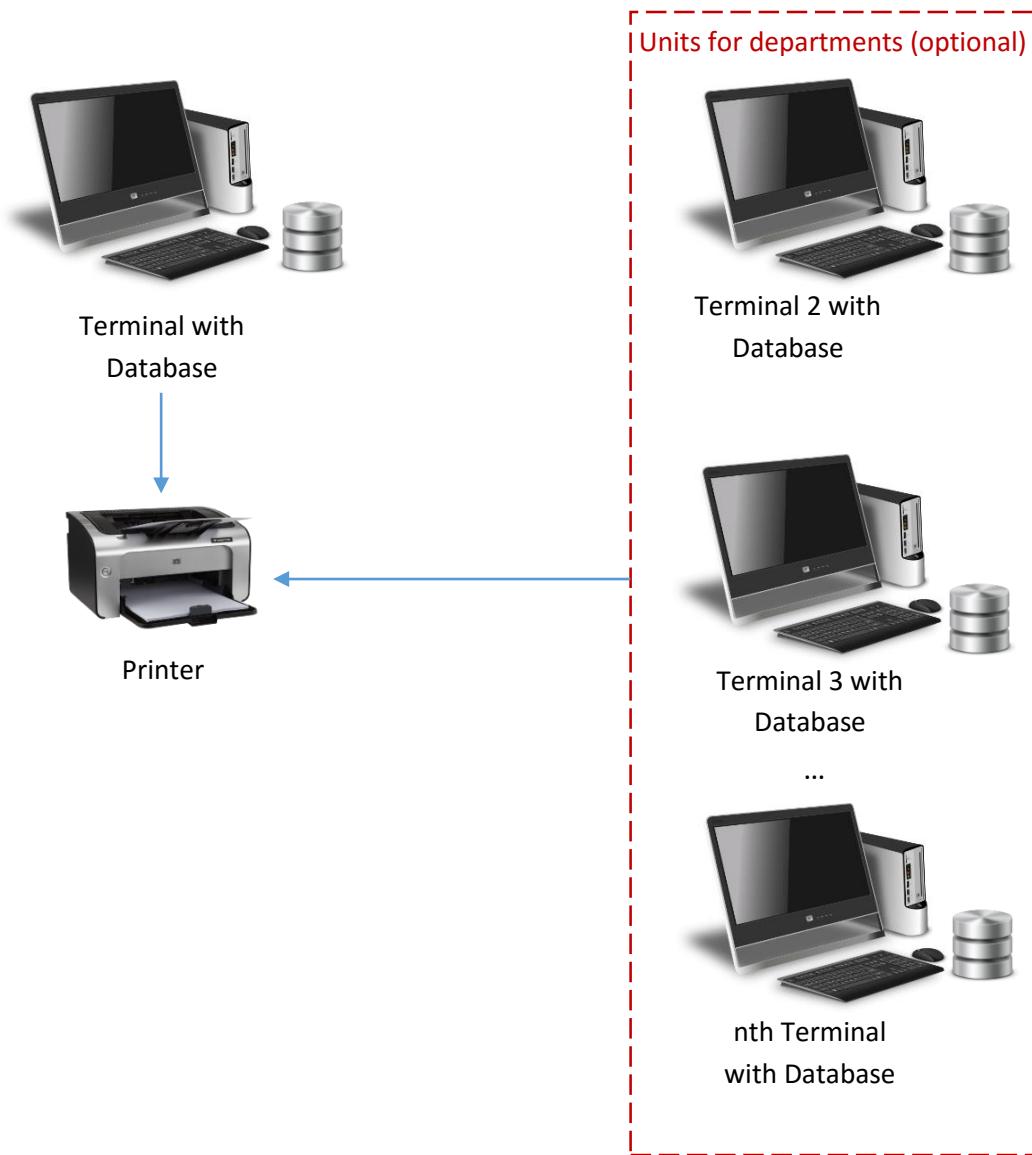


STUDENT MODULE

EXAMINATION MODULE



3.3.1.2 Physical Element



3.3.1.3 Database/Table:

User Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
Password	Alphanumeric	16	User's Password
User Level	Numeric	1	Access Level

Faculty Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Faculty's First Name
Middle Name	Alphabetic	25	Faculty's Middle Name
Last Name	Alphabetic	25	Faculty's Last Name
Course IDs	Alphanumeric	100	List of Course Codes
Subject IDs	Alphanumeric	200	List of Subject Codes

Chairman Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Chairman's First Name

Middle Name	Alphabetic	25	Chairman's Middle Name
Last Name	Alphabetic	25	Chairman's Last Name
Department	Alphabetic	45	Name of Department

Student Info Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Student's First Name
Middle Name	Alphabetic	25	Student's Middle Name
Last Name	Alphabetic	25	Student's Last Name
Subject IDs	Alphanumeric	200	List of Subject Codes

Subject Database

Field Name	Field type	Length	Description
Course Code	Alphanumeric	10	Course's Code
Course Title	Alphabetic	50	Course's Title
Subject Code	Alphanumeric	10	Subject's Code
Subject Title	Alphabetic	50	Subject's Title
Department	Alphabetic	45	Name of Department

Question Bank

Field Name	Field type	Length	Description
Question ID	Numeric	4	Question's ID Number
Subject Code	Alphanumeric	10	Subject's Code
Question	Alphanumeric	500	Questions that satisfies the Blueprint
Question Type	Alphabetic	30	Question's Type
Difficulty Index	Alphabetic	20	Difficulty Status
Difficulty	Numeric	5	Difficulty Value
Discrimination Index	Alphabetic	20	Discrimination Status
Discrimination	Numeric	5	Discrimination Value
Right Answer	Alphanumeric	30	Right answer of an exam
Wrong Answer	Alphanumeric	30	Wrong answer of an exam
Exam IDs	Alphanumeric	8	Exam's ID Number

Answer Bank

Field Name	Field type	Length	Description
Question ID	Alphanumeric	5	Question's ID
Answer	Alphanumeric	30	Answer of examinee
Choices	Alphanumeric	250	Choices of a question

Examination Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
Batch Number	Numeric	8	Batch's Number
Department	Alphabetic	45	Name of Department
Course Code	Alphanumeric	10	Course's Code
Subject Code	Alphanumeric	10	Subject's Code
Exam Type	Alphabetic	25	Examination's Type
Year	Numeric	4	Year the exam was taken
Month	Alphabetic	8	Month the exam was taken
Day	Numeric	2	Day the exam was taken
Question IDs	Alphanumeric	5	Question's ID

Sets Database

Field Name	Field type	Length	Description
Set ID	Alphabetic	1	Set's ID
Exam IDs	Alphanumeric	8	Exam's ID Number

Score Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
User ID	Numeric	5	User's ID number
Score	Numeric	3	Score of the examinee

3.3.1.4 Reports:

Item Analysis - result of the examination including the difficulty and discrimination of each questions.

Statistical Report – report that shows the reliability of an examination.

Questionnaire – list of questions used for the examination

3.3.1.5 Manual Process (Existing):

- Generating Blueprint
- Generating Questionnaire Draft
 - Creating Questions based on the Textbooks
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Questionnaire Draft
- Generating Official Questionnaire
 - Consolidating Questionnaire Drafts
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Official Questionnaire
- Printing Official Questionnaire copies
- Photocopying Official Questionnaire

3.3.1.6 Requirement Definition:

ITEMS	REQUIRED	EXISTING	NEEDED
Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor)	4	0	4
Software Operating System (Windows 7)			
Printer Cannon LBP-6000 Laser Printer	1	0	1

3.3.1.7 Cost and Benefit Analysis:

ITEMS	COSTS
ONE TIME COST	
<ul style="list-style-type: none"> Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor) (PHP 11,780.00) Software Operating System (Windows 7) (PHP 5,311.00) 	PHP 68,364
<ul style="list-style-type: none"> Printer Cannon LBP-6000 Laser Printer 	PHP 3,200
TOTAL ONE TIME COST	PHP 71,564
RECURRING COST	
MAINTENANCE <ul style="list-style-type: none"> Money allotted for Computer and Printer Problems 	PHP 1,000
ELECTRICITY COST <ul style="list-style-type: none"> Monthly cost of computers and printers 	PHP 1,000
PRINTER COST <ul style="list-style-type: none"> Printer ink 	PHP 500
TOTAL RECURRING COST	PHP 2,500
TOTAL COST	PHP 74,064

3.3.1.8 Computation for Payback Period

SAVED EXPENSES	COST per YEAR
EMPLOYEE SALARY	PHP 19, 500
PAPER COST	PHP 6, 000
PHOTOCOPY COST	PHP 4, 500
SCANTRON SHEET	PHP 20, 000
TOTAL	PHP 50, 000 per YEAR

$$\begin{aligned} \text{PBP} &= \text{TOTAL COST}/50, 000 \\ &= 1.48 \text{ YEARS} \end{aligned}$$

3.3.1.9 Tangible / Intangible Benefits

1. Easy access of the information of the students.
2. Essential summary of reports.
3. More effective monitoring of the examinations.
4. Delay in making reports will be prevented.
5. Terminates unnecessary workloads.
6. Reduces output of papers.

3.3.2 Alternative 2: Centralized set-up

The second alternative is centralized set-up of the system. This kind of system setup will need the respective lab to have at least one terminal that is connected to the server with the use of RJ-45, commonly known as a telephone jack or computer networking equipment. Each terminal must install the proposed system in order to access it.

The accessibility of the systems depends on the users' level of authorization. Because the system is centralized, the college can access all of the reports of the exam within an area may print it whenever needed.

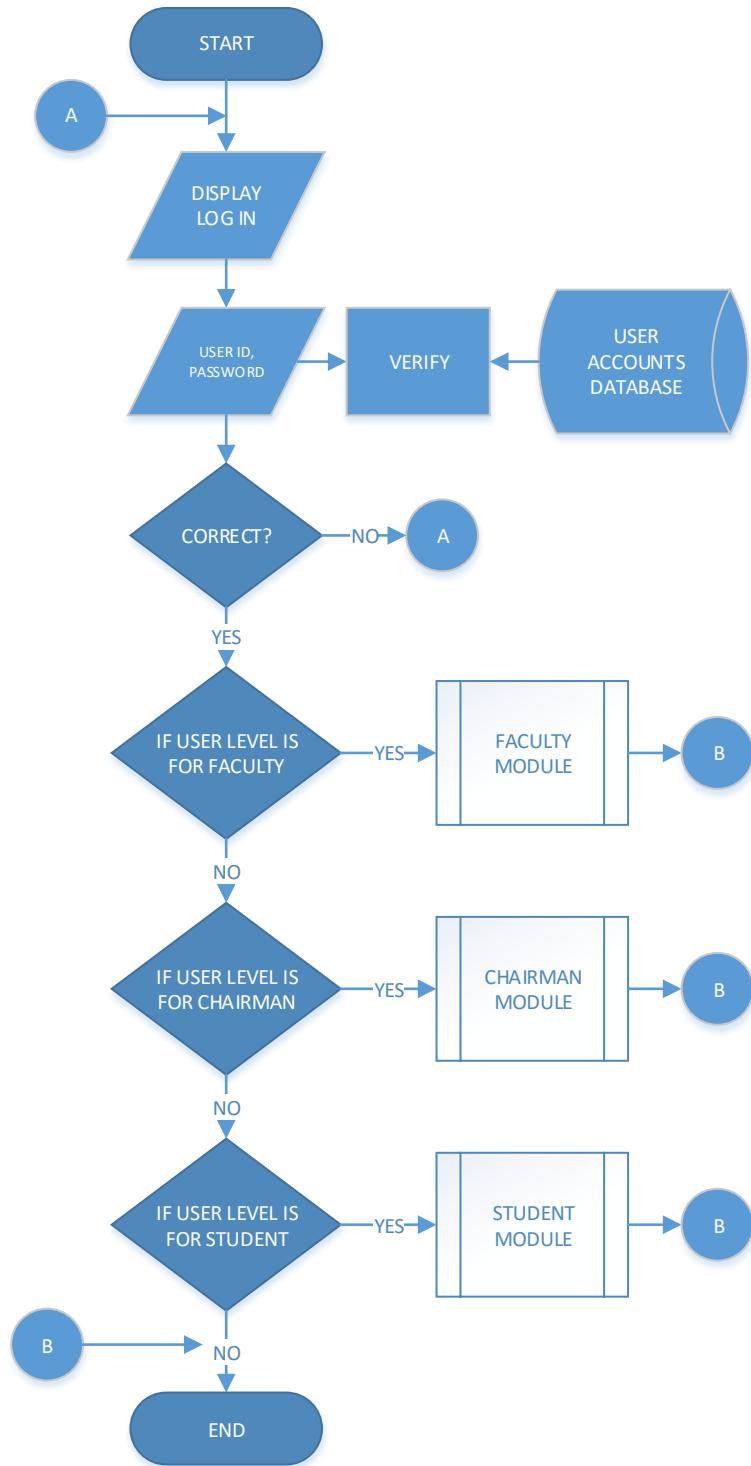
The proposed alternative will have the following advantages:

