Unit 1

Sets

Scheme of Work

Estimated Number of Periods: 13

Specific Learning Outcomes	Number of periods
• Describe sets using language (tabular, descriptive and set-builder notation) and Venn diagrams	3
• Find the power set (P) of set A where A has up to four elements	2
• Describe operations on sets and verify commutative, associative, distributive laws with respect to union and intersection	5
• Verify De Morgan's laws and represent through Venn Diagram	2
• Apply sets in real-life word problems	1

Prior Knowledge Assessment

Pupils should be able to:

- recognise examples and non-examples of sets.
- understand the terms "element" or "member" of a set.
- understand the symbols used in sets.
- describe different types of sets including universal set.
- describe sets using listing method, tabular method, and Venn diagram.

Written Assignments

Exercise	Class Assignment	Home Assignment
1.1	2, 3(c, d, e, f), 4, 5, 7	1, 3(a, b), 6
1.2	1, 2(ii, iii) of (a, b, c, d)	2(i, ii) of (a, b, c, d)
1.3	1(b), 2, 3, 4(b, d, f, g, h)	1(a), 4(a, c, e)

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 2

Real Numbers

Scheme of Work

Estimated Number of Periods: 15

Specific Learning Outcomes	Number of periods
• Differentiate between rational and irrational numbers • Represent real numbers on a number line and recognise the absolute value of a real number • Demonstrate the ordering properties of real numbers. • Demonstrate the following properties: closure property, associative property, existence of identity element, existence of inverses, commutative property, distributive property • Solve real-world word problems involving calculation with decimals and fractions • Identify and differentiate between decimal numbers as terminating, (non-recurring) and non-terminating (recurring)	5
• Round off numbers up to 5 significant figures • Analyse approximation error when numbers are rounded off • Solve real-world word problems involving approximation	4
• Find the square root of natural numbers, common fractions and decimal numbers (up to 6-digit) • Solve real-world word problems involving squares and square roots	3
• Recognise perfect cubes and find: cubes of up to 2-digit numbers, cube roots of up to 5-digit numbers which are perfect cubes • Solve real-world word problems involving cubes and cube roots	3

Prior Knowledge Assessment

Pupils should be able to:

- apply four operations on integers, fractions, and decimal numbers.
- apply the order of operations when evaluating expressions with various types.
- understand and use the following properties for whole numbers, integers, fractions, and decimals: Commutative, distributive, associative, additive identity, multiplicative identity.
- find factors and multiples and recognize prime and composite numbers.
- use prime factorization method.
- round off numbers to nearest whole number, tens, hundreds, thousands, and upto a specified number of decimal places.

Written Assignments

Exercise	Class Assignment	Home Assignment
2.1	1, 2, 3(e, f, g), 4(e – h), 5(b), 6, 7	3(a, b, c, d), 4(a – d), 5(a)
2.2	1, 2(d – h), 4, 5, 6,	2(a – c), 3
2.3	1(d – h), 2(d – h), 3(c, d, h, I, j, l), 4, 5, 6	1(a – c), 2(a – c), 3(a, c, e, f, g, k), 3
2.4	1, 2(d – f), 3, 4(d – f), 5, 7(c, d), 8, 11, 12	2(a – c), 4(a – c), 6, 7(a, b), 9, 10

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 3

Compound Proportion

Scheme of Work

Estimated Number of Periods: I0

Specific Learning Outcomes	Number of periods
• Calculate direct proportion and solve real-world word problems related to direct proportion. (using table, equation and graph)	4
• Calculate inverse proportion and solve real-world word problems related to inverse proportion. (using table, equation and graph)	4
• Calculate compound proportion and solve real-world word problems related to compound proportion.	2

Prior Knowledge Assessment

Pupils should be able to:

- understand simple proportion as an equality of two ratios. This forms the direct basis for direct and inverse proportion.
- solve simple linear equations in one variable, as setting up and solving proportions.
- substitute numerical values for variables in an equation or expression.
- plotting points on cartesian coordinate plane.

