

# ALP Curriculum for Elementary

Package | 2022  
D & E

# MATHEMATICS

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## ACKNOWLEDGEMENT

Education clarifies our perception of the world around us and helps changing it into a better place. It develops an insight of peeping deep into our lives. It is of utmost importance that every individual be educated for unlocking his/ her potential. Both on personal and national levels, education has been shown to increase economic growth and stability. Education strengthens economic and social status of an individual as well as contributes to a skilled human resource of a country.

Pakistan has many national and international commitments to provide quality education to all children in the country and to enroll all Out-of-School (OOS) Children. The government of Khyber Pakhtunkhwa is determined to provide innovative solutions to address the issue of OOSC in KP, which will pave ways to meet Sustainable Development Goals (SDGs) and Education 2030 targets.

To overcome these challenges the Directorate of Curriculum and Teachers Education (DCTE) has come forward with a solution of “Accelerated Education Programme” that provides fast track and cost-effective education opportunities to those who missed their first chance of education. The accelerated education programme will provide them a chance to re-connect to education and continue their education and training for improved living. The main objective of the AEP is to guide teachers/education providers to teach the curriculum in an accelerated mode without compromising the Student Learning Outcomes (SLOs) and required abilities and competencies.

Elementary & Secondary Education Department, Government of Khyber Pakhtunkhwa, introduces Elementary level Accelerated Education (AE) Curriculum that offers fast track Elementary (middle) education course/ program for children who cannot continue their education in formal schools system because of various reasons, such as being overage, dropped out before completing primary or elementary education cycle, involved in some work etc. It is worthwhile to mention that children out-of-school (OOSC), especially those between the ages of 10 to 16 constitute 82% of the total OOSC in the province. This curriculum will provide an opportunity to large proportion of children within this age cohort.

As part of the overall Non-Formal Education (NFE) programme of the Government, this AE curriculum is equivalent to the formal education elementary level curriculum. Being flexible, alternative and fast track in nature, this curriculum will fulfill the learning needs of a diverse, marginalized and complex group of out-of-school children in the province particularly those who overage, dropped out and have limited opportunities for re-entering the education stream.

The experts deserve enormous appreciation for accomplishing a complex task of developing, reviewing and refining the NFE/ AE curriculum for Elementary level. Although AE curriculum development is a breakthrough and huge accomplishment, but I take it as a new

beginning and first step towards the development of a new accelerated education program at this level.

Let me appreciate the technical and financial cooperation of development partners especially UNICEF who graciously extended their support.

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## INTRODUCTION

Articles 25-A and 37(b) of the Constitution of Islamic Republic of Pakistan guarantee right to education (RTE) to all children between the ages of 5 and 16. It is pertinent to mention that basic education is free and compulsory according to these articles and the Government is responsible to provide free education (textbooks, tuition fee etc.) to all children of this age group. At the same time, the Government of Pakistan is bound to provide the right to quality and relevant education under Sustainable Development Goal # 4 (SDG-4) and education 2030 framework for action that is taking forward the agenda enshrined in Education for All (EFA).

In order to translate the constitutional and international commitments into reality and provide the right to free and compulsory education, the Government of KP has responded positively by developing and implementing KP Education Sector Plan. In addition, the E&SED is also strengthening the Non-Formal Basic Education sub-sector by developing provincial NFE policy and related accelerated education programmes for primary and elementary levels to provide alternative education opportunities to out-of-school children in the province. Alternative and accelerated education programmes at both primary and secondary levels will not only complement efforts to address the issue of out-of-school children, but also as stand-alone approach to provide basic education to older age out-of-school who cannot seek admission in formal schools.

### **Why Accelerated Elementary Education Programme**

Following are major reasons that necessitated development of accelerated education programme (curriculum) for elementary level:

- In KP, 80.5% public sector schools are primary, whereas remaining 19.5% include elementary, secondary and higher secondary schools. The supply side proportion of schools in KP highlights its direct relationship with out-of-school children in the province i.e. only 18% children of 5-9 years of age are not in schools and that remaining 82% belong to 10-16 years of age cohort. This proportion validates that; more schools-less out-of-school children and less schools-more out-of-school children. Based on this fact, the province essentially needs a programme at elementary level that is cost effective, flexible and have the ability to be established quickly, so that the children of 10-16 years of age have extensive opportunities of education (Data source: Pakistan Education Statistics 2016-17).
- Accelerated elementary education will fill gap that has been caused by less number of elementary education schools in the province. This programme will essentially be offered

in areas where OOSC are more and that only primary schools are available. This programme may be offered in both morning and evening shifts as appropriate.

- Furthermore, a large number of children, especially girls between the ages of 10-16 in KP, have completed primary education and cannot go to schools owing to unavailability of elementary schools. Therefore, accelerated elementary education programme can offer them a second chance to reconnect to education. This programme will particularly be extremely useful for girls as 67% of the OOSC in KP are girls (Data source: Pakistan Education Statistics 2016-17).
- Accelerated elementary education (curriculum) programme will provide continuing education opportunities to primary pass-outs to transit to elementary level without any interruption. The elementary education programme will be offered in areas where accelerated primary education programme is offered.
- Accelerated elementary education programme, which is fast track and will offer completion of elementary cycle in 18-20 months instead of 36 months, will be an excellent option for those who have primary education certificate and have wasted a few years owing to unavailability of elementary school. This will help in bridging lost educational years and come at par with other children. The said fast track programme will also help in addressing the psychological fears of children that restrict them to reconnect to education.
- The accelerated elementary programme, being a fast track, flexible and cost effective, will require less cost to get operationalized. Therefore, the E&SED may expand the said programme to include most of the OOSC.

## **INTRODUCTION TO THE CURRICULUM**

Curriculum consists of elements that promotes learners' intellectual, spiritual, aesthetic, emotional, social and physical development. Together with curricular and co-curricular activities, it includes approaches to teaching, learning and assessment, quality of relationships within the school, and the values embodied in the systematic functioning of a school especially in non-formal and accelerated education setting.

Subject based curriculum refers to a document describing learning outcomes, the scope and sequence of contents, learning activities, methods of delivery in the classroom. It also includes assessment and evaluation techniques consistent with the Curriculum Framework of a particular subject, and it also provides guidelines for developing pedagogical materials. The accelerated elementary curriculum builds logical connections with the national Curriculum 2006, equivalent to the same as well, and narrates terminal competencies accordingly.

The elementary AEP curriculum is standard based and provides indicators of expectations from learners at completion of each of the packages and grades defined in the curriculum. The curriculum provides a logical sequence of strands/ competencies, standards, benchmarks and students learning outcomes (SLOs). Each SLO is further elaborated by contents, preferred teaching methodologies and techniques to assess the SLOs, which are coded properly. The purpose of coding the SLOs is to enable teachers and education experts to understand the connection between a specific SLO and the corresponding topics provided in the textbook and the guide for teachers. In this way, the teachers will be able to meaningfully connect the topics with SLOs and eventually establish a link to the benchmarks, standards and the strand, which describe expectations from the learners. Such an arrangement is equally useful for the material developers/ authors to be specific while designing contents and activities and examples that suit the learning needs of the learners of NFBE schools, which are comparatively different from the learners studying in formal school environment. Similarly, the prescribed assessment techniques are useful for the teachers and evaluators to formulate relevant test items and apply a pertinent assessment method to assess the learning achievement of the learners.

