آغا خان یونیورسٹی ایگزامینیشن بورڈ

AGA KHAN UNIVERSITY EXAMINATION BOARD

Higher Secondary School Certificate Examination Syllabus

COMPUTER STUDIES

CLASS XII

(based on National Curriculum 2000)

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Higher Secondary School Certificate Examination Syllabus

COMPUTER STUDIES

CLASS XII

This subject is examined in both May and September Examination sessions

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PREFACE

In pursuance of National Education Policy (1998-2010), the Curriculum Wing of the Federal Ministry of Education has begun a process of curriculum reform to improve the quality of education through curriculum revision and textbook development (Preface, National Curriculum documents 2000 and 2002).

AKU-EB was founded in August 2003 with the same aim of improving the quality of education nationwide. As befits an examination board it seeks to reinforce the National Curriculum revision through the development of appropriate examinations for the Secondary School Certificate (SSC) and Higher Secondary School Certificate (HSSC) based on the latest National Curriculum and subject syllabus guidance.

AKU-EB has a mandate by Ordinance CXIV of 2002 to offer such examination services to English and Urdu medium candidates for SSC and HSSC from private schools anywhere in Pakistan or abroad, and from government schools with the relevant permissions. It has been accorded this mandate to introduce a choice of examination and associated educational approach for schools, thus fulfilling a key objective of the National Curriculum of Pakistan: "Autonomy will be given to the Examination Boards and Research and Development cells will be established in each Board to improve the system" (ibid. para. 6.5.3 (ii)).

AKU-EB is committed to creating continuity of educational experience and the best possible opportunities for its students. In consequence it offered HSSC for the first time in September, 2007 to coincide with the arrival of its first SSC students in college or higher secondary school. Needless to say this is not an exclusive offer. Private candidates and students joining AKU-EB affiliated schools and colleges for HSSC Part 1 are eligible to register as AKU-EB candidates even though they have not hitherto been associated with AKU-EB.

This examination syllabus exemplifies AKU-EB's commitment to national educational goals.

- It is in large part a reproduction, with some elaboration, of the Class XII National Curriculum of the subject.

- It makes the National Curriculum freely available to the general public.

- The syllabus recommends a range of suitable textbooks already in print for student purchase and additional texts for the school library.

- It identifies areas where teachers should work together to generate classroom activities and materials for their students as a step towards the introduction of multiple textbooks, another of the Ministry of Education's policy provisions for the improvement of higher secondary education (ibid. para. 6.3.4).

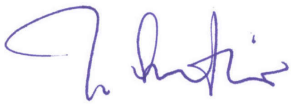
This examination syllabus brings together all those cognitive outcomes of the National Curriculum statement which can be reliably and validly assessed. While the focus is on the cognitive domain, particular emphasis is given to the application of knowledge and understanding, a fundamental activity in fostering "attitudes befitting useful and peaceful citizens and the skills for and commitment to lifelong learning which is the cornerstone of national economic development" (Preface to National Curriculum documents 2000 and 2002).

To achieve this end AKU-EB has brought together university academicians, teacher trainers, writers of learning materials and above all, experienced teachers, in regular workshops and subject panel meetings.

AKU-EB provides copies of the examination syllabus to subject teachers in affiliated schools to help them in planning their teaching. It is the syllabus, not the prescribed textbook which is the basis of AKU-EB examinations. In addition, the AKU-EB examination syllabus can be used to identify the training needs of subject teachers and to develop learning support materials for students. Involving classroom teachers in these activities is an important part of the AKU-EB strategy for improving the quality of learning in schools.

The Curriculum Wing of the Federal Ministry of Education has recently released new subject specifications and schemes of study to take effect in September, 2008. These documents are a major step forward towards a standards-related curriculum and have been welcomed by AKU-EB. Our current HSSC syllabuses have been revised to ensure conformity with the new National Curriculum 2006.

We stand committed to all students who have embarked upon the HSSC courses in facilitating their learning outcomes. Our examination syllabus document ensures all possible support.



Dr. Thomas Christie
Director,
Aga Khan University Examination Board
July 2009

1. Aims/Objectives of the National Curriculum (2000) [1]

Objectives

The main objectives of this curriculum on Computer Studies / Science are to prepare students for working in the Computer world of tomorrow and to provide an adequate supply of computer personnel in order to meet their need in the private and public organizations of Pakistan which are striving their way patiently and boldly in this challenging technology of the developed countries of the world.