Written Assignments

Exercise	Class Assignment	Home Assignment
3.I	I(c, d), 2, 3, 6, 7, 8	I(a, b), 4, 5
3.2	I(c, d), 2, 3, 5, 6	I(a, b), 4
3.3	I, 3, 5, 6, 7	2, 4

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment.
- Teacher's assessment

Unit 4

Financial Arithmetic

Scheme of Work

Estimated Number of Periods: 13

Specific Learning Outcomes	Number of periods
• Convert Pakistani currency to well-known international currencies and vice versa	2
• Explain and calculate profit percentage, loss, percentage, and discount • Solve real world word problems involving profit %, loss %, and discount	4
• Explain and calculate profit/markup, principal amount and markup rate • Solve real world word problems involving markup	3
• Explain insurance, partnership and inheritance • Solve real world word problems involving insurance, partnership and inheritance	4

Prior Knowledge Assessment

Pupils should be able to:

- express a quantity as a percentage of another quantity.
- increase and decrease a quantity by a certain percentage.
- calculate simple profit and loss.
- deal with ratios and proportions.

Written Assignments

Exercise	Class Assignment	Home Assignment
4.1	2, 3, 5, 6	1, 4
4.2	1(b, c), 3, 6, 7, 9, 10	1(a, d), 2, 4, 5, 8
4.3	1(c, d, e), 2, 5, 7, 8	1(a, b), 3, 4, 6
4.4	2, 3, 4, 7, 8	1, 5, 6
4.5	3, 4, 6, 7, 9, 10	1, 2, 5, 8

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 5

Algebra: Polynomials

Scheme of Work

Estimated Number of Periods: 19

Specific Learning Outcomes	Number of periods
• Differentiate between an arithmetic sequence and a geometric sequence • Find terms of an arithmetic sequence using: - term to term rule – position to term rule	4
• Construct the formula for the general term (nth term) of an arithmetic sequence	2
• Solve real life problems involving number sequences and patterns	2
• Recall the difference between: open and close sentence, expression and equation, equation and inequality • Recall the addition and subtraction of polynomials • Recall the multiplication of polynomials	3
• Divide a polynomial of degree up to 3 by a monomial, and binomial • Simplify algebraic expressions involving addition, subtraction, multiplication and division	4
• Identify base, index/ exponent and its value • Deduce and apply the following laws of Exponents/ Indices: -Product Law, Quotient Law, and Power Law	4

Prior Knowledge Assessment

Pupils should be able to:

- identify and describe simple number patterns.
- identify rules for number patterns.
- extend number sequence using a rule.
- simplify expressions.
- recognize polynomials as monomial and binomial.
- describe the difference between equation and expression.

Written Assignments

Exercise	Class Assignment	Home Assignment
5.1	1(c, d, f, g, h, i, j, k), 2(c, d, e, h, j), 3(b, c, e, f), 4(a, d, e, g, h), 5(b, c, d), 6, 7	1(a, b, e, l), 2(a, b, f, g, i), 3(a, d), 4(b, c, f), 5(a)
5.2	1, 2, 3, 4(b, c, d), 5(b, c, d), 6(c, d, e), 7(c, d, e, f), 10, 11, 12	4(a), 5(a), 6(a, b), 7(a, b), 8, 9
5.3	1(c, d, e, f), 2, 3, 5, 7, 9, 10	1(a, b), 4, 6, 8

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 6

Algebraic Expressions: Expansion and Factorisation

Scheme of Work

Estimated Number of Periods: 14

Specific Learning Outcomes	Number of periods
• Recognise the following algebraic identities and use them to expand expressions: $(a+b)^2 = a^2+2ab+b^2$, $(a-b)^2 = a^2-2ab+b^2$, $(a+b)(a-b) = a^2 - b^2$	4
• Apply algebraic identities to solve problems like $(103)^2$, $(1.03)^2$ $(99)^2$, 101×99	3
• Factorize the following types of expressions: $ka + kb + kc$, $ac + ad + bc + bd$, $a^2 \pm 2ab + b^2$, $a^2 - b^2$, $a2 \pm 2ab + b2 - c2$	3
• Manipulation of algebraic expressions: $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$	4

Prior Knowledge Assessment

Pupils should be able to:

- apply all four basic arithmetic operations (addition, subtraction, multiplication, division) with integers, fractions, and decimals.
- consistent application of the order of operations when evaluating expressions.
- simplifying algebraic expressions by combining like terms.
- factorise expressions by taking out the common factor.
- recognise perfect squares.
- know basic multiplication facts and identify factors of numbers.
- understand that factorisation is the reverse of expansion.