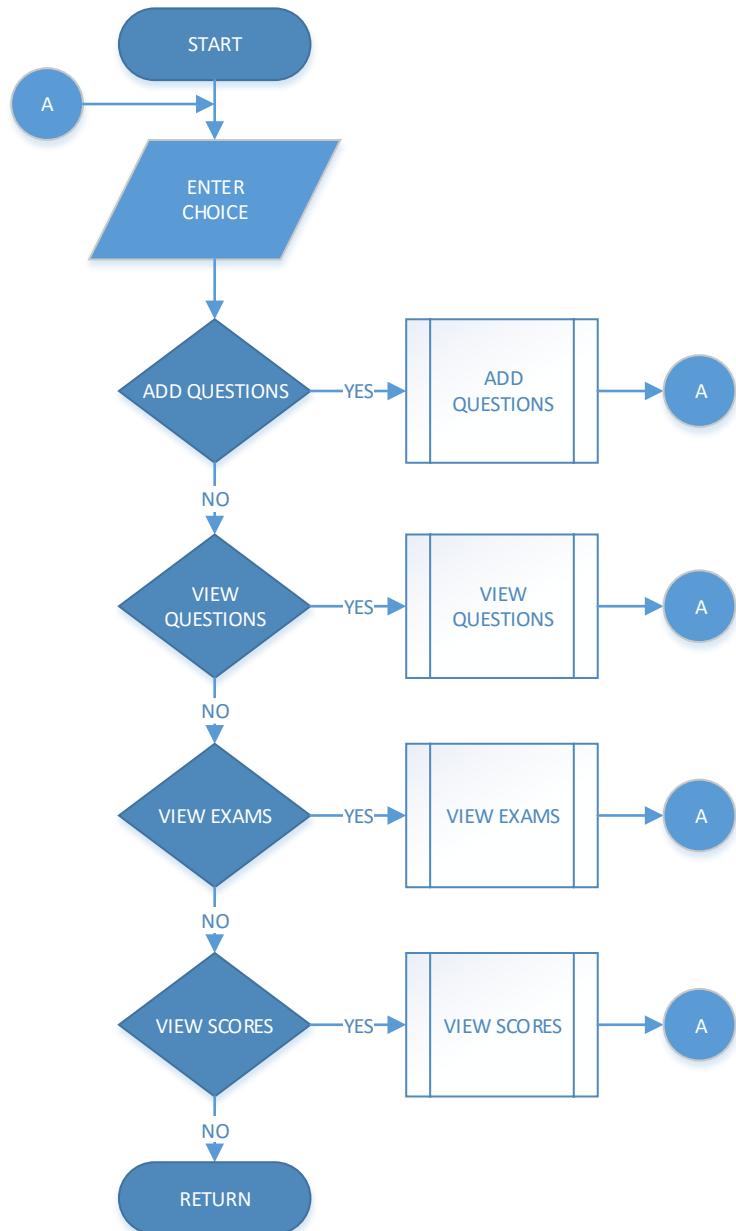
- **Data Security:** only the main server can access the data of an exam.
- **Data Integrity:** the greatest benefit of centralizing a company's data is data integrity. One of the basic rules in database management is that no data will be duplicated as there is only one server. A centralized database means that each faculty has one primary record.
- **Easier Access to Data:** Data can be accessed through different points as long as it is connected to the server.

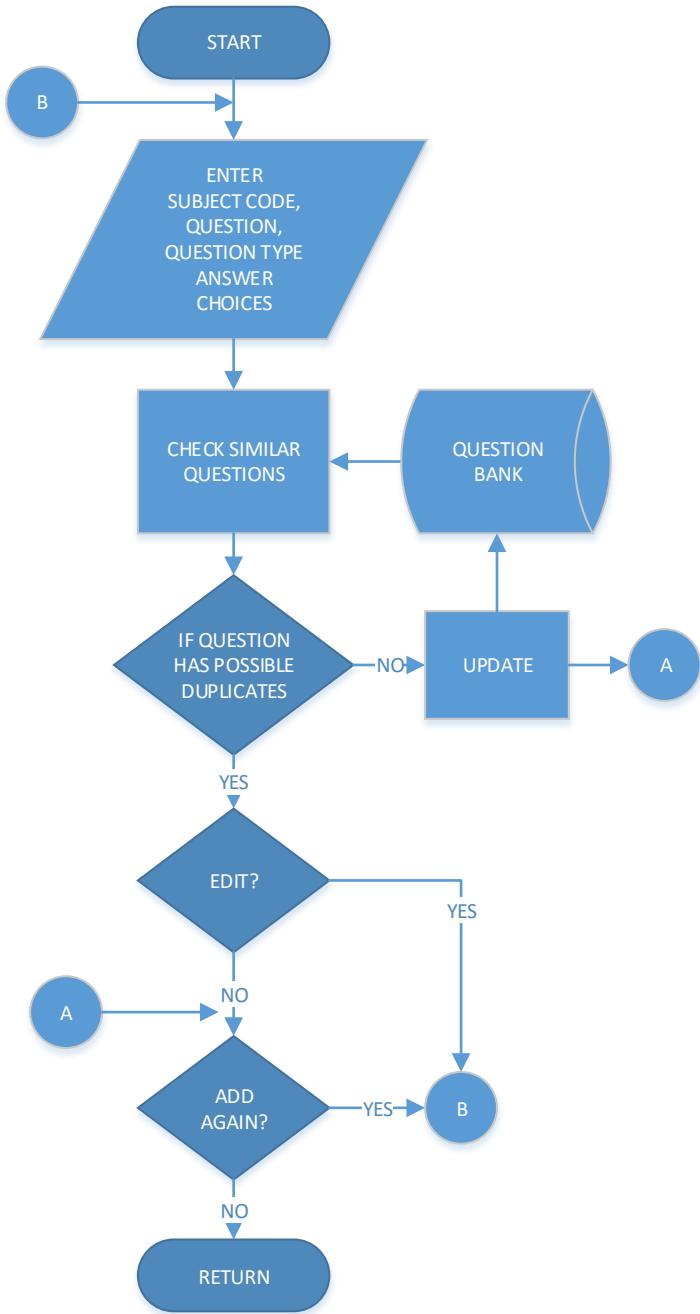
In this proposed set up, the faculty, chairman and students can access the system using their log-in code and password. The students' answers are automatically saved to the server after they finished taking their exam. The faculty and chairman can access.

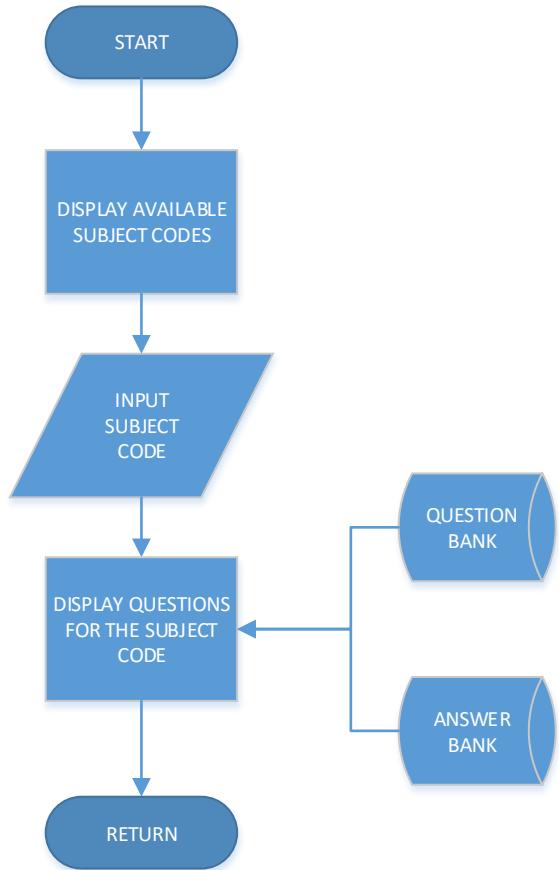
3.3.2.1 Flowchart

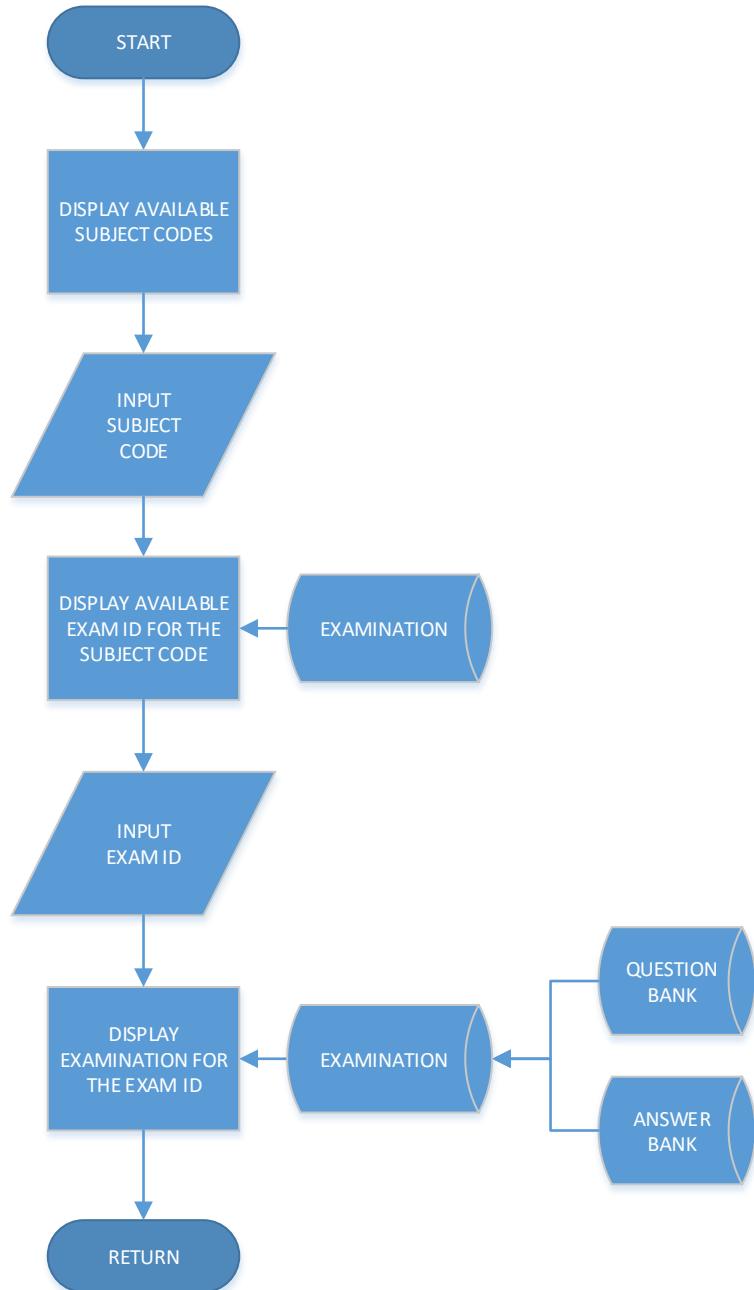
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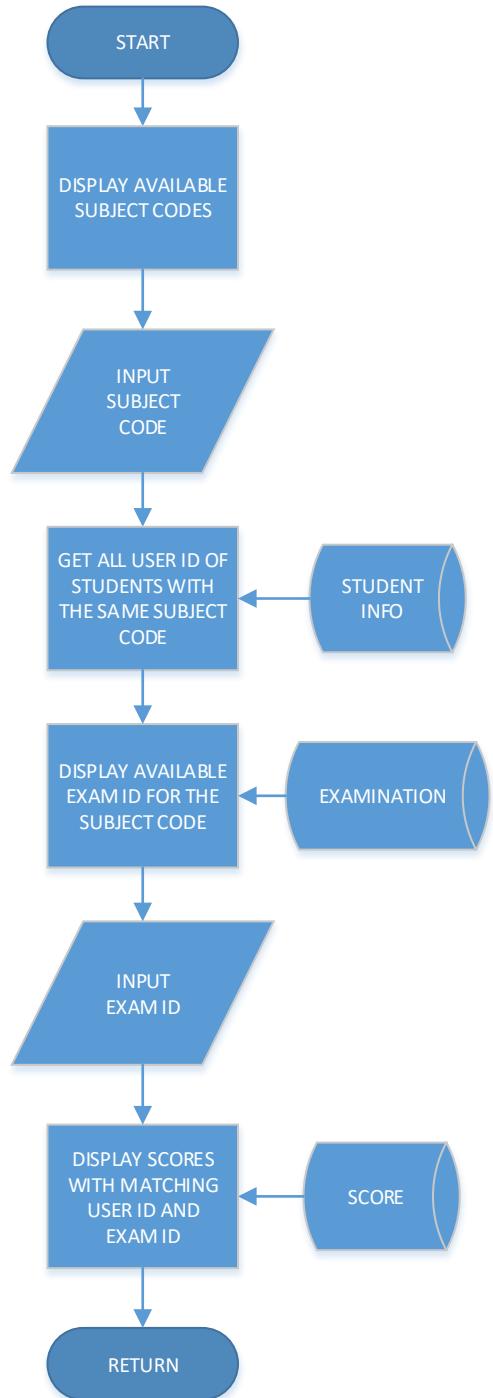