Curriculum provides base of the teaching and learning system which derives its inspiration and vision from the Education Policies. It sets its structure accordingly to describe concepts, skills and attitudes that have to be developed in the students. It aims to address key questions such as what is the purpose of teaching; what is the desired level of the students as measured by standards and benchmarks, and what will be taught to the students to prepare them for higher studies and the world of work. Curricula documents provide guidelines for textbook developers and authors to develop textbooks and supplementary reading material according to the defined and agreed competencies, scope and guidelines. These enable teachers

to plan their classroom lessons; examiners to set formative and summative assessment according to the prescribed competencies, and to textbook reviewers to review the textbooks according to the contents and scope. The curriculum is also a guiding document for the general public and parents about the wider aims of education and the academic processes that learners experience.

## **Curriculum Development Process**

Department of Elementary and Secondary Education (ESED), Government of KP, decided to develop and offer accelerated education programme for a specific group of OOSC after carrying out a thorough survey to identify OOSC. At the same time, Technical Working Group (TWG) for Non-Formal Education (NFE) conducted a detailed situation analysis of education in general and Non-Formal Education in particular that gave concrete recommendations to go for Elementary level Accelerated Education Programme (AEP) and its curriculum that offers elementary cycle in short period of time in Khyber Pakhtunkhwa. OOSC situation and general situation analysis of the education sector precisely recommended development of accelerated education curriculum for both primary and elementary levels in KP.

DCTE engaged curriculum experts, non-formal education experts and subject specialists for Pashto, Urdu, English, Mathematics, Science, Islamiyat, Geography and History. A couple of workshops were held to review the national curriculum 2006 that showed a variety of different ways of curriculum framework for each subject. However, DCTE experts agreed have standard framework for all the subjects. The framework agreed highlighted vertical and horizontal sequence. The vertical sequence narrated strands/ competencies or themes, learning standards, benchmarks and SLOs. Similarly, the horizontal sequence suggested contents for authors/ materials developers, strategies for teachers and assessment techniques for assessors. Following key strategies were used to condense the curriculum:

- Merging the grades/ levels such as Katchi & 1 to be merged as package A, grades 2 & 3 as Package B, and grades 4 & 5 to be merged as Package C. This vertical integration of the grades/ levels helped in reducing levels/ grades and SLOs
- Review SLOs
- Finding out SLOs that can be integrated, without harming the acquisition of competencies
- Deleting the SLOs that appears to be repetitive
- Integrating SLOs that help in clubbing grades/ levels
- Analyzing where lower order competencies can easily be merged with the higher order skills/ competencies
- Integrating SLOs with other subjects that have alike (similar) learning outcomes.



- Integrating alike contents (concepts) of different subjects (based on SLOs' alignment)
- Emphasis on pedagogy (interactive activities) proposed in the curriculum.

DCTE has conducted a thorough review of elementary level national curriculum 2006 and merged certain levels, such as Grades 6 & 7 were merged as Package D, while Grade 8 was termed as Package E. However, Grade 6 and 7 were kept as it is under Package D and grade 8 under Package E for the purpose of equivalence and certification. Therefore, the accelerated elementary curriculum offers two levels instead of conventional three levels. Similarly, the experts conducted a detailed analysis of the SLOs and merged those appearing to be similar, repetitive and were not compatible with the age of the learners. However, competencies, standards and benchmarks, were kept as they were in the curriculum to obey equivalency principles. Curriculum experts and Subject specialists proposed viable contents, teaching and assessment strategies in the curriculum.

After that, experts review the curriculum and made it ready for approval and further use.

## **Curriculum Framework**

The curriculum framework provides a generic introduction of the curriculum and a brief description of curriculum for non-formal basic education, aims and specific standards elaborated in the national guidelines. Briefly, Curriculum Framework is a broad policy guideline regarding development of learning materials, professional development of teachers/ instructional delivery system, assessment and testing of students' learning outcomes and feedback for changes required for effective future revision of curriculum.

## **Strand / Competency or Themes**

Strand or competency is a key learning area, and used as the top most learning expectation of a particular topic of any subject. Strand and competencies are used interchangeably in different curricula, but convey the same meaning as the top learning expectation in a curriculum hierarchy.

## **Standards**

Standards are broad descriptions of the levels of knowledge, skills and values we expect students to reach in a specific subject during specific time period of learning. The standards describe what all students should know, be able to do and values they should develop in each subject. Knowledge includes the important facts, concepts, issues and information. Skills include the ways of thinking, working, communication, reasoning and investigating that characterize

each subject. The values are the feelings, attitudes, conscience, dispositions, principles, sanctions that are developed in each subject.

## Benchmarks

Benchmarks are clear, specific descriptions of developmentally appropriate knowledge, skills and values that students should have by a certain point in time in their schooling. The benchmark statements indicate what students should know, be able to do and the values they should develop at each of the developmental levels i.e. early year, primary, elementary in order to meet the standards.

## Student Learning Outcomes (SLOs)

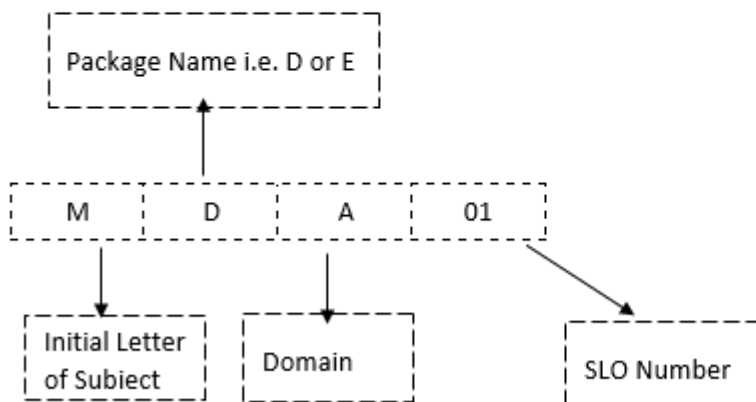
Student Learning Outcomes (SLOs) are specific statements that describe the knowledge, skills and values that students are expected to attain at the end of a particular grade. The SLOs must be SMART i.e. specific, measurable, achievable, realistic, time bound and observable. SLOs differ from objectives in that the focus is not on what the teacher will do but on what students should achieve.

### Coding Scheme:

To understand alignment among Standards, Benchmarks, SLOs, Content and Assessment, a systematic coding scheme has been followed.

The elaboration of coding scheme is as follows:

Complete Code : MDA01



## PACKAGE D

### Domain A: Numbers and Operations

**Standard:** Students will be able to recognize factors, multiples, HCF and LCM

**BENCHMARK:** Students will be able to calculate factors, multiples, HCF and LCM, and apply all of these concepts in real life contexts.

