

# Course Outline

## Teaching Mathematics

<b>Course Title:</b>	Teaching Mathematics
<b>Credit Hours:</b>	3(3+0)
<b>Course Level:</b>	B.Ed.
<b>DR. MUHAMMAD ARSHAD <i>Ph.D</i></b>	

Topic Title		Objectives/Learning Outcomes of the Topic	How will the said objective be assessed	No. of Video Minutes Dedicated to this Topic	Primary/Secondary Resource/Book; Course Notes for the Topic	Page/Section/URL of the Resource
1	Aims of Teaching Mathematics	After completing this topic, student will be able to understand the general aim of teaching mathematics	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Teaching of Mathematics of <a href="http://www0.hku.hk/cerc/Publications/CERC_5.htm">http://www0.hku.hk/cerc/Publications/CERC_5.htm</a> pp-1	Teaching of Mathematics of <a href="http://www0.hku.hk/cerc/Publications/CERC_5.htm">http://www0.hku.hk/cerc/Publications/CERC_5.htm</a> pp-1
2	Educational value of Math	After completing this topic, student will be able to understand the importance of mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs .	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams pp-1</i>
3	Place and function of Math	After completing this topic, student will be able to understand use and application of math	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams pp-1-2</i>
4	Mathematics in everyday life	After completing this topic, student will be able to understand the use of mathematics in every day life	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams pp-1-2</i>

5	Mathematics in profession	After completing this topic, student will be able to understand the use of Mathematics in different professions	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs .	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams pp-1-2</i>
6	Mathematics in other branches of knowledge	After completing this topic, student will be able to understand application of Mathematics in other branches of knowledge.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams pp-1-2</i>
7	Mathematical Equipment (Numeracy, Algebra)	After completing this topic, student will be able to know about equipment used for teaching of mathematics	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs .	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 5</i>
8	Mathematical Equipment (Geometry)	After completing this topic, student will be able to know about equipment used for teaching of geometry	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 6</i>
9	Preparation of AV-aids/materials for teaching Mathematics (charts, models, pictures,	After completing this topic, student will be able to prepare AV aids and materials for teaching mathematics	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 6</i>

	graphics etc)		.			
10	Use of aids/materials for teaching Mathematics (Charts, models, pictures)	After completing this topic, student will be able to use charts, models, pictures	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 6</i>
11	Use of aids/materials for teaching Mathematics (Graphics, slides, films)	After completing this topic, student will be able to use graphics, slides, films.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Psacharopoulos, George (1990) Comparative Education: From theory to practice or Are you A;/neo or B:/ist, Comparative Education Review, Vol 34, No.3 pp 369-380  pp 377-379	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 6</i>
12	Use of aids/materials for teaching Mathematics (Videos, Interactive board & Multimedia)	After completing this topic, student will be able to use Videos, Interactive board	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Psacharopoulos, George (1990) Comparative Education: From theory to practice or Are you A;/neo or B:/ist, Comparative Education Review, Vol 34, No.3 pp 369-380  pp 377-379	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 6</i>
12	Mathematics Curriculum; An overview	After completing this topic, student will be able to understand basics of	Assessment will include theory covered in lectures, Formative	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum</i>	National Curriculum for Mathematics 2006

		Maths Curriculum	assessment (question answer during class)formal examination and MCQs.		<i>Development Teams</i>	– <i>Curriculum Development Teams Page 1</i>
13	Themes of Mathematics Curriculum.	After completing this topic, student will be able to understand Themes of Mathematics Curriculum.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 2</i>
14	Standards of Mathematics Curriculum.	After completing this topic, student will be able to understand Standards of Mathematics Curriculum.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 3</i>
15	Benchmarks of Mathematics Curriculum.	After completing this topic, student will be able to understand Themes of Mathematics Curriculum.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 4</i>
16	Student Learning Outcomes (SLOs) of Mathematics Curriculum.	After completing this topic, students will be able to understand the historical context of theoretical understanding of SLOs of Mathematics	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams Page 4-7</i>
17	Role of Teacher in Teaching	After completing this topic, students will be able	Assessment will include theory covered in	5 minutes	National Curriculum for Mathematics	National Curriculum for