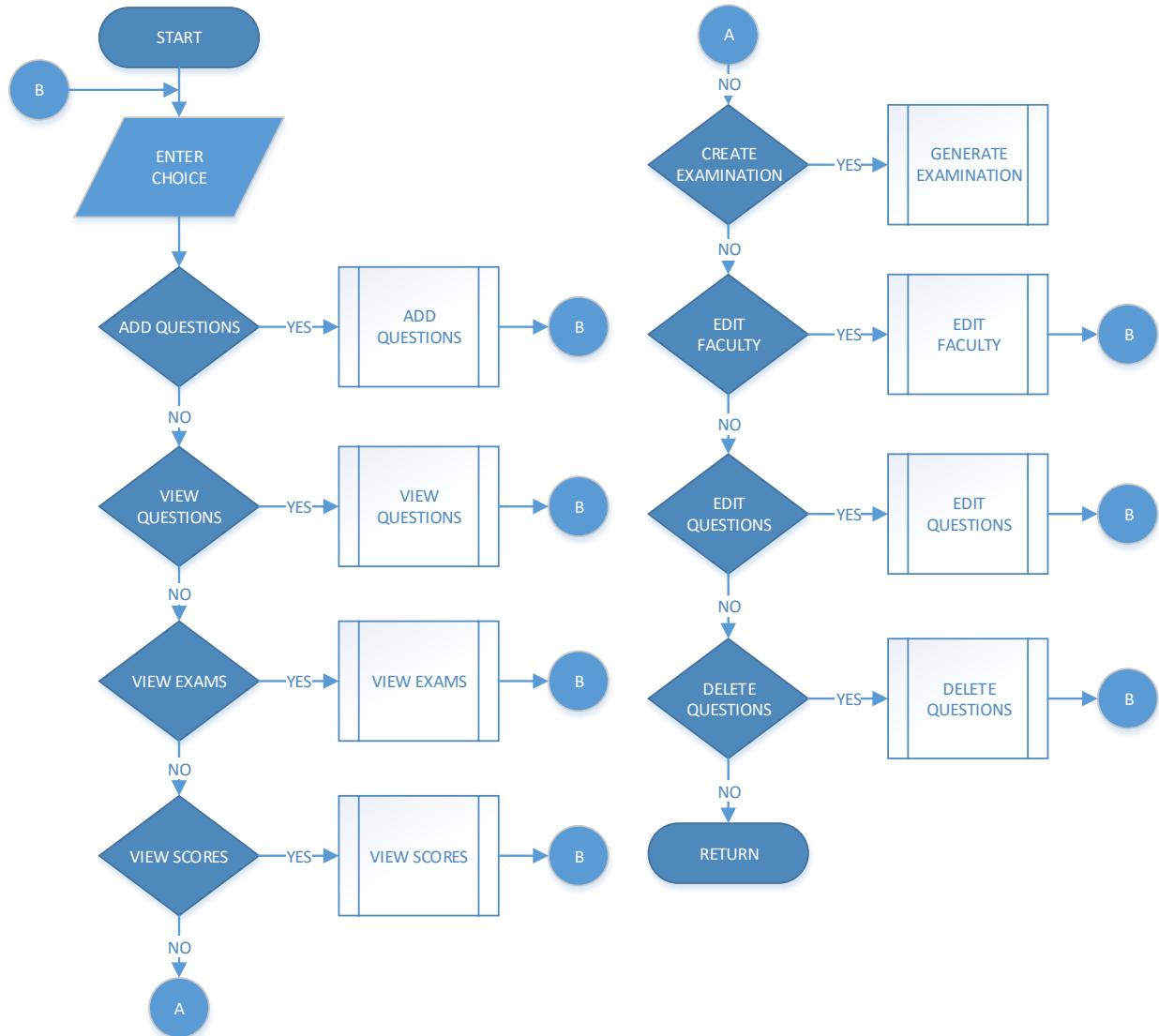
FACULTY MODULE

ADD QUESTIONS MODULE

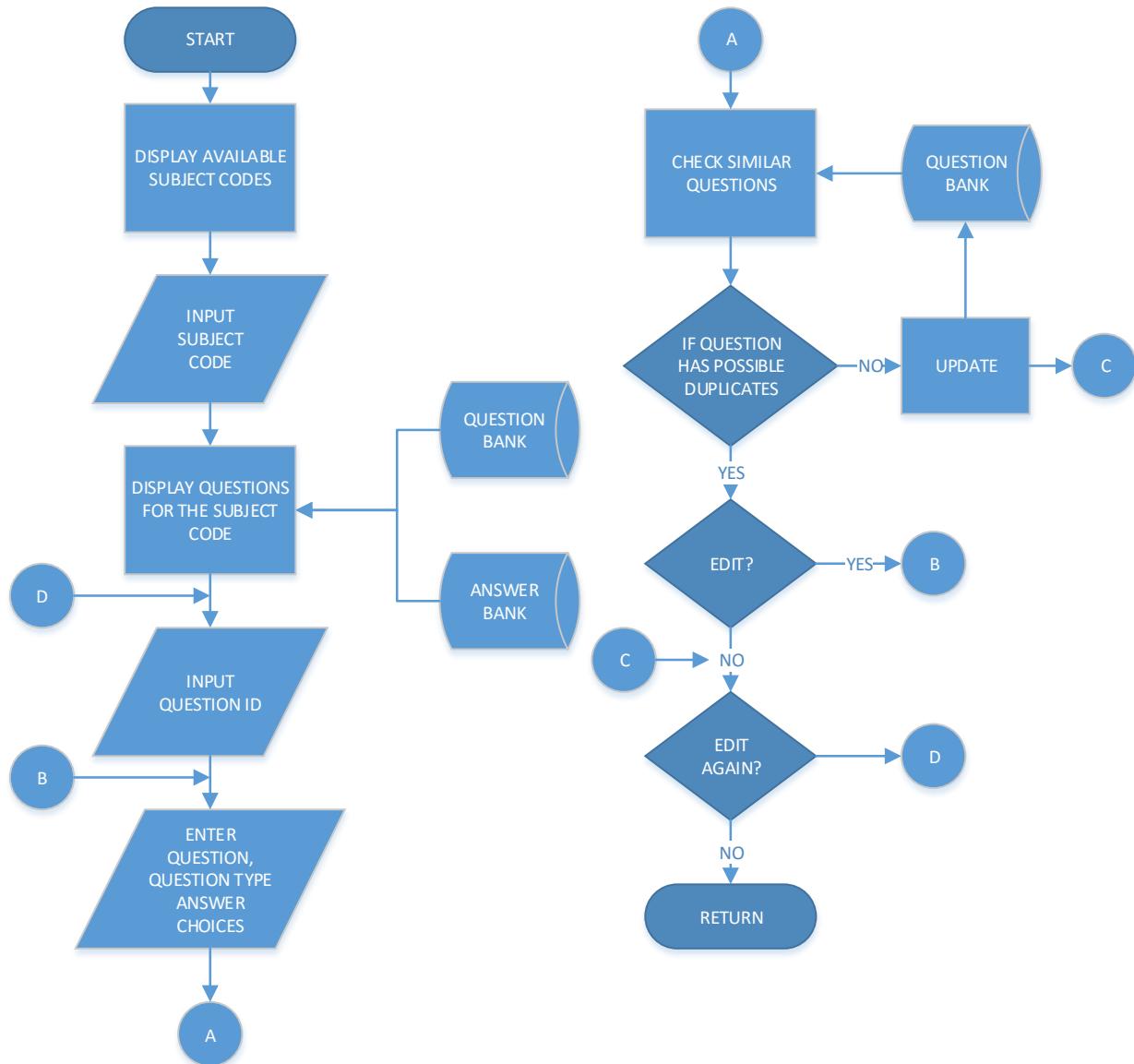
VIEW QUESTIONS MODULE

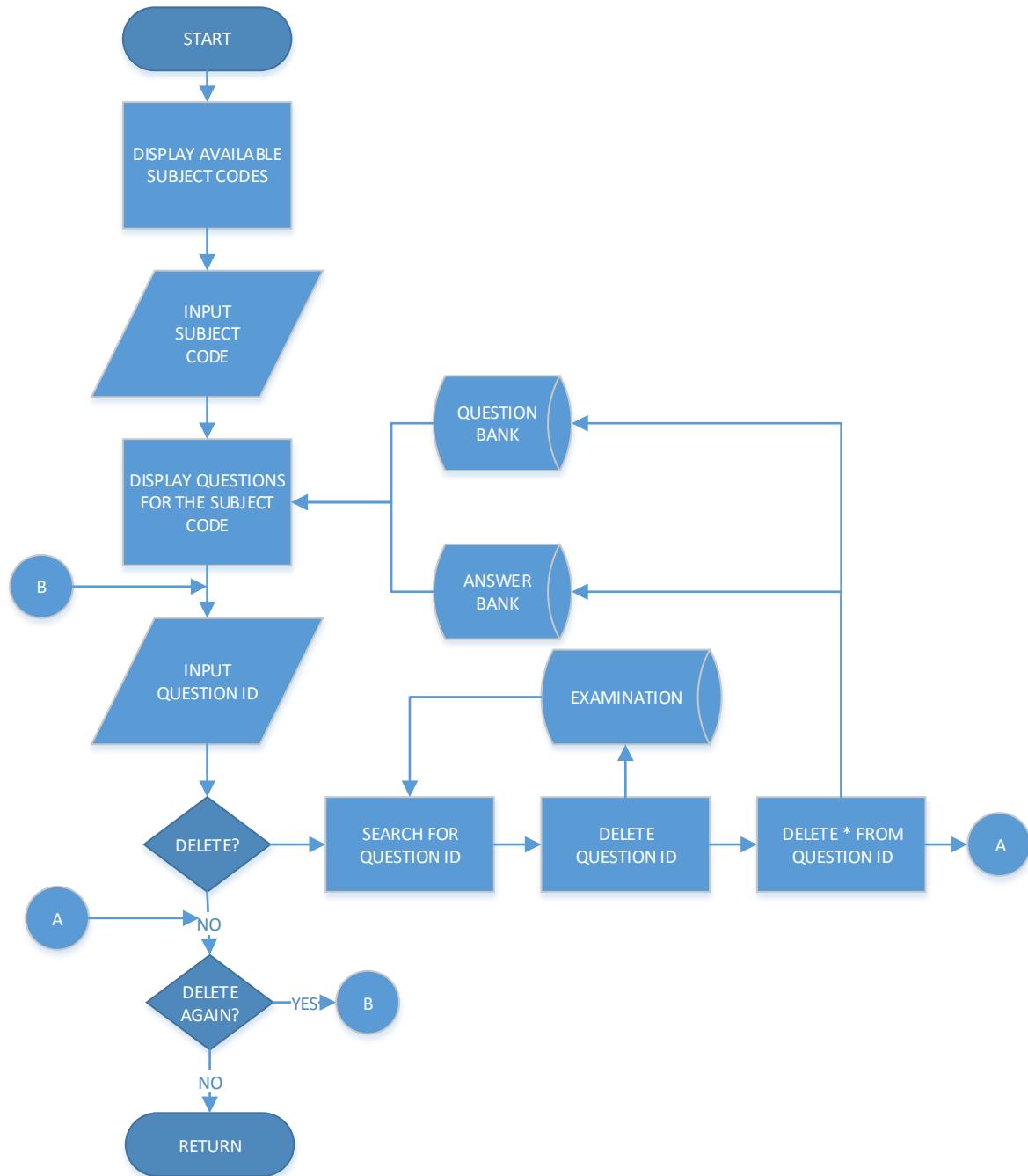
VIEW EXAMS MODULE

VIEW SCORES MODULE

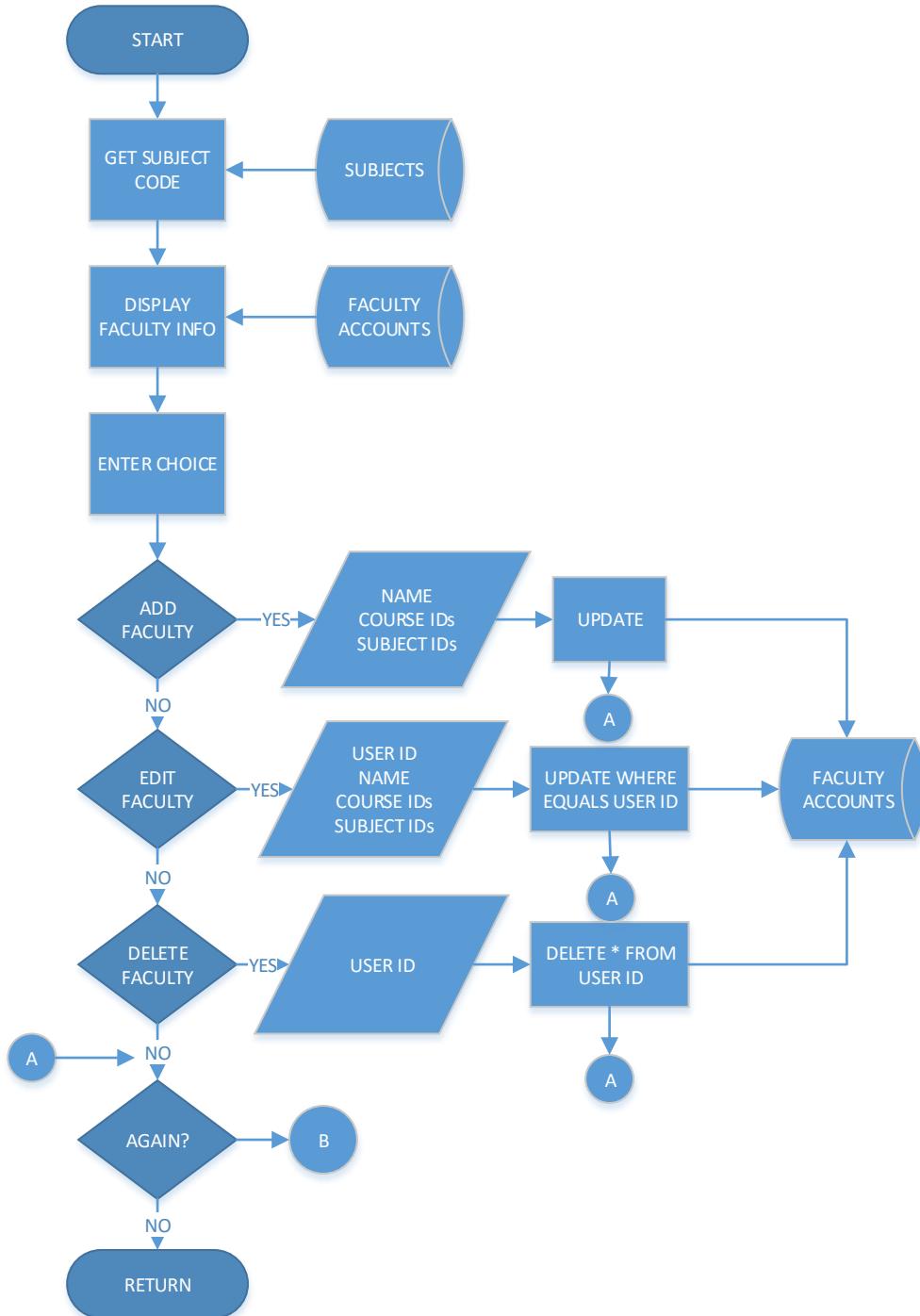
CHAIRMAN MODULE

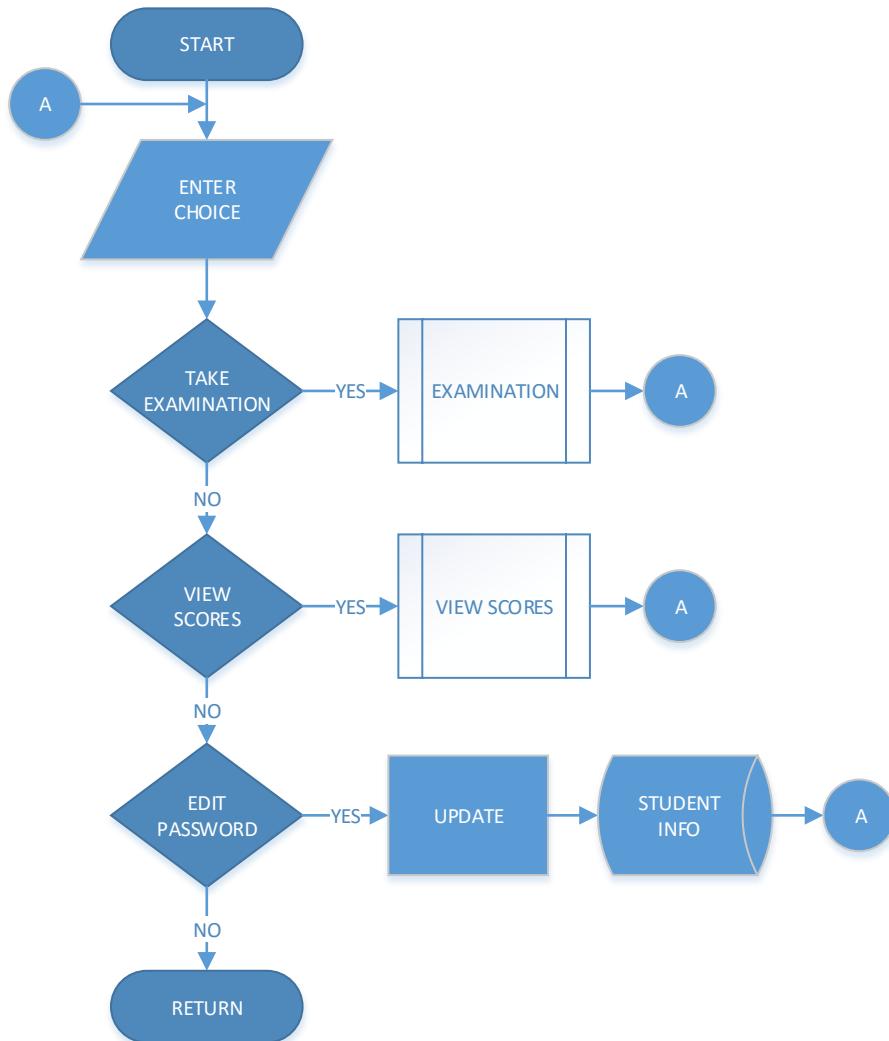
EDIT QUESTIONS MODULE

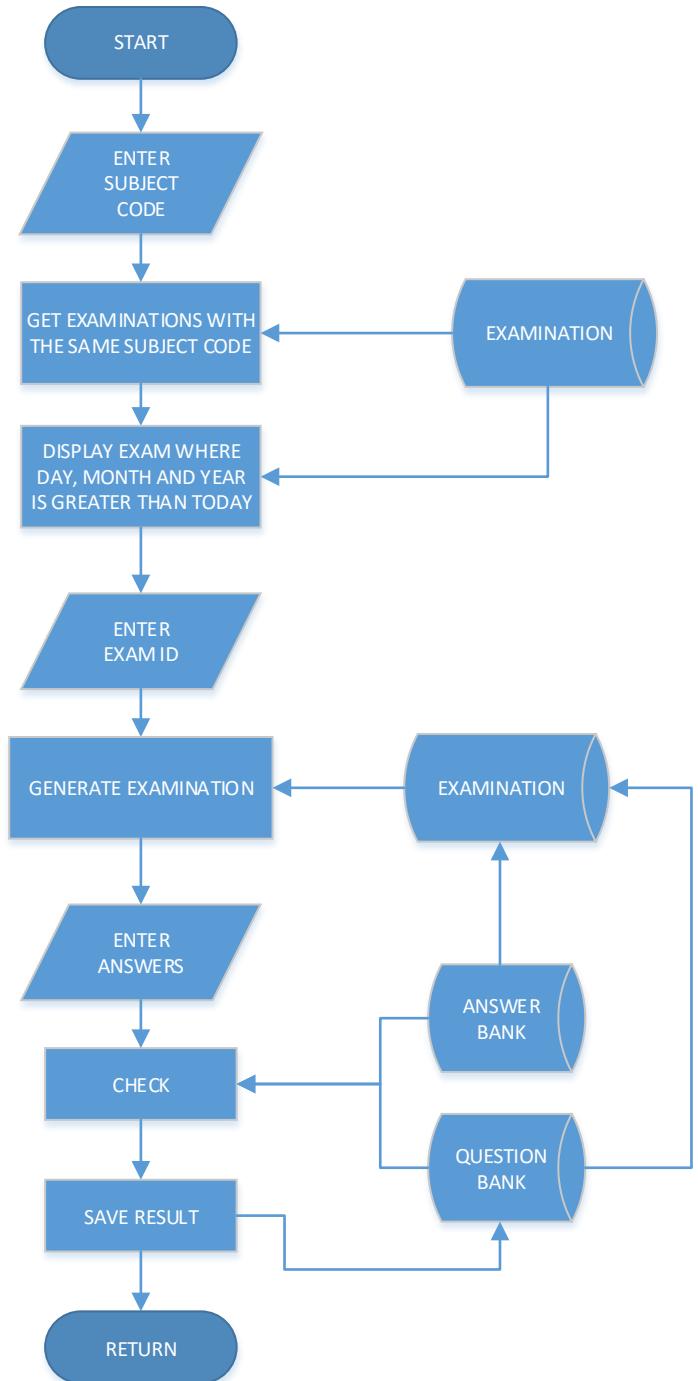


DELETE QUESTION MODULE

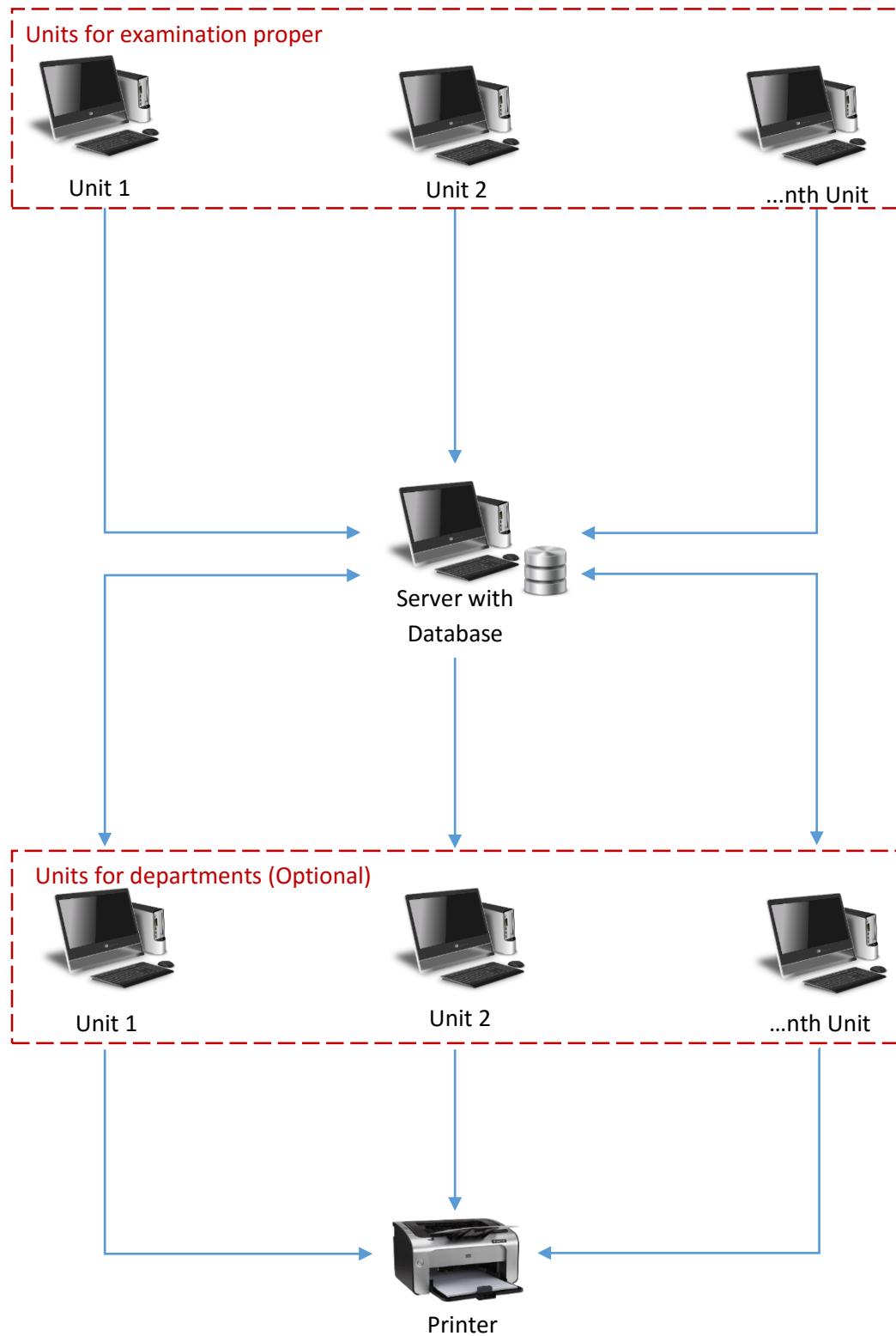
EDIT FACULTY MODULE



STUDENT MODULE

EXAMINATION MODULE

3.3.2.2 Physical Elements



3.3.2.3 Database/Table:

User Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
Password	Alphanumeric	16	User's Password
User Level	Numeric	1	Access Level

Faculty Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Faculty's First Name
Middle Name	Alphabetic	25	Faculty's Middle Name
Last Name	Alphabetic	25	Faculty's Last Name
Course IDs	Alphanumeric	100	List of Course Codes
Subject IDs	Alphanumeric	200	List of Subject Codes

Chairman Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Chairman's First Name

Middle Name	Alphabetic	25	Chairman's Middle Name
Last Name	Alphabetic	25	Chairman's Last Name
Department	Alphabetic	45	Name of Department

Student Info Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Student's First Name
Middle Name	Alphabetic	25	Student's Middle Name
Last Name	Alphabetic	25	Student's Last Name
Subject IDs	Alphanumeric	200	List of Subject Codes

Subject Database

Field Name	Field type	Length	Description
Course Code	Alphanumeric	10	Course's Code
Course Title	Alphabetic	50	Course's Title
Subject Code	Alphanumeric	10	Subject's Code
Subject Title	Alphabetic	50	Subject's Title