Specific Objectives

The students should be able to:

1. improve their efficiency by adopting the computer oriented methods in place of traditional manual methods;

2. use the computer system to solve the various scientific and socio-economical problems with enormous speed, one hundred percent accuracy and be ware of the huge capacity of storing such information;

3. codify the problem oriented information (the programming techniques) by using the Computer Languages to catch up with the present state of art of the latest computer technology in this era;

4. familiarize with the functioning of various computer equipment and the day- too-day working technologies.

2. Rationale of the AKU-EB Examination Syllabus

2.1 General Rationale

2.1.1 In 2007, the Curriculum Wing of the Federal Ministry of Education (MoE) issued a revised part-wise Scheme of Studies. All subjects are to be taught and examined in both classes XI and XII. It is therefore important for teachers, students, parents and other stakeholders to know:

(a) that the AKU-EB Scheme of Studies for its HSSC examination (Annex A) derives directly from the 2007 Ministry of Education Scheme of Studies;
(b) which topics will be examined in Class XI and in Class XII;
(c) at which cognitive level or levels (Knowledge, Understanding, Application and other higher order skills) the topics and sub-topics will be taught and examined;

[1] Government of Pakistan (2000), National Curriculum*; Computer Studies Class XII, Islamabad,* Ministry of Education (Curriculum Wing)

2.1.2 This AKU-EB examination syllabus addresses these concerns. Without such guidance teachers and students have little option other than following a single textbook to prepare for an external examination. The result is a culture of rote memorization as the preferred method of examination preparation. The pedagogically desirable objectives of the National Curriculum which encourage "observation, creativity and other higher order thinking [skills]" are generally ignored. AKU-EB recommends that teachers and students use multiple teaching-learning resources for achieving the specific objectives of the National Curriculum reproduced in the AKU-EB examination syllabuses.

2.1.3 The AKU-EB examination syllabuses use a uniform layout for all subjects to make them easier for teachers to follow. Blank sheets are provided in each syllabus for writing notes on potential lesson plans. It is expected that this arrangement will also be found helpful by teachers in developing classroom assessments as well as by question setters preparing material for the AKU-EB external examinations. The AKU-EB aims to enhance the quality of education through improved classroom practices and improved examinations.

2.1.4 The Student Learning Outcomes (SLOs) in Section 3 start with command words such as list, describe, relate, explain, etc. The purpose of the command words is to direct the attention of teachers and students to specific tasks that candidates following the AKU-EB examination syllabuses are expected to undertake in the course of their subject studies. The examination questions will be framed using the same command words or the connotation of the command words to elicit evidence of these competencies in candidates' responses. The definitions of command words used in this syllabus are given in Section 8. It is hoped that teachers will find these definitions useful in planning their lessons and classroom assessments.

2.1.5 The AKU-EB has classified SLOs under the three cognitive levels Knowledge (K), Understanding (U) and Application of knowledge and skills (A) in order to derive multiple choice questions and constructed response questions on a rational basis from the subject syllabuses ensuring that the intentions of the National Curriculum should be met in full. The weighting of marks to the Multiple Choice and Constructed Response Papers is also derived from the SLOs, command words and cognitive levels. In effect the SLOs derived from the National Curriculum determine the structure of the AKU-EB subject examination set out in Section 4.

2.2 Specific Rationale of the AKU-EB Computer Studies Examination Syllabus

2.2.1 The syllabus for Computer Studies as prescribed by the Curriculum Wing in National Curriculum (2000) is maintained in its entirety except for a few changes which are made to keep the subject in line with global trends in the field of computer education by making the syllabus more practical and providing "hands on" experiences to students.

2.2.2 The National Curriculum is based on the assumption that students are exposed to computers initially in Classes IX and X. Many students will have encountered these elementary techniques much earlier. Therefore there is a need to focus on the latest developments in technology along with the existing devices which will lead to progression in learning computer skills.

2.2.3 Computer Studies is a practical subject, but the curriculum is more conceptual than practical. However, concepts must be seen to work in practical applications. Schools must ensure that equipment and facilities provided are adequate for the students to be able to work as required by the syllabus.

2.2.4 The student learning outcomes as outlined in the syllabus will facilitate both teachers and students to apply the knowledge and skills to new problems and situations.

2.2.5 The focus on hands-on learning experiences will allow students to test a variety of solutions, analyse results quickly and make predictions.