	Mathematics; need & importance.	to understand the role, need and importance of teacher in teaching of mathematics.	lectures, Formative assessment (question answer during class)formal examination and MCQs.		2006 – <i>Curriculum Development Teams</i>	Mathematics 2006-Teaching strategies page no.133
18	Role of Teacher in Teaching Mathematics; A planner	After completing this topic, students will be able to understand the role, need and importance of teacher in teaching of mathematics as as planner.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
19	Role of Teacher in Teaching Mathematics;An Organizer	After completing this topic, students will be able to understand the role, need and importance of teacher in teaching of mathematics as an organizer	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
20	Role of Teacher in Teaching Mathematics;An encourager.	After completing this topic, students will be able to understand the role, need and importance of teacher in teaching of mathematics as encourager.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
21	Role of Teacher in Teaching Mathematics;A negociator	After completing this topic, students will be able to understand the role, need and importance of teacher in teaching of mathematics as negociator.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
22	Role of Teacher in Teaching Mathematics;A mediator.	After completing this topic, students will be able to understand the role, need and importance of	Assessment will include theory covered in lectures, Formative assessment (question	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development</i>	National Curriculum for Mathematics 2006-Teaching

		teacher in teaching of mathematics as mediator.	answer during class)formal examination and MCQs.		<i>Teams</i>	strategies page no.133
23	Effective Teaching Strategies in Mathematics	After completing this topic students will be able to learn about the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
24	Investigating Mathematics	After completing this topic students will be able to learn about investigating as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
24	Examples Investigating Mathematics	After completing this topic students will be able to learn & practice about investigating as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes		
25	Problem Solving Method	After completing this topic students will be able to learn & understand about problem solving as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	KURNIK, Z. (2001), <i>Matematički pojam, Matematika i škola</i> , Vol.3, n11, pp. 8-16.	KURNIK, Z. (2001), <i>Matematički pojam, Matematika i škola</i> , Vol.3, n11, pp. 8-16.
25	Examples Problem Solving Method	After completing this topic students will be able to learn & practice about investigating as one of the effective teaching strategies for	Assessment will include theory covered in lectures, Formative assessment (question answer and solving problems during	5 minutes	KURNIK, Z. (2001), <i>Matematički pojam, Matematika i škola</i> , Vol.3, n11, pp. 8-16.	KURNIK, Z. (2001), <i>Matematički pojam, Matematika i škola</i> , Vol.3, n11,

		mathematics.	class)formal examination and MCQs.			pp. 8-16.
26	Lecture Discussion Method	After completing this topic students will be able to learn & practice about Lecture Discussion Method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
26	Examples Lecture Discussion Method	After completing this topic students will be able to learn & practice about Lecture Discussion Method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer and solving problems during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
27	Cooperative and Collaborative learning	After completing this topic students will be able to learn & practice about Cooperative and Collaborative learning as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
27	Examples Cooperative and Collaborative learning	After completing this topic students will be able to learn & practice about Cooperative and Collaborative learning as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133

28	Jigsaw method	After completing this topic students will be able to learn & practice about Jigsaw method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
28	Examples Jigsaw method	After completing this topic students will be able to learn & practice about Jigsaw method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
29	Think pair share method	After completing this topic students will be able to learn & practice about Think pair share method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
29	Examples Think pair share method	After completing this topic students will be able to learn & practice about Think pair share method as one of the effective teaching strategies for mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
30	Time Distribution in mathematics	After completing this topic students will be able to understand about time distribution in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133

30	Illustrations	After completing this topic students will be able understand about time distribution in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006 – <i>Curriculum Development Teams</i>	National Curriculum for Mathematics 2006-Teaching strategies page no.133
31	Assessment in Mathematics	After completing this topic, student will be able to understand assessment in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Rowntree, D. (1990) <i>Teaching through Self-Instruction (Second Ed)</i> , London: Kogan Page.	National Curriculum for Mathematics 2006-Teaching strategies page no.137
32	Focus of Assessment in Mathematics	After completing this topic, student will be able to understand the focus / scope of assessment in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006-Teaching strategies	National Curriculum for Mathematics 2006-Teaching strategies page no.137
33	Types of Assessment in Mathematics	After completing this topic, student will be able to understand types of assessment in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006-Teaching strategies	National Curriculum for Mathematics 2006-Teaching strategies page no.138
34	Traditional Examination in mathematics	After completing this topic, student will be able to understand traditional examination as effective way of assessment in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006-Teaching strategies	National Curriculum for Mathematics 2006-Teaching strategies page no.138
35	Unit-wise Weightage in	After completing this topic, student will be able	Assessment will include theory covered in	5 minutes	National Curriculum for Mathematics	National Curriculum for

	Mathematics Assessment	to understand & learn about unit wise weightage in mathematics assessment.	lectures, Formative assessment (question answer during class)formal examination and MCQs.		2006-Teaching strategies	Mathematics 2006-Teaching strategies page no.139 to144
35	Illustrations	After completing this topic, student will be able to understand & learn /practice about unit wise weightage in mathematics assessment by taking examples of elementary & Secondary class assessments.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	National Curriculum for Mathematics 2006-Teaching strategies	National Curriculum for Mathematics 2006-Teaching strategies page no.139 to144
36	Lesson Planning.	After completing this topic, student will be able to understand and learn about lesson planning .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes		
37	Steps of lesson Planning	After completing this topic, student will be able to understand and learn about steps involved in lesson planning .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes		
38	Some Model Lesson Plans (10 Lesson Plans Teaching of Sets,algebraic	After completing this topic, student will be able to understand and learn/ practice about developing lesson plan of various	Assessment will include theory covered in lectures, Formative assessment (question answer and written	50 minutes (5 minutes Each)		

	equations, geometry, trigonometry, matrices, statistics, prime numbers, LCM, HCF, Percentage etc.,)	topics in mathematics .	projects during class)formal examination and MCQs.			
39	Teaching Content (Lesson approach) Plan	After completing this topic, student will be able to understand and learn/practice about teaching various contents in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes		
40	Set Numbers and	After completing this topic, student will be able to understand and learn/practice about teaching Set and Numbers in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Punjab Text board 7 <sup>th</sup> class book of Mathematics Punjab Text board 8 <sup>th</sup> class book of Mathematics Punjab Text board 9 <sup>th</sup> class book of Mathematics	Punjab Text board 7 <sup>th</sup> class book of Mathematics Punjab Text board 8 <sup>th</sup> class book of Mathematics Punjab Text board 9 <sup>th</sup> class book of Mathematics
40	Examples-Set Numbers and	After completing this topic, student will be able to understand and learn/practice about teaching Set and Numbers in mathematics . Express a set in <ul style="list-style-type: none"> <li>• Descriptive form</li> <li>• Set builder form</li> <li>• Tabular form</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	60 (3 -4 Minutes for Each topic )	Punjab Text board 7 <sup>th</sup> class book of Mathematics Punjab Text board 8 <sup>th</sup> class book of Mathematics Punjab Text board 9 <sup>th</sup> class book of Mathematics	Punjab Text board 7 <sup>th</sup> class book of Mathematics Punjab Text board 8 <sup>th</sup> class book of Mathematics Punjab Text board 9 <sup>th</sup> class book of Mathematics

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|--|--|---|--|--|--|--|
|  |  | <ul style="list-style-type: none"><li>• Define union intersection and difference of two sets</li><li>• Find; Union of two or more sets</li><li>• Difference of two sets</li><li>• Intersection of two or more sets</li><li>• Define and identify disjoint and overlapping set</li><li>• Define a universal set and complements of a set</li><li>• Verify different properties involving union of sets, intersection of sets, difference of set, e.g. <math>A \cap A^c = \emptyset</math></li><li>• Represents through Venn diagrams.</li><li>• Perform operations of union, intersection, difference and compliments on two sets A and B.</li><li>• Define rational number as a number that can be expressed in the form of <math>p/q</math>,</li></ul> |  |  |  |  |
|--|--|---|--|--|--|--|

		<p>where p and q are integers and <math>q \neq 0</math>.</p> <ul style="list-style-type: none"> <li>• Represent rational numbers on number line.</li> <li>• Add and subtract a rational number.</li> <li>• Find additive inverse multiply divide multiplicative inverse reciprocal of non zero rational number.</li> </ul>				
41	Exponents and radicals: its properties.	<p>After completing this topic, student will be able to understand and learn/practice about teaching Exponents and radicals: its properties in mathematics .</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.43 TO 45
41	Examples Exponents and radicals: its properties.	<p>After completing this topic, student will be able to understand and learn/practice about teaching Exponents and radicals: its properties in mathematics .</p> <ul style="list-style-type: none"> <li>• Concepts of radicals</li> <li>• Base and exponents</li> <li>• Defference between radical form and exponent form</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	25 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.43 TO 45

