

**Time: 3 hrs**

Notes: Figures within brackets to indicate the number of questions and figures outside the brackets to indicate marks.
Denotes that marks have been combined to form one question.

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Summary Sheet for Mathematics

S. No.	Abilities	Standard for Basic & Proficient Level	Question Number	No. of items
1	Awareness	50%	1,22,31,24,33,6,8,27,26,29,28,35,36,30	14
2	Sensitivity	25%	14,15,23,3,25,7,9,18,11,10,12,21	12
3	Creativity	25%	4,5,32,16,17,19,20,13,34,2	10

Nature of Questions	Standard for Basic, Proficient & Advance	No. of Items	Marks
Long Answer (LA)	25%	6	4
Short Answer (SA)	30%	9	2
Very Short Answer (VSA)	20%	8	3
Objective (O)	25%	13	13

Competencies Covered: Mathematics

S. No.	Competency Code	Competency Details	Question Number	No. of items
1	C-1.1	Develops understanding of numbers, including the set of real numbers and its properties	1,22,14	3
2	C-2.1	Extends the understanding of powers (radical powers) and exponents		
3	C-3.1	States and motivates/proves remainder theorem, factor theorem, and division algorithm		
4	C-3.2	Models and solves contextualised problems using equations (e.g., simultaneous linear equations in two variables or single polynomial equations) and draws conclusions about a situation being modelled	2,31,23,14,15,22	6
5	C-3.3	Learns Brahmagupta's quadratic formula (in both symbolic and poetic form) and its derivation, and uses it to solve some of the poetic puzzles of Bhaskara as well as modern-day problems	24,3,4	3



S. No.	Competency Code	Competency Details	Question Number	No. of items
6	C-4.1	Describes relationships including congruence of two-dimensional geometric shapes (such as lines, angles, triangles) to make and test conjectures and solve problems	33,25,16	3
7	C-4.2	Proves theorems using Euclid's axioms and postulates for triangles and quadrilaterals, and applies them to solve geometric problems		
8	C-4.3	Proves theorems about the geometry of a circle, including its chords, subtended angles, inscribed polygons, and area in terms of π		
9	C-4.4	Understands the irrationality of π , the best approximations to π discovered over human history, and the first exact formula (infinite series) for π given by Madhava		
10	C-4.5	Specifies locations and describes spatial relationships using coordinate geometry, e.g., plotting a pair of linear equations and graphically finding the solution, or finding the area of triangle with given coordinates as vertices	6,7,17	3
11	C-4.6	Understands the definitions of the basic trigonometric functions, their history and motivation (including the introduction of the sin and cos functions by Aryabhata using chords), and their utility across the sciences	8,26,18,9,19,34	6
12	C-5.1	Visualises, represents, and calculates the area of a triangle using Heron's formula and its generalisation to cyclic quadrilaterals given by Brahmagupta's formula		
13	C-5.2	Visualises and uses mathematical thinking to discover formulae to calculate surface areas and volumes of solid objects (cubes, cuboids, spheres, hemispheres, right circular cylinders or cones, and their combinations)	29,35,11,20	4
14	C-6.1	Applies measures of central tendencies such as mean, median, and mode	36,12,21	3
15	C-6.2	Applies concepts from probability to solve problems on the likelihood of everyday events	30,13	2
16	C-7.1	Proves mathematical statements and carries out geometric constructions using stated assumptions, axioms, postulates, definitions, and mathematics vocabulary		
17	C-7.2	Visualises and appreciates geometric proofs for algebraic identities and other 'proofs without words'		
18	C-7.3	Proves theorems using Euclid's axioms and postulates – for angles, triangles, quadrilaterals, circles, area related theorems for triangles and parallelograms	27,28,10	3
19	C-7.4	Constructs different geometrical shapes like bisectors of line segments, angles and their bisectors, triangles, and other polygons, satisfying given constraints		



S. No.	Competency Code	Competency Details	Question Number	No. of items
20	C-8.1	Models daily-life phenomena and uses representations such as graphs, tables, and equations to draw conclusions		
21	C-8.2	Uses two-dimensional representations of three dimensional objects to visualise and solve problems such as those involving surface area and volume		
22	C-8.3	Employs optimisation strategies to maximise desired quantities (such as area, volume, or other output) under given constraints		
23	C-9.1	Decomposes a problem into sub problems		
24	C-9.2	Describes and analyses a sequence of instructions being followed		
25	C-9.3	Analyses similarities and differences among problems to make one solution or procedure work for multiple problems		
26	C-9.4	Engages in algorithmic problem solving to design such solutions	32,5	2
27	C-10.1	Recognises the important contributions made by mathematicians (Indian and others) in the field of Mathematics (such as the evolution of numbers, geometry, algebra)		
28	C-10.2	Recognises modern contributions to Mathematics made in both India and abroad, and understands the next frontiers and next major open questions in the field of Mathematics		
29	C-11.1	Applies mathematical knowledge and tools to analyse problems or situations in multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports		