

Credit Hours: 4

Teaching Hours: 128

Estimated Periods: 171 (Each of 45minutes)

Credit Distribution:

SN	Unit	Teaching Hours	Teaching Periods (Each of 45 Min)
1	Algebra	29	39
2	Trigonometry	30	40
3	Coordinate Geometry	18	24
4	Transformation	18	24
5	Vector	11	15
6	Statistics	10	13
7	Limit and Continuity	12	16
	Total	128	171

Specification Chart, 2080 (Opt. Mathematics)

(बाह्य मूल्याङ्कनका लागि)

(For External Examination)

पूर्णाङ्क : 75

समय : 3 hour

SN	Contents	Knowle dge	Underst anding	Applica tion	Higher Ability	Total	Total Marks
		each of 1 marks	each of 2 marks	each of 3 marks	each of 4 marks		
1.	बीजगणित (Algebra)	2	2	2	1	7	16
2.	सीमान्त मान र निरन्तरता (Limit and continuity)	1		1		2	4
3.	मेट्रिक्स (Matrix)	1	1	1		3	6
4.	निर्देशाङ्क ज्यामिति (Co-ordinate Geometry)	2	1	1	1	5	11
5.	त्रिकोणमिति (Trigonometry)	2	2	3		7	15
6.	भेक्टर (vector)	1	1		1	3	7
7.	स्थानान्तरण (Transformation)	1		1	1	3	8
8.	तथ्याङ्क शास्त्र (Statistics)		1	2		3	8
	जम्मा प्रश्न सङ्ख्या (Total questions)	10	8	11	4	33	75
	अङ्कभार (Weight)	10	16	33	16	75	

आन्तरिक मूल्याङ्कनका लागि

आन्तरिक मूल्याङ्कनका लागि आन्तरिक मूल्याङ्कनका लागि मूल्याङ्कनका आधारहरू निम्नानुसार रहेका छन् :

क्र.स.	आन्तरिक मूल्याङ्कनका आधारहरू	अङ्कभार
१.	सहभागिता (उपस्थिति र सिकाइ क्रियाकलापमा सक्रियता र सहभागिता)	३
२.	प्रयोगात्मक तथा परियोजना कार्य	१६
३.	त्रैमासिक परीक्षा	६
	जम्मा	२५

नोट : विद्यार्थीको आन्तरिक मूल्याङ्कन गर्दा अनिवार्य गणित विषयमा प्रयोग गरिने आन्तरिक मूल्याङ्कनका साधन नै प्रयोग गर्नुपर्ने छ ।

First Terminal Examination**Opt. I Mathematics**

Units	Topics	per iods	Teaching Materials	Teaching Methods	Evaluation Procedure	Rem arks
Algebra	Order Pair	2	Formula chart, Graph board and paper	Demonstratio n Explanation Problem solving	Class test Unit test Assignment	
	Cartesian product	2				
	Relation types, and representation of relation (Domain, Range, Inverse Relation)	4				
	Functions (Types, Domain, Co-domain, Range, Problems on functions)	7				
Matrix	Types of Matrices	2	Data sheet, mark sheet Bivariate frequency table	Discussion Application Problem solving	Class test Unit test Assignment	
	Operation of Matrices and the Properties on it.	5				
	Multiplication of Matrix with Scalar	2				
Coordinate	Locus and Its Graphical Presentation (Straight line, Perpendicular Bisector and Circular Locus)	4	Geo board GeoGebra app	Discussion, Demonstratio n, Problem solving	Class test Unit test Assignment	
Trigonometry	Measurement of Angle	1	Different triangular structure, Protractor Circular shape	Formula derivation Demonstratio n, solving Real life problems, Problem solving	Class test Unit test Assignment Project work	
	Sexagesimal, Centesimal and Radian Measure	6				
	Relation between Central angle and its corresponding arc	6				
Statistics	Quartiles, Percentiles	3	Primary/ Secondary data	Analysis of data	Class test Unit test Assignment	
	Quartile deviation	2				
	Five Numbers Summary and Whisker-Box Plot	2				
Total		48				

SYLLABUS:**O. I Mathematics****Grade: 9****Mid Terminal Examination****Opt I Mathematics**

Units	Topics	per iods	Teaching Materials	Teaching Methods	Evaluation Procedure	Rem Arks
Algebra	Polynomials (Roots, Division of Polynomials by Synthetic division)	4	Formula chart, Graph board and paper	Demonstration Explanation Problem solving	Class test Unit test Assignment	Formula chart, Graph board and paper
Trigonometry	Trigonometric ratio	6	Formula chart,	Demonstration Explanation, Problem solving	Class test Unit test Assignment	
	Trigonometric Identities	8				
	Conversion of trigonometric ratio	3				
Coordinate						
	Section Formula, Mid- Point Formula	5				
Transformation	Introduction, Types, Uses in Daily Life	1	Graph paper, geometrical instruments, GeoGebra Formula chart	Demonstration, Practice, Problem solving	Class test Unit test Assignment Project work	
	Reflection on the lines $x=y$, $x=-y$, $x=a$, $y=b$	8				
Statistics	MD	3	Primary and Secondary data	Collection and analysis of data Problem solving	Class test Unit test Assignment Project work	
	SD	3				
Total		41				

Second Term Examination**Opt I Mathematics**

Units	Topics	per iods	Teaching Materials	Teaching Methods	Evaluation Procedure	Rem arks
Algebra	Graph of the function $y = x^n, n = 1, 2, 3$	3				
Limit and Continuity	Concept of infinity and indeterminate form	2	Graph, Geo board GeoGebra,	Analysis, Demonstration, Estimation Problem solving	Class test Unit test Assignment	
	Concept of Limit	2				
	Notation of Limit	1				
	Limiting Value and Functional Value	2				
	Finding Limits of Algebraic Functions	9				
Coordinate Geometry-	X-Intercept, Y- Intercept, Slope	3	Graph, Geo board GeoGebra,	Demonstration, Experiment Problem solving	Class test Unit test Assignment Project work	
	Equation of the lines of the Form $x=a$, $y=b$					
	Slope-intercept form	2				
	Double Intercept Form	3				
	Normal Form	3				
Transformation	Rotation about $90^\circ, 180^\circ, 270^\circ$ about the centers (0,0) and (a, b)	7	Graph paper, geometrical instruments, GeoGebra Formula chart	Demonstration, Practice, Problem solving	Class test Unit test Assignment Project work	
	Enlargement & Reduction	8				

SYLLABUS:**O. I Mathematics****Grade: 9**

Total		45				
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Annual Examination**Opt I Mathematics**

Units	Topics	per iods	Teaching Materials	Teaching Methods	Evaluation Procedure	Rem arks
Algebra	Equation, Inequality and Graph	4	Graph, Chart, Board	Explanation, Problem solving, Problem formulation	Class test Unit test Assignment	
	Number System, Surds, Interval Notation of Real Numbers	4				
Co-ordinate Geometry	General Equation of Straight Line	2	Graph, Geo board geogebra	Demonstration Problem solving	Class test Unit test Assignment	
	Conversion of General Equation into Standard Forms	3				
Trigonometry	Standard angle	4	Angle value table, Formula chart	Explanation Problem solving	Class test Unit test Assignment	
	Allied angle	6				
Vector	Types of Vector	2	Graph Geogebra	Demonstration Concept building, Problem solving	Class test Unit test Assignment Project work	
	Vector and Scalar	1				
	Vectors in Coordinate and Graph	2				
	Laws of vector addition	2				
	Operation of vectors	4				
	Magnitude and direction of Vector, unit vector	4				
Total		38				