Detailed Syllabus for the post of LECTURER IN MATHEMATICS (Kerala General Education (DIET)) - Direct Recruitment and LECTURER IN MATHEMATICS (BY-TRANSFER) (Kerala General Education (DIET)) - By Transfer Recruitment

(Cat.Nos: 380/2022, 381/2022)

PART I - General Subject (50 Marks)

Module 1 : Community Engagement – Resources & Practices

Total: 10 Marks

Unit 1: <u>Community Resources</u>

Resources that enhance or facilitate the lives of people in a community - examples of community resources are factories, educational institutions, cinema halls, libraries, religious places, hospitals, community centers, parks, etc - make use of these resources in education as it develops a sense of value and belonging among students.

Unit 2: Community Engagement

Community Engagement in Education - and symbiotic relationship that exists between communities and Education Institutions - sustainable networks, partnerships, communication media, and activities - Linking formal learning and the local community

Unit 3: Forms of community engagement

Community-student engagement -Researching with the community, sharing knowledge with the community, Designing new curriculum and courses, Involving local practitioners as trainers, Social Innovation by students and the like

Unit 4: Practices for Community engagement

Engagement practices and activities - formal or informal - include building relationships through collaboration initiatives, community campaigns, <u>Community Survey</u>, <u>Community services</u>, <u>Excursions</u>, cooperatives, small businesses, consultation meetings &

conferences, sports events, cultural events, community development and community research projects.

Unit 5: Rural Community Development

Social, economic, political and cultural framework of the rural society - Rural Resilience -Rural Institutions Close to Community, Participatory Learning - Approaches and Methods, Community Project Proposals and Project Management, Community living camps, Engagement with - School, Street Committee, Health Centre, Panchayat, SHGs -Programmes

Module II : Syllabus for General Subject - ICT in Education

Total: 10 Marks

Unit 1: Potentials of ICT in Education

ICT as a means to connect with the world – Pedagogy and ICT – Potentials and Advantages of Approaches to ICT

Unit 2: ICT integration in Curriculum transaction

Computer based Curricular planning- ICT Based Model of Curriculum Transaction -Considerations for integrating ICT – Innovations in Curriculum Transaction

Unit 3: ICT and Internet Resources for Teaching and Learning

Resources – Access and Creation, resource mobilization – Web-based learning, Social Networking –Virtual learning Environment - Designing e-initiatives

Unit 4: ICT in Classrooms

Creating Personal learning environments - ICT integrated Inclusive education - Assistive and Adaptive technologies

Unit 5: ICT for Assessment and Evaluation

Purposes and Techniques of Evaluation, Scope of ICT for evaluation- Innovative Practices in Assessment & Evaluation

Module 3 : PERSPECTIVES OF EDUCATION (10 Marks)

PHILOSOPHICAL PSYCHOLOGICAL AND SOCIOLOGICAL PERSPECTIVES OF EDUCATION

Philosophical perspectives of Education

Role of education in philosophizing the issues of life –Metaphysics, Epistemology, Logic, Phenomenology, Aesthetics and Axiology. Critical appraisal of schools of philosophy in the context of Twenty First Century – aims, content, methods and ongoing changes.

Focus of education in the 21st century. Building perspectives on educational philosophies, Modern schools of Philosophy-Empiricism, Positivism, Relativism.- Post -structuralist views and eclectic views. Comparative study of philosophies and educational contributions of Indian and western thinkers

Psychological perspectives of education

Learning and development- Learner Characteristics and Learning styles with special reference to pre- primary, primary, secondary, higher secondary and adult learners Learning in twenty first century classrooms., Characteristics And types, Development – language development, emotional, moral, motor and identity development. Cognitive Functions-Thinking, Reasoning, Problem Solving and Meta-cognition, Personality- types characteristics and development

Intelligence-different types~ Multiple, Cultural, social and emotional, impact on learners. Mental Health-, Factors affecting Mental Health (parents, family environment, society, school practices) - Strategies for enhancing Mental health

Sociological perspectives of education

Education for social security, wellness and progress, sustenance and transformation in society. Determinants of social change in the context of globalization.-Constraints on social change in India with respect to caste, ethnicity, class, language, religion, gender, regionalism, political interest

Education and Secularism - Role of teacher in inculcating democracy and international values.- Pluralism – Role of education in creating unity in diversity- Nationalism and education.-Role of Education in addressing cultural lag, privatization, globalization and partnership in social progress – Current trends in social development and transformation of values in society.