Department	Alphabetic	45	Name of Department

Question Bank

Field Name	Field type	Length	Description
Question ID	Numeric	4	Question's ID Number
Subject Code	Alphanumeric	10	Subject's Code
Question	Alphanumeric	500	Questions that satisfies the Blueprint
Question Type	Alphabetic	30	Question's Type
Difficulty Index	Alphabetic	20	Difficulty Status
Difficulty	Numeric	5	Difficulty Value
Discrimination Index	Alphabetic	20	Discrimination Status
Discrimination	Numeric	5	Discrimination Value
Right Answer	Alphanumeric	30	Right answer of an exam
Wrong Answer	Alphanumeric	30	Wrong answer of an exam
Exam IDs	Alphanumeric	8	Exam's ID Number

Answer Bank

Field Name	Field type	Length	Description
Question ID	Alphanumeric	5	Question's ID
Answer	Alphanumeric	30	Answer of examinee
Choices	Alphanumeric	250	Choices of a question

Examination Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
Batch Number	Numeric	8	Batch's Number
Department	Alphabetic	45	Name of Department
Course Code	Alphanumeric	10	Course's Code
Subject Code	Alphanumeric	10	Subject's Code
Exam Type	Alphabetic	25	Examination's Type
Year	Numeric	4	Year the exam was taken
Month	Alphabetic	8	Month the exam was taken
Day	Numeric	2	Day the exam was taken
Question IDs	Alphanumeric	5	Question's ID

Sets Database

Field Name	Field type	Length	Description
Set ID	Alphabetic	1	Set's ID
Exam IDs	Alphanumeric	8	Exam's ID Number

Score Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
User ID	Numeric	5	User's ID number
Score	Numeric	3	Score of the examinee

3.3.2.4 Reports:

Item Analysis - result of the examination including the difficulty and discrimination of each questions.