		<ul style="list-style-type: none"> <li>• Properties of radicals</li> <li>• Applications of laws of exponents.</li> </ul>				
42	Logarithm	After completing this topic, student will be able to understand and learn/practice about teaching Logarithm in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.57 TO 72
42	Examples Logarithm	<p>After completing this topic, student will be able to understand and learn/practice about teaching Logarithm in mathematics .</p> <ul style="list-style-type: none"> <li>• Express a number in standard form of scientific notation and vice versa</li> <li>• Define Logarithm of a number <math>y</math> to the base <math>a</math> as the power to which <math>a</math> must be raised to give the number.</li> <li>• Define a common logarithm characteristic and mantissa of log of a number.</li> <li>• Use tables to find the log of a number</li> <li>• Give concept of</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	45 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.57 TO 72

		<p>antilog and use tables to find the antilog of a number.</p> <ul style="list-style-type: none"> <li>• Laws of Logarithm</li> <li>• Application for solving problems.</li> </ul>				
43	Algebraic expressions	<p>After completing this topic, student will be able to understand and learn/practice about teaching Algebraic expressions in mathematics .</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.75
43	Examples Algebraic expressions	<p>After completing this topic, student will be able to understand and learn/practice about teaching Algebraic expressions in mathematics .</p> <ul style="list-style-type: none"> <li>• KNOW that a rational expression behave a rational number</li> <li>• Define a rational expression.</li> <li>• Examine wether a given algebraic expression is a</li> <li>• Polynomial or not,</li> <li>• Rational expression or not</li> <li>• Define p/q as a rational expression in its lowest term if p and q are polynomial.</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	45 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.75 to 87

		<ul style="list-style-type: none"> <li>• Reduce a given rational expression to its lowest term.</li> <li>• Find value of algebraic expression at some particular real number.</li> <li>• Examples</li> </ul>				
44	Factorization	After completing this topic, student will be able to understand and learn/practice about teaching Factorization in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.97
44	Examples Factorization	<p>After completing this topic, student will be able to understand and learn/practice about teaching Factorization in mathematics .</p> <ul style="list-style-type: none"> <li>• Recall factorization of expressions of the following types</li> <li>• <math>Ka+kb+kc</math></li> <li>• <math>ac+ad+bc+bd</math></li> <li>• <math>a^2+b^2</math></li> <li>• define zeros of a polynomial.</li> <li>• State and prove factor theorem</li> <li>• Use factor the rorem to factorize a cubic</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	35 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.97-105

		polynomial.				
45	Algebraic sentences	After completing this topic, student will be able to understand and learn/practice about teaching Algebraic sentences in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114
45	Examples of Algebraic sentences	<p>After completing this topic, student will be able to understand and learn/practice about teaching Algebraic sentences in mathematics .</p> <ul style="list-style-type: none"> <li>• Find H.C.F and L.C.M of algebraic expressions.</li> <li>• Use factor or devision method to determine H.C.F and L.C.F.</li> <li>• Know the relationship between L.C.F and H.C.F.</li> <li>• solve real life problems related to H.C.F and L.C.F.</li> <li>• Find square root of algebraic expression by factorization and division.</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	35 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114 to 126
46	Linear Equation	After completing this	Assessment will include	5 minutes	PUNJAB TEXT	PUNJAB TEXT

	and Inequalities <ul style="list-style-type: none"> <li>• Linear Equations</li> <li>• Equations involving absolute values</li> <li>• Linear Inequalities</li> <li>• Solving Linear Inequalities</li> </ul>	topic, student will be able to understand and learn/practice about teaching Algebraic sentences in mathematics .	theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.		BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114
46	Examples of Linear Equation and Inequalities	After completing this topic, student will be able to understand and learn/practice about teaching Algebraic sentences in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	45 (2-3 minutes for each type/topic/ concept)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114
47	Quadratic Equations	After completing this topic, student will be able to understand and learn/practice about teaching Quadratic Equations in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114
47	Examples of Quadratic Equations	After completing this topic, student will be able to understand and learn/practice about teaching Quadratic Equations in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	45 (2-3 minutes for each type/topic/ concept)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.114
48	Introduction to trigonometry	After completing this topic, student will be able to understand and learn/	Assessment will include theory covered in lectures, Formative	5 minutes	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS BOOK OF	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS BOOK OF

