नेपाल सरकार
शिक्षक सेवा आयोग
माध्यमिक शिक्षकको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम, २०७५

खण्ड (ख) : विषय - गणित अङ्क : ६०

1. Algebra, Calculus and Number Theory

1.1 Fundamentals of abstract concepts, theorems and problems: Groups, rings and fields, matrices and applications.

1.2 Fundamentals of calculus: Functions, continuity, limits, derivatives and anti-derivatives.

1.3 Composite numbers, Goldbach's conjecture, greatest common divisor.

1.4 Euclidean algorithms, fundamental theorem of arithmetic, least common multiple.

2. Graph Theory and Topology

2. 1 Graph Theory: Introduction, historical development of graph theory, Applications of graph theory, concepts basic to graph theory, degree of vertices.

2.2 Trees: Trees and their properties.

2.3 Topology: Topology and geometry, Koenisberg bridge problem, topological surface.

3. Numeration System, Symbolic Logic and Linear Programming

3.1 Numeration system: Historical development of numeration system, Babylonian, Mayan, Egyptians, Greek, Chinese-Japanese, Roman and Hindu-Arabic numeration system, characteristics of different numeration systems and bases other than ten.

3.2 Symbolic logic: Logical connectives, algebra of propositions.

3.3. Linear Programming: Introduction, Solution of linear programming Problem: Graphical method and simplex method.

4. Descriptive Statistics

4.1 Measures of Central Tendency: Mean, weighted mean, combined mean, Median and mode, geometric mean, harmonic mean, properties, use and Relations among them.

4.2 Measures of dispersion: Range, inter-quartile range, mean deviation and Standard deviation, its properties, use, comparison and relations among them. Coefficient of variation, Z-score.

5. Inferential Statistics

5.1 Design of sample survey, basic method of sampling.

5.2 Probability: Sample space and event, definition, principle of counting, Laws of probability, Bayes's Theorem and its properties.

5.3 Random variable: Random and continuous, random variable discrete and Continuous random variable and probability distribution.

5.4 Discrete probability distribution: Uniform distribution, Poisson distribution, binomial distribution.

6. Euclidean Geometry

6.1 Introduction Euclidean geometry and it's Elements.

6.2 Foundations of Euclidean geometry and its foundation properties.

6.3 Axioms of incidence geometries, Hilbert axioms for Euclidean geometry, Birkhff's model for Euclidean geometry.

6.4 SMSG postulate for Euclidean Geometry.

6.5 Congruence, Parallelism, The Sachheri Legendre theorem, area and volume, similarity, convexity, circular and circular arcs.

7. Non-Euclidean Geometry

7.1 Euclid's fifth postulates, substitute for the fifth postulates, attempts to Prove the fifth postulate, discovery of non-Euclidean geometry.

7.2. Hyperbolic Geopmety: Hyperbolic parallel postulate, angle of parallelism, quadrilateral and triangles.

7.3. Elliptical Geometry: Models for elliptic parallel postulates, quadrilateral and triangles.

8. Transformation and Projective Geometry

8.1 Projective Geometry: Fundamental concepts. The real projective plane, projective properties.

8.2 Transformation geometry: Isometric transformations: Reflection, Translation, Half turn rotation.

8.3 Non-isometric transformation: Enlargement and reduction.

विषयगत परीक्षाको प्रश्न योजना (Specification Grid)

एकाइ	पाठ्यक्रमको क्षेत्र	विषयगत प्रश्न सङ्ख्या	अङ्क भार
१.	Algebra, Calculus and Number Theory	१० X १	१०
२.	Graph Theory and Topology		
३.	Numeration System, Symbolic Logic and Linear Programming	१० X १	१०
४.	Descriptive Statistics	१० X १	१०
५.	Inferential Statistics		
६.	Euclidean Geometry	१० X १	१०
७.	Non-Euclidean Geometry	१० X १	१०
८.	Transformation and Projective Geometry	१० X १	१०
	जम्मा	**१० X ६**	**६०**