Statistical Report – report that shows the reliability of an examination.

Questionnaire – list of questions used for the examination

3.3.2.5 Manual Process (Existing):

- Generating Blueprint
- Generating Questionnaire Draft
 - Creating Questions based on the Textbooks
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Questionnaire Draft
- Generating Official Questionnaire
 - Consolidating Questionnaire Drafts
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Official Questionnaire
- Printing Official Questionnaire copies
- Photocopying Official Questionnaire

3.3.2.6 Requirement Definition

ITEMS	REQUIRED	EXISTING	NEEDED
Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor)	20	0	20
Software Operating System (Windows 7)			
Printer Cannon LBP-6000 Laser Printer	1	0	1

3.3.2.7 Cost and Benefit Analysis

ITEMS	COSTS
ONE TIME COST	
<ul style="list-style-type: none"> Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor) (PHP 11,780.00) Software Operating System (Windows 7) (PHP 5311.00) 	PHP 341, 820
<ul style="list-style-type: none"> Printer Cannon LBP-6000 Laser Printer 	PHP 3, 200
TOTAL ONE TIME COST	PHP 345, 020
RECURRING COST	
MAINTENANCE <ul style="list-style-type: none"> Money allotted for Computer and Printer Problems 	PHP 10, 000
ELECTRICITY COST <ul style="list-style-type: none"> Monthly cost of computers and printers 	PHP 10, 000
PRINTER COST <ul style="list-style-type: none"> Printer ink 	PHP 500
TOTAL RECURRING COST	PHP 20, 500
TOTAL COST	PHP 365, 520

3.3.2.8 Computation for Payback Period

SAVED EXPENSES	COST per YEAR
EMPLOYEE SALARY	PHP 19, 500
PAPER COST	PHP 6, 000
PHOTOCOPY COST	PHP 4, 500
SCANTRON SHEET	PHP 20, 000
TOTAL	PHP 50, 000 per YEAR

$$\begin{aligned} \text{PBP} &= \text{TOTAL COST}/50, 000 \\ &= 7.31 \text{ YEARS} \end{aligned}$$

3.3.2.9 Tangible / Intangible Benefits

1. Easy access of the information of the students.
2. Centralized data is secure and easy to backup.
3. Essential summary of reports.
4. More effective monitoring of the examinations.
5. Delay in making reports will be prevented.
6. The reports and examination is dynamically created, thus minimizing error and human labor.
7. Terminates unnecessary workloads.
8. Reduces output of papers.

3.3.3 Alternative 3: Wireless Network set-up

Wireless Connection set-up is a setup where the system requires a terminal per unit of computer. Every after examination proper the server will save all the students examinations. The said system will follow the standards of the college for checking and computing for the evaluation of each examination.

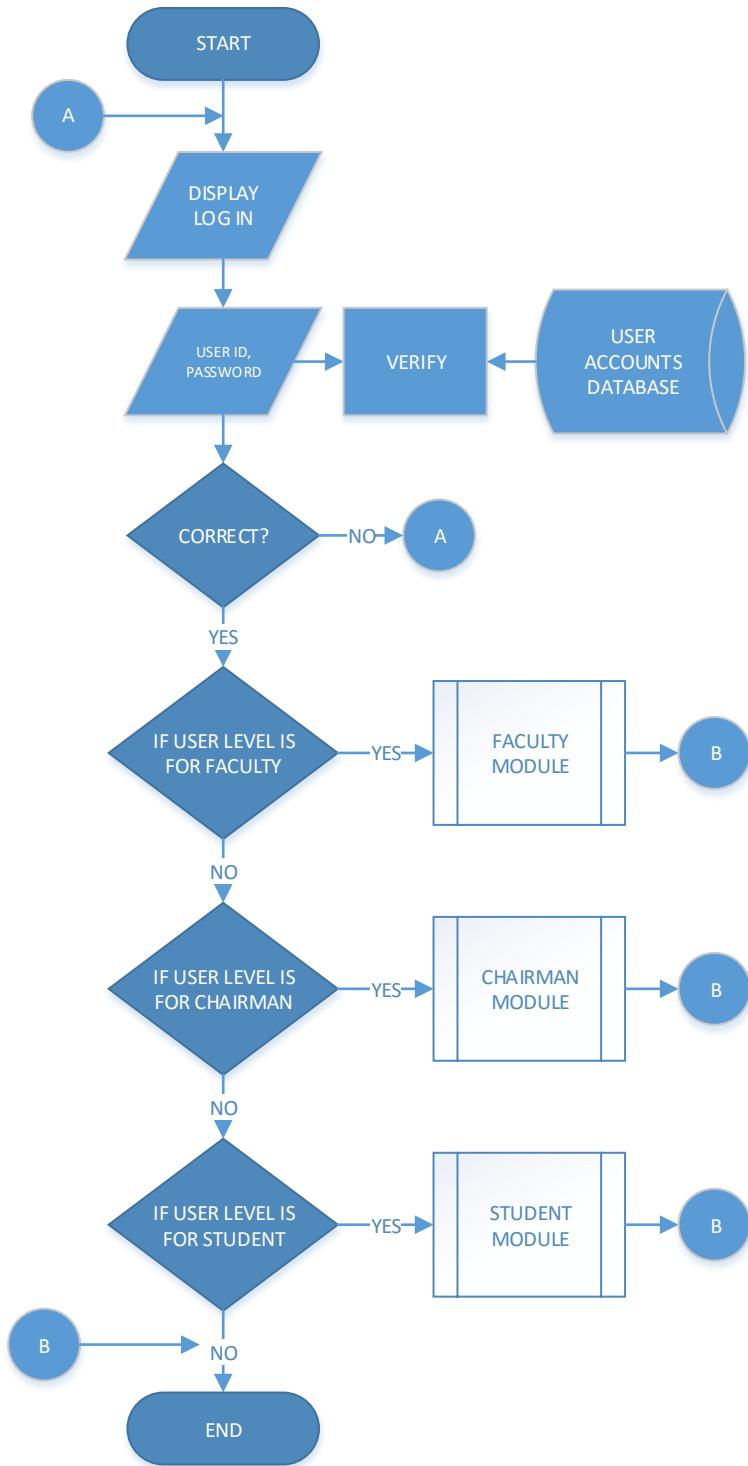
The proposed system can be used as long as the users are connected to the internet. For security purposes, user levels will be used to identify the access level of the user's account. The modules of the system can only be accessed by the user according to their level. Only the chairman can access all the reports of respective department by the use of internet. All reports are available for printing.

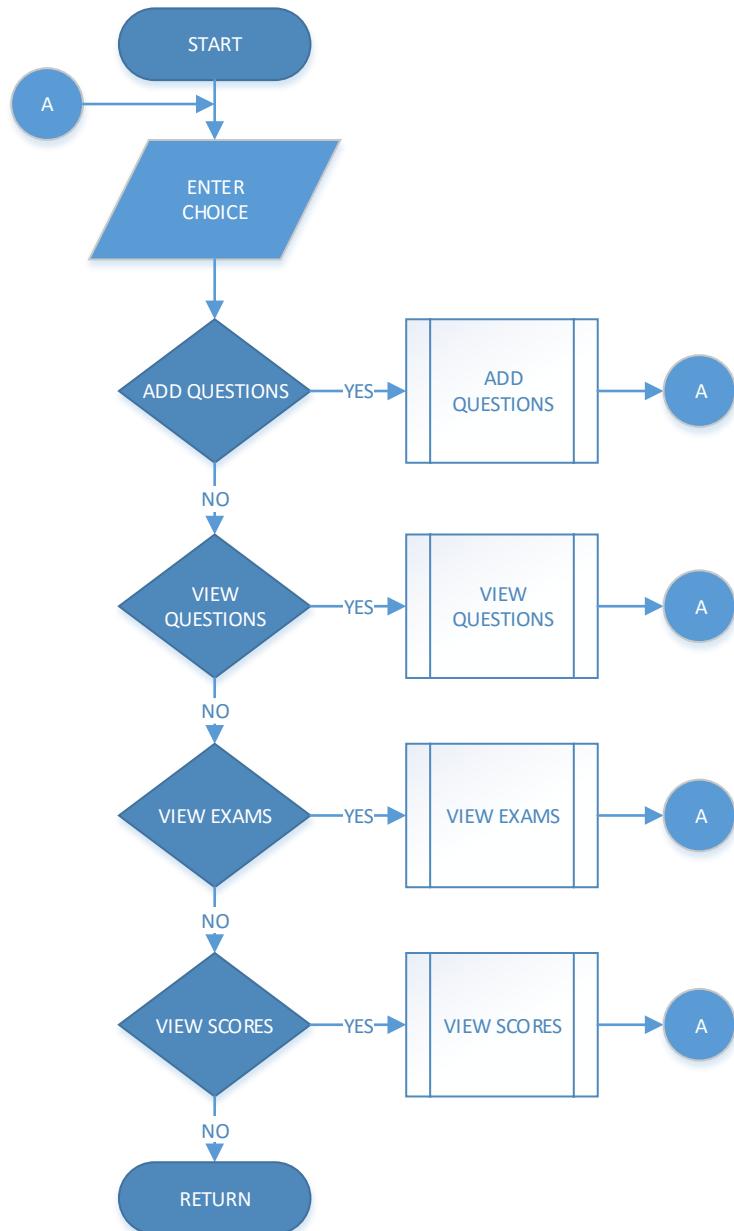
The proposed alternative will have the following advantages:

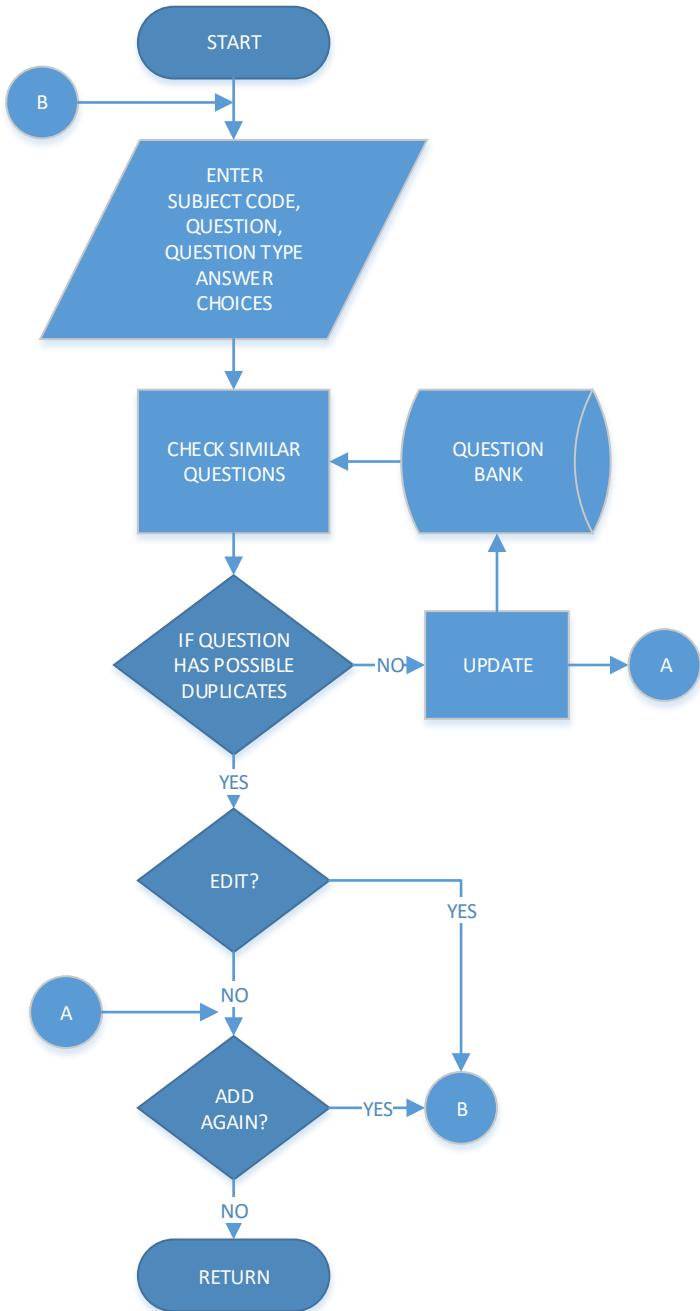
- **Convenience:** as long as there is internet connection and the user is logged in, the system will be available and accessible.
- **Secured:** information is protected against incidence of system failure
- **Portability:** the system can be used as long as the user is connected to the internet and logged in using any computer.