		practice about teaching Introduction to trigonometry in mathematics .	assessment (question answer during class)formal examination and MCQs.		MATHEMATICS 10 SCIENCE GROUP	MATHEMATICS 10 SCIENCE GROUP PAGE NO.145
48	Examples Introduction to trigonometry	<p>After completing this topic, student will be able to understand and learn/ practice about teaching Introduction to trigonometry in mathematics .</p> <ul style="list-style-type: none"> <li>• Measure and angle in degree.minute and seconds</li> <li>• Convert an angle given in degree minute and second in to decimal form and vice versa.</li> <li>• Define a radian and relationship between radian and degree.</li> <li>• Prove that the area of sector of a circle is <math>\frac{1}{2} r^2\theta</math>.</li> <li>• Recognize quadrants and quadrental angles.</li> <li>• Find the value of trignomatic ratios for <math>45^\circ</math>, <math>30^\circ</math>, <math>60^\circ</math></li> <li>• Find angle of elevation and depression.</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	45 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	<p>PUNJAB TEXT BOOK 10<sup>TH</sup> CLASS BOOK OF MATHEMATICS 10</p> <p>SCIENCE GROUP PAGE NO.145 to 165</p>

49	Laws of exponents and radicals:	After completing this topic, student will be able to understand and learn/practice about teaching Laws of exponents and radicals in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.43
49	Examples of Laws of exponents and radicals:	<p>After completing this topic, student will be able to understand and learn/practice about teaching Laws of exponents and radicals in mathematics .</p> <ul style="list-style-type: none"> <li>• Concepts of radicals</li> <li>• Base and exponents</li> <li>• Defference between radical form and exponent form</li> <li>• Properties of radicals</li> <li>• Applications of laws of exponents.</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	25 (5 minutes Each)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP PAGE NO.43 TO 45
50	Matrices:	After completing this topic, student will be able to understand and learn/practice about teaching Matrices in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP
50	Examples of Matrices:	After completing this topic, student will be able to understand and learn/practice about teaching Matrices in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during	50 (2-3 minutes for each topic/concept)	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE GROUP	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 9 SCIENCE

		<p>Matrix</p> <ul style="list-style-type: none"> <li>• Rows &amp; columns of matrix</li> <li>• Order of matrix</li> <li>• Equal matrix</li> </ul> <p>Types of Matrix</p> <ul style="list-style-type: none"> <li>• Row Matrix</li> <li>• Column Matrix</li> <li>• Rectangular matrix</li> <li>• Square Matrix</li> <li>• Null or Zero Matrix</li> <li>• Transpose of Matrix</li> <li>• Negative of Matrix</li> <li>• Symetric Matrix</li> <li>• Skew-symetric Matrix</li> <li>• Diagonal Matrix</li> <li>• Scalar Matrix</li> <li>• Identity Matrix</li> <li>• Addition of matrices.</li> <li>• Subtraction of matrices.</li> <li>• Multiplication of Matrices by real numbers.</li> </ul>	class)formal examination and MCQs.			GROUP PAGE NO.1 to 16
51	Formulas and factors	After completing this topic, student will be able to understand and learn/practice about teaching Formulas and factors in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.25 TO 37.
51	Examples Formulas and factors	After completing this topic, student will be able to understand and learn/practice about teaching Formulas and factors in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal	35 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.25 TO 37.

		<ul style="list-style-type: none"> <li>• Define factor as a number which divides the dividend completely leaving zero remainder.</li> <li>• Define a multiple as a dividend into which a factor can divide</li> <li>• Know that 1 is a factor of every number.</li> <li>• Know that 2 is the only prime number whereas all other prime numbers are odd</li> <li>• Recognize index notation.</li> <li>• Factorize a given number and express its factors in the index notation.</li> </ul>	examination and MCQs.			
52	Elements of statistics	After completing this topic, student will be able to understand and learn/practice about teaching Elements of statistics in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS OF MATHEMATICS SCIENCE	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE GROUP PAGE NO.
52	Examples of Elements of statistics	After completing this topic, student will be able to understand and learn/practice about teaching Elements of statistics in	Assessment will include theory covered in lectures, Formative assessment (question answer during	35 minutes	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS OF MATHEMATICS SCIENCE GROUP	PUNJAB TEXT BOOK 10 <sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE

		<p>mathematics .</p> <ul style="list-style-type: none"> <li>• Construct group frequency table.</li> <li>• Construct histogram with equal and equal class intervals.</li> <li>• Construct a frequency polygon.</li> <li>• Construct a cumulative frequency table.</li> <li>• Calculate median,mode,geometric mean, harmonic mean.</li> <li>• Recognize properties of arithmetic mean.</li> <li>• Measure range,variance and standard deviation.</li> </ul>	class)formal examination and MCQs.			GROUP NO.	PAGE
53	Application of ratio and proportion.	After completing this topic, student will be able to understand and learn/practice about teaching Application of ratio and proportion in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PAGE NO.65 to 70
53	Examples Application of ratio and proportion.	After completing this topic, student will be able to understand and learn/practice about teaching Application of ratio and proportion in	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal	35 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PAGE NO.65 to 70

		<p>mathematics .</p> <ul style="list-style-type: none"> <li>• define ratio as a relation which one quality bears to another quantity of the same kind with regard to their magnitudes.</li> <li>• Know that of the two quantities forming a ratio, the first one is called antecedent and the second one consequent.</li> <li>• Know the ratio has no unit.</li> <li>• Calculate ratio of two numbers.</li> <li>• Reduce given ratio into lowest form.</li> <li>• Find proportion direct and inverse.</li> <li>• Solve real life problems involving direct and inverse proportion.</li> <li>•</li> </ul>	examination and MCQs.			
55	Application of percentage:	After completing this topic, student will be able to understand and learn/practice about teaching Application of percentage in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.65 to 74-85
55	Examples Application of	After completing this topic, student will be able	Assessment will include theory covered in	25 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS

	percentage:	to understand and learn/practice about teaching Application of percentage in mathematics .	lectures, Formative assessment (question answer during class)formal examination and MCQs.		BOOK OF MATHEMATICS	BOOK OF MATHEMATICS PAGE NO.65 to 74-85
56	Computation in system with bases 2 and 5.	After completing this topic, student will be able to understand and learn/practice about teaching Computation in system with bases 2 and 5. in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 8 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 8 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.65 to 37-50
56	Examples Computation in system with bases 2 and 5.	After completing this topic, student will be able to understand and learn/practice about teaching Computation in system with bases 2 and 5. in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	35 minutes	PUNJAB TEXT BOOK 8 <sup>TH</sup> CLASS OF MATHEMATICS	PUNJAB TEXT BOOK 8 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.65 to 37-50
57	Factors and multiples	After completing this topic, student will be able to understand and learn/practice about teaching Factors and multiples in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	Factorize (rectangle applet): <a href="http://tinyurl.com/Rrectangle-Factors">http://tinyurl.com/Rrectangle-Factors</a> Factor game (an inductive approach) (Math Solutions): <a href="http://tinyurl.com/Factor-">http://tinyurl.com/Factor-</a>	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE 25 to 44 PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS OF MATHEMATICS PAGE NO.74 to 93
57	Examples Factors and multiples	After completing this topic, student will be able to understand and learn/practice about teaching Factors and multiples in mathematics . • Divisibility rules	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	35 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE 25 to 44 PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS OF MATHEMATICS PAGE 25 to 44 PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS

		<ul style="list-style-type: none"> <li>• Prime and composite numbers</li> <li>• Multiples</li> <li>• Factors</li> <li>• Prime factorization.</li> <li>• Division method</li> <li>• Finding LCM using prime factorization.</li> <li>• Common factors and highest common factors</li> </ul>			BOOK OF MATHEMATICS PAGE NO.74 to 93	BOOK OF MATHEMATICS PAGE NO.74 to 93
58	Division of whole numbers	After completing this topic, student will be able to understand and learn/practice about teaching Division of whole numbers in mathematics.	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	<ul style="list-style-type: none"> <li>•'Planning a Math Unit: Launch-Explore-Summarize Teaching Model':</li> <li>•Division as repeated subtraction (compared to multiplication as repeated addition):</li> <li>•Divisibility rules lesson:</li> <li>•'Multiplication and Division Word Problems':</li> </ul> PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS BOOK OF MATHEMATICS	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE NO.14 to 22
58	Examples of Division of whole numbers	After completing this topic, student will be able to understand and learn/	Assessment will include theory covered in lectures, Formative	35 minutes	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS BOOK OF	PUNJAB TEXT BOOK 6 <sup>TH</sup> CLASS BOOK OF