### Unit 1: FACTORS AND MULTIPLES

Coding Key	SLO/learner will be able to:	Contents	Methodology	Assessment
<b>M-D-A-01</b>	<b>[SLO: M -06- A -01]</b> Identify: <ul style="list-style-type: none"> <li>●Factors of up to 3- digit numbers</li> <li>●Multiples of up to 2- digit numbers</li> <li>●Prime factors of up to 4- digit numbers and express in index notation</li> </ul>	<b>1.1 Multiples and Factor</b> 1.1.1 Multiples 1.1.2 Factors	Problem solving/Discussion/demonstration	oral questions and written test
<b>M-D-A-02</b>	<b>[SLO:M-06-A-02]</b> Identify base and exponent and express numbers given in expanded form in index notation and vice versa.	<b>1.2 Index notation</b>	Problem solving/Discussion/demonstration	Observation/oral questions and written test
<b>M-D-A-03</b>	<b>[SLO:M-06-A-03]</b> Find H.C.F and L.C.M of two or three numbers (up to 3-digits) using various methods (for instance prime factorization and division method).	1.3 (HCF) and (LCM) 1.3.1 HCF 1.3.2 LCM	Problem solving/Discussion/demonstration	oral questions and written test

<b>M-D-A-04</b>	<b>[SLO:M-06-A-04]</b> Solve real-world word problems involving H.C.F and L.C.M.	1.3.3 Applications of HCF and LCM	Inductive/Deductive/group work/Problem solving	Observation and written tests
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**Domain A:** Numbers and Operations.

**STANDARD:** Students will be to recognize and identify integers, their absolute values and compare and arrange in different order.

**BENCHMARK:** Students will be able to operate with real numbers, their properties, and apply all of these concepts in real life contexts.

**Unit 2: RATIONAL NUMBERS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-A-05</b>	<b>[SLO:M-06-A-05]</b> Recognize, identify and represent integers (positive, negative and neutral integers) and their absolute or numerical value.	<b>2.1 Integers</b> 2.1.1 Absolute/numerical value of Integers	Problem solving/Discussion/demonstration	Oral questions/Observations and written tests
<b>M-D-A-06</b>	<b>[SLO:M-06-A-06]</b> Arrange a given list of integers and their absolute value in ascending and descending order.	2.1.2 Ordering of integers	Problem solving/Discussion/demonstration	
<b>M-D-A-07</b>	<b>[SLO:M-06-A-07]</b> Add and subtract upto-2-digit like and unlike integers	<b>2.2 Operations on Integers</b> 2.2.1 Addition and subtraction	Problem solving/Discussion/demonstration	Oral question/written tests

<b>M-D-A-08</b>	<b>[SLO:M-07-A-08]</b> Multiply up to 2-digit like and unlike integers	2.2.2 multiplication	Problem solving/Discussion/demonstration	Oral question/written tests
<b>M-D-A-09</b>	<b>[SLO:M-06-A-09]</b> Divide like and unlike integers.	2.2.3 division	Problem solving/Discussion/demonstration	Oral question/written tests
<b>M-D-A-10</b>	<b>[SLO:M-07-A-06]</b> Identify and represent (on a number line) rational numbers.	<b>2.3 Rational numbers</b>	Inductive/Deductive/group work	Observations and written tests
<b>M-D-A-11</b>	<b>[SLO:M-07-A-08]</b> Identify and convert between various types of fractions.	<b>2.4 Fractions</b>	Problem solving/Discussion/demonstration	Observations and written tests
<b>M-D-A-12</b>	<b>[SLO:M-07-A-09]</b> Compare (using symbols $<$ , $>$ , $=$ , $\leq$ and $\geq$ ) and arrange (in ascending or descending order) whole numbers, integers, rational numbers and decimal numbers.	<b>2.5 Comparing and ordering of rational numbers</b>	Problem solving/Discussion/demonstration	Observations and written tests
<b>M-D-A-13</b>	<b>[SLO:M-07-A-11]</b> Verify associative, commutative and distributive properties of rational numbers.	<b>2.6 Properties of rational numbers</b>	Inductive/Deductive	written tests
<b>M-D-A-14</b>	<b>[SLO:M-06-A-10]</b> Recognize the order of operations and use it to solve mathematical	<b>2.7 Operations on rational numbers</b>	Problem solving/Discussion/demonstration	written tests

	expressions involving whole numbers, decimals, fractions and integers.			
<b>M-D-A-15</b>	<b>[SLO:M-07-A-12]</b> Solve real-world word problems involving operations on rational numbers.	<b>2.8 Real life applications</b>	Problem solving	written tests

**Domain A: NUMBERS AND OPERATIONS**

**STANDARD:** Use prime factorization to calculate square root of perfect square numbers.

**BENCHMARK:** Students will be able to calculate square and square root and apply all of these concepts in real life contexts.

**Unit 3: SQUARE AND SQUARE ROOTS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-A-16</b>	<b>[SLO:M-07-A-20]</b> Recognize and calculate squares of numbers up to 3-digits.	<b>3.1 Square of numbers</b>	Discussion/demonstration	written test
<b>M-D-A-17</b>	<b>[SLO:M-07-A-21]</b> Find the square roots of perfect squares of (up to 3-digit) natural numbers, fractions and decimals.	<b>3.2 Square root</b>	Discussion/demonstration	
<b>M-D-A-18</b>	<b>[SLO:M-07-A-22]</b> Solve real-world word problems involving squares and square roots.	<b>3.3 Real life applications</b>	Problem solving	written test

**DOMAIN A: NUMBERS AND OPERATIONS**

**STANDARD:** Perform appropriate operations on fractions and percentages in various problem-solving contexts.

**BENCHMARK:** Students will be able to calculate ratio, rate, proportion, percentages, and apply all of these concepts in real life contexts.

**Unit 4: RATIO, RATE AND PERCENTAGE**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-A-19</b>	<b>[SLO:M-06-A-11]</b> Express one quantity as a percentage of another, compare two quantities by percentage and increase or decrease a quantity by a given percentage.	<b>4.1 Percentage</b>	Inductive/Deductive/Problem solving	Oral questions observation and written tests
<b>M-D-A-20</b>	<b>[SLO:M-06-A-12]</b> Solve real-world word problems involving percentage.	<b>4.2 Real life applications of Percentage</b>	Inductive/Deductive/Problem solving	

<b>M-D-A-21</b>	<b>[SLO:M-06-A-14]</b> Calculate ratio of two numbers (up to 3-digit) and simplify ratios	<b>4.3 Ratio</b>	Inductive/Deductive/Problem solving	
<b>M-D-A-22</b>	<b>[SLO:M-06-A-15]</b> Explain and calculate continued ratio.	<b>4.3.1 Continued Ratio</b>	Inductive/Deductive/Problem solving	written tests
<b>M-D-A-23</b>	<b>[SLO:M-06-A-13]</b> Explain rate as a comparison of two quantities where one quantity is 1.	<b>4.4 Rate and average Rate</b>	Inductive/Deductive/Problem solving	written tests
<b>M-D-A-24</b>	<b>[SLO:M-07-A-14]</b> Calculate rate of quantities.	<b>4.4.1 Average Rate</b>	Inductive/Deductive/Problem solving	Oral questions and written tests
<b>M-D-A-25</b>	<b>[SLO:M-06-A-16]</b> Solve real-world word problems involving ratio and rate.	<b>4.5 Real life Applications of ratio and rate</b>	Problem solving	written tests
<b>M-D-A-26</b>	<b>[SLO:M-07-A-16]</b> Explain and calculate direct and inverse proportion and solve real-world word problems related to direct and inverse proportion.	<b>4.6 Proportion</b> 4.6.1 Direct and inverse proportion 4.6.2 Applications of proportion	Problem solving	Oral questions observation and written tests



**DOMAIN A: NUMBERS AND OPERATIONS**

**STANDARD:** Use the concept of rate, ratio and proportion in various problem-solving contexts.

**BENCHMARK:** Students will be able to calculate profit, loss, discount, Zakat, Ushr, Taxes and apply all of these concepts in real life contexts.

