SYLLABUS 2079   C. Mathematics   Class: 9

First Terminal Examination

Unit	Topics	Per	Teaching Methods	Teaching Materials	Evaluation techniques & tools	Rem
1	**Set** * Operations on set (Union, Intersection, Difference, complement)	5	* question/ answer * Demonstration * Analysis/ synthesis	Two or three ring and wooden block numbers.	* oral test * Written Exam * practical * project work /field work	
2	**Arithmetic** * Commission ,bonus and Dividend * Tax and VAT	9	* Q\A discussion visit shop\ market/Tax office and related field if possible	<u>Tax related bills</u>	* oral test * Written Exam * practical * project work/field work	
3	**Mensuration** * Area of Plane figure * Application of area in terms of Measurement scale in local contest(Bigha, Kattha, Dhur,Ropani, Aana, paisa and Daam) *Problems Related to find area and perimeter of triangular and quadrilateral shape of field.	6	*Develop formula for the area of scalene triangle * Use the relation of meter, square meter and local measurement like Bigha, Kattha, Dhur,Ropani, Aana, paisa and Daametc to find area of triangular and quadrilateral field * Use measuring tape and find the area of square shape and rectangular shape, quadrilateral shape, triangular shape field and find their area. *Practical *Q\A discussion	Measurement tape, Scale etc.	* oral test * Written Exam * practical * project work/field work	
4.	**Algebra** * Sequence and series *Factorization (Review of the form a^2-b^2, a^3+b^3, a^3-b^3, ax^2+bx+c)	6	*Q\A discussion *Demonstration like $x^2+3x+2 =(x+2)(x+1)$ etc.	<u>Sheet of hard paper and scissors</u>	* oral test * Written Exam * practical * project work/field work	
5.	**Geometry Triangles** *Verification of properties of triangle (experimentally) * The sum of three angles of a triangle. * Relation of external angle and the interior angle which are non-adjacent angles. * Sum of two sides of a triangle is always greater then third side (Experimental verification only) * Relation of angle opposite to greatest and smallest side. (Experimental verification only) * Shortest distance form a point to a line is perpendicular to the line (only concept) * Geometrical problems related to above facts.	7	* practical * question/ Answer * Research * Demonstration * paper folding *showing triangular shape in house temple playground etc * problem solving	Wooden or paper triangle or quadrilaterals etc are required.	* oral test * Written Exam * practical * project work/field work	
6	**Trigonometry:** **Concept of trigonometry ratios**	2				
7	**Statistics** Collection of data, frequency table, histogram, ogives	4				
8.	Probability					
	Revision	3	Teachers can revise the lessons, observe the copies, deal with difficult problems faced by students			
	Total working days From Jestha 3 to Ashad 21, 2079	42				

SYLLABUS 2079   C. Mathematics   Class: 9

First term

Subject: C. Mathematics   Class : 9   Full Marks: 75   **Time: 3:00 hrs.**

Specification Grid

Area	Content	K	C	A	HA	T.N Q	Total Marks	Total Time
Sets	* Operations on set (Union, Intersection, Difference, complement)	1	3	1		5		26 min
Arithmetic	Commission ,bonus, Dividend Tax and VAT	1	4	3	2	10		56 min
Menstruation	Area of scalene triangle, Problems related to area of Triangles *Measurement scale in local contest(Bigha, Kattha, Dhur,Ropani, Aana, paisa and Daam) *Problems Related to find area and perimeter of triangular and quadrilateral shape of field.	1	4	1	1	7		32 min
Algebra	Sequence and series Factorization (Review of the form a^2-b^2, a^3+b^3, a^3-b^3, ax^2+bx+c)	2	3	2		7		29 min
Geometry	* Verification of properties of triangle (experimentally) * The sum of three angles of a triangle. * Relation of external angle and the interior angle which are non- adjacent angles. * Sum of two sides of a triangle is always greater then third side (Experimental verification only) * Relation of angle opposite to greatest and smallest side. (Experimental verification only) * Geometrical problems related to above facts.		3	2	1	6		34 min
Statistics	Collection of data, frequency table, histogram, ogives		1	1		2		
Trigonometry	**Concept of trigonometry ratios**	1	1			2		5 min
Probability								
Total		6	17	10	4	37	75	180min

Note: The questions will be asked by joining the very short, short and long questions. Thus, number of questions may vary according to the structure of the question pattern.