		<p>practice about teaching Division of whole numbers in mathematics.</p> <ul style="list-style-type: none"> <li>• Differentiate between natural and whole numbers.</li> <li>• Identify natural and whole numbers.</li> <li>• Add and subtract two given whole numbers</li> <li>• Multiply and divide two given whole numbers.</li> <li>• Recognize 1 as multiplicative identity.</li> <li>• Verify law of multiplication over addition.</li> <li>• Verify distributive law of multiplication over subtraction.</li> </ul>	<p>assessment (question answer during class) formal examination and MCQs.</p>		MATHEMATICS	MATHEMATICS PAGE NO.14 to 22
59	Prime factorization	<p>After completing this topic, student will be able to understand and learn/ practice about teaching Prime factorisation in mathematics .</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class) formal examination and MCQs.</p>	5 minutes	PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS OF MATHEMATICS 5	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS OF MATHEMATICS PAGE 18-27
59	Examples Prime factorization	<p>After completing this topic, student will be able to understand and learn/ practice about teaching</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question</p>	35 minutes	PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS OF MATHEMATICS 5	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS OF MATHEMATICS

		<p>Prime factorisation in mathematics .</p> <ul style="list-style-type: none"> <li>Recall factorization of vexpressions of the following types</li> <li><math>Ka+kb+kc</math></li> <li><math>ac+ad+bc+bd</math></li> <li><math>a^2+b^2</math></li> <li>define zeros of a polynomial.</li> <li>State and prove factor theorem</li> </ul> <p>Use factor theroem to factorize a cubic polynomial.</p>	answer during class)formal examination and MCQs.			PAGE 18-27
60	Greatest common factor	After completing this topic, student will be able to understand and learn/practice about teaching Greatest common factor in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5	PUNJAB TEXT BOOK 9 <sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE 18-27
60	Examples Greatest common factor	After completing this topic, student will be able to understand and learn/practice about teaching Greatest common factor in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	35 minutes	PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5	PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE 18-27
61	Operations with fractions	After completing this topic, student will be able to understand and learn/practice about teaching Operations with fractions in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal	5 minutes	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 4 PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 4 PUNJAB TEXT

			examination and MCQs.		BOOK OF MATHEMATICS 5	BOOK 5 <sup>TH</sup> CLASS OF MATHEMATICS PAGE 18-27
61	Examples Operations with fractions	<p>After completing this topic, student will be able to understand and learn/practice about teaching Operations with fractions in mathematics .</p> <ul style="list-style-type: none"> <li>• Understanding fractions</li> <li>• Like and unlike fractions</li> <li>• Comparing like fractions</li> <li>• Ordering like fractions</li> <li>• Addition and subtraction like fraction</li> <li>• Multiplying whole number with fractions</li> <li>• Equilent fractions</li> <li>• Comparing unlike fractions</li> <li>• Addition and subtraction of unlike fractions</li> <li>• Improper and mixed fractions</li> <li>•</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	35 minutes	<p>PUNJAB TEXT BOOK 4<sup>TH</sup> CLASS OF MATHEMATICS 4</p> <p>PUNJAB TEXT BOOK 5<sup>TH</sup> CLASS OF MATHEMATICS 5</p>	<p>PUNJAB TEXT BOOK 4<sup>TH</sup> CLASS OF MATHEMATICS 4</p> <p>PUNJAB TEXT BOOK 5<sup>TH</sup> CLASS OF MATHEMATICS 5</p> <p>Pages 95 to 126</p>
62	Least common multiple	After completing this topic, student will be able to understand and learn/	Assessment will include theory covered in lectures, Formative	5 minutes	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS OF	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS OF