**Unit 5: FINANCIAL ARITHMETIC**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-A-27</b>	<b>[SLO:M-07-A-17]</b> Identify and differentiate between selling price, cost price, loss, discount, profit percentage and loss percentage.	<b>5.1 Profit and Loss and discount</b>	Demonstration method/Discussion	Oral questions observation and written test
<b>M-D-A-28</b>	<b>[SLO:M-07-A-18]</b> Explain income tax, property tax, general sales tax, zakat and ushr.	<b>5.2 Tax</b> <b>5.3 Zakat and Ushr.</b>	Demonstration method/Discussion	
<b>M-D-A-29</b>	<b>[SLO:M-07-A-19]</b> Solve real world word problems involving profit, loss, discount, tax, zakat and ushr.	<b>5.4 Real life Applications</b>	Demonstration method/Problem solving	

**Domain A: Numbers and Operations**

**STANDARD:** Use language, notation (tabular and descriptive form) and Venn diagrams to describe sets and their elements, and solve word problems.

**BENCHMARKS:** Students will be able to use language, notation and Venn diagrams to describe sets and their elements and apply all of these concepts in real life contexts.

**Unit 6: SETS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-A-30</b>	[SLO: M-07- A-23] Use language, notation and Venn Diagrams to represent different types of sets and their elements.	6.1 Sets and its notation 6.1.2 Types of sets 6.2 common sets and Venn diagrams.	Demonstrations/Discussion	Oral questions, Observations and written test
<b>M-D-A-31</b>	[SLO: M-07- A-24] Identify and differentiate between: ● subset and superset ● proper and improper ● equal and equivalent ● disjoint and overlapping.	6.1.3 Subsets and supersets 6.1.4 Types of subsets 6.1.5 equal and equivalent 6.1.6 disjoint and overlapping.	Individual work/group work	Oral questions, Observations and written test
<b>M-D-A-32</b>	[SLO: M-07- A-25] Describe and perform operations on sets (union, intersection, difference and complement).	6.3 operations on sets	Problem solving/Individual work/group work	

<b>M-D-A-33</b>	<b>[SLO: M-07- A-26]</b> Verify the following: $A \cap A^c = \emptyset$ $A \cup A^c = U$ $(A \cup B)^c = A^c \cap B^c$ $(A \cap B)^c = A^c \cup B^c$	<b>6.4 Complement of a set</b>	Problem solving/Inductive/ deductive method	written test
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**DOMAIN B: ALGEBRA**

**STANDARD:** Students will be able to recognize simple number patterns.

**BENCHMARKS:** Students will be able to recognize and manipulate number patterns and apply all of these concepts in real life context.

**Unit 7: NUMBER PATTERNS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-B-34</b>	<b>[SLO:M-06-B-01]</b> Recognize simple patterns from various number sequences	<b>7.1 Number Patterns</b>	Demonstration/Discussion	Oral questions and written tests
<b>M-D-B-35</b>	<b>[SLO:M-06-B-02]</b> Continue a given number sequence and find: -term to term rule -position to term rule	<b>7.1.1</b> Term to term rule <b>7.1.2</b> Position to term rule	Problem solving/Discussion	
<b>M-D-B-36</b>	<b>[SLO:M-07-B-03]</b> Find terms of a sequence when the general term (nth term) is given.	<b>7.2 The nth term</b>	Problem solving/Discussion	

<b>M-D-B-37</b>	<b>[SLO:M-07-B-04]</b> Solve real life problems involving number sequences and patterns.	<b>7.3 Real life Applications</b>	Problem solving/Discussion	
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**DOMAIN B: ALGEBRA**

**STANDARD:** Manipulate algebraic expressions

**BENCHMARKS:** Students will be able to explain and manipulate number patterns, use letters to represent numbers, expand, simplify, factorize, evaluate and manipulate algebraic expressions, use algebraic identities and apply all of these concepts in real life context.

**Unit 8: ALGEBRIC EXPRESSIONS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-B-38</b>	<b>[SLO:M-06-B-04]</b> Explain the term algebra as an extension of arithmetic, where letters, numbers and symbols are used to construct algebraic expressions.	<b>8.1 Algebraic expressions</b>	Demonstration method/Discussion	Oral questions observation and written test
<b>M-D-B-39</b>	<b>[SLO: M-06- B-05]</b> Evaluate algebraic expressions by substitution of variables with numerical values.	<b>8.1.1</b> Evaluation of algebraic expressions	Problem solving/Demonstration	written test

<b>M-D-B-40</b>	<b>[SLO: M-07- B-07]</b> Recognize open and close sentences, like and unlike terms, variable, constant, expression, equation and inequality.	<b>8.1.2</b> Sentences and statements	Demonstration method/Discussion	Oral questions and written test
<b>M-D-B-41</b>	<b>[SLO: M-07- B-12]</b> Simplify algebraic expressions (by expanding products of algebraic expressions by a number, a variable or an algebraic expression) involving addition, subtraction, and multiplication division.	<b>8.1.3</b> Simplification of Algebraic expressions	Demonstration method/Discussion	written test
<b>M-D-B-42</b>	<b>[SLO: M-07- B-10]</b> Add and subtract two or more polynomials.	<b>8.2 Operations on Polynomials.</b>	Problem solving/Demonstration	written test
<b>M-D-B-43</b>	<b>[SLO: M-07- B-13]</b> ]Explore the following algebraic identities and use them to expand expressions: $(a + b)^2 = a^2 + b^2 + 2ab$ $(a - b)^2 = a^2 + b^2 - 2ab$ $(a + b)(a - b) = a^2 - b^2$	<b>8.3 Algebraic Identities</b>	Demonstration method/Discussion	written test
<b>M-D-B-44</b>	<b>[SLO: M-07- B-14]</b> Factorize algebraic expressions (by taking out common terms and by regrouping)	<b>8.4 Factorization Algebraic expressions</b>	Problem solving/Demonstration	written test

<b>M-D-B-45</b>	<b>[SLO: M-07- B-15]</b> Factorize quadratic expressions (by middle term breaking method).	<b>8.5</b> Factorization of Quadratic expressions	Demonstration method/Discussion	written test
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**DOMAIN B: ALGEBRA**

**STANDARD:** Students will be able to identify and differentiate between linear expressions and linear equations, solve linear equations and apply them in real life context.

**STANDARD:** Use the concept of linear functions to solve problems pertaining to Coordinate Geometry.

**BENCHMARKS:** Students will be able to explain and manipulate algebraic expressions, use algebraic identities, interpret and plot graphs of linear equations, solve linear and simultaneous linear equations and linear inequalities and apply all of these concepts in real life context.