Mid-Terminal Examination

Unit	Topics	Per Iods	Teaching Methods	Teaching Materials	Evaluation techniques & tools	Rem.
1	Set * Cardinality of sets (solution of word problems related to two sets and their Venn-diagram)	5				
2	**Arithmetic** * Home arithmetic(bill of electricity, water, telephone, mobile, taxi etc)	8	* Q/A discussion * Research * Demonstration * visit related field if possible.	Bill of related field	* oral test * Written Exam * practical * project work /field work	
3	**Mensuration** * Area of four walls, ceiling, floor of room. * Cost estimation. * Total cost	8	* Analysis and synthesis * Research * Q/A discussion * Demonstration * Problem solving * paper folding	Measurement tape, scale etc	* oral test * Written Exam * practical * project work /field work	
4.	**Algebra** * Factorization (Review of the form a^2-b^2, a^3+b^3, a^3-b^3, ax^2+bx+c) * H.C.F. and L.C.M. of algebraic expression like$(a+b)^3$, $(a-b)^3$, a^2-b^2, a^3+b^3, a^3-b^3, ax^2+bx+c, $a^4+a^2b^2+b^4$etc up to three algebraic expressions.	12	* Q/A discussion * Demonstration		* oral test * Written Exam * practical * project work /field work	
5.	**Geometry** * Base angles of isosceles triangle and their relations, and its converse. * The bisector of the vertical angle of an isosceles triangle is perpendicular bisector of base and its converse * Similar Triangles (Relations between corresponding sides and angles)	6	* Demonstration * Practical * Analysis and synthesis * Research	Triangular shapes of different size but similar are required	* oral test * Written Exam * practical * project work /field work	
6.	**Trigonometry** Table of 0^0 to 90^0 and trigonometric calculations	3				
7.	**Statistics** * Data collection classification and tabulation * Frequency table discrete and Group, cumulative frequency table * histogram, frequency polygon ogive curve *Arithmetic mean (individual and discrete data)	6	Use statistical data available in school, class room and field work		* oral test * Written Exam * practical * project work /field work	
8.	**Probability**					
	Revision	4	Teachers can revise the lessons, observe the copies, deal with difficult problems faced by students			
	Total working days From Shrawan 1 to Bhadra 31	52				

SYLLABUS 2079   C. Mathematics   Class: 9
Mid-term class 9

Subject: C. Mathematics   Full Marks: 75 **Time: 3:00 hrs.**

Specification Grid

Area	Content	K	C	A	HA	T.N Q	Total Marks	Total Time
Sets	* Cardinality of sets (solution of word problems related to two sets and their Venn-diagram)	1	1	1		3		13 min
Arithmetic	Home arithmetic(bill of electricity, water, telephone, mobile, taxi etc) + revue from first term	1	2	2	1	7		45 min
Menstruation	* Area of four walls, ceiling, floor of room. * Cost estimation.	1	5	2	2	10		42 min
Algebra	* H.C.F. and L.C.M. of algebraic expression like$(a+b)^3$, $(a-b)^3$, a^2-b^2, a^3+b^3, a^3-b^3, ax^2+bx+c, $a^4+a^2b^2+b^4$etc up to three algebraic expressions.	1	3	2		6		27 min
Geometry	* Shortest distance form a point to a line is perpendicular to the line (only concept) * Base angles of isosceles triangle and their relations, and its converse. * The bisector of the vertical angle of an isosceles triangle is perpendicular bisector of base and its converse *Similar Triangles (Relations between corresponding sides and angles)	1	2	1	1	5		26 min
Statistic	* Data collection classification and tabulation * Frequency table discrete and Group, cumulative frequency table * histogram, frequency polygon ogive curve *Arithmetic mean (individual and discrete data)	1	2	2		5		23 min
Trigonometry	Table of 0^0 to 90^0 and trigonometric calculations		1			1		4 min
Probability								
Total		6	17	10	4	37	75	180min

Note: The questions will be asked by joining the very short, short and long questions. Thus, number of questions may vary according to the structure of the question pattern.

SYLLABUS 2079   **C. Mathematics**   **Class: 9**

Second Terminal Examination

Unit	Topics	Per iods	Teaching Methods	Teaching Materials	Evaluation techniques & tools	Remarks
1	**Set**					
2	**Arithmetic**					
3	**Mensuration** **Prism** **Cylinder and Sphere**	7				
4.	**Algebra** * Solution of simultaneous equations. (substitution method, elimination method) *verbal problems having two unknowns.	12	* Q\A discussion * demonstration * problem solving		* oral test * Written Exam * practical * project work /field work	
5.	**Geometry** Quadrilaterals: *Properties of parallelogram (theoretically only) * The St. lines joining the end points of same sides of equal and parallel lines are also equal and parallel * Opposite angles and sides of parallelogram are equal * Diagonals of parallelogram bisect each other * Converse of above theorems * Problems related to above theorems. * problem related to quadrilateral * Midpoint Theorem	25	* Demonstration * Practical * Analysis and synthesis * Research	Paper or wooden shape of parallelogram etc are required. Geo board Geometry box	* oral test * Written Exam * practical * project work /field work	
6.	**Trigonometry**					
7.	**Statistics** **Mean, Median, Mode, Range,**	7				
8.	**Probability** * Definition of basic terms, probability scale and use of probability * Theoretical and empirical probability * Probability of an experiment and an event	6	* Q\A discussion * demonstration * research	Dice, spinners, coin, playing cards, numbered cards etc	* oral test * Written Exam * practical * project work /field work	
	Revision	3	Teachers can revise the lessons, observe the copies, deal with difficult problems faced by students			
	Total working days From Asoj 24 to Poush 15	60				