Written Assignments

Exercise	Class Assignment	Home Assignment
6.I	I(d - i), 2(c, d), 3(d – f), 4(c – e), 5(d – f), 6(c, d), 7(c, d)	I(a – c), 2(a, b), 3(a – c), 6(a, bb, c, d, g), 4, 6, 8
6.2	I(c, d, e, f), 2(b, c), 3(b, c), 4(b, c)	I(a, b), 2(a), 3(a), 4(a)
6.3	I(f – o), 2(f – o), 3(f – o)	I(a – e), 2(a – e), 3(a – e)

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessmen

Unit 7

Linear Equations and Linear Inequalities

Scheme of Work

Estimated Number of Periods: 15

Specific Learning Outcomes	Number of periods
• Recognise the gradient of a straight line. Recall the equation of horizontal and vertical lines • Find the value of '*y*' when '*x*' is given from the equation and vice versa • Plot graphs of linear equations in two variables i.e. y = mx and y = mx + c • Interpret the gradient/ slope of the straight line	5
• Construct simultaneous linear equations in two variables • Solve simultaneous linear equations in two variables using substitution method, elimination method, and graphical method • Solve real-world word problems involving two simultaneous linear equations in two variables	5
• Solve simple linear inequalities i.e.,, ax > b or cx < d ax + b < c and ax + b > c • Represent the solution of linear inequality on the number line	5

Prior Knowledge Assessment

Pupils should be able to:

- work with expressions containing one or more variables.
- construct and evaluate algebraic expressions by substituting numerical values for variables.
- simplify algebraic expressions by combining like terms.
- understand how multiplication distributes over addition and subtraction.
- multiply a monomial by a polynomial and perform basic division involving algebraic terms.
- solve simple linear equations in one variable using inverse operations.
- use the Cartesian coordinate system and to accurately plot ordered pairs (x,y) on a coordinate plane.
- identify the coordinates of a given point on a graph.

- understand and interpret word problems.
- extract relevant numerical values and relationships from a problem.

Written Assignments

Exercise	Class Assignment	Home Assignment
7.1	1(c – f), 2, 3, 5(c – f)	1(a, b), 4, 5(a, b)
7.2	1(c, d), 2(d – f), 3(b, c)	1(a, b), 2(a – c), 3(a)
7.3	1, 2, 3, 6, 8, 10, 11, 12, 13	4, 5, 7, 9
7.4	1, 3, 5, 6, 7, 9, 10, 11, 12	2, 4, 8

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 8

Practical Geometry

Scheme of Work

Estimated Number of Periods: 10

Specific Learning Outcomes	Number of periods
• Construct a triangle when: -three sides (SSS) - two sides and included angle (SAS) - two angles and included side (ASA) - a right- angled triangle when hypotenuse and one side (HS) are given	4
• Construct different types of quadrilaterals (square, rectangle, parallelogram, trapezium, rhombus and kite)	5
• Draw angle and line bisectors to divide angles and sides of triangles and quadrilaterals	1

Prior Knowledge Assessment

Pupils should be able to:

- use a compass to transfer specific lengths and intersecting arcs.
- draw an angle of a specific measure (using a protractor for initial learning, or potentially a compass for specific angles) and then accurately marking off the two sides using a ruler or compass.
- create parallel lines (e.g., by ensuring consistent distances or using angle properties with a transversal if already covered).
- to construct perpendicular lines using a compass and ruler.