**Unit 9: LINEAR EQUATIONS**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-B-46</b>	<b>[SLO: M-06- B-08]</b> Recognize and Construct linear equation in one variable.	<b>9.1 Linear equations</b> <b>9.1.1</b> Construction of Linear equations in one variable	Demonstration method/Discussion	Oral questions and written test
<b>M-D-B-47</b>	<b>[SLO: M-06- B-09]</b> Solve linear equations involving integers, fractions and decimal coefficients.	<b>9.1.2</b> Solution of Linear equations in one variable	Demonstration method/Discussion	written test

<b>M-D-B-48</b>	<b>[SLO: M-07-B-18]</b> Introduction to Cartesian coordinate system.	<b>9.2 Cartesian coordinate system.</b>	Demonstration method/Discussion	Oral questions observation and written test
<b>M-D-B-49</b>	<b>[SLO: M-07-B-19]</b> Plot the graph of the linear equation $ax + b = 0$ where $a \neq 0$ and of linear equations in two variables.	<b>9.3 Graph of the linear equation</b>		
<b>M-D-B-50</b>	<b>[SLO: M-07-B-16]</b> Construct linear equations in two variables such as: $ax + by = c$ where $a$ and $b$ are not zero.	<b>9.4 Construction of linear equations in two variables</b>	Demonstration method/Discussion	written test
<b>M-D-B-51</b>	<b>[SLO: M-07-B-20]</b> Recognize and state the equation of a horizontal line and a vertical line.	<b>9.5 linear equations in two variables</b> <b>9.5.1</b> equation of a horizontal line. <b>9.5.2</b> equation of a vertical line.	Demonstration method/Discussion	Oral questions observation and written test
<b>M-D-B-52</b>	<b>[SLO: M-07-B-21]</b> Find values of 'x' and 'y' from the graph.	<b>9.6 Graphical solution linear equations in two variables</b>	Demonstration method/Discussion	written test
<b>M-D-B-53</b>	<b>[SLO: M-07-B-10]</b> Solve real life situation involving linear equations.	<b>9.7 Real life Applications</b>	Demonstration method/Problem solving	written test

**DOMAIN C: MEASUREMENT**

**STANDARD:** Use the concepts of Perimeter, Circumference, Area, Volume and Surface Area in problem solving

**BENCHMARKS:** Students will be able to solve problems involving area and perimeter of 2D shapes, surface area and volume of 3D shapes.

**Unit 10: MEASUREMENT**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-C-54</b>	<b>[SLO: M-06-C-01]</b> Calculate the area of; a path (inside or outside) a rectangle or square, parallelogram, triangle and trapezium.	<b>10.1 Area and Perimeter</b>	Demonstration and practice/Discussion	written test
<b>M-D-C-55</b>	<b>[SLO: M-06-C-02]</b> Solve real life word problems involving perimeter and area.	<b>10.2 Real life Applications</b>	Problem Solving/Demonstration/Discussion	
<b>M-D-C-56</b>	<b>[SLO: M-07-C-08]</b> Calculate the circumference and area of a circle.	<b>10.3 The circumference and area of a circle.</b>	Demonstration and practice/Discussion	written test



<b>M-D-C-57</b>	<b>[SLO: M-07-C-07]</b> Calculate the area and perimeter of the shaded/un-shaded region in composite shapes.	<b>10.4 Area and Perimeter of shaded/un-shaded region</b>	Demonstration and practice/Discussion	written test
<b>M-D-C-58</b>	<b>[SLO: M-06-C-03]</b> Calculate the surface area and volume of cube and cuboids	<b>10.5 Surface area and volume of cube and cuboid</b>	Demonstration and practice/Discussion	written test
<b>M-D-C-59</b>	<b>[SLO: M-06-C-04]</b> Solve real life word problems involving the surface area and volume of cubes and cuboids.	<b>10.6 Real life Applications involving Surface area and volume</b>	Problem Solving/Demonstration/Discussion	written test

**Domain D: GEOMETRY**

**STANDARD:** Students will be able to construct angles of different measure (with compass), bisectors of angles and bisector and perpendicular bisectors of line segments.

**STANDARD:** Develop an understanding of the properties of Quadrilaterals, triangles and circles.

**BENCHMARKS:** Students will be able to construct lines, angles of different measure, bisectors of angles, triangles and quadrilaterals ,use the properties of triangles ,quadrilaterals, and circles to calculate unknown angles ,and apply concepts of symmetry from two and three-dimensional perspectives.

**Unit 11: GEOMETRY**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
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<b>M-D-D-60</b>	<b>[SLO: M-06-D-04]</b> Identify adjacent angles and find unknown angles related to parallel lines and transversals. (Corresponding, alternate and vertically opposite angles)	<b>11.1 Angles</b>	Demonstration/Discussion	Oral questions observation and written test
<b>M-D-D-61</b>	<b>[SLO: M-06-D-06]</b> Construct angles of specific measures (30, 45, 60, 75, 90, 105 and 120) and bisect angles using a compass.	<b>11.2 Construction of Angles</b>	Demonstration/Discussion	written test
<b>M-D-D-62</b>	<b>[SLO: M-06-D-07]</b> Construct a perpendicular (from a point on the line and outside the line) and a perpendicular bisector.	<b>11.3 Perpendicular lines</b>	Demonstration/Discussion	written test
<b>M-D-D-63</b>	<b>[SLO: M-07- D-01]</b> Recognize quadrilaterals and their characteristics (parallel sides, equal sides, equal angles, right angles, lines of symmetry etc). (Square, rectangle, parallelogram, rhombus, trapezium and kite).	<b>11.4 Quadrilaterals</b> <b>11.4.1 types of quadrilaterals</b>	Demonstration/Discussion	Oral questions observation and written test
<b>M-D-D-64</b>	<b>[SLO: M-07-D-06]</b> Calculate unknown angles in quadrilaterals using the properties of quadrilaterals. (Square, rectangle, parallelogram, rhombus, trapezium and kite).	<b>11.4.2 Calculate unknown angles in Quadrilaterals</b>	Problem Solving/Demonstration/ Discussion	Oral questions observation and written test

<b>M-D-D-65</b>	<b>[SLO: M-07-D-10]</b> Calculate unknown angles in a triangle.	<b>11.4.3 Calculate unknown angles in Triangles</b>	Problem Solving/Demonstration/ Discussion	Oral questions observation and written test
<b>M-D-D-66</b>	<b>[SLO: M-07-D-11]</b> Construct different types of triangles. (equilateral, isosceles, scalene, acute-angled, right-angled and obtuse-angled).	<b>11.5 Construction of Triangles</b>	Problem Solving/Demonstration/ Discussion	written tests
<b>M-D-D-67</b>	<b>[SLO: M-07-D-05]</b> Describe the properties of a circle; centre, radius, diameter, chord, arcs, major and minor arc, semi-circle and segment of a circle.	<b>11.6 Circles</b>	Demonstration/ Discussion	Oral questions observation and written test

**DOMAIN E: PROBABILITY AND STATISTICS**

**STANDARD:** Students will be able to recognize graphs, grouped, ungrouped data continuous and discrete variables. Calculate mean, median and mode.

**BENCHMARKS:** Students will be able to collect, classify and tabulate statistical data, interpret, construct and use statistical graphs, calculate and interpret measures of Central tendency and solve problems.