3. Topics and Student Learning Outcomes of the Examination Syllabus

Class XII

Topics		Student Learning Outcomes		Cognitive Levels[2]		
				K	U	A
1.	**Introduction to Computers**	**Candidates should be able to:**				
	1.1 Computer and its Usefulness	1.1.1	define the terms associated with computer (hardware, software, peripherals);	*		
		1.1.2	describe the use of computers in business sector, e.g. banks, insurance, shipping stock exchange, examination, inventory and personal information system;		*	
		1.1.3	describe various jobs associated with computers e.g. data entry clerk, system analyst, programmer;		*	
	1.2 Types of Computers: Analogue, Hybrid and Digital	1.2.1	describe analogue, hybrid and digital computers;		*	
		1.2.2	classify computers according to physical size, processing power and capabilities;		*	
	1.3 Classification of Digital Computers: Micro, Mini, Mainframe and Super Computers	1.3.1	describe various types of digital computers;		*	
		1.3.2	explain the use of types of digital computers according to their physical size, processing power and capabilities.		*	

[2] K = Knowledge, U = Understanding, A= Application (for explanation see Section 7: Definition of command words used in Student Learning Outcomes and in Examination Questions).

NOTES

				K	U	A
2.	**Components of a Digital Computer and their Functions**	**Candidates should be able to:**				
2.1	Central Processing Unit (CPU) Control Unit Arithmetic Logic Unit	2.1.1 2.1.2	identify various components of CPU; describe the function of each unit and the relationship between the internal components of a personal computer;	*	*	
2.2	Primary/Main Memory (RAM, ROM), Secondary Memory	2.2.1 2.2.2 2.2.3	describe computer memory and its types i.e. primary and secondary; state the differences between RAM and ROM; describe the need for secondary memory;		* * *	
2.3	Input Devices (keyboard, mouse, joystick, scanner, trackball, light pen, voice synthesizer, microphone, digital video camera, disk drive)	2.3.1 2.3.2 2.3.3 2.3.4 2.3.5 2.3.6	name different input devices; demonstrate the use of a mouse and the function of right and left click; describe the five key groups of a keyboard; describe suitable input devices in relation to the requirements of the applications; give reasons for the use of alternate methods of input over a standard keyboard or mouse; describe the types of optical input devices and their uses;	*	* * *	*
2.4	Output Devices (monitors, printers and their kinds, plotters, CD writer, disk drive (hardcopy, softcopy)	2.4.1 2.4.2 2.4.3	name various output devices; describe suitable output devices in relation to the requirements of the applications; justify the use of hardcopy output over softcopy output.		* *	 *

NOTES

				K	U	A
3.	**Secondary Storage Devices**	**Candidates should be able to:**				
3.1	Main Memory RAM, ROM, SIMM, DIMM	3.1.1	describe characteristics of different types of main memory;		*	
3.2	Units of Measurement bits, byte, KB, MB, GB, TB	3.2.1 3.2.2	recognize the value of units in KB, MB, GB, TB and write these acronyms in full as words or numbers; convert from one unit to another;	*		 *
3.3	Secondary Memory Devices and Media: Floppy discs, hard discs, CD and magnetic tape	3.3.1 3.3.2 3.3.3 3.3.4	differentiate between media and devices; justify the use of various devices and media in the concerned application; describe the working of secondary memory devices; describe the working of serial and sequential media.		* * *	 *
4.	**Data Representation, Data Definition**	**Candidates should be able to:**				
4.1	Types of Data: numeric, alphabetic, alphanumeric	4.1.1 4.1.2	identify the main categories of data; explain the use of type of data in concerned application;	*	 *	
4.2	Number Systems: decimal, binary, octal and hexadecimal	4.2.1	explain the use of various number systems in computers;		*	

NOTES

				K	U	A
4.3	Number System Conversion	4.3.1	convert from one number system to another;			*
4.4	Binary Arithmetic: addition, subtraction, multiplication and division	4.4.1	perform calculations using two's complements.			*
5.	***Computer Software* and Programming Languages**	**Candidates should be able to:**				
5.1	*Types of* Software *(Text and graphical)*	5.1.1 5.1.2 5.1.3	define the term software; describe the purpose of software in a computer system; describe the types of software in computer system namely system software and application software;	*	* *	
5.2	Programming Languages Low level machine Intermediate (assembly) High level languages Fortran, Pascal, Cobol and BASIC	5.2.1 5.2.2 5.2.3	describe the necessity of programming languages; name various high level languages and enlist their characteristics; justify the use of a particular language in accordance with the nature of the problem.	*	*	*