Written Assignments

Exercise	Class Assignment	Home Assignment
8.1	1(a, c, e, f), 3, 4	1(b, d), 5
8.2	1, 2, 3a,5, 6, 7a, 8a, 10	3b, 4, 7b, 8b, 9

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 9

Congruence, Similarity, and Transformation

Scheme of Work

Estimated Number of Periods: 13

Specific Learning Outcomes	Number of periods
• 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	5
• Rotate an object and find the centre of rotation by construction	4
• Enlarge a figure (with the given scale factor) and find the centre and scale factor of enlargement	4

Prior Knowledge Assessment

Pupils should be able to:

- visually identify objects that are identical.
- recognize different types of triangles.
- accurately measure and draw angles of specific measures.
- compare quantities/values using ratios.
- simplify ratios.
- accurately plot ordered pairs (x,y) on a coordinate plane.
- bisect line segments and angles.

Written Assignments

Exercise	Class Assignment	Home Assignment
9.1	1, 3, 4	2
9.2	1(b, d e, f), 2, 3(b)	1(a, c), 3(a)
9.3	1, 2(b), 3(c, d), 4(a)	2(a), 4(b)

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 10

Measurement

Scheme of Work

Estimated Number of Periods: 14

Specific Learning Outcomes	Number of periods
• State the Pythagoras theorem and use it to solve right angled triangles • Solve real life word problems using Pythagoras theorem	4
• Describe chord, arcs, major and minor arc, semi-circle, segment of a circle, sector, central angle, secant, tangent and concentric circles • Calculate the arc length and the area of the sector of a circle	4
• Calculate the surface area and volume of the pyramid, sphere, hemisphere and cone • Solve real life word problems involving the surface area and volume of pyramid, sphere, hemisphere and cone	6

Prior Knowledge Assessment

Pupils should be able to:

- identify the hypotenuse and the other two legs of a right-angled triangle.
- understand the value of π and use in calculations involving circles.
- recognize and understand the properties of 3D objects.
- calculate surface area by summing the areas of all faces.
- substitute the values in formulae.
- use the standard units of length (cm, m), area (cm^2, m^2), and volume (cm^3, m^3).

Written Assignments

Exercise	Class Assignment	Home Assignment
10.1	1(a, d), 2(c, d), 4, 5, 6	1(b, c), 2(a, b), 3
10.2	1, 2, 4, 5(c, d)	3, 5(a, b)
10.3	1, 4, 5, 6	2, 3
10.4	2, 3, 4, 6, 7	1, 5
10.5	2, 3, 4, 6	1, 5

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment

Unit 11

Data Handling

Scheme of Work

Estimated Number of Periods: 14

Specific Learning Outcomes	Number of periods
• Select and justify the most appropriate graph(s) for a given data set and draw simple conclusions based on the shape of the graph • Recognise the difference between discrete, continuous, grouped and ungrouped data • Construct frequency distribution tables, histograms (of equal widths) and frequency polygons and solve related real-world problems	5
• Calculate range, variance and standard deviation for ungrouped data and solve related real-world problems	2
• Explain and compute the probability of; mutually exclusive, independent, simple combined and equally likely events. (including real-world word problems)	3
• 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 • Compare experimental and theoretical probability in simple events	4

Prior Knowledge Assessment

Pupils should be able to:

- sort and tally data.
- recognize, read, and draw various graph types (bar, pie) and their general purpose.
- round numbers to a specified number of decimal places or significant figures, especially in statistical calculations.
- calculate squares and square roots.
- collect and organize simple data.
- recognition of discrete vs. continuous data and ungrouped vs. grouped data.
- understanding basic probability terms.
- calculate the probability of a simple event.
- read and interpret word problems, extract relevant information, and apply

appropriate formulas or methods.

- calculate simple probability.
- to extract numerical data from word problems and apply the correct calculation.

Written Assignments

Exercise	Class Assignment	Home Assignment
II.I	2, 4, 5	I, 3
II.2	2, 3, 4	I
II.3	I, 2, 5, 6, 7	3, 4

Evaluation

Ways to evaluate teaching and students learning.

- Oral assessment
- Written assessment
- Teacher's assessment