Module 4 : Teaching aptitude (10 Marks)

Teaching aptitude.

- Teaching -characteristics, levels, phases and maxims
- teaching methods, techniques and strategies
- modern trends in professional development and ethics
- technology integration in education
- Research, evaluation and innovations in classroom teaching, -

Module 5 : Research Aptitude (10 Marks)

- Research Meaning, Characteristics and Types
- Steps to Research
- Methods of Research
- Aims of Educational Research
- Research Ethics
- Research paper, Article, Workshop, Seminar, Conference and Symposium
- Thesis writings its characteristics and Format

PART II

Module: I - Sets, Relations and Functions (10 Marks)

Basic set operations like union, intersection, subset, superset concepts, equality of sets, complements, disjoint sets, indexed family of sets and operations on such families, ordered pairs, relations on sets, cartesian products (finite case only), various types of relations (reflexive, symmetric, transitive, equivalence), partitions of sets; Functions: domain, codomain, range of functions, one-one, onto, bijective functions, image, preimage of functions, composing functions and the order of composition, inverse functions, cardinality of a set.

Module: II – Set of Numbers (10 Marks)

Set of Counting numbers, Whole numbers, Integers, Rational and Irrational numbers and Real numbers, Divisibility, Divisors of a given number, Greatest Common divisor, Different types of numbers: Prime and Composite numbers, Amicable numbers, Perfect numbers etc. Multiples and divisors, decimal numbers, recurring decimals and non-recurring decimals, squares and square roots Ratio, proportion, percent and the relation among them, Simplifying ratios to lowest terms, ratios of mixed numbers, Percent: Fractions - decimals - percent, converting between these three, relation with proportions, equations involving percent, increase and decrease in percent, finding simple and compound interests.

Module: III – Learning Geometry (10 Marks)

Plane figures, Different types of angles, triangles and quadrilaterals, Properties of triangles, properties of different quadrilaterals, Areas of different polygons, Different Solids like Prisms and Pyramids- total surface area, lateral surface area and Volume of these solids. Congruence and Similarity of geometrical shapes (special reference to triangles), Construction of different geometrical shapes-triangles & quadrilaterals.

Module: IV – Algebra & equations (10 marks)

Algebra as generalisation of Arithmetic, Simple equations and Quadratic equationsformation and solving, solving practical problems using algebra, formation of algebraic expressions, Exponents, Squares and square roots -using algebraic expressions, Law of exponents, Polynomials-concept, addition, subtraction, multiplication and division.

Module: V – Statistics and Probability (10 Marks)

Need and importance of Statistics in Research, Nature and types of educational data, Scales of measurement, Measures of central tendency, dispersion and relative position- Concept, uses and computation. Graphical representation of data -histogram, Frequency Polygon, Frequency curve, Uses and interpretation of graphs, Representation of data using Pie Diagram, Pictograms and uses.

Concepts of Probability and Probability distribution, Normal Probability distribution, Characteristics and application of Normal curve, Concepts of Skewness and Kurtosis, Measures of Skewness and Kurtosis.

Measure of Relationship: Concept and types of correlation, Coefficient of correlation, Methods of computing Coefficient of correlation, Linear correlation, Multiple correlation and Partial correlation, Biserial, Point biserial, Tetra choric correlation and Phi coefficient of correlation, Uses and interpretation of correlation in educational research. Regression and Prediction -Concept and uses, Simple linear regression, Scatter plots, Regression equations and regression lines.

Statistical inference and Hypothesis testing – Meaning of statistical inference, Parametric and Non-Parametric tests, Parameter and Statistics, Sampling error and Standard error, Degrees of freedom, Estimation of parameters, Confidence intervals and Level of Significance, Null

hypotheses, Test of Significance, Directional and Non directional tests of significance, errors in making inferences.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.