NOTES

				K	U	A
6.	**Problem Solving**	**Candidates should be able to:**				
6.1	The Problem	6.1.1 6.1.2 6.1.3	define the term 'problem'; describe the meaning of problem solving; design an algorithm to solve an arithmetic or simple daily life problem;	*	* 	 *
6.2	Analysis of the Problem	6.2.1	demonstrate the importance of breaking down the given problem into various components to solve it;			*
6.3	Algorithm	6.3.1 6.3.2	define the term algorithm; describe the types of algorithm (pseudo code and flow chart);	*	 *	
6.4	Flow Chart Symbols of a Flow Chart	6.4.1	use the standard shapes of flowcharts in solving simple problems of daily life;			*
6.5	Computer Programming: Conversion of Flow Chart or Algorithm into Instructions of Computer Language	6.5.1 6.5.2	describe that an algorithm and a flow chart are easily converted into programming language; explain the meaning of computer instructions and a program;		* *	
6.6	Running and Debugging the program Types of Errors: Syntax and Logical	6.6.1 6.6.2	define the terms running and debugging; identify the types of errors that occur during programming with examples;	* *		

NOTES

				K	U	A
6.7	Implementation and Documentation	6.7.1	explain the terms implementation and documentation.		*	
7.	**Data Types**	**Candidates should be able to:**				
7.1	Character Set Reserve words, Commands and Statements	7.1.1 7.1.2 7.1.3	recognize the different types of data; recognize different types of instructions used in BASIC; identify key words of BASIC as statements, commands and functions;	* * *		
7.2	Numeric and String Constants and Variables	7.2.1 7.2.2 7.2.3	define the terms constants and variables; differentiate between numeric and string constants and variables; assign appropriate data items to a given type of variable;	*	* 	 *
7.3	Operators: Arithmetic, Relational and Logical	7.3.1 7.3.2	convert arithmetic expressions into BASIC expressions; use the operators of BASIC language to solve an arithmetic problem;			* *
7.4	Hierarchy of Operators, Arithmetic Expressions, Relational and Logical	7.4.1 7.4.2 7.4.3	demonstrate the hierarchy of operators in BASIC language; compare two or more values using relational operators; demonstrate the use of logical operators to compare a value or a variable with more than one value or variables;		* 	* *

NOTES

				K	U	A
7.5	Assignment LET statement	7.5.1 7.5.2	state the purpose and the syntax of LET statements; assign data to a variable for various calculations;	*		 *
7.6	INPUT/OUTPUT Statements INPUT, READ-DATA	7.6.1	demonstrate the purpose and the syntax of INPUT statement and Read-Data;			*P
7.7	PRINT	7.7.1	demonstrate the purpose and the syntax of PRINT statement.			*P
8.	**Control Statements**	**Candidates should be able to:**				
8.1	Transfer of Control GOTO, ON …GOTO IF …THEN…ELSE, ON ERROR … GOTO	8.1.1 8.1.2 8.1.3 8.1.4	differentiate among the use of conditional, unconditional and multiple branching; use a GOTO statement for unconditional branching to remote statement; demonstrate the use of GOTO statements with IF-THEN …ELSE in a program; demonstrate the use of ON … GOTO in a program;		*	 *P *P *P
8.2	LOOPs FOR …NEXT Statement, WHILE …WEND Statement, Loops and Nested Loop	8.2.1 8.2.2 8.2.3 8.2.4 8.2.5	define the term loop; state the syntax and the purpose of statement, FOR …NEXT and WHILE … WEND statements; use different types of looping statements in a repetitive program;. state the purpose of nested loops in a program; demonstrate the use of nested loops in a program.	* * * 		 *P *P

* *Practical Activity

NOTES

				K	U	A
9.	**Arrays**	**Candidates should be able to:**				
	9.1 One and Two Dimensional Arrays	9.1.1 9.1.2	define the term array; demonstrate the use of one and two dimensional arrays in a program;	*		*P
	9.2 Reading, Writing and Manipulation of Arrays	9.2.1	demonstrate reading, writing and manipulation of data using an array.			*P
10.	**Programming**	**Candidates should be able to:**				
	10.1 Writing Programs	10.1.1 10.1.2 10.1.3 10.1.4	write a program using BASIC (statements commands and functions); write a program to demonstrate simple arithmetic operations (like calculation of area of triangle, volume of cylinder and speed of object, conversion of temperature from C to F and vice-versa); write a program to demonstrate use of formatted Input/Output statement, (calculation of grades of class for different students, selection of the largest number out of given 12 numbers without using list); write a program which reads 12 values in an array and after doing some arithmetic operations, print the desired results.			*P *P *P *P