**Unit 12: DATA HANDLING**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-E-68</b>	<b>[SLO: M-06-E-02]</b> Identify and organize different types of data (i.e. discrete, continuous, grouped and ungrouped).	<b>11.1 Data and its Presentation</b>	Demonstration/Discussion	Oral questions observation and written

**DOMAIN E: PROBABILITY AND STATISTICS**

<b>M-D-E-69</b>	<b>[SLO: M-07- E-04]</b> Construct frequency distribution tables for given data (i.e., frequency, lower class limit, upper class limit, class interval and mid-point) and solve related real world problems.	<b>11.2 Frequency Distribution.</b>	Demonstration/Discussion	test
<b>M-D-E-70</b>	<b>[SLO: M-07- E-01]</b> Recognize drawing and interpreting of bar graphs, line graphs and pie charts. -	<b>11.3 Graphs</b>	Demonstration/Discussion	Observation and written test
<b>M-D-E-71</b>	<b>[SLO: M-06- E-03]</b> Calculate mean, median, mode and range for ungrouped data and solve related real life situations	<b>11.4 Measure of central tendency</b>	Problem Solving/Demonstration/ Discussion	observation and written test

**STANDARD:** Students will be able to understand the concepts relating to probability.

**BENCHMARKS:** Students will be able to solve problems using various concepts pertaining to Experimental and Theoretical Probability.

**Unit 13: PROBABILITY**

<b>Coding Key</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-D-E-72</b>	<b>[SLO: M-06- E-04]</b> Explain experiments, outcomes, sample space, events, equally likely events and probability of a single event. Differentiate between the outcomes that are equally likely and not equally to occur (including real world problems.	<b>13.1 Probability</b> <b>13.1.1</b> Experiments and Random experiments <b>13.1.2 Types of Events</b> <b>13.1.3 outcomes</b> <b>13.1.4 sample space</b>	Demonstration/Discussion	Observation and written test

<b>M-D-E-73</b>	<b>[SLO: M-07- E-05]</b> Explain and compute the probability of: certain events, impossible events and compliment of an event including real world problems.	<b>13.2 Probability of an event</b> <b>13.2.1</b> impossible and certain events <b>13.2.2</b> compliment of an event	Problem Solving/Demonstration/ Discussion	Oral questions observation and written test
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## PACKAGE E

**DOMAIN- A: NUMBERS AND OPERATIONS**

**Sub-Domain: Approximation and Estimation**

**Standard:** Students will be able to round numbers and measures to an appropriate/required degree of accuracy and use approximation through rounding to estimate answers.

**Benchmark:** Round off real numbers to required degree of accuracy.

**Unit 1: APPROXIMATION AND ESTIMATION**

CODING KEY	SLO/learner will be able to:	Contents	Methodology	Assessment
<b>M-E-A-01</b>	[SLO: M-08-A-01] Round off numbers up to 5 significant figures.	2.1 Estimation	Problem solving/Demonstration/Discussion	Observation/oral questions and written test
<b>M-E-A-02</b>	[SLO: M-08-A-03] Solve real-world word problems involving approximation	2.1 Estimation	Problem solving/Demonstration/Discussion	Observation/oral questions and written test

**DOMAIN- A: NUMBERS AND OPERATIONS**

**Sub-Domain: Real Numbers**

**Standard:** Students will be able to demonstrate understanding of real numbers, operate with real numbers (with and without number line) and identify the absolute value of real numbers.

**Benchmark:** Explore, represent and evaluate real numbers

**Unit 2: REAL NUMBERS**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-A-03</b>	[SLO: M-08-A-09] Solve real-world word problems involving calculation with decimals and fractions.	1.1 Real Numbers	Problem solving/Discussion	Oral questions, observations and written test
<b>M-E-A-04</b>	[SLO: M-08-A-06] Represent real numbers on a number line and Recognize the absolute value of a real number.	1.1 Real Numbers	Problem solving/ Discussion	Oral questions, observations and written test
<b>M-E-A-05</b>	[SLO: M-08-A-07] Demonstrate the ordering properties of real numbers	1.1 Real Numbers	Problem solving/ Discussion	Oral questions, observations and written test
<b>M-E-A-06</b>	[SLO: M-08-A-08] P-183 <ul style="list-style-type: none"> <li>• demonstrate the properties of real numbers and their subsets with respect to addition and multiplication:               <ul style="list-style-type: none"> <li>▪closure property</li> <li>▪associative property</li> </ul> </li> </ul>	1.2 Properties of Real Numbers	Problem solving/ Discussion	Oral questions, observations and written test

	<ul style="list-style-type: none"> <li>▪existence of identity element</li> <li>▪existence of inverses</li> <li>commutative property</li> <li>distributive property of multiplication over addition/ subtraction</li> </ul>			
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**DOMAIN- A: NUMBERS AND OPERATIONS**

**Standard:** Students will be able to extend and formalize their knowledge of ratio and proportion in working word problems, and in expressing proportional relations algebraically

**Benchmark:** Solve real life situations of proportion, Profit, insurance, partnership and inheritance.

**Unit 3: FINANTIAL ARITHMETICS**

CODING KEY	SLO/learner will be able to:	Contents	Methodology	Assessment
<b>M-E-A-07</b>	<p><u>[SLO: M-08-A-11]</u> P-189 (SG)</p> <ul style="list-style-type: none"> <li>● solve problems involving direct proportion of two quantities using:               <ul style="list-style-type: none"> <li>▪ table</li> <li>▪ equation</li> <li>▪ graph</li> </ul> </li> <li>● solve problems involving inverse proportion of two quantities using:               <ul style="list-style-type: none"> <li>▪ table</li> <li>▪ equation</li> </ul> </li> </ul>	3.1 Proportion	Problem solving/demonstration	Oral questions/Observations and written tests



<b>M-E-A-08</b>	[SLO: M-08-A-11] P-189 (SG) solve real life situations/word problems involving compound proportion	3.4 Compound Proportion	Problem solving/demonstration	Oral questions/Observations and written tests
<b>M-E-A-09</b>	[SLO: M-08-A-15] P-191 (SG) <ul style="list-style-type: none"> <li>● differentiate profit and markup</li> <li>● calculate: <ul style="list-style-type: none"> <li>▪ the profit/ markup</li> <li>▪ the principal amount</li> <li>▪ the profit/ markup rate, time period</li> </ul> </li> <li>● solve real life situations involving: <ul style="list-style-type: none"> <li>▪ Insurance</li> <li>▪ Partnership</li> </ul> </li> </ul> Inheritance (according to Islamic principles)	3.2 Profit 3.3 Markup 3.4.1 Partnership and inheritance 3.5 Insurance 3.6 inheritance	Problem solving	Oral questions observation and written test

**DOMAIN- A: NUMBERS AND OPERATIONS**

**Sub-Domain: Factors and Multiples**

**Standard:** Students will be able to evaluate square roots and cube roots and solve problems involving square roots and cube roots.