SYLLABUS 2079   C. Mathematics   Class: 9
Second term class 9

Subject: C. Mathematics   Full Marks: 75 **Time: 3:00 hrs.**

Specification Grid

Area	Content	K	C	A	HA	T.N Q	Total Marks	Total Time
Sets	Revue from first term			1		1		7 min
Arithmetic	Review from first and mid term		2	1	1	4		23min
Menstruation	Review from first and mid term	1	2	1		4		17 min
Algebra	Solution of simultaneous equations. (substitution method, elimination method) *verbal problems having two unknowns.	1	2	3	1	7		40 min
Geometry	Properties of parallelogram (theoretically only) * The st. lines joining the end points of same sides of equal and parallel lines are also equal and parallel * Opposite angles and sides of parallelogram are equal * Diagonals of parallelogram bisect each other * Converse of above theorems * Problems related to above theorems. * problem related to quadrilateral * Midpoint Theorem	1	6	4	2	13		70min
Statistics	Review from mid term	1	1			2		5 min
Trigonometry								
Probability	* Definition of basic terms, probability scale and use of probability * Theoretical and empirical probability * Probability of an experiment and an event	2	4			6		18 min
Total		6	17	10	4	37	75	180min

Note: The questions will be asked by joining the very short, short and long questions. Thus, number of questions may vary according to the structure of the question pattern.

Unit	Topics	Per iods	Teaching Methods	Teaching Materials	Evaluation techniques & tools	Rem arks
1	**Set**					
2	**Arithmetic**					
3	**Mensuration**					
4.	**Algebra** * Laws of indices *Simplification of indices.	10	* question/ answer discussion * Research, * practical * demonstration		* oral test * Written Exam * practical * project work /field work	
5.	**Geometry** *Construction quadrilateral, trapezium and rhombus * Circle:- Relation of chord and its perpendicular from center. * Relation of line joining the centre and mid point of chord with the chord of a circle. * Relation of centre and the perpendicular bisector of chord of circle. * Relation of equal chords and their distance from the center of circle. *Problem related to centre of circle and a chord.	27	* practical and demonstration * Analysis and synthesis * Research	Geo- board and rubber are required Circular sheet with chords and angle in them	* oral test * Written Exam * practical * project work /field work	
6.	**Trigonometry** Review of previous terms	4	* problem solving * Q/A discussion	Ratio table and right angled triangle	* oral test * Written Exam * practical * project work /field work	
7.	**Statistics** Quartiles	8	* visit village/school and other place and collection data * presentation and tabulation * finding the partition values and mode of the collected data.	Graph paper. chart paper etc	* oral test * Written Exam * practical * project work /field work	
8.	Probability					
	Revisions	4	Teachers can revise the lessons, observe the copies, deal with difficult problems faced by students			
	Total working days From Magh 2-Chaitra 10, 2079	53				

SYLLABUS 2079   **C. Mathematics**   **Class: 9**
Annual exam class 9
Subject: C. Mathematics   Full Marks: 75**Time: 3:00 hrs.**
Specification Grid

Area	Content	K	C	A	HA	T.N Q	Total Marks	Total Time
Sets		1		1		2		9 min
Arithmetic			2	2	1	5		30 min
Mensuration			1		1	2		13 min
Algebra		1	4	2	1	8		40 min
Geometry		1	4	3	1	9		47min
Statistic		1	2	1		4		16 min
Trigonometry		1	2	1		4		16 min
Probability		1	2			3		9 min
Total		6	17	10	4	37	75	180min

Note: The questions will be asked by joining the very short, short and long questions. Thus, number of questions may vary according to the structure of the question pattern.

Process of learning teaching
        In the process of teaching mathematics the teacher needs to emphasize more on the implementation of mathematical knowledge , skill in their homes, neighborhood, school and daily lives discussing the exercises given in the text books rather than on his/her presentation in classroom . The mathematics teacher needs to help students how to analyses their mistakes/errors and to follow remedial measures .The following teaching methods should be adopted to develop learning   teaching mathematics.
>Method of question/ answer and discussion.
>Method of demonstration
>Problem solving method.
>Research method.
>Inductive and deductive method.
>Practical method
>Analysis and synthesis method.
Process of Evaluation
        In the process of teaching compulsory mathematics, students' evaluation should be done keeping the following objective in to examine.
>Whether or not the students could achieve assigned.
>To examine whether or not the students have learnt the basic knowledge (entering behavior) for new mathematics chapters.
>To examine how effectively the teacher is able to teach.
>To examine the standard of students about their achievement.
The following evaluation methodology should be adopted to make constructive evaluation of students.
>To observe their change and improvement or their activities.
>Participation of students on class work and other activities.
>To use mathematical skills in practice.
>Written work (like class work and home work) and practical work.
The objective of student's evaluation is to ascertain their achievement. It helps to improve then by identifying their difficulty level. Therefore, should introduce reformative measures by taking students' evaluation and examination result as the basis. The teacher needs to construct question paper strictly on the basis of specification grid for conducting the written exam for grade 9. The SEE examination should be held as ascertained following the specification grid.