* *Practical Activity

NOTES

4. Scheme of Assessment

Class XII

Table 1: Number of Student Learning Outcomes by Cognitive Level

Topic No.	Topics	No. of sub-Topics	SLOs			Total
			K	U	A	
1.	Introduction to Computers	3	1	6	0	7
2.	Components of a Digital Computer and their Functions	4	2	10	2	14
3.	Secondary Storage Devices	3	1	4	2	7
4.	Data Representation, Data Definition	4	1	2	2	5
5.	*Computer Software* and Programming Languages	2	2	3	1	6
6.	Problem Solving	7	4	5	3	12
7.	Data Types	7	5	2	8	15
8.	Control Statements	2	3	1	5	9
9.	Arrays	2	1	0	2	3
10.	Programming	1	0	0	4	4
	Total	**35**	**20**	**33**	**29**	**82**
	Percentage		**25**	**40**	**35**	**100**

Table 2: Allocation of Marks for the Multiple Choice Questions, Constructed Response Questions and Extended Response Questions

Topic No.	Topics	No. of Sub-topics	Marks			Total
			Multiple Choice Questions	Constructed Response Questions	Extended Response Questions	
1.	Introduction to Computers	3	5	0	8	13
2.	Components of a Digital Computer and their Functions	4				
3.	Secondary Storage Devices	3	4	4	0	8
4.	Data Representation, Data Definition	4	4	5	0	9
5.	*Computer Software* and Programming Languages	2	3	5	0	8
6.	Problem Solving	7				
7.	Data Types	7	7	8	0	15
8.	Control Statements	2				
9.	Arrays	2				
10.	Programming	1	2	5	0	7
	Total	**35**	**25**	**27**	**8**	**60**
	Practical					15
	Total					**75**

Table 3: Paper Specifications

Topic No.	Topic	Marks Distribution			Total Marks
1.	Introduction to Computers	MCQs 5 @ 1 Mark each *ERQ 1 @ 8 Marks Choose any ONE from TWO			13
2.	Components of a Digital Computer and their Functions				
3.	Secondary Storage Devices	MCQs 4@ 1 Mark each CRQ 1 @ 4 Marks			8
4.	Data Representation, Data Definition	MCQs 4 @ 1 Mark each CRQ 1 @ 5 Marks			9
5.	*Computer Software* and Programming Languages				
6.	Problem Solving	MCQs 3 @ 1 Mark each CRQ 1 @ 5 Marks			8
7.	Data Types	MCQs 7@ 1 Mark each CRQs 2 @ 4 Marks each			15
8.	Control Statements				
9.	Arrays				
10.	Programming	MCQs 2 @ 1 Mark each CRQ 1 @ 5 Marks			7
	Total	**MCQs 25**	**CRQs 27**	**ERQ 8**	**60**
	Practical				15
	Total Marks				**75**

* Extended response question will require answer in more descriptive form. Students will be writing the answer in a paragraph rather than a word or a simple sentence.

4.1 Table 1 summarizes the number and nature of SLOs in each topic in class XII. This will serve as a guide in the construction of the examination paper. It also indicates that more emphasis has been given to Understanding (40%), Application and higher order skills (35%) to discourage rote memorization. Table 1, however does not translate directly into marks.

4.2 There will be examination at the end of Class XII.

4.3 The theory paper will be in two parts: paper I and paper II. Both papers will be of duration of 3 hours.

4.4 Paper I theory will consist of 25 compulsory, multiple choice items. These questions will involve four response options.

4.5 Paper II theory will carry 35 marks and consist of a number of compulsory, structured questions and an extended response question. The extended response question will be presented in an either/or form.

4.6 Practical examination will be conducted separate from the theory paper. It will be based on the list of practical activities listed in the examination syllabus.

4.7 All constructed response questions will be in a booklet which will also serve as an answer script.

4.8 Practical exams to assess performance skills will carry 15 marks in class XII.

4.9 The practicals identified in the SLOs by a "P" should be carried out throughout the academic year. It is essential for each school to equip its computer laboratories with necessary devices, software etc. to meet the requirements of the practicals in the examination syllabus. Each school will be responsible to make sure that each student is provided the opportunity to do the practicals.

List of practicals is attached as annex B.

5. Teaching-Learning Approaches and Classroom Activities

5.1 Computer Studies is a practical subject therefore most parts of the syllabus will need to be supplemented by a range of practical exercises. Students should be taught the handling and use of a computer in a well-set computer lab.

5.2 Whenever new software is used, the teacher must demonstrate either on a large monitor screen or connected to the TV so that students can see the software and how it is used.

5.3 Case studies and small projects can be assigned to students on an individual basis or to be solved as a group

5.4 Students can be assigned to present their case studies or other projects in the form of a formal report using a computer.

5.5 Students should be encouraged to explore and question on topics related to computers to satisfy their quest for computer knowledge.