**Benchmark:** Explore, represent and evaluate real numbers

**Unit 4: SQUARES, ROOTS AND CUBE ROOTS**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-A-10</b>	<u>[SLO: M-08-A-16]</u> P-187 (SG) compute square root of: a natural number a common fraction a decimal, given in perfect square form by division method up to 5- digit.	4.1 Squares and square Roots	Inductive/Deductive /Problem solving/Discussion	Observation/oral questions and written test
<b>M-E-A-11</b>	<u>[SLO: M-08-A-17]</u> P-187 (SG) Apply squares and square roots in real life situations	4.2 Real Life of Square Root	Inductive/Deductive /Problem solving/Discussion	
<b>M-E-A-12</b>	<u>[SLO: M-08-A-18]</u> Recognize perfect cubes and find:	4.3 Cubes and Cube Roots	Inductive/Deductive /Problem solving/Discussion	Observation/oral questions and written test
<b>M-E-A-13</b>	-cubes of up to 2-digit numbers - cube roots of up to 5-digit numbers which are perfect cubes Recognize perfect cube			
<b>M-E-A-14</b>	<u>[SLO: M-08-A-19]</u> P-188 (SG) Apply cubes & cube roots in real life situations/word problems	4.3 Cubes and Cube Roots	Inductive/Deductive /Problem solving/Discussion	Observation/oral questions and written test

**DOMAIN-A: NUMBERS AND OPERATIONS**

**Standard:** Students will be able to use language, notation and Venn diagram to describe sets and their elements, and solve word problems.

**Benchmark:** Identify, represent different types of sets and apply properties of set operations

**Unit 05: SETS**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-A-15</b>	[SLO: M-08-A-20] Describe sets using language (tabular, descriptive, and set builder notation) and Venn diagrams.	5.1 Set Notations	Demonstration/Problem Solving/Discussion	Observation and written test
<b>M-E-A-16</b>	[SLO: M-08-A-21] Find the Power set (P) of a set A, where A has up to four elements	5.2.2 Power Set	Demonstration/Problem Solving/Discussion	
<b>M-E-A-17</b>	[SLO: M-08-A-22] Describe Operations on sets and verify Commutative, associative, distributive laws with respect union and intersection.	5.3 Properties involving Operations on sets	Demonstration/Problem Solving/Discussion	
<b>M-E-A-18</b>	[SLO: M-08-A-23] Verify De Morgan's laws and represent through Venn diagrams.	5.3.7 De Morgan's Laws	Demonstration/Problem Solving/Discussion	

<b>M-E-A-19</b>	[SLO: M-08-A-24] <ul style="list-style-type: none"> <li>Apply sets in real life word problems.</li> </ul>	5.3.8 Real Life situation involving sets.	Demonstration/Problem Solving/Discussion	
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**DOMAIN-B: ALGEBRA**

**Sub-Domain: Number Sequence and Pattern**

**Standard:** Students will be able to solve problems involving numbers sequences and patterns.

**Benchmark:** Explore, represent and evaluate real numbers

**Sub-Domain: Expansion and Factorization**

**Standard:** Students will be able to simplify and factorize algebraic expressions and apply algebraic identities to solve problems.

**Bench mark:** Apply basic algebraic operations to manipulate algebraic expressions

**Unit 6: SEQUENCES AND ALGEBRA**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-B-20</b>	[SLO: M-08-B-02] Discover terms of an arithmetic sequence using: <ul style="list-style-type: none"> <li>term to term rule</li> </ul>	6.1 Number Sequence	Problem solving/ Group work	Oral questions observation and written test

	<ul style="list-style-type: none"> <li>position to term rule</li> </ul>			
<b>M-E-B-21</b>	<u>[SLO: M-08-B-03]</u> construct the formula for general term (nth term) of an arithmetic sequence			
<b>M-E-B-22</b>	<u>[SLO: M-08-B-04]</u> Solve problems from real life situations involving numbers sequence and patterns	6.2 General term of an Arithmetic Sequence	Problem solving/ Group work	
<b>M-E-B-23</b>	<u>[SLO: M-08-B-10]</u> Recognize the following algebraic identities and use them to expand expressions:  $(a + b)^2 = a^2 + b^2 + 2ab$ $(a - b)^2 = a^2 + b^2 - 2ab$ $(a + b)(a - b) = a^2 - b^2.$	6.9 Algebraic Identities	Problem solving/Group work	Observation and written test

<b>M-E-B-24</b>	<u>[SLO: M-08-B-11]</u> Apply algebraic identities to solve problems like;  $(103)^2$ , $(99)^2$ , $101 \times 99$	6.9 Algebraic Identities	Problem solving/Group work	
<b>M-E-B-25</b>	<u>[SLO: M-08-B-13]</u> Manipulation of algebraic expressions $(a + b)^3 = a^3 + 3a^2 b + 3ab^2 + b^3$  $(a - b)^3 = a^3 - 3a^2 b + 3ab^2 - b^3$	6.12 Some more Algebraic Formulae		

**DOMAIN-B: ALGEBRA**

**Sub-Domain: Number Sequence and Pattern**

**Standard:** Students will be able to simplify and factorize algebraic expressions and apply to solve problems.

**Benchmark:** Evaluate and manipulate algebraic expressions.

**Unit 7: EXPONENTS AND LAWS OF EXPONENTS**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-B-26</b>	<u>[SLO: M-08-B-18]</u> Deduce and apply the following laws of Exponents/ Indices: -Product Law -Quotient Law -Power Law	7.2 Laws of exponents 7.3 Application of Exponent Laws	Inductive /Deductive /Problem solving/Group work	

**DOMAIN-B: ALGEBRA**

**Sub-Domain: Linear Equations and Inequalities**

**Standard:** Students will be able to interpret and plot graphs of linear equations, solve linear and simultaneous linear equations and linear inequalities.

**Benchmark:** Formulate and solve real life situations involving simultaneous linear equations analytically and graphically

**Unit 8: SIMULTANEOUS LINEAR EQUATIONS**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-B-27</b>	[SLO: M-08-B-14] P-204 (SG) Construct simultaneous linear equations in two variables	8.1 Simultaneous Linear Equations	Problem solving/Group work	Observation and written test

<b>M-E-B-28</b>	<u>[SLO: M-08-B-15]</u> Solve simultaneous linear equations in two variables using <ul style="list-style-type: none"> <li>▪ elimination method</li> <li>▪ substitution method</li> <li>▪ graphical method</li> </ul>	8.2 The solution of two Simultaneous Linear Equations in two variables	Problem solving/Group work	
<b>M-E-B-29</b>	<u>[SLO: M-08-B-16]</u> Solve real world word problems involving two simultaneous linear equations in two variables	8.6 Word Problems	Problem solving/Group work	

**DOMAIN-C: MEASUREMENT**

**Sub-Domain: Mensuration**

**Standard:** Students will be able to recognize various parts of a circle, solve problems involving surface area and volume of 3-shapes and apply the Pythagorean Theorem.

