

लोक सेवा आयोग
नेपाल शिक्षा सेवा, शिक्षा प्रशासन समूह, गणित उपसमूह, राजपत्राङ्कित तृतीय श्रेणी पदको खुला
प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

तृतीय पत्र (Paper III) : Technical Subject

Section A- 30 Marks

- 1. Introduction to Mathematics Education 10%**
 - 1.1 Development of mathematics
 - 1.2 Goals, nature and structure of mathematics
 - 1.3 Place of mathematics in school and utilitarian value of mathematics
 - 1.4 Growth of mathematics in ancient civilization (Babylonean, Egyptian, Greek, Chinese and Hindu)
 - 1.5 Practical mathematics and integrated approach
- 2. Learning theories and their implication in learning and teaching of mathematics 10%**
 - 2.1. Piaget's theory of intellectual development
 - 2.2. Bruner's theory of instruction
 - 2.3. Robert Gagne's theory
 - 2.4. Van Hiele's Model of learning
 - 2.5. Ausbell's theory
- 3. Study of secondary school mathematics curricula and Textbooks 10%**
 - 3.1. Curriculum structure
 - 3.2. Overview of primary/ lower secondary/ secondary school mathematics curriculum and textbooks of Nepal
 - 3.3. The need for change in curriculum
 - 3.4. The nature of change in curriculum
 - 3.5. The in-depth grade-wise study of secondary school textbooks
 - 3.5.1 Textbooks of compulsory mathematics
 - 3.5.2 Textbooks of optional mathematics
 - 3.5.3 Consistency of textbooks with reference to the curriculum
 - 3.5.4 Report on the analysis of textbooks
 - 3.6. Study of Secondary school mathematics curriculum of SAARC countries

Section B- 20 Marks

- 4. Instructional strategies 10%**
 - 4.1. Problems of instruction in mathematics
 - 4.1.1 Teaching for understanding
 - 4.1.2 Teaching for assimilation
 - 4.1.3 Teaching for transfer
 - 4.1.4 Teaching for permanence
 - 4.2. Methods of teaching mathematics
 - 4.2.1 Expository method
 - 4.2.2 Inductive and deductive methods
 - 4.2.3 Analytic and synthetic methods
 - 4.2.4 Discovery and guided discovery methods
 - 4.2.5 Problem solving method
- 5. Development of Instructional Materials in improving mathematics 10%**
 - 5.1. Types of teaching materials: - literature, audio-visual aids models, manipulative materials
 - 5.2. Collection and construction of teaching materials
 - 5.2.1 Collection of different journals, cassettes/ pamphlets/ articles/ related to secondary school math's teaching

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- 5.2.1 Construction of different materials such as charts, graphs, paper folding, models, geoboard, circle board, etc
- 5.3. Use/application of teaching materials
 - 5.3.1 Local resources and environment in mathematics teaching
 - 5.3.2 Black board Use of prepared and collected different materials
- 5.4. Evaluation of manipulative materials in secondary school math's classroom

Section C- 30 Marks

6. Planning classroom Instruction 10%

- 6.1. Needs of planning in instruction
- 6.2. Yearly, unit and daily lesson plans
- 6.3. Classroom management in math's teaching and principles of motivation
- 6.4. Strategies in planning for improving mathematics instruction

7. Evaluation in mathematics Education 10%

- 7.1 Assessment techniques
- 7.2 Planning of a test
- 7.3 Construction of test items (specification chart, marking scheme etc)
- 7.4 Construction of different test items
- 7.5 Analysis and reporting the test

8. Supervision and Training 10%

- 8.1 Supervision of mathematics instruction
 - 8.1.1 Needs of supervision
 - 8.1.2 Techniques of supervision in mathematics teaching
 - 8.1.3 Evaluation of teaching
- 8.2 Mathematics teachers training program in Nepal

Section D- 20 Marks

9. Teaching selected topic 10%

- 9.1 **Teaching Arithmetic** (sets, ratio and proportion and percentage, unitary method, profit and loss, simple and compound interest, commission and discount, home arithmetic, mensuration)
- 9.2 **Teaching Algebra** (algebraic expressions, equation and inequalities, linear equations and simple inequalities, quadratic equations and simple inequalities in two variables, relations and function, matrices, vectors)
- 9.3 **Teaching Geometry** (classification of polygons, similarity and congruency of two triangles and their applications, Parallelogram, area of triangles and quadric laterals, bearing and scale drawing, surface and volume of solids, coordinate, geometry, transformation geometry, reflection, rotation, translation, enlargement)
- 9.4 **Teaching Trigonometry** (trigonometric functions, values of trigonometric ratios, sine, cosine and tangent graphs, area of triangles using trigonometric ratios)
- 9.5 **Teaching Statistics** (graphical presentation of data, central tendencies, probability)
- 9.6 Linear Programming

10. Diagnostic and remedial Teaching 10%

- 10.1 Problems faced by students in learning mathematics
- 10.2 Remedial instruction
- 10.3 Counseling with parents/ guardians
- 10.4 Application and Understanding of basic mathematics in everyday life

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प्रथम चरणको लिखित परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र
लिइने **सामूहिक परीक्षण (Group Test)** को लागि

सामूहिक छलफल (Group Discussion)

यस प्रयोजनको लागि गरिने परीक्षण १० पूर्णाङ्क र ३० मिनेट अवधिको हुनेछ, जुन नेताविहिन सामूहिक छलफल (Leaderless Group Discussion) को रूपमा अवलम्बन गरिने छ। दिइएको प्रश्न वा Topic का विषयमा पालैपालोसँग निर्दिष्ट समयभित्र समूहबीच छलफल गर्दै प्रत्येक उम्मेदवारले व्यक्तिगत प्रस्तुति (Individual Presentation) गर्नु पर्नेछ। यस परीक्षणमा मूल्याङ्कनको लागि देहाय अनुसारको ३ जनाको समिति रहनेछ।

आयोगका अध्यक्ष वा सदस्य	-	अध्यक्ष
मनोविज्ञ	-	सदस्य
दक्ष/विज्ञ (१ जना)	-	सदस्य

सामूहिक छलफलमा दिइने नमुना प्रश्न वा Topic

उदाहरणको लागि - उर्जा संकट, गरीबी निवारण, स्वास्थ्य बीमा, खाद्य सुरक्षा, प्रतिभा पलायन जस्ता Topics मध्ये कुनै एक Topic मात्र दिइनेछ।