5.6 The computer itself is an important demonstration device that can be used to facilitate teaching.

5.7 Due to limited numbers of computers and also to enhance learning among students group work on computers should be encouraged and the concept of time sharing introduced on a practical basis.

5.8 Students can be taken on field trips to places where computers are used to provide them exposure to not only hardware but also software components.

6. Recommended Text and Reference Material

Recommended Books

Any ONE book depending on the location and choice of the college

1. National Book Foundation. *Computer Studies Textbook for Classes IX & X*. Islamabad: National Book Foundation.

2. Punjab Textbook Board. (2007). *Computer Studies Textbook for Classes IX & X*. Lahore: Punjab Textbook Board.

3. Sindh Textbook Board. (2007). *Computer Studies Textbook for Classes IX & X*. Jamshoro: Sindh Textbook Board.

4. NWFP Textbook Board. (2007). *Computer Studies Textbook for Classes IX & X*. Peshawar: NWFP Textbook Board.

5. Baluchistan Textbook Board. (2007). *Computer Studies Textbook for Classes IX & X*. Quetta: Baluchistan Textbook Board.

Reference Books

1. Kapadia, N. and Shah, M. K. (2003). *Exploring Computer Studies: textbook for Classes IX and X*. Karachi: Oxford University Press.

2. Norton, Peter. (2001). *Introduction to Computers*, Singapore: McGraw- Hill Co.

3. Long Larry and Nancy. (Tenth edition). *Computers Information Technology in Perspective.* New Jersey, Prentice Hall.

7. Definition of Cognitive Levels and Command Words

7.1 Definition of Cognitive Levels

Knowledge
This requires knowing and remembering facts and figures, vocabulary and contexts, and the ability to recall key ideas, concepts, trends, sequences, categories, etc. It can be taught and evaluated through questions based on: who, when, where, what, list, define, describe, identify, label, tabulate, quote, name, state, etc.

Understanding
This requires understanding information, grasping meaning, interpreting facts, comparing, contrasting, grouping, inferring causes/reasons, seeing patterns, organising parts, making links, summarising, solving, identifying motives, finding evidence, etc. It can be taught and evaluated through questions based on: why, how, show, demonstrate, paraphrase, interpret, summarize, explain, prove, identify the main idea/theme, predict, compare, differentiate, discuss, chart the course/direction, report, solve, etc.

Application
This requires using information or concepts in new situations, solving problems, organizing information and ideas, using old ideas to create new ones, generalizing from given facts, analyzing relationships, relating knowledge from several areas, drawing conclusions, evaluating worth, etc. It can be taught and evaluated through questions based on: differentiate, analyse, show relationship, propose an alternative, prioritise, give reasons for, categorise, illustrate, corroborate, compare and contrast, create, design, formulate, integrate, rearrange, reconstruct/recreate, reorganise, predict consequences, etc.

7.2 Definition of Command Words

Knowledge

Define:	Means only a formal statement about a term or function without any examples.
Identify:	Recognize with specific examples.
Name:	Identify people, places and organizations.
Recognize:	Involves looking at a given example and stating what it most probably is.
State:	Implies a concise answer with little or no supporting argument, e.g. a numerical answer that can be obtained by inspection.

Understanding

Classify:	State a basis for categorization of a set of related entities and assign examples to categorize.
Compare:	List the main characteristics of two entities clearly identifying similarities and differences.
Describe:	State in words (using diagrams where appropriate) the main points of the topic. It is often used with reference either to a particular phenomenon or experiment. In the former instance, the term usually implies that the answer should include reference to (visual) observations associated with the phenomena.
Differentiate:	Identify those characteristics which always or usually help us to tell two categories apart. A list of features is required.
Explain:	To make an idea/ situation/ problem clear by describing it in detail, revealing relevant data or facts.
Give reason:	To support opinion with evidences or reasons or provide adequate ground to rationalise one's idea.

Application

Assign:	Putting data against a variable for doing a programme or a project to achieve certain objectives.
Convert:	Shift or change the given programme or data into a different form with different characteristics.
Demonstrate:	Show how one thing is related to another, usually by physical manipulation or experiment to show a computer related skill.
Design:	Requires developing a new programme or a set of functions from one's own experience.
Justify:	Provide evidence of understanding any concept or skill with sufficient grounds.
Perform:	Demonstrate or prove by evidence and or by argument.
Use:	Deploy the required attribute in a constructed response or apply any computer skill of software in a practical way.
Write:	Implies making a list of desired entities or functions.