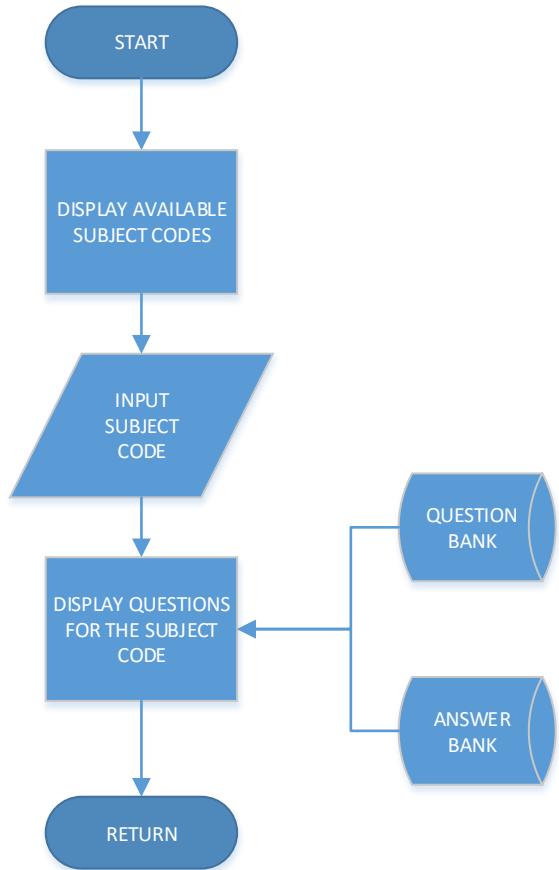
3.3.3.1 Flowchart

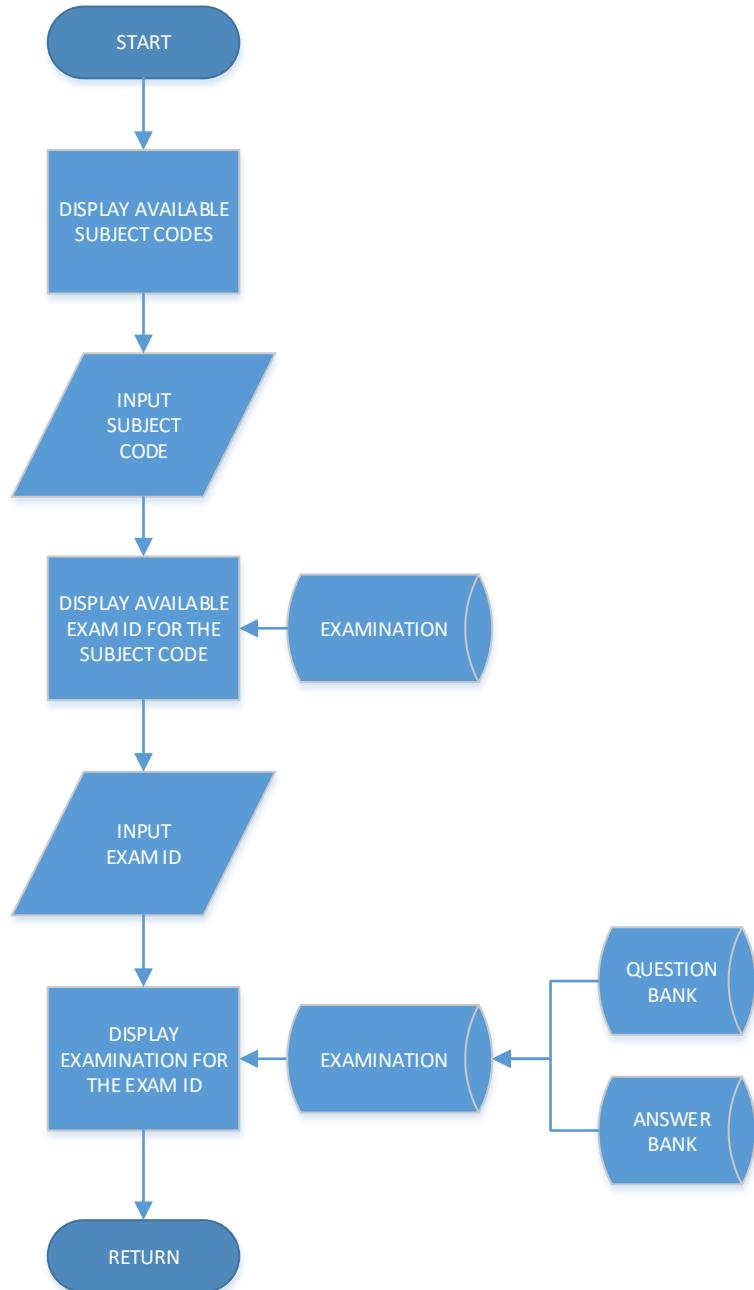
MAIN

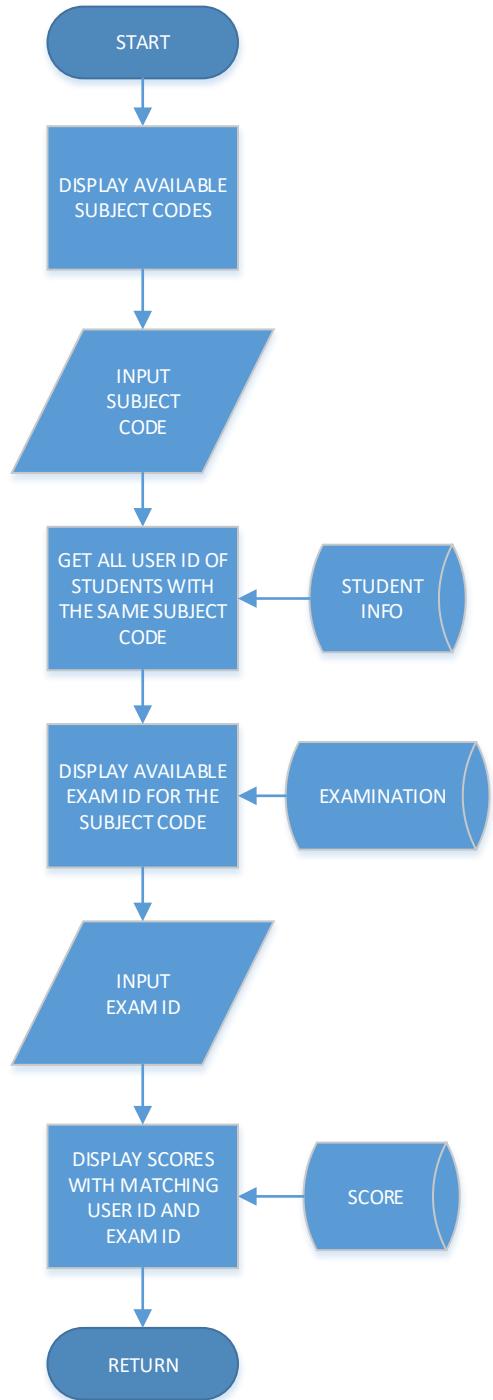


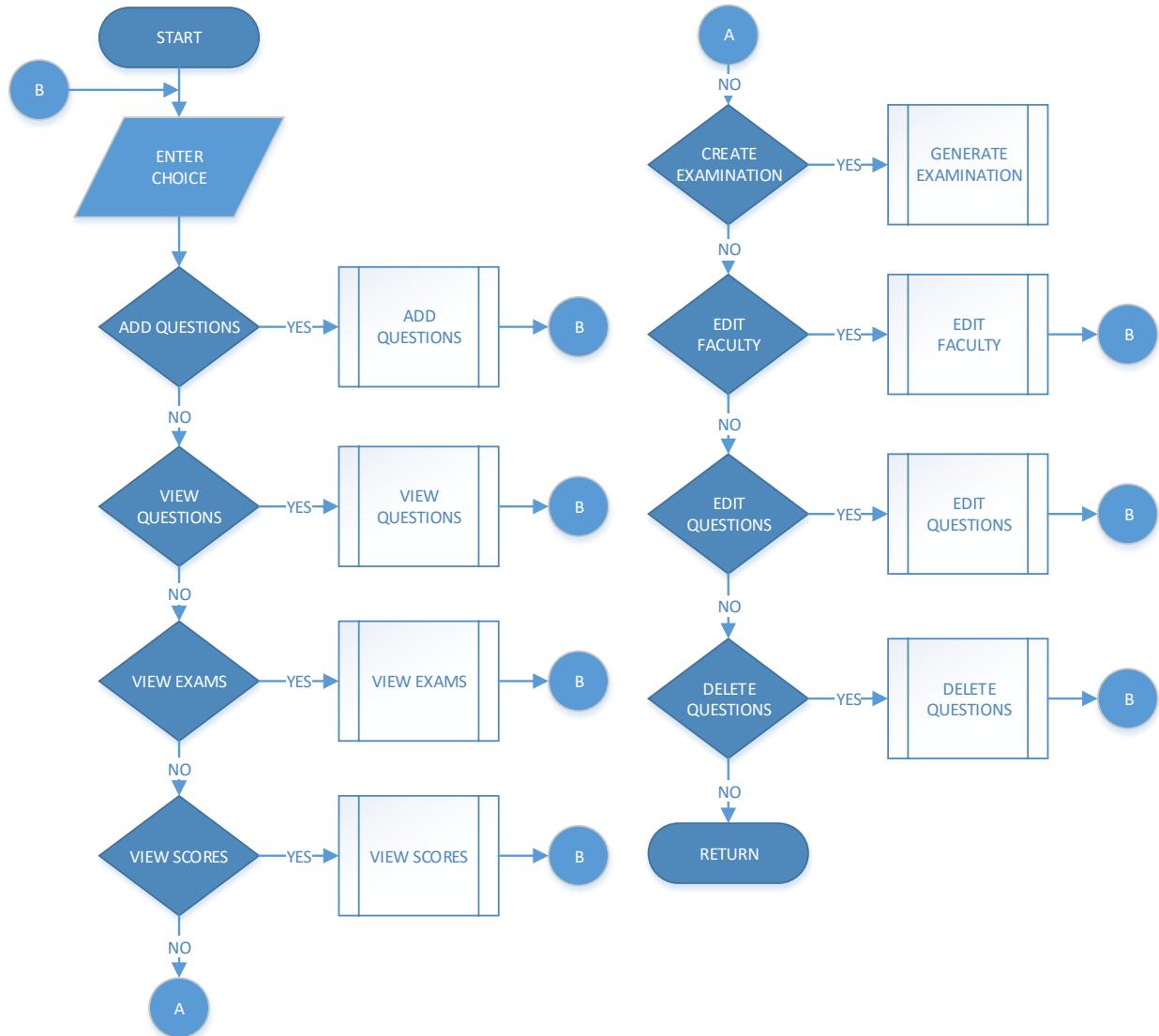
FACULTY MODULE

ADD QUESTIONS MODULE

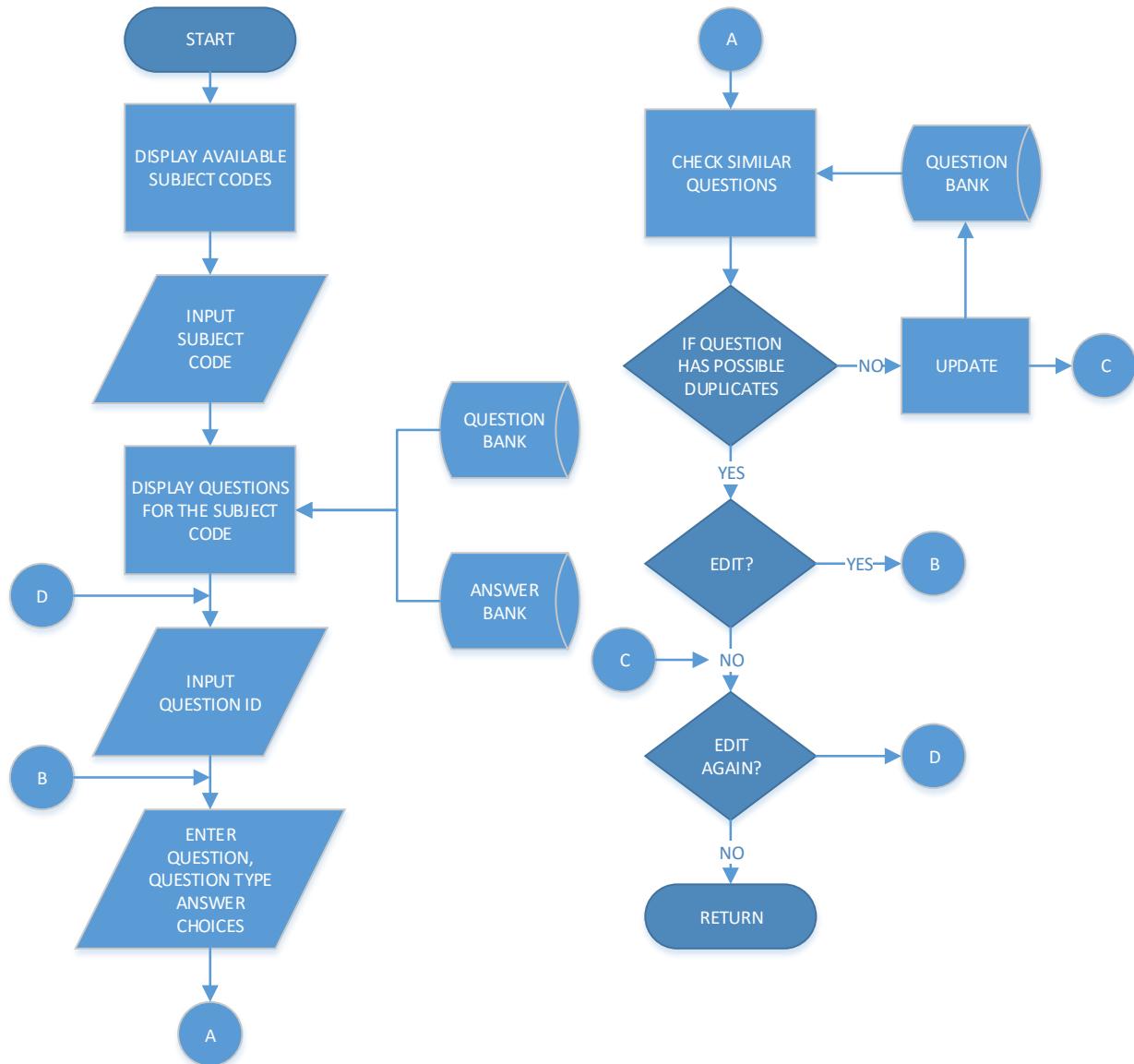
VIEW QUESTIONS MODULE

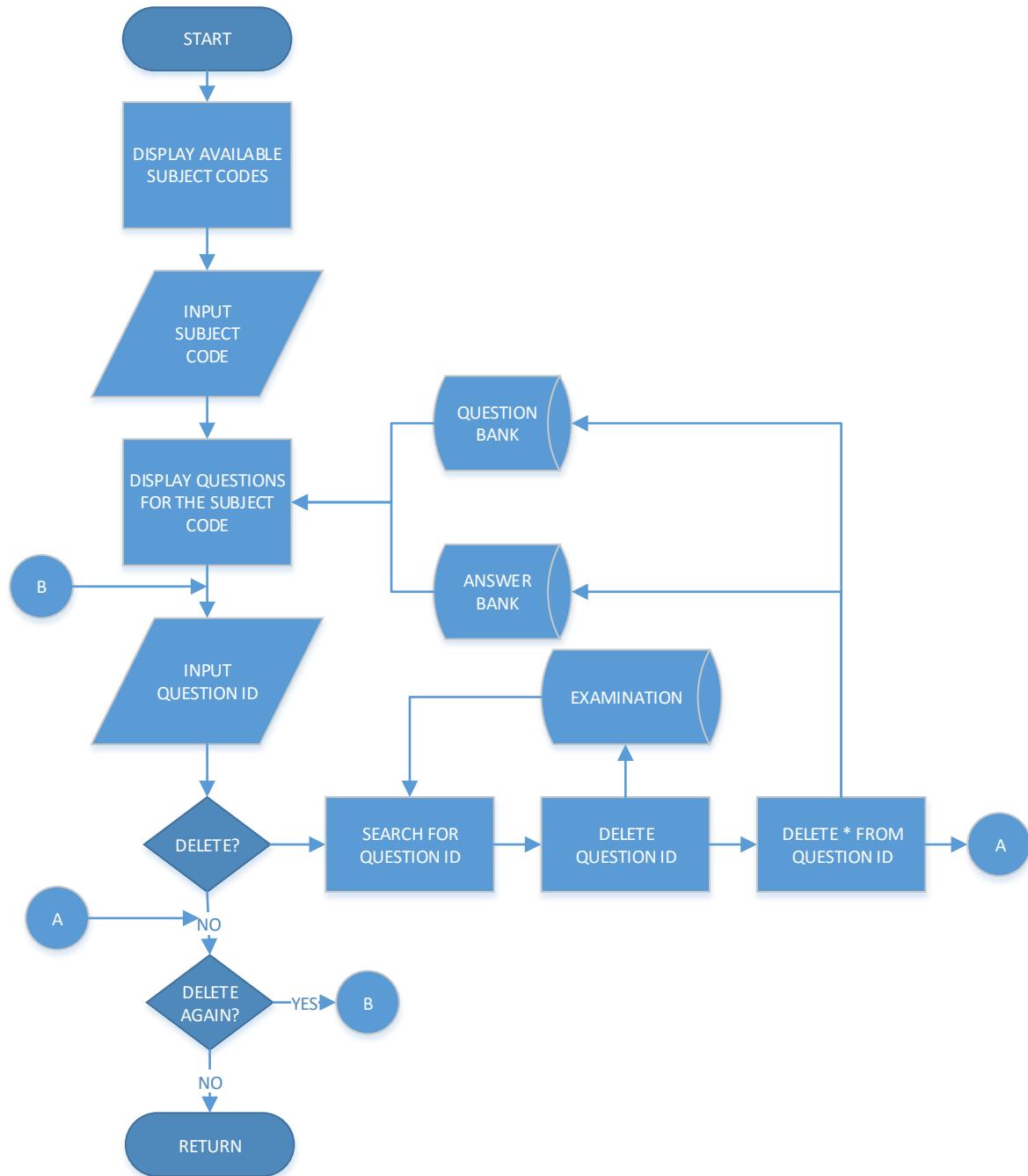
VIEW EXAMS MODULE

VIEW SCORES MODULE

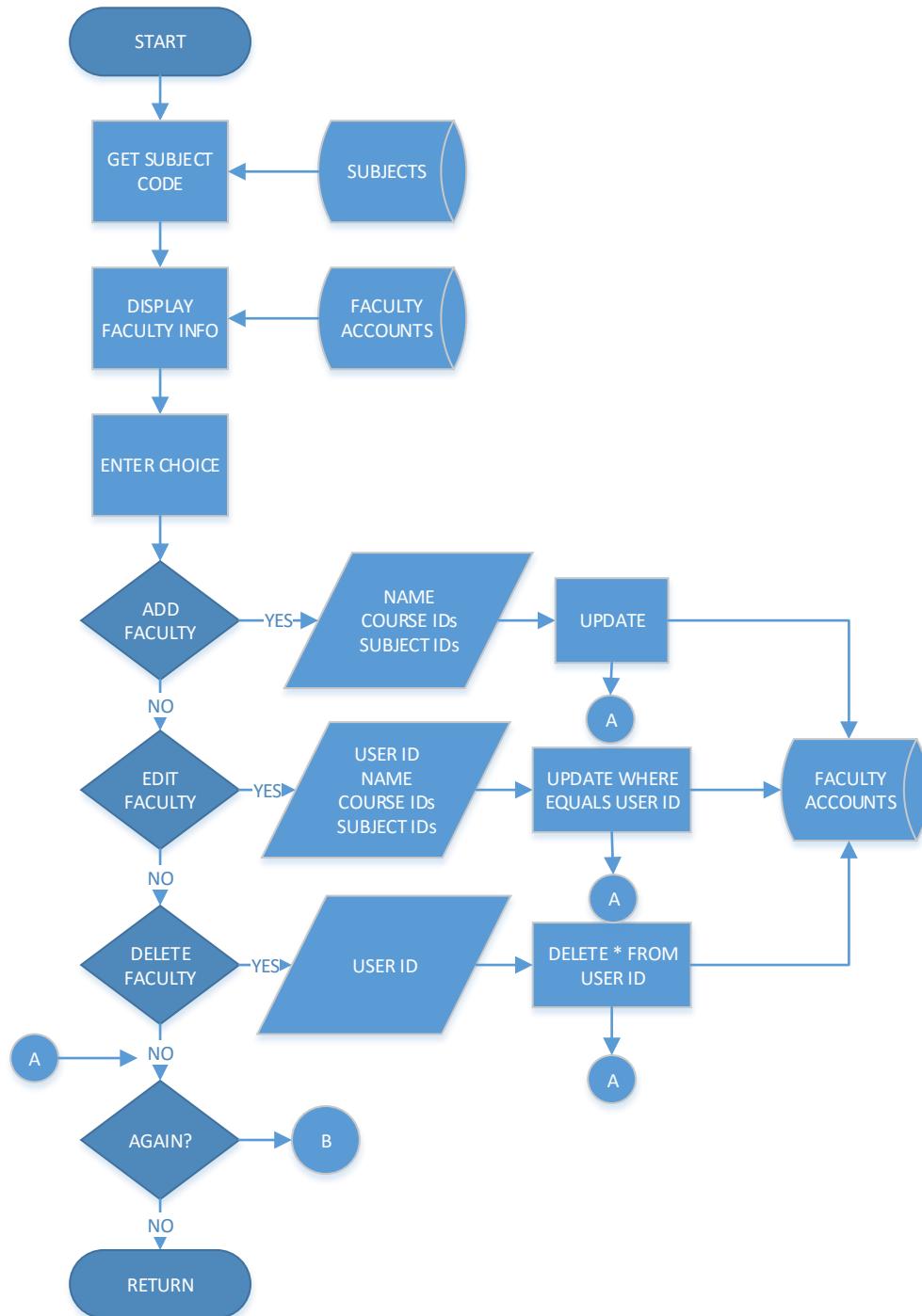
CHAIRMAN MODULE

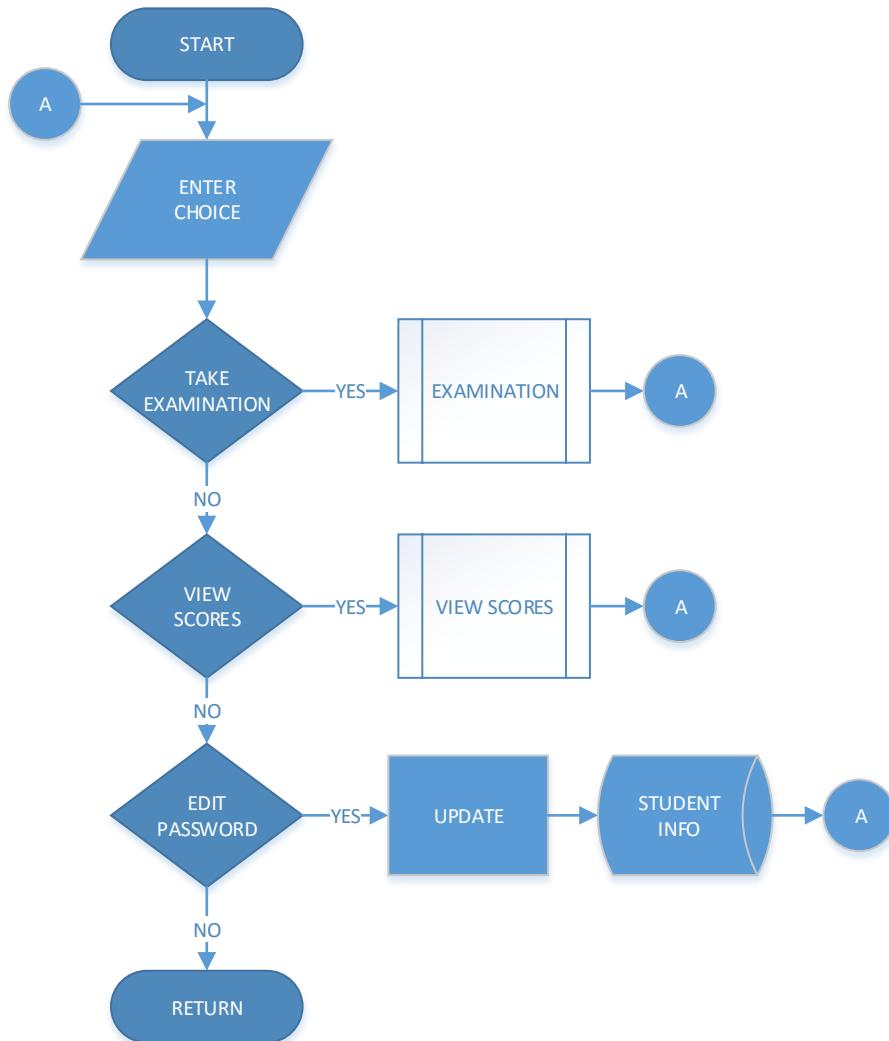
EDIT QUESTIONS MODULE

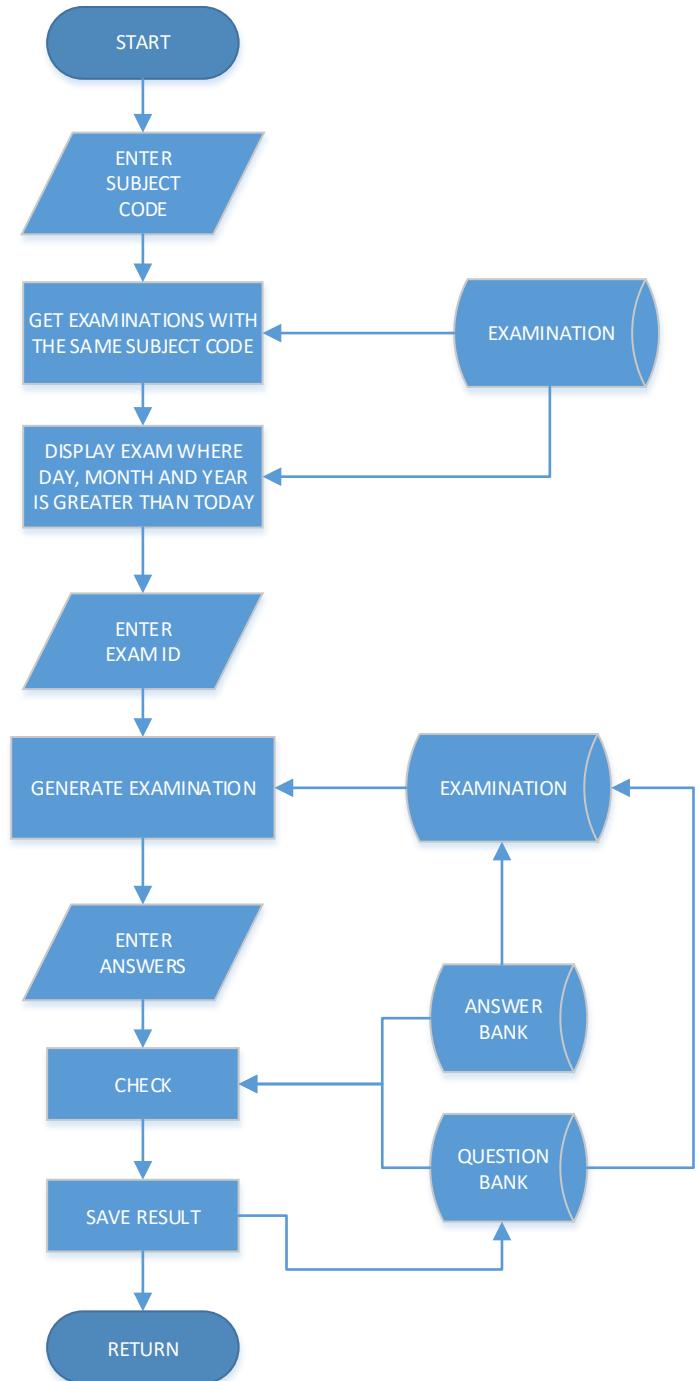


DELETE QUESTION MODULE

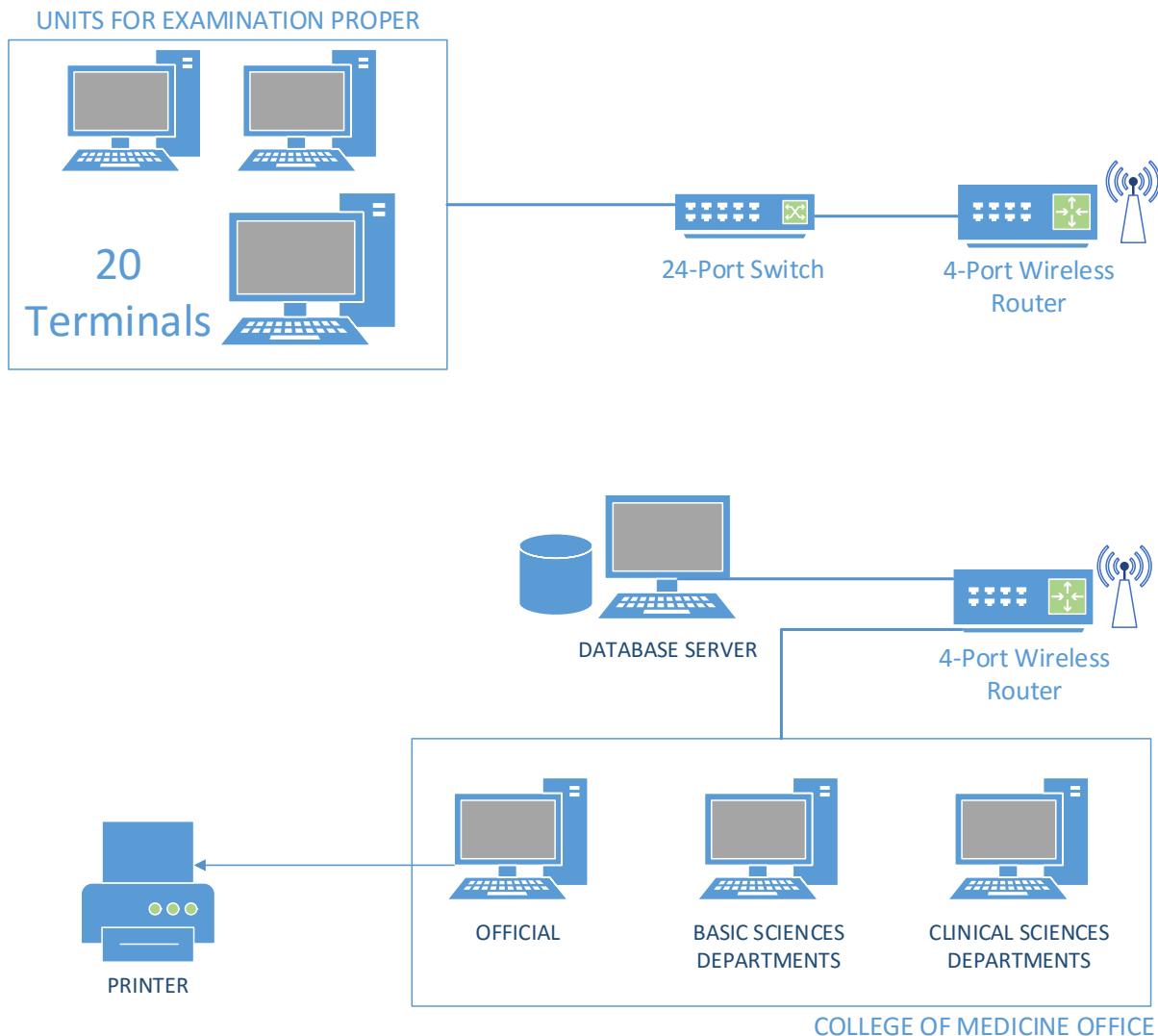
EDIT FACULTY MODULE



STUDENT MODULE

EXAMINATION MODULE

3.3.3.2 Physical Elements



3.3.3.3 Database/Table:

User Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
Password	Alphanumeric	16	User's Password
User Level	Numeric	1	Access Level

Faculty Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Faculty's First Name
Middle Name	Alphabetic	25	Faculty's Middle Name
Last Name	Alphabetic	25	Faculty's Last Name
Course IDs	Alphanumeric	100	List of Course Codes
Subject IDs	Alphanumeric	200	List of Subject Codes

Chairman Accounts Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Chairman's First Name

Middle Name	Alphabetic	25	Chairman's Middle Name
Last Name	Alphabetic	25	Chairman's Last Name
Department	Alphabetic	45	Name of Department

Student Info Database

Field Name	Field type	Length	Description
User ID	Numeric	5	User's ID number
User Level	Numeric	1	Access Level
First Name	Alphabetic	30	Student's First Name
Middle Name	Alphabetic	25	Student's Middle Name
Last Name	Alphabetic	25	Student's Last Name
Subject IDs	Alphanumeric	200	List of Subject Codes

Subject Database

Field Name	Field type	Length	Description
Course Code	Alphanumeric	10	Course's Code
Course Title	Alphabetic	50	Course's Title
Subject Code	Alphanumeric	10	Subject's Code
Subject Title	Alphabetic	50	Subject's Title
Department	Alphabetic	45	Name of Department

Question Bank

Field Name	Field type	Length	Description
Question ID	Numeric	4	Question's ID Number
Subject Code	Alphanumeric	10	Subject's Code
Question	Alphanumeric	500	Questions that satisfies the Blueprint
Question Type	Alphabetic	30	Question's Type
Difficulty Index	Alphabetic	20	Difficulty Status
Difficulty	Numeric	5	Difficulty Value
Discrimination Index	Alphabetic	20	Discrimination Status
Discrimination	Numeric	5	Discrimination Value
Right Answer	Alphanumeric	30	Right answer of an exam
Wrong Answer	Alphanumeric	30	Wrong answer of an exam
Exam IDs	Alphanumeric	8	Exam's ID Number

Answer Bank

Field Name	Field type	Length	Description
Question ID	Alphanumeric	5	Question's ID
Answer	Alphanumeric	30	Answer of examinee
Choices	Alphanumeric	250	Choices of a question

Examination Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
Batch Number	Numeric	8	Batch's Number
Department	Alphabetic	45	Name of Department
Course Code	Alphanumeric	10	Course's Code
Subject Code	Alphanumeric	10	Subject's Code
Exam Type	Alphabetic	25	Examination's Type
Year	Numeric	4	Year the exam was taken
Month	Alphabetic	8	Month the exam was taken
Day	Numeric	2	Day the exam was taken
Question IDs	Alphanumeric	5	Question's ID

Sets Database

Field Name	Field type	Length	Description
Set ID	Alphabetic	1	Set's ID
Exam IDs	Alphanumeric	8	Exam's ID Number

Score Database

Field Name	Field type	Length	Description
Exam ID	Alphanumeric	8	Exam's ID Number
User ID	Numeric	5	User's ID number
Score	Numeric	3	Score of the examinee

3.3.3.4 Reports:

Item Analysis - result of the examination including the difficulty and discrimination of each questions.

Statistical Report – report that shows the reliability of an examination.

Questionnaire – list of questions used for the examination

3.3.3.5 Manual Process (Existing):

- Generating Blueprint
- Generating Questionnaire Draft
 - Creating Questions based on the Textbooks
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Questionnaire Draft
- Generating Official Questionnaire