		practice about teaching Least common multiple in mathematics .	assessment (question answer during class)formal examination and MCQs.		MATHEMATICS 4 PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5	MATHEMATICS 4 PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5 Pages 95 to 126
62	Examples Least common multiple	After completing this topic, student will be able to understand and learn/ practice about teaching Least common multiple in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	25 minutes	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 4 PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5	PUNJAB TEXT BOOK 4 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 4 PUNJAB TEXT BOOK 5 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 5 Pages 95 to 126
63	decimals,	After completing this topic, student will be able to understand and learn/ practice about teaching decimals, in mathematics .	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	5 minutes	PUNJAB TEXT BOOK 7 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 7	PUNJAB TEXT BOOK 7 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 7 : page 37 to 45
63	Examples decimals,	After completing this topic, student will be able to understand and learn/ practice about teaching decimals, in mathematics . <ul style="list-style-type: none"> <li>• Convert decimals to rational numbrs.</li> <li>• Define terminating decimals as decimals having a finite number of digits after the</li> </ul>	Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.	25 minutes	PUNJAB TEXT BOOK 7 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 7	PUNJAB TEXT BOOK 7 <sup>TH</sup> CLASS BOOK OF MATHEMATICS 7 : page 37 to 45

		<p>decimal point.</p> <ul style="list-style-type: none"> <li>• Get an approximate value of a number called rounding off to a desired number of decimal places</li> </ul>				
64	Simultaneous linear equations	<p>After completing this topic, student will be able to understand and learn/practice about teaching simultaneous linear equations in mathematics .</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	5 minutes		
64	Examples simultaneous linear equations	<p>After completing this topic, student will be able to understand and learn/practice about teaching simultaneous linear equations in mathematics .</p> <ul style="list-style-type: none"> <li>• Define a linear equation in one variable.</li> <li>• Demonstrate different techniques to solve linear equation.</li> <li>• Solve real life problems involving linear equation.</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	25 minutes		<p>PUNJAB TEXT BOOK 7<sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE NO.117 to 123</p>
65	Volume and surface area	<p>After completing this topic, student will be able to understand and learn/practice about teaching Volume and surface area</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during</p>	5 minutes	<p>PUNJAB TEXT BOOK 7<sup>TH</sup> CLASS BOOK OF MATHEMATICS</p>	<p>PUNJAB TEXT BOOK 7<sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE NO.156 to</p>

		in mathematics .	class)formal examination and MCQs.			164
65	Examples Volume and surface area	<p>After completing this topic, student will be able to understand and learn/practice about teaching Volume and surface area in mathematics .</p> <ul style="list-style-type: none"> <li>• Find the circumference of a circle using formula</li> <li>• Find the area of circular region using formula</li> <li>• Find the surface area of a cylinder using formula</li> <li>• Find the volume of cylindrical region.</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	35 minutes	<p>PUNJAB TEXT BOOK 7<sup>TH</sup> CLASS BOOK OF MATHEMATICS Oxford University Press Syllabus D series.</p>	<p>PUNJAB TEXT BOOK 7<sup>TH</sup> CLASS BOOK OF MATHEMATICS PAGE NO.156 to 164</p>
66	Fundamentals of Geometry	<p>After completing this topic, student will be able to understand and learn/practice about teaching Fundamentals of Geometry in mathematics .</p>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class &amp; project/assignment)formal examination and MCQs.</p>	5 minutes	<p>PUNJAB TEXT BOOK 10<sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE</p>	<p>PUNJAB TEXT BOOK 10<sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE GROUP PAGE NO.</p>
66	Examples Fundamentals of Geometry	<p>After completing this topic, student will be able to understand and learn/practice about teaching Fundamentals concepts of Geometry in mathematics;</p> <ul style="list-style-type: none"> <li>• Line &amp; line segment</li> <li>• Angles &amp; types of</li> </ul>	<p>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</p>	60 minutes	<p>PUNJAB TEXT BOOK 10<sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE</p>	<p>PUNJAB TEXT BOOK 10<sup>TH</sup> CLASS BOOK OF MATHEMATICS SCIENCE GROUP PAGE NO.</p>

		<p>angles</p> <ul style="list-style-type: none"> <li>• Polygons-Triangles, parallelogram square &amp; rectangles and their types</li> <li>• Circles &amp; Practical geometry.</li> <li>• Principles &amp; Theorems</li> </ul>				
67	<p><b>Audio/video insertions, graphics, outdoor recordings, animations etc to enrich the learning experience of your students.</b></p>	<p><b>After completing this task, student will be able to understand and learn/ practice about teaching of mathematics at elementary level .</b></p>	<p><b>Assessment will include theory covered in lectures, Formative assessment (question answer during class)formal examination and MCQs.</b></p>	<b>60 minutes</b>		
<b>Total Video Minutes</b>						