Annex A

HSSC Scheme of Studies[3]

AKU-EB as a national board offers SSC and HSSC qualifications for both English and Urdu medium schools. The revised HSSC Scheme of Studies issued by the Curriculum Wing was implemented from September 2007. The marks allocated to subjects in the revised National Scheme of Studies have been followed.

HSSC I-II (Classes XI-XII) subjects on offer for examination

HSSC Part-I (Class XI) Science Group (Pre-Medical)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-I	100	-	100	English
Urdu Compulsory-I **OR** Pakistan Culture-I [a]	100	-	100	Urdu English
Physics-I	85	15	100	English
Chemistry-I	85	15	100	English
Biology-I	85	15	100	English
Total:	**455**	**45**	**500**	

HSSC Part-II (Class XII) Science Group (Pre-Medical)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-II	100	-	100	English
Urdu Compulsory-II **OR** Pakistan Culture-II [a]	100	-	100	Urdu English
Islamiyat **OR** Ethics [b]	50	-	50	English / Urdu
Pakistan Studies	50	-	50	English / Urdu
Physics-II	85	15	100	English
Chemistry-II	85	15	100	English
Biology-II	85	15	100	English
Total:	**555**	**45**	**600**	

a. Foreign students may opt for Pakistan Culture in lieu of Urdu Compulsory, subject to the Board's approval.
b. For non-Muslim candidates in lieu of Islamiyat.

Note: Pakistan Studies, Islamiyat / Ethics will be taught in Classes XI and XII, but the examination will be conducted at the end of Class XII.

[3] Government of Pakistan September 2007. *Scheme of Studies for SSC and HSSC (Classes IX-XII).* Islamabad: Ministry of Education, Curriculum Wing.

HSSC Part-I (Class XI) Science Group (Pre-Engineering)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-I	100	-	100	English
Urdu Compulsory-I **OR** Pakistan Culture-I [a]	100	-	100	Urdu English
Physics-I	85	15	100	English
Chemistry-I	85	15	100	English
Mathematics-I	100	-	100	English
Total:	**470**	**30**	**500**	

HSSC Part-II (Class XII) Science Group (Pre-Engineering)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-II	100	-	100	English
Urdu Compulsory-II **OR** Pakistan Culture-II [a]	100	-	100	Urdu English
Islamiyat **OR** Ethics [b]	50	-	50	English / Urdu
Pakistan Studies	50	-	50	English / Urdu
Physics-II	85	15	100	English
Chemistry-II	85	15	100	English
Mathematics –II	100	-	100	English
Total:	**570**	**30**	**600**	

a. Foreign students may opt for Pakistan Culture in lieu of Urdu Compulsory, subject to the Board's approval.
b. For non-Muslim candidates in lieu of Islamiyat.

Note: Pakistan Studies, Islamiyat / Ethics will be taught in Classes XI and XII, but the examination will be conducted at the end of Class XII.

HSSC Part-I (Class XI) Science Group (Science General)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-I	100	-	100	English
Urdu Compulsory-I Pakistan Culture-I [a]	100	-	100	Urdu English
Any one subject combinations of the following:				
Physics-I Mathematics-I *Statistics-I	85 100 85	15 - 15	300	English English English
Economics-I Mathematics-I *Statistics-I	100 100 85	- - 15	300	English / Urdu English English
Economics-I Mathematics-I Computer Science-I	100 100 85	- - 15	300	English / Urdu English English
Physics-I Mathematics-I Computer Science-I	85 100 85	15 - 15	300	English English English
Mathematics-I *Statistics-I Computer Science-I	100 85 85	- 15 15	300	English English English
Total:			**500**	

HSSC Part-II (Class XII) Science Group (Science General)

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-II	100	-	100	English
Urdu Compulsory-II **OR** Pakistan Culture-II [a]	100	-	100	Urdu English
Islamiyat **OR** Ethics [b]	50	-	50	English / Urdu
Pakistan Studies	50	-	50	English / Urdu
Any one subject combinations of the following:				
Physics-II Mathematics-II *Statistics-II	85 100 85	15 - 15	300	English English English
Economics-II Mathematics-II *Statistics-II	100 100 85	- - 15	300	English / Urdu English English
Economics-II Mathematics-II Computer Science-II	100 100 85	- - 15	300	English / Urdu English English
Physics-II Mathematics-II Computer Science-II	85 100 85	15 - 15	300	English English English
Mathematics-II *Statistics-II Computer Science-II	100 85 85	- 15 15	300	English English English
Total:			**600**	

a. Foreign students may opt for Pakistan Culture in lieu of Urdu Compulsory, subject to the Board's approval.

b. For non-Muslim candidates in lieu of Islamiyat.