 - Consolidating Questionnaire Drafts
 - Comparing each Questions with the Previous Shifting Exam
 - Finalizing Official Questionnaire
- Printing Official Questionnaire copies
- Photocopying Official Questionnaire

3.3.3.6 Requirement Definition

ITEMS	REQUIRED	EXISTING	NEEDED
Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor) Software Operating System (Windows 7)	20	0	20
Printer Cannon LBP-6000 Laser Printer	1	0	1

3.3.3.7 Cost and Benefit Analysis

ITEMS	COSTS
ONE TIME COST	
<ul style="list-style-type: none"> Hardware Personal Computer (HP Compaq DC5800 Intel Core 2 Duo E8400 3.0GHz / 2GB DDR2 / 320GB SATA HDD / On Board Video Card 384MB / DVD-ROM with IBM ThinkVision L190p 19-inch LCD Monitor) (PHP 11,780.00) Router TP-LINK TL-WR841N (PHP 995) Software Operating System (Windows 7) (PHP 5311.00) 	PHP 342, 815
<ul style="list-style-type: none"> Printer Cannon LBP-6000 Laser Printer 	PHP 3, 200
TOTAL ONE TIME COST	PHP 346, 015
RECURRING COST	
MAINTENANCE <ul style="list-style-type: none"> Money allotted for Computer and Printer Problems 	PHP 10, 000
ELECTRICITY COST <ul style="list-style-type: none"> Monthly cost of computers and printers 	PHP 10, 000
PRINTER COST <ul style="list-style-type: none"> Printer ink 	PHP 500
TOTAL RECURRING COST	PHP 20, 500
TOTAL COST	PHP 366, 515

3.3.3.8 Computation for Payback Period

SAVED EXPENSES	COST per YEAR
EMPLOYEE SALARY	PHP 19, 500
PAPER COST	PHP 6, 000
PHOTOCOPY COST	PHP 4, 500
SCANTRON SHEET	PHP 20, 000
TOTAL	PHP 50, 000 per YEAR

$$\text{PBP} = \text{TOTAL COST}/50, 000$$

$$= 7.33 \text{ YEARS}$$

3.3.3.9 Tangible / Intangible Benefits

1. Easy access of the information of the students.
2. Networked data is secure and easy to backup.
3. Essential summary of reports.
4. More effective monitoring of the examinations.
5. Delay in making reports will be prevented.
6. The reports and examination is dynamically created, thus minimizing error and human labor.
7. Terminates unnecessary workloads.
8. Reduces output of papers