**Benchmark:** Students will be able to calculate surface area and volume of 3-D shapes.

**Unit 9: SURFACE, AREA AND VOLUME**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
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<b>M-E-C-30</b>	<u>[SLO: M-08-C-01]</u> State the Pythagoras theorem and use it to solve right angled triangles.	<b>9.1</b> Pythagoras Theorem <b>9.1.2</b> Practical application of Pythagoras theorem	Problem solving/Group work	Observation and written test
<b>M-E-C-31</b>	<u>[SLO: M-08-C-02]</u> Calculate the arc length and area of the sector of a circle.	<b>9.2</b> Parts of circles	Problem solving/Group work	Observation and written test
<b>M-E-C-32</b>	<u>[SLO: M-08-C-03]</u> Solve real life problem using Pythagoras theorem.	<b>9.1.2</b> Practical application of Pythagoras Theorem	Problem solving/Group work	Observation and written test
<b>M-E-C-33</b>	<u>[SLO: M-08-C-04]</u> Calculate the surface area and volume of the pyramid, sphere, hemisphere and cone.	<b>9.3</b> Sphere <b>9.4</b> Pyramid Surface area and volume of Hemisphere <b>9.5</b> Cone	Problem solving/Group work	Observation and written test
<b>M-E-C-34</b>	<u>[SLO: M-08-C-05]</u> Solve real life problems involving the surface area and volume of the pyramid, sphere, hemisphere and cone.	<b>9.3</b> Sphere <b>9.4</b> Pyramid Surface area and volume of Hemisphere <b>9.5</b> Cone	Problem solving/Group work	Observation and written test

**DOMAIN-D: GEOMETRY**

**Standard:** Students will be to apply facts of congruency and similarity, construct triangles, quadrilaterals, circle with its parts and understand transformations from a two-dimensional perspective.

**Benchmark:** use the properties of triangles, quadrilaterals, polygons and circles to calculate unknown angles and lengths, apply facts of congruence and similarity.

**Unit 10: GEOMETRY**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-D-35</b>	<u>[SLO: M-08-D-01]</u> Rotate an object and find the center of rotation by construction	10.1 Rotation	Demonstration/Group work	Observation and written test
<b>M-E-D-36</b>	<u>[SLO: M-08-D-03]</u> Describe chord, arcs, major and minor arc, semi-circle, segment of a circle, sector, central angle, secant, tangent and concentric circles.	10.3 Circle and its parts	Demonstration/ Problem solving and practice	
<b>M-E-D-37</b>	<u>[SLO: M-08-D-04]</u> Construct a triangle when:- <ul style="list-style-type: none"> <li>• Three sides (SSS)</li> <li>• Two sides and included angle (SAS)</li> <li>• Two angles and included side (ASA)</li> <li>• A right-angled triangle when hypotenuse and one side (HS) are given</li> </ul>	10.1 Construction of triangles	Demonstration/Group work	Observation and written test
<b>M-E-D-38</b>	<u>[SLO: M-08-D-07]</u> Identify congruent and similar figures (in your surroundings), apply properties of two figures to be congruent or similar and apply postulates for congruence between triangles.	<b>10.09</b> Congruent and Similar Figures  <b>10.10</b> Congruent Triangles and their Properties	Demonstration and Practice	Observation/oral and written test

**DOMAIN-E: STATISTICS AND PROBABILITY**

**Standard:** Students will be able to collect, classify and tabulate statistical data, represent data graphically, construct and use cumulative frequency diagrams and calculate and interpret measures of central tendency in various problem solving contexts.

**Benchmark:** Represent and interpret information using data

**Unit 11: DATA MANAGEMENT AND PROBABILITY**

<b>CODING KEY</b>	<b>SLO/learner will be able to:</b>	<b>Contents</b>	<b>Methodology</b>	<b>Assessment</b>
<b>M-E-E-39</b>	<p><u>[SLO: M-08-E-04]</u>            Construct frequency distribution tables, histograms (of equal widths) and frequency polygons and solve related real-world word problems.</p>	<p>11.3 Frequency Distribution and Histogram.</p>	<p>Demonstration/Group work</p>	<p>Observation/oral questions and written test</p>
<b>M-E-E-40</b>	<p><u>[SLO: M-08-E-06]</u>            Perform probability experiments (for example tossing a coin, rolling a die, spinning a spinner etc. for certain number of times) to estimate probability of a simple event..</p>	<p>11.4 Probability</p>	<p>Demonstration/Group work</p>	<p>Observation/oral questions and written test</p>

**MATHEMATICS PACKAGE D & E FOR GRADE 6, 7 & 8**

**GRADE WISE SELECTION OF SLOs FOR PACKAGE-D & E ALP CURRICULUM 2022**

<b>S.NO</b>	<b>GRADES</b>	<b>Number of SLOs in Domains</b>	<b>Number of SLOs Selected for ALP curriculum</b>
<b>Package-D</b>	<b>6</b>	A-18 B-10 C-04 D-07 E-04	A-15 B-06 C-04 D-04 E-03
		<b>43</b>	<b>32</b>
	<b>7</b>	A-26 B-21 C-11 D-11 E-05	A-18 B-14 C-02 D-04 E-03
<b>Total</b>		<b>73</b>	<b>41</b>
<b>Package-E</b>	<b>8</b>	A-24 B-25 C-05 D-07 E-07	A-19 B-10 C-05 D-04 E-02
<b>Total</b>		<b>68</b>	<b>40</b>

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## **DIRECTORATE OF CURRICULUM & TEACHER EDUCATION**

**KHYBER PAKHTUNKHWA, ABBOTTABAD**

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**Dated Abbottabad the, 27.09.2022**

### **NOTIFICATION**

**No. 4436-43/ADL(C&TR):** In exercise of powers conferred under the “*Khyber Pakhtunkhwa Supervision of Curricula, Textbooks and Maintenance of Standard of Education Act. 2011*” and consequent upon the recommendations of the Review Committee notified vide No. 4340-45 dated 16.09.2022, **Mr. Muhammad Shoukat, Director, Curriculum & Teacher Education Khyber Pakhtunkhwa Abbottabad**, being Competent Authority is pleased to notify the “**Alternate Learning Pathways (ALP) Elementary (Grades VI-VIII) Curriculum 2022**”.

1. The Directorate of Professional Development Khyber Pakhtunkhawa (DPD), Regional Professional Development Centers (RPDCs), FATA Institute for Teacher Education, Elementary Colleges of Khyber Pakhtunkhawa shall align Training Manuals/Material, related to ALP with Curriculum 2022.
2. All development partners, NGOs/INGOs working or intends to work in the area of ALP activities shall obtain prior approval/NOC for their training, textual materials and align them with the ALP Curricula 2022 (Grades VI-VIII) from DCTE Khyber Pakhtunkhawa Abbottabad in the educational institutions / allotted ALP centers of Khyber Pakhtunkhawa and Newly Merged Districts.
3. In case of non-compliance, the institutions/ firms at fault shall be proceeded against under Section (4) of the Khyber Pakhtunkhawa Supervision of Curricula, Textbooks and Maintenance of Standard of Education Act. 2011.

**DIRECTOR**

**Endst: of even No & Date  
Copy for information to the:**

1. Secretary to Government of Khyber Pakhtunkhwa E&SE Department, Peshawar.
2. CPO Elementary and Secondary Education Department Khyber Pakhtunkhwa Peshawar.
3. Chairman Khyber Pakhtunkhwa Textbook Board Phase V Hayatabad Peshawar.
4. Ms. Gulnaz Jabeen, Education Officer UNICEF Peshawar.
5. Director, Elementary & Secondary Education Khyber Pakhtunkhwa Peshawar.
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11. Director General, Information & Public Relations Khyber Pakhtunkhwa Peshawar.
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13. Section Officer (B/T), Elementary & Secondary Education Department Peshawar.
14. P.S to Director, Local Directorate.

**Syed Amjad Ali  
Additional Director  
Curriculum & Textbooks Review**