Note: Pakistan Studies, Islamiyat / Ethics will be taught in Classes XI and XII, but the examination will be conducted at the end of Class XII.

***These subject is offered <u>ONLY</u> in the May examination.**

HSSC Part-I (Class XI) Commerce Group

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-I	100	-	100	English
Urdu Compulsory-I **OR** Pakistan Culture-I [a]	100	-	100	Urdu English
Principles of Accounting-I	100	-	100	English
Principles of Economics	75	-	75	English
Principles of Commerce	75	-	75	English
Business Mathematics	50	-	50	English
Total:	**500**	**-**	**500**	

HSSC Part-II (Class XII) Commerce Group

Subjects	Marks			Medium
	Theory	Practical	Total	
English Compulsory-II	100	-	100	English
Urdu Compulsory-II **OR** Pakistan Culture-II [a]	100	-	100	Urdu English
Islamiyat **OR** Ethics [b]	50	-	50	English / Urdu
Pakistan Studies	50	-	50	English / Urdu
Principles of Accounting-II	100	-	100	English
Commercial Geography	75		75	English
Computer Studies **OR** Banking	60 **OR** 75	15 -	75	English
Business Statistics	50	-	50	English
Total:	**600**		**600**	

a. Foreign students may opt for Pakistan Culture in lieu of Urdu Compulsory, subject to the Board's approval.
b. For non-Muslim candidates in lieu of Islamiyat.

Note: Pakistan Studies, Islamiyat / Ethics will be taught in Classes XI and XII, but the examination will be conducted at the end of Class XII.

***This subjects are offered <u>ONLY</u> in the May examination.**

HSSC Part-I (Class XI) Humanities Group

Subjects	Marks	Medium
English Compulsory-I	100	English
Urdu Compulsory-I **OR** Pakistan Culture-I [a]	100	Urdu English
Any three of the following Elective Subjects	300	
1. Civics-I	(100	English / Urdu
2. Computer Science-I (85+15 practical)	each)	English
3. Economics-I		English / Urdu
4. *Education-I		English / Urdu
5. *Geography-I (85+15 practical)		English / Urdu
6. *Islamic Studies-I		English / Urdu
7. *Islamic History-I		English / Urdu
8. Literature in English-I		English
9. Mathematics-I		English
10. *Psychology-I (85+15 practical)		English / Urdu
11. *Statistics-I (85+15 practical)		English
12. *Sociology-I		English / Urdu
13. Urdu Literature-I		Urdu
14. *Fine Arts-I		English
Total:	**500**	

HSSC Part-II (Class XII) Humanities Group

Subjects	Marks	Medium
English Compulsory-II	100	English
Urdu Compulsory-II **OR** Pakistan Culture-II [a]	100	Urdu English
Islamiyat **OR** Ethics [b]	50	English / Urdu
Pakistan Studies	50	English / Urdu
Any three of the following Elective Subjects	300	
1. Civics-II	(100	English / Urdu
2. Computer Science-II (85+15 practical)	each)	English
3. Economics-II		English / Urdu
4. *Education-II		English / Urdu
5. *Geography-II (85+15 practical)		English / Urdu
6. *Islamic Studies-II		English / Urdu
7. *Islamic History-II		English / Urdu
8. Literature in English-II		English
9. Mathematics-II		English
10. *Psychology-II (85+15 practical)		English / Urdu
11. *Statistics-II (85+15 practical)		English
12. *Sociology-II		English / Urdu
13. Urdu Literature-II		Urdu
14. *Fine Arts-II		English
Total:	**600**	

a. Foreign students may opt for Pakistan Culture in lieu of Urdu Compulsory, subject to the Board's approval.
b. For non-Muslim candidates in lieu of Islamiyat.

Note: Pakistan Studies, Islamiyat / Ethics will be taught in Classes XI and XII, but the examination will be conducted at the end of Class XII.

***These subjects are offered <u>ONLY</u> in the May examination.**

Annex B

List of Practical Activities

Class XII

EXP. No.	OBJECTIVE	EQUIPMENT	SOFTWARE
1	Writing a program to demonstrate simple arithmetic operations.	PC	GWBASIC
2	Writing a program to demonstrate the use of formatted Input/ Output statement along with conditional statement IF- THEN.	PC	GWBASIC
3	Writing a program for the iteration of statement, (use of looping statements: FOR-NEXT and WHILE-WEND).	PC	GWBASIC
4	Writing a program which reads 12 values in an array and after doing some arithmetic operations print the desired results.	PC